

UNIT 3

BASIC TROUBLESHOOTING

UNIT OUTCOME

Students will be able to:

- ☞ recognise basic idea in preventive maintenance;
- ☞ apply the knowledge gained in preventive maintenance to prolong the life of the computer;
- ☞ be aware of basic safety issues;
- ☞ recognise major hardware components inside the computer;
- ☞ acquire knowledge on how to format hard disk and install software.

3.1 BASICS OF PREVENTIVE MAINTENANCE

You have already studied about computers and their applications in Grades 9 and 10. Computers play an important role in our lives. Generally computers are built to be professional, reliable machines. A computer may hang; send error messages, or worse, no longer work at all. For computer users, troubleshooting problems can stop their work. If you know how to troubleshoot problems related to a computer, you can save hundreds or even thousands of Birrs.

● Environment and Location of a Computer

Computer is a very sensitive device and needs to be placed very carefully. Its physical environment and location requires some special arrangements, protections and precautions (see Fig. 3.1). These precautions and protections are not only necessary for computers but are equally important for computer users.



A Desktop Computer



A Laptop

Fig. 3.1: Proper environment and location are very important for any computer

In order to ensure trouble free, prolonged life and smooth working of any computer, you must take into consideration that dust-free environment and proper location are maintained for it. You must take care of the following:

- (i) Always place your computer in an open area that allows adequate airflow.
- (ii) Keep the computer in a cool, dry and dust-free environment.

- (iii) Keep level, stable floors and tables.
- (iv) Arrange ergonomic furniture.
- (v) Keep precautionary fire prevention equipment.
- (vi) Must have static electricity.
- (vii) Keep the computer safe from vibrations.



Useful Tip

Keep it Cool

Do not restrict the airflow around your computer. Always avoid putting your computer in an area with a lot of dust and do not stack papers, books or other items on or around your computer.

● Electric Power

Computers need electric power to work, but it can harm a PC or its data if it does not flow properly. The electricity available from a standard wall outlet is Alternating Current (AC), but a PC runs on Direct Current (DC). The power supply is a device that converts AC to DC to run the computer. The on/off switch in your computer turns on or shuts off the electricity to the power supply.

Your computer needs good power to run properly, but various factors can take what should be a steady stream of electricity from the wall socket and turn it into a trickle or a fire hose. It is important that you know how to protect your computing environment from electrical power sags and power losses, power spikes, lightning strikes, and electromagnetic interference.

Let us understand some of the causes of power problems.

A *brownout* occurs when the supply of electricity drops dramatically but does not go out completely. During a brownout, you will notice lights flickering or growing dim. When the power rises back up to its original level, your computer might not be able to handle the drastic change and damage may occur.

Blackouts occur when power goes out completely. The danger of a blackout is twofold. First, you may have data loss or corruption when the power goes out. Second, your PC may receive electrical damage from the power surge when the electricity comes back on.

Power spikes or *power surges* occur when the voltage on your power line rises suddenly to above-normal levels. Power spikes are extremely dangerous and can destroy PCs, monitors, and any other component plugged into the affected power line.

Lightning storms are an underrated hazard. Using a computer or even leaving it plugged in during a lightning storm is asking for trouble. Keep in mind that no accessory can completely protect your PC from the damage caused by a lightning strike.

All electrical equipment puts out a certain amount of electrical noise caused by the signal running through wires, cables, and circuits. *Electromagnetic interference* (EMI) occurs when two signals get too close together and the noise of one is picked up by the other. In computers and networking, this can cause problems, such as wavy screens or slow or corrupted data transfers. Long cable runs tend to pick up EMI, especially if a power cable is running alongside a data cable.

Instead of plugging your computer directly into the wall electrical outlet, it is a good idea to plug it into a power protection device such as surge protector, voltage regulator, UPS (Uninterruptible Power Supply).

● Backup Methods

Every computer user must backup the files stored in the computer. If you backup your files, you can restore files in the event of a hard disk crash. Backing up files represents a significant investment of time and effort. At the same time, all computer files are potentially easy to change or erase, either intentionally or by accident.

There are different methods for backing up data stored in files. Some of the best and most secure methods are:

- (i) **External hard drives:** External hard drives are the most reliable, simplest, and most affordable method of backup for computer users. They are gradually increasing in size and reliability, and many now come with software that can be used to backup your data regularly and perfectly.
- (ii) **Flash drives/USB thumb drives:** If you do not have a massive amount of data to backup, a portable flash drive is a great backup method. Flash media is extremely hard to break, very reliable, and modern thumb drives can hold upwards of three or four GB of information.
- (iii) **Remote data storage via the Internet:** Some companies offer services with small monthly fees for online data storage. The advantages to these services are of great importance; your data is encrypted, so it is kept very safe. Since it is not in your physical location, if there is any natural disaster, your files are still fine. If your data is extremely important and you want to keep it safe, remote data storage might be your preferred method of backup.
- (iv) **CD/DVD-ROMs:** These days, nearly every computer has a DVD-ROM drive that can write large amounts of information relatively quickly to either a DVD-R or CD-R disk. The disks themselves are relatively inexpensive, and they are a great form of data backup, as long as they are kept properly labeled and checked for consistency.

So, good backup habits are a very important part of computer repair and can leave you with some much-deserved peace of mind.



1. Data backup is an important part of computer maintenance.
2. When choosing a backup method, look at cost and reliability.
3. Be sure to develop data backup habits in order to avoid costly recovery.

