9 Computer safety and research

Objectives

At the end of this chapter you will be able to:

- explain the personal safety rules of the computer laboratory
- explain the general rules for using computers in the laboratory
- list some possible causes of hardware malfunction
- explain the rules for handling optical discs and USB drives
- explain the rules for using the internet in the computer laboratory
- define the terms ‘intellectual property’ and ‘trademark’
- explain the term ‘intellectual property rights’
- explain the term ‘plagiarism’
- give examples of plagiarism
- describe ways to determine the accuracy of online information
- describe the role of local organisations that are responsible for protecting the rights of content creators
- apply the APA and MLA style of references to cite information sourced from online and offline resources
- find information on the internet using advanced search techniques.

The growing importance of computers in our daily lives has raised concerns about possible threats to computer systems, data and individuals. Threats may arise due to online interactions, improper care of storage and hardware devices or through contact with physical devices.

Causes of hardware malfunction

Computers and most peripheral devices are generally very safe to work with. However, these devices need electricity to work and have mechanical parts, both of which can injure or even kill someone if you do not use them safely.

To ensure that a computer, its peripherals and its components have a long and active working life, it needs to be taken care of and handled carefully. Hardware can malfunction for many reasons, as follows.

- **Normal wear and tear of parts and circuitry:** Over time, computers will wear down, simply because they are partly mechanical.
- **Poor assembly by the manufacturer:** Computers are not always perfectly built, in which case the malfunction is the responsibility of the manufacturer.
- **Dust accumulation:** This can especially, can cause the cooling system in computers to fail, resulting in damage to the equipment and possible loss of data.
- **Extreme heat:** Extreme heat can cause damage to the magnetic parts of computer equipment, including optical discs.
- **Humidity:** If there is humidity beyond the level required to maintain computer equipment, corrosion may result, which can cause malfunction.
- **Power fluctuations:** A poor electricity supply that results in fluctuations in a building's power supply could cause equipment to fail, especially if the computer receives too much current (a 'power surge').
- **Vermin:** Creatures such as rodents, insects, or other animals can cause damage to cables, resulting in loss of electrical power and damage to equipment.

Safety in the computer room

To prevent the misuse or mishandling of equipment in the computer ‘lab’ or laboratory, we need to follow a set of rules. You may already be familiar with the rules in your school. You should follow the rules provided by your teacher and/or the rules listed in this chapter. Rules help to establish order and structure, and create the best learning environment for students.

Rules for the computer lab – personal safety

- Avoid stepping on electrical wires or any other computer cables.
- Do not open the computer's system unit or monitor casing – these can be dangerous. For example, some monitors may have capacitors which can store up to **35** kilovolts of electricity. Coming into contact with such a device can cause electric shock and even death.
- Do not insert any metal objects – such as clips, pins and needles – into the computer casing or monitor casing. This may cause the device to short circuit or give you an electric shock.
- Do not touch, connect or disconnect any plug or cable without your teacher's permission.
- Report any broken cables, sparks or smoke in the laboratory immediately.

Note

Always make sure that there is enough light, otherwise people may trip over things and cause damage to the equipment and themselves.

Rules for the computer – computer safety

- Do not switch your computer on or off too often. Always shut down computers using the proper procedure ‘on-screen’, rather than directly using the on/off switch.
- Avoid exposing the computer to excessive dust; cover the computer with dust covers when you have finished using it. An excess of dust may affect the circuitry.
- Avoid using USB drives, CDs and DVDs that were used to store information in computers from outside the lab: these storage devices may contain viruses that will affect the computer you are using.
- Do not pile anything onto the computer keyboard. Objects on the keyboard may damage the keys.
- Do not eat or drink in the computer laboratory. Liquids can cause short circuits or electric shocks and the crumbs from food can cause malfunctions inside the computer.
- Do not change any of the settings (desktop themes, date, time, and so on) on the computer.
- Do not install any software without your teacher’s permission.
- Avoid excessive printing – paper and printing cartridges are expensive.
- Respect other people’s files on the computer. Do not change, copy, delete, read or otherwise access files that are not yours or that you do not have permission to access.
- Do not copy any software contained on the computer unless you are permitted to do so. Copying software without proper authorisation may be illegal.

Rules for the care of optical discs (CDs and DVDs) and USB drives

Optical discs and USB drives are used to store data and information. These devices can be damaged, resulting in loss of data and information, if not handled properly. The following rules should be followed to protect your optical discs and USB drives from damage:

Care of optical discs

1. Never bend CDs or DVDs. Bending can cause the disc to break.
2. Do not write on the underside of CDs or DVDs; this is the side that is recorded.
3. Do not leave or store CDs or DVDs in sunlight or excessive humidity. Excessive heat and humidity may cause the disc to warp and become unreadable.
4. Always keep CDs and DVDs covered when not in use to prevent them from being scratched or soiled.

Care of USB drives

- Ensure that the protective connector cover is on at all times when the USB drive is not in use – small bits of dust, dirt and fluff may find their way into the connector and cause a short circuit that could damage the electronic components when it is connected to power.
- Avoid plugging the USB drive into the computer indefinitely – a power surge onto the USB port can cause malfunction and damage to the electronic components on the drive.
- Properly remove your USB drive from the host device – after you are finished working with your USB drive, you should close all files you have opened from the drive. Then you can stop and remove the device easily. If the USB drive is removed during a write operation, for example, the USB drive may be corrupted and data loss may occur.
- Properly store USB drives in their plastic cases and close the cap on the drives. USB drives, while quite reliable, can be damaged when dropped on hard surfaces.
- Do not force USB drives into connectors – USB Flash drive connectors are unidirectional. This means that the USB drive must be inserted in one direction only; if you cannot insert the drive or card, do not force it in.