● Manual

Personal computers are expensive appliances, and risk being damaged from several sources: viruses, electric power disturbances, and human error. As such, it makes sense to take routine precautionary measures.

- (i) **Update anti-virus program:** A computer virus can potentially wipe out all of the information stored on your computer. New viruses are constantly being created, and your protection is only as good as your last anti-virus update.
- (ii) **Back-up hard drive:** Creating a back-up of the important files on your hard drive helps and assures you that you will have a safe copy available of your important information incase anything happens to damage or compromise your hard drive.
- (iii) **Test electrical surge protector:** A properly maintained surge detector can prevent major damage to your personal computer.

● Using Utility Programs

Utility programs, also called *service* programs, perform tasks related to the control and allocation of computer resources. They enhance existing functions or provide services not supplied by other system software programs. The utility programs can perform the following tasks:

- (i) **Backup:** There is always a possibility that the hard-disk drive fails and you have no more programs or files to use. A backup utility is used to make a backup, or duplicate copy, of the information on the hard disk. For example, *Norton Backup* and *Colorado Scheduler*.
- (ii) **Data-recovery:** A data-recovery utility is used to restore data that has been physically damaged or corrupted. Data can be damaged by viruses, bad software, hardware failure, and power fluctuations that occur while data is being written/recorded.
- (iii) **Virus protection:** A virus consists of hidden programming instructions that are buried within an application or system program. Viruses are spread when people exchange floppy disks, download (make copies of) information from the Internet and other computer networks, or open the files attached to e-mail.

To protect viruses, you must install antivirus software. *Antivirus software* is a utility program that scans hard disks, floppy disks, and memory to detect viruses. Some utilities destroy the virus on the spot. Others notify you of possible viral behaviour. As new viruses are constantly being created, you need the type of antivirus software for detecting the unknown viruses. For example, *Norton Antivirus*, *McAfee's Virus Scan*, etc.

- (iv) **Data compression:** As you keep on storing files on the hard disk, it will eventually fill up. You can either delete old files to make room for the new or you can use a data compression utility, such as *PK Zip* or *Stuffit*.

Data compression utilities remove redundant elements, gaps, and unnecessary data from a computer's storage space so that less space (fewer bits) is required to store or transmit data.

● Improving Hard Disk Performance

With the passage of time the hard disk of a computer normally gets cluttered with lot of data. This makes it slower to read data off the hard disk. This is because the files are sometimes scattered across different parts of the hard disk, and it takes more time to access all the parts. Figure 3.2 shows a hard disk.

The following steps will help you in cleaning your hard disk from all the junk that it might have accumulated, and to improve hard disk performance:

- (i) Remove duplicate files from hard disk.
- (ii) Remove temporary files.
- (iii) Hive off the non-essential files.
 - (a) Find large files occupying your disk space.
 - (b) Store all these files online.
- (iv) Defragment hard disk.
- (v) Detect and repair disk errors.

These steps will free up lot of space from the hard disk, and will improve hard disk performance.

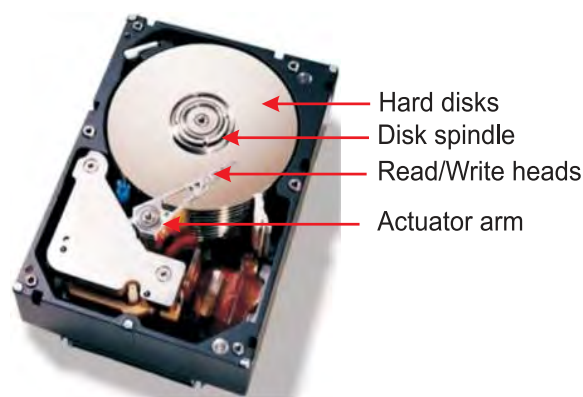


Fig. 3.2: A Hard Disk



Useful Tip

Data Recovery

Is your hard disk crashed? Try these

- (i) www.driversavers.com (ii) www.drivelabs.com (iii) www.harddriverecovery.org

• Disk Defragmenter

When you delete old files from your hard disk and add new ones, something happens: The files become fragmented. *Fragmentation is the scattering of portions of files about the disk in nonadjacent areas, thus greatly slowing access to the files.*

When a hard disk is new, the operating system puts files on the disk contiguously (next to one another). However, as you update a file over time, new data for that file is distributed to unused spaces. These spaces may not be contiguous to the older data in that file. It takes the operating system longer to read these fragmented files. A defragmenter utility program, commonly called a “defragger,” will find all the scattered files on your hard disk and reorganize them as contiguous files. Defragmenting the files will speed up the drive’s operation. Figure 3.3 shows disk defragmentation.

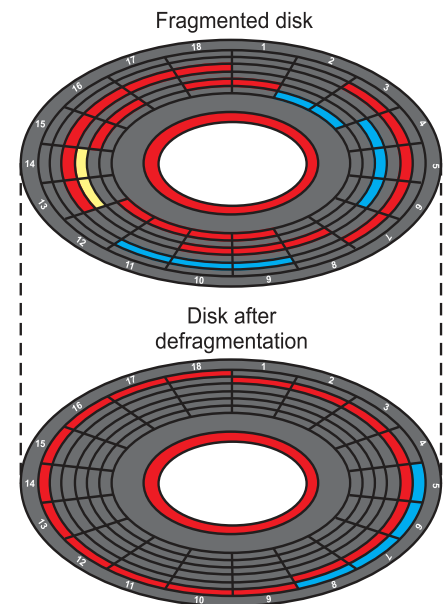


Fig. 3.3: Disk defragmentation

• Disk Cleanup

The disk cleanup utilities can search for and remove unnecessary files, such as temporary files, or “temp files”. Both Windows and the applications you run create temp files needed only for short tasks and system restore (return to normal operating conditions) after certain types of system problems. These files are stored in the Temp folder. For example, when you create a word document, Word will store a temp file version of it in the Temp folder. When you save this document, Word will save it to the location you designated and delete the temp file. The computer should delete temp files when a program is closed, but this does not always happen. Also, files will be left in the Temp folder if the computer crashes. Thus temp files can accumulate in the Temp folder and take up space.