Note

Can you think of any additional rules for your lab?

Note

If your computers are networked, your teacher may need to give you additional rules.

Tips for solving simple computer problems

Table 9.1 lists some computer problems with the possible causes and solutions.

Problem	Possible causes	Possible solution
Computer will not start	Power cord not connected properly Power strip or power outlet may be bad Bad power cable Power supply button in the power unit may be defective Incorrect power supply Loosely connected hardware Bad battery (If your computer is a laptop or portable computer that uses a battery for mobility, it may be causing your issue.)	If there is no power light on: a Make sure all cables are firmly secured. b Check to make sure the outlet has power by plugging in another device. c Check the power supply button switch to make sure it is in the 'on' position.
Screen is blank	Monitor is off Connections between computer and monitor may be loose Brightness and contrast may be turned down	Turn monitor off and then back on. Remove all cables and re-insert. Turn up the brightness and contrast.
An abnormally functioning operating system or software	Operating system or other software is either unresponsive or is acting up	Try restarting your computer and run a virus scan.
Overheating	Computer fan may be defective	Restart the computer. Check: Can you see or hear the fan spinning? If not, the fan may need to be replaced.
Printer will not print	No power Printer cables not connected properly (Your printer should have two cables connected to it: the power cable and the data cable.) Printer error (orange or blinking light) (After your printer has completed its initial startup, you should see a solid coloured light. If the indicator is blinking or is orange, often this is an indication of a printer error, such as a paper jam or an issue with the ink or toner cartridge.	Check the power indicator button on the printer to make sure it has power. Try turning the printer off and on. Unplug the printer and plug it back in. Make sure the power and data cables are connected to both the printer and computer. Check your printer's print queue by looking for the printer icon in the system tray and double-clicking it. The print queue shows you the status of each job as well as the general status of your printer. As there are no standards for all printers, if you see a blinking light,

		visit the manufacturer’s website or review the printer manual for specific error details.

Table 9.1 Some computer problems with possible causes and solutions

Reporting problems

Report all software or hardware problems to your teacher immediately. Do not attempt to fix computer or peripheral device problems.

Note

The toner in cartridges is carcinogenic (cancer causing), so empty toner cartridges need to be disposed of carefully and responsibly. Check the printer's manual on the correct disposal procedures for ink and toner cartridges.

Rules for the internet in the classroom

Many computer laboratories now have internet access, which can be a very useful tool in the school. However, if not used properly it can also have its negative side:

- Only perform tasks that you are required to do.
- Do not click on any advertisements – just close the box or screen – as this may introduce viruses to your system.
- Immediately notify your teacher if you find yourself on an inappropriate website.

Chapter 9: Summary

- Avoid stepping on electrical wires or any other computer cables.
- Do not open the computer' system unit or monitor casing or insert any metal objects such as clips, pins and needles into the computer casing or monitor casing.
- Do not touch, connect or disconnect any plug or cable without your teacher' permission.
- Report any broken cables, sparks or smoke in the laboratory immediately.
- Do not switch your computer on/off too often. Always shut down computers using the proper procedure.
- Avoid exposing the computer to excessive dust; cover the computer with dust covers when you have finished using it.
- Avoid using USB drives, CDs and DVDs that were used to store information in computers from outside the lab.
- Do not pile anything onto the computer keyboard.
- Do not eat or drink in the computer laboratory.
- Do not change any of the settings (desktop themes, date, time, etc.) on the computer.
- Do not install any software without your teacher' permission.
- Avoid excessive printing.
- Respect other people' files on the computer. Do not change, copy, delete, read or otherwise access files that are not yours or that you do not have permission to access.
- Do not copy any software contained on the computer unless you are permitted to do so.
- Properly remove your USB drive from the host device
- Intellectual property refers to unique and original works of someone or an organisation. It includes ideas, inventions, art, writings, processes and trademarks.
- A trademark can be a name, word, slogan, design, symbol or another unique device that identifies a product or organisation.
- Intellectual property rights are the rights to which creators are entitled to their work.
- Copyright organisations protect the rights of content creators.
- Copyright organisations in Jamaica include The Jamaican Copyright Licensing Agency (JAMCOPY), Jamaica Music Society Limited (JAMMS) and The Jamaican Association of Authors Composers & Publishers (JACAP).
- CD-ROM, graphics, sound and video can be referenced using APA and MLA styles of referencing.
- Copyright gives an author or creator specific rights in relation to works such as literary, artistic, musical and dramatic work as well as films, sound recordings and typographical arrangements. It prohibits unauthorised actions such as duplication, publication, and sale of the material.
- Plagiarism refers to the act of using the work of another author without authorisation or representing the work of an author as one's own.
- Online and offline sources can be cited using either the American Psychological Association (APA) or Modern Language Association (MLA).
- The criteria that make an online source credible includes the source, author, objectivity, date and completeness.
- Using a search engine to perform the following types of searches; range, site-specific, synonyms and filetype can provide better search results.