In Windows XP, run Disk Cleanup to determine how much hard disk space you can free up (see Fig. 3.4). Then choose which files to get rid of.

To use Windows Disk Cleanup,

Click *Start* → *All Programs* → *Accessories* → *System Tools* → *Disk Cleanup*



Many other utilities are available to cleanup your hard disk including *CleanIt!* and *CleanWin*. Most are freeware or shareware.



Fig. 3.4: Using Disk Cleanup

ACTIVITY 3.1



PREVENTING COMPUTER FROM ELECTRICAL POWER PROBLEMS

The students will practise as the teacher instructs about preventing computer from electrical power problems.

Electrical Power and Power Supply

The electricity available from a standard wall outlet is Alternating Current (AC), but a PC runs on Direct Current (DC). The power supply is a device that converts AC to DC to run the computer.

Preventing Problems

Too little or too much electricity can devastate your data and computer hardware. For example, a sudden surge, or spike, in AC voltage can burn out the low-voltage DC circuitry in the computer.

Do the following things to keep your data and computer hardware safe:

1. *Back up data regularly:* You must make backup (duplicate) copies of your data every few minutes as you are working. Then, if your computer has power problems you will be able to get back in business fairly quickly once the machine is running again.
2. *Use a surge protector to protect against too much electricity:* Plug all your hardware into a surge protector (suppressor), which will prevent damage to your equipment if there is a power surge (see Fig. 3.5). (You will know you have experienced a power surge when the lights in the room suddenly get very bright.)
3. *Use a voltage regulator to protect against too little electricity:* Plug your computer into a voltage regulator (also called a line conditioner) to adjust for power sags or brownouts. If power is too low for too long, it's as though the computer were turned off.
4. *Use a stabilizer to ensure the level of voltage being supplied at a desired level:* Plug your computer into a stabilizer (see Fig. 3.6) to adjust for power variations, which will deliver a consistent voltage level to the equipment. Power fluctuations can cause damage to electrical motors and components. This damage could be severe and immediate, or it could result in a shorter operating lifespan.
5. *Consider using a UPS to protect against complete absence of electricity:* Consider plugging your computer into a UPS (Uninterruptible Power Supply). The UPS is kind of a short-term battery that, when the power fails, will keep your computer running long enough (5–30 minutes) for you to save your data before you turn off the computer (see Fig. 3.7). It also acts as a surge protector.



Fig. 3.5: Surge Protector



Fig. 3.6: Voltage Stabilizer



Fig. 3.7: UPS

6. *Turn ON highest-power consuming hardware first:* When you turn on your computer system, you should turn on the devices that use the most power first. This will avoid causing a power drain on smaller devices. The most common advice is to turn on (i) printer, (ii) other external peripherals, (iii) system unit, (iv) monitor—in that order.
7. *Turn OFF lowest-power-consuming hardware first:* When you turn off your system, follow the reverse order. This avoids a power surge to the smaller devices.
8. *Unplug your computer system during lightning storms:* Unplug all your system's components—including phone lines—during thunder and lightning storms. If lightning strikes your house or the power lines, it can ruin your equipment.

So, you can prevent your computer from electrical power problems by following the things stated above.

3.2 BASIC SAFETY ISSUES

Today the computers are an essential tool in the work of most schools and organizations all over the world. With the increase in computer use, a number of health and safety concerns related to vision and body aches and pains have arisen. Although problems can occur through their use, with the proper equipment, ergonomic workstation design, proper techniques and working practices, the risk of problems can be greatly reduced.

● Overview of Safety Measures

Whether you are having a desktop PC or a laptop computer, safety measures are most important. Some safety measures are:

- (i) Guarding against hardware theft and loss.
- (ii) Guarding against heat, cold, spills and drops.
- (iii) Guarding against damage to software.
- (iv) Protecting the data.
- (v) Protecting the health.

● Electro Static Discharge (ESD)

Electro Static Discharge (ESD) is the release of static electricity when two objects come into contact. Familiar examples of ESD include the shock we receive when we walk across a carpet and touch a metal doorknob and the static electricity we feel after drying clothes in clothes dryer. A more extreme example of ESD is a lightning bolt.

ESD is one of the few things an individual can do to damage or destroy his or her computer or hardware components. It can occur when working in your computer and will cause components you touch to no longer work properly. ESD can occur without the user feeling a shock and will only occur while working on the inside of the computer or handling an expansion card.

Sources of ESD

The most common sources of ESD are:

- (i) **Charged person:** A person can become charged due to walking or other movement. ESD damage can be especially severe if the discharge from the person is via a metallic object, such as a tool.
- (ii) **A cable rubbing across carpet:** If a charged cable is plugged into a conductive contact with any source of charge, ESD will occur.

- (iii) **An electronic device sliding into or out of a bag or tube** generates an electrostatic charge as the device's case and/or metal leads make multiple contacts and separations with the surface of the container.

Preventing ESD

ESD is one of the main enemies of your computer. The best method of preventing ESD is to use an ESD *wrist strap* or use a *grounding mat* or *table*. However, because most users do not have access to such items, the following steps can help in reducing the chances of ESD as much as possible:

- (i) **Zero Potential:** Most importantly, make sure you and the computer are at zero potential by continuously touching an unpainted metal surface of the *chassis* or the computer power supply case.
- (ii) **Standing:** It is also very important that you are standing at all times when working on the computer. Sitting on a chair can generate more electrostatic discharge.
- (iii) **Cords:** Make sure everything is removed from the back of the computer (power cord, mouse, keyboard, etc).
- (iv) **Clothes:** Make sure not to wear any clothing that conducts a lot of electrical charge, such as a woolen sweater.
- (v) **Weather:** Electrical storms can increase the ESD risk; unless absolutely necessary, try not to work on a computer during an electrical storm.
- (vi) **Accessories:** To help reduce ESD and help prevent other problem, it is also a good idea to remove all jewelry.



Anything that protects sensitive computer equipment by preventing electrostatic discharge is termed as anti-static.

● Hidden ESD

Dust buildup on PC components causes hidden ESD damage. Over time, this buildup creates a small electrical charge. This charge is not enough to cause obvious damage, and in most cases you will not be aware that a problem exists until a component begins to behave erratically. By that time, it is extremely difficult or impossible to pinpoint the original source of the problem. Hidden ESD is a good reason to clean your computer regularly.

● Catastrophic ESD

Catastrophic ESD causes a computer component to fail immediately. When catastrophic ESD occurs it will be obvious to you, in all likelihood, you will be the one who caused it!

ESD has the potential to cause a lot of damage—lightning is a well known example. Delicate electronic components have little chance of surviving the sudden discharge of static electricity. When the heat from ESD visibly melts or welds components and immediately destroys them, it's known as a catastrophic ESD event. It is estimated that catastrophic ESD is to blame for 10% of all defects caused by electrostatic faults.

Catastrophic ESD causes a computer component to fail immediately. When catastrophic ESD occurs, it will be obvious. You can remove the component and replace it with a new one, and it most likely will not affect any other component.

● Degradation

ESD degradation occurs when the effects of ESD are cumulative. This is caused by situations where low levels of ESD occur repeatedly. Damage caused by ESD degradation is not immediately apparent in full force; instead, the effects gradually get more and more noticeable. Like hidden ESD, degradation will cause your components to behave erratically, and it can make the original problem hard to recognize.

● Some Common ESD Protection Devices

Any physical device that minimizes static electricity is called an antistatic device.

Some common ESD protection devices are given below:

- | | |
|---------------------------------------|----------------------------|
| (i) Antistatic wrist and ankle straps | (ii) Antistatic floor mats |
| (iii) Antistatic bags | (iv) Workbench |

● Anti-static Wrist and Ankle Straps

Anti-static wrist and ankle straps wrap around the users wrist or ankle like a bracelet. These have a cord or other connection coming from that bracelet that attaches to the device being worked on, clips onto, or plugs into. These straps keep the user grounded, which helps prevent electrostatic damage to the device being worked on. Figure 3.8 shows a wrist strap.



Fig. 3.8: Anti-static wrist strap

Some examples of how a user would properly use the anti-static wrist and ankle straps are:

- (i) While working on a computer you could place your wrist or ankle in the strap and attach the other end (often using the *alligator clip*) to a metal portion of the computer case.
- (ii) While working with an electrostatic sensitive hardware you could place your wrist or ankle in the strap and plug the other end into an antistatic mat the device is lying on or into an antistatic workbench.



Fig. 3.9: Anti-static Mat

● Anti-static Mats

An anti-static mat or a grounding mat is a floor or table mat used to help reduce the risk of electrostatic discharge while working on a computer or other electrostatic sensitive device. Figure 3.9 shows a laptop being repaired by a technician. The blue mat under this laptop is an anti-static mat.

● Setting up an Ergonomic Computer and Seating

Ergonomics is the study of the interaction between people and machines. The purpose of *ergonomics* is to make working conditions and equipment safer and more efficient. It is concerned with designing hardware and software that is less stressful and more comfortable to use, that blends more smoothly with a person's body or actions. Examples of ergonomic hardware are tilting display screens, detachable keyboards, and keyboards hinged in the middle to allow the users' wrists to rest in a more natural position.

Whether you set up a desktop computer and never move it or have a portable PC which you move from place to place, you need to be careful about protecting your computer. For setting up an ergonomic computer, you must take care of the following:

- (i) Guarding against hardware theft and loss.
- (ii) Guarding against heat, cold, spills and drops.
- (iii) Guarding against damage to software.
- (iv) Protecting the data.

More important than any computer system and (probably) any data is computer user's health. The most serious effects are painful hand and wrist injuries, eyestrain and headache, and back and neck pains. You can avoid most of these problems, if not all, by sitting properly. Figure 3.10 shows the correct sitting posture.

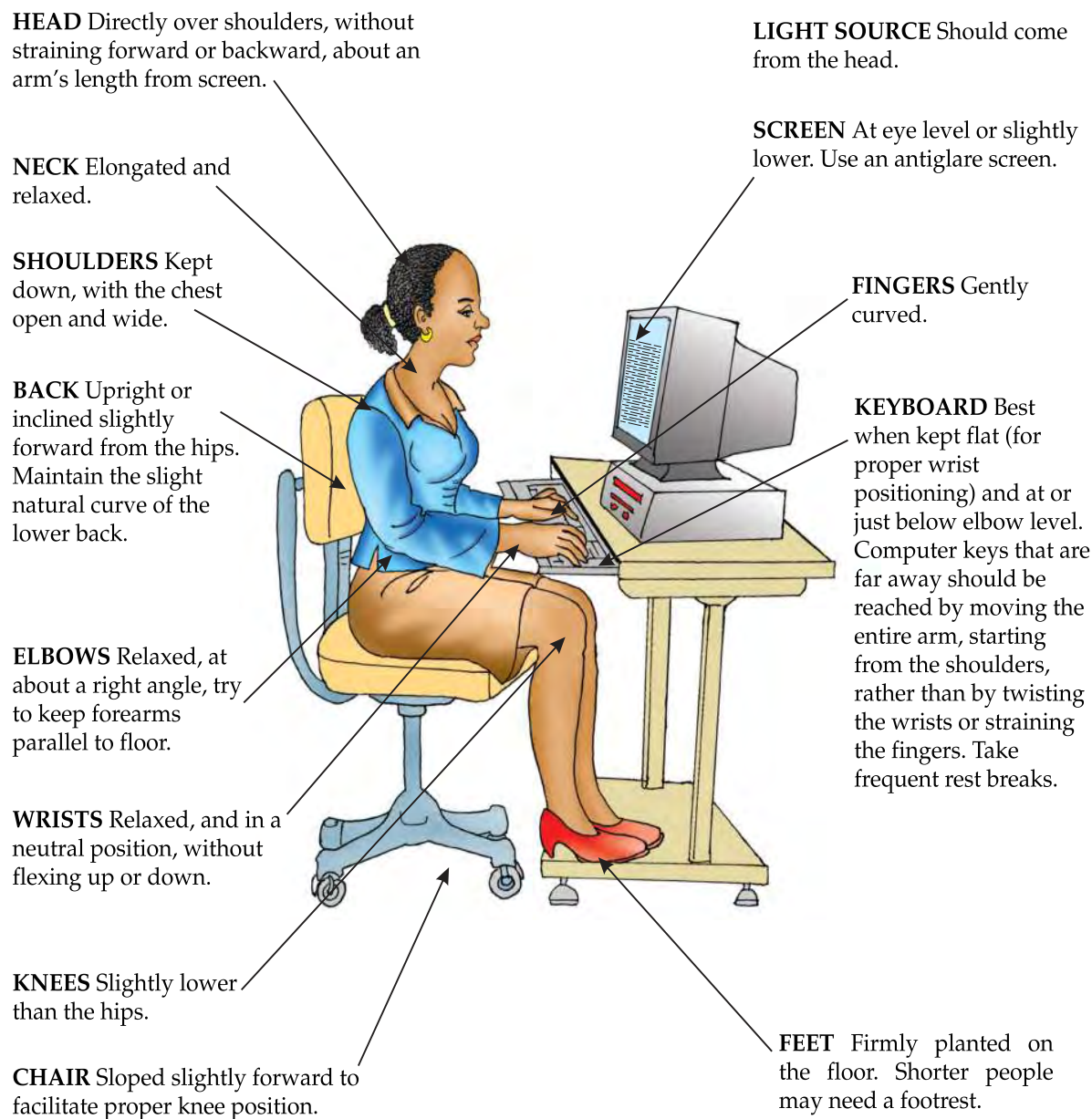


Fig. 3.10: Correct sitting posture



Eyestrain usually arises because of improper lighting, screen glare, and long shifts staring at the screen. Make sure that the windows and lights do not throw a glare on the screen and that the computer is not framed by an uncovered window.

3.3 HARDWARE MAINTENANCE BASICS

All the system components must be *compatible*—in other words, each brand must work with other brands. You will have to make sure each component comes with any necessary cables, instructions, and component-specific software (called a *driver*) that makes the component run. Arrange all the components so that these can be put together.

● Connecting Basic Input and Output Devices with the System Unit

Let us connect the basic input and output devices with the system unit.

Monitor

Place the monitor and the system unit (the *case* or *system cabinet*) where you wish on the desk or work area (see Fig. 3.11).

Locate the *monitor cable*. With PC computers, the ends of the monitor cable are often blue (see Fig. 3.12).



Fig. 3.11: Monitor and System Unit on Desk



Fig. 3.12: Monitor Cable

Locate the *monitor port* on the back of the *system unit*, and on the *monitor*. You may have to look under the screen to locate the port on the monitor. These ports are also called VGA ports and are usually *blue*.

Connect the cable into the monitor port on the monitor (see Fig. 3.13). The pins on the cable fit the port in a specific way, so line up the cable connector and the port. *Be careful not to force or bend the pins.*

Once the pins in the cable connector are pushed into the port, turn the plastic-covered screws on each side of the cable to secure it to the monitor.

Connect the *cable* into the monitor port on the back of the system unit (see Fig. 3.14). Like with the monitor, be careful not to *misalign the pins* with the port. Once the pins in the cable connector are pushed into the port, turn the plastic-covered screws on each side of the cable to secure it to the system unit.



Fig. 3.13: Monitor Port Under Monitor Screen

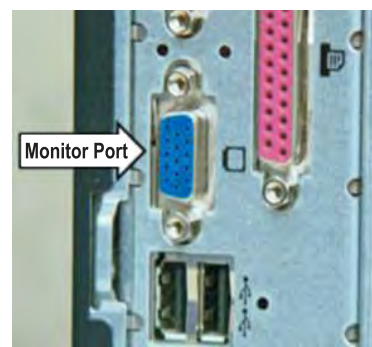


Fig. 3.14: Monitor Port on Back of System Unit

Keyboard

Locate the PS/2, or keyboard port on the back of the system unit (see Fig. 3.15). Plug the cable on the end of the keyboard into the PS/2 port. If the keyboard has a USB connector, locate a USB port on the back of the system unit and connect the keyboard.



PS/2 and USB Ports for Keyboards



Keyboard with PS/2 Connector

Fig. 3.15: Connecting the keyboard with the system unit

Mouse

Locate the PS/2, or mouse port on the back of the system unit (see Fig. 3.16). Plug the cable on the end of the mouse into the PS/2 port. If the mouse has a USB connector, locate a USB port on the back of the system unit and connect the mouse.



PS/2 and USB Ports for a Mouse



USB Mouse

Fig. 3.16: Connecting the mouse with the system unit

Speakers

If your computer uses *external speakers*, locate the bank of audio ports on the back of the tower and connect the speakers (see Fig. 3.17). If the speakers are located in the monitor then these do not have to be connected.

The audio ports are often confusing. If your computer has *color-coded peripherals* that match the colors on the back of the computer case, then connecting the audio components is generally very easy. If the peripheral does not have a color-coded cable, then remember that the *speakers will always go in the green port*. Headphones connect to the *pink port*, and various other devices will connect to the *blue port*, which is the *Line In* port.

Additionally, many devices, including headphones, now come with USB connectors. In most computers, the USB ports are located directly above the bank of audio ports.



Fig. 3.17: Audio Ports

Power Supply

Plug the *power supply* cable into the back of the system unit, and then into a *surge protector power strip* (see Fig. 3.18).



Fig. 3.18: Plug Power Supply Cord into System Unit and Power Supply Cable into Power Strip

Plug the second power supply cable into the monitor, and then into the power strip with surge protection (see Fig. 3.19). The power supply port may be located beneath the screen on the monitor.

The basic computer hardware components are now connected (see Fig. 3.20). You might be ready to start working, but before you do, spend a little time arranging your workspace.



Fig. 3.19: Power Supply Port on Monitor



Fig. 3.20: System unit connected with basic input and output devices

Connecting Other Devices

Once Windows is running, you can *connect your printer and other devices*. Printer is an output device that produces text and graphics on paper (see Fig. 3.21). Each printer and other peripherals are installed differently, so review the related instruction manual before connecting a device.



Fig. 3.21: A printer

● Checking a Dead System

Many problems with computer use are temporary and can be resolved by adopting simple corrective action. The most common computer problem is when you cannot access your system at all. When you turn on the power switch, nothing happens, that is, you have a dead system.

A checklist of troubleshooting procedures to check a dead system is given below:

- (i) Try the power switch a second or third time. If nothing happens.
- (ii) Check the wall outlet for power, if the outlet has power.
- (iii) Check the power cord itself from wall to the computer.
- (iv) Check the power supply inside the system unit.

- (v) Replace the power supply rather than trying to repair it.
- (vi) If the system makes those click noises, but the screen is blank, check the monitor.
- (vii) If the monitor proves to be good, check the video card, even in a new system.

● General Steps to Troubleshoot Problems

The general troubleshooting steps to help you identify your software or hardware problems are:

- (i) *Symptom Recognition*: Recognize the symptoms of your problem.
- (ii) *Symptom Elaboration*: Elaborate on your problems.
- (iii) *Action Plan*: Develop an action plan and list all possible causes.
- (iv) *Isolate Fault*: Is it hardware or software. Review all possible software issues before jumping to any conclusions.
- (v) *Repair, Functionality and Logging*: Repair the problem, verify the functionality of your computer, log exactly what the symptoms were and what you did to correct the problem.

● Troubleshooting Common Input and Output Devices

Computer problems related to common input and output devices can be upsetting, especially if you are trying to meet a deadline for work or school. *Most problems are minor* and can be easily fixed, so do not panic when these problems happen. Instead, work your way through some *basic troubleshooting techniques* and try to solve the problems. These are given below:

- (i) *Always check the cables, wires, and cords*: A majority of computer problems are related to an issue in the cables and connections of the input and output devices. The easiest first step you can take to troubleshoot most problems is to check all related cables and connections (see Fig. 3.22).
- (ii) Check the *Power Button* if your computer does not start.
- (iii) Check for *overheating*. Make sure the vents in the case are not blocked.



Fig. 3.22: Check All Cables, Wires and Cords

3.4 INSTALLING AND UNINSTALLING APPLICATION SOFTWARE

● Installing Application Software

Carefully select and purchase any software, that is, it must be licensed. Now you can get it onto your computer—*install* it. Software has recently become much more “user friendly” in this area. Most software will handle the installation steps without a lot of input from the user.

Installing Microsoft Office Enterprise 2007

For CD or DVD installation, your manual’s directions will tell you what command starts the installation process. It is usually either *setup.exe* or *install.exe*. That should bring up a series of dialog boxes that will offer you whatever choices you can make for this software.

Under Windows using a CD/DVD disk, the install process will start up automatically if your computer is still set to auto play CDs or DVDs. If the disk does not start up by itself, you can use the *Run* line from the *Start* menu to type in the command. Or open a *Computer* or *Explorer window* to the drive with the installation disk, find the command that starts the install, and double-click on it.

To install Microsoft Office Enterprise 2007, perform the following steps:

1. Start your computer.
2. Insert the Microsoft Office Enterprise 2007 CD in your computer's CD-Rom drive.
3. Double click on *setup.exe* to start the installation process.
4. Type your 25-character Product Key that comes with your Microsoft Office 2007 CD or written on the cover of CD and then click *Continue* (see Fig. 3.23). Here, the 25-character product key has not been shown due to security reasons.



Fig. 3.23: Entering Product Key

5. Software license window box appears. Accept the terms of this agreement by clicking on it. Click on *Continue* (see Fig. 3.24).



Fig. 3.24: Accepting the License Agreement

6. Click on *Install Now* button (see Fig. 3.25).



Fig. 3.25: Clicking Install Now

7. Microsoft Office 2007 installing process will start. Figure 3.26 shows the installation process in progress.



Fig. 3.26: Installation process in progress

8. After few minutes a dialog box will appear showing the message of successful completion of the installation. Click *Close* (see Fig. 3.27).



Fig. 3.27: Clicking Close after successful installation

Now, you can use the installed Microsoft Office Enterprise 2007 programs on your system.

● Uninstalling an Application Software

There are several reasons why you may want to uninstall software from your computer. It could be that the software is no longer being used and is unnecessary, it conflicts with other programs, it is not functioning as expected or you just want to free up some space on your computer's hard drive. Whatever the reason, we can uninstall a software.

Uninstalling Microsoft Office Enterprise 2007

To uninstall Microsoft Office 2007, perform the following steps:

1. Click *Start* → *Control Panel*.
2. Open the *Add and Remove Programs* dialog box in *Control Panel*.
3. Select the desired application which you want to uninstall. Here, we select Microsoft Office Enterprise 2007. Click *Remove* button (see Fig. 3.28).

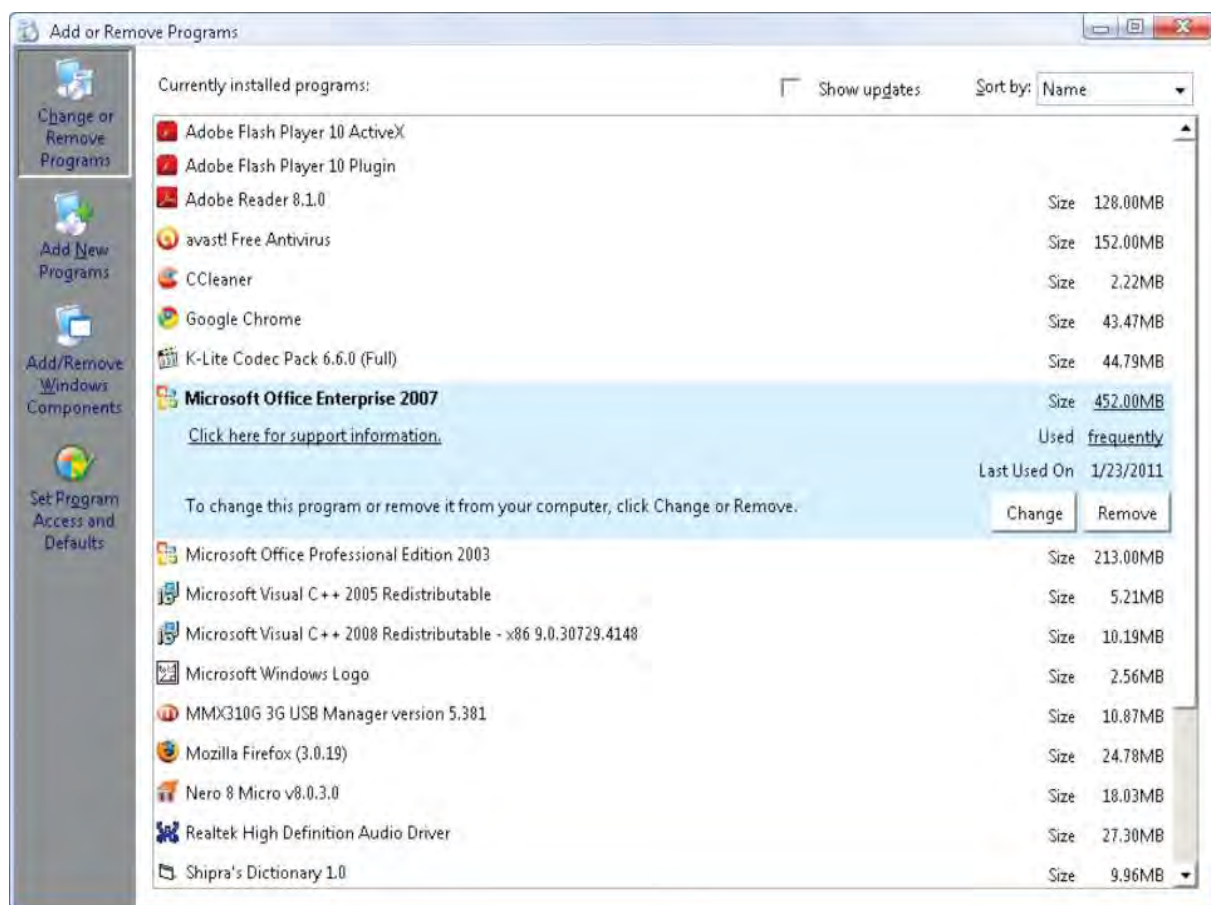


Fig. 3.28: Clicking Remove

4. Click *OK* button to confirm the removal of Microsoft Office Enterprise 2007.
5. Uninstalling process will start (see Fig. 3.29).



Fig. 3.29: Uninstallation process in progress

6. After few minutes, Microsoft Office Enterprise 2007 will be successfully uninstalled. Click *Close* button to close the uninstallation process (see Fig. 3.30).

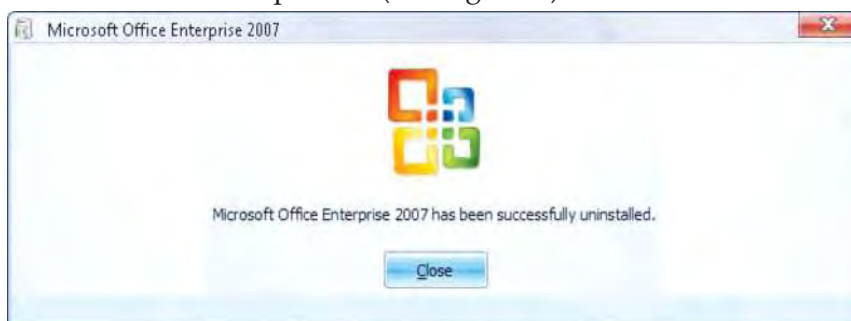


Fig. 3.30: Clicking Close after successful uninstallation

7. After completion of setup, you may be asked for rebooting the system. Click *Yes* to reboot the system (see Fig. 3.31).

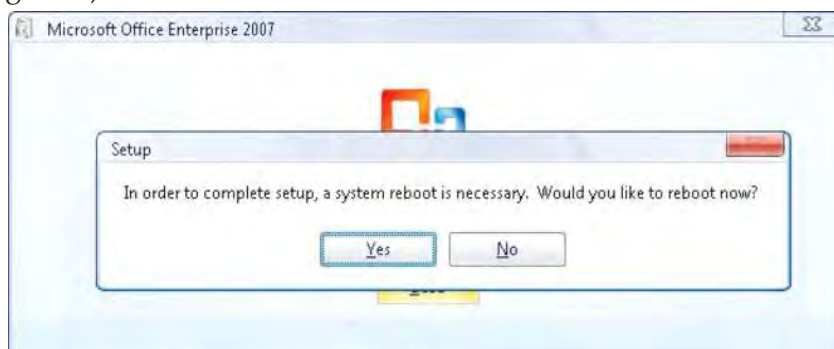


Fig. 3.31: Clicking Yes to reboot the system



KEY CONCEPTS

- Computer is a very sensitive device and needs to be placed very carefully and its physical environment and location requires some special arrangements, protections and precautions.
- A backup utility is used to make a backup, or duplicate copy, of the information on the hard disk. Use defragmenter and disk cleanup to improve hard disk performances.
- Electro Static Discharge (ESD) is the release of static electricity when two objects come into contact. The best method of preventing ESD is to use anti-static wrist and ankle straps, or use a grounding mat or table.
- Eyestrain usually arise because of improper lighting, screen glare, and long shifts staring at the screen.
- We must know how to plug properly input and output devices with a system and their troubleshooting.
- We must know how to install and uninstall application software.



REVIEW QUESTIONS

Fill in the Blanks

- is a very sensitive device and needs to be placed very carefully.
- is the release of static electricity when two objects come into contact.
- A computer user must know how to plug properly and devices with the system unit.
- is the study of interaction between people and machines.

State Whether True or False

- Utility programs do not perform tasks related to the control and allocation of computer resources.
- If you back up your files, you can restore files in the event of a hard disk crash.
- A majority of computer problems are related to an issue in the cables and connections.
- How to install and uninstall application software are not important to learn.

Multiple Choice Questions

- Which of the following is/are backup method(s)?
 - External hard drives
 - Flash drives/USB thumb drives
 - Remote data storage via the Internet
 - All of these
- is the scattering of portions of files about the disk in nonadjacent areas, thus greatly slowing access to the files.
 - Fragmentation
 - Electric Power
 - Disk Cleanup
 - Surge Protector
- Which of the following is not a source of Electro Static Discharge (ESD)?
 - Charged person
 - A cable rubbing across carpet
 - An electronic device sliding into or out of a bag or tube
 - Anti-static wrist strap
- When you turn on the power switch of a computer and nothing happens, that is, you have a/an
 - Booted system
 - Dead system
 - Working system
 - Online system

Match the Following

Column A

- Power Supply
- Norton Backup
- Catastrophic ESD
- Anti-static Ankle Strap

Column B

- Utility Program
- ESD protection device
- Converts AC to DC
- Causes a computer component to fail immediately.

Answer the Following

1. How will you identify proper location for a computer and protect it from harm and damage?
2. Explain possible problems that may occur with power supply and the use of stabilizers and UPS.
3. Discuss the use of defragmenter and disk cleanup to improve hard disk performance.
4. Explain the concept of ergonomically correct computer and seating.
5. Give the steps to install and uninstall an application software.

Suggested Activities

1. Practice as the teacher instructs about the following:
 - (a) Backup methods.
 - (b) Using utility programs.
 - (c) Improving hard disk performance.
 - (d) Disk defragmenter.
 - (e) Disk cleanup.
2. Explain the concept of safety precautions, ESD and its effects.
3. Explain and demonstrate ESD protection devices and an ergonomically correct computer.
4. Explain the basic steps to follow while troubleshooting problems.
5. Explain and demonstrate how to install and uninstall an application software.

Field Trip

Visit some nearby educational institutions and business houses to prepare a report on basic troubleshooting.