

<b>INTRODUCTION TO COMPUTING</b>		
<b>STRAND 1</b>		
Sub-strand 1.1:	Components of computers and computer systems	2
Sub-strand 1.2:	Technology in the community	33
Sub-strand 1.3:	Health and Safety in Using ICT Tools	43
<b>STRAND 2</b>	<b>Productivity Software</b>	
Sub-strand 2.1:	Introduction to Word Processing	56
Sub-strand 2.2:	Introduction to Presentation	83
Sub-strand 2.3:	Introduction to Electronic Spreadsheet	101
<b>STRAND 3</b>	<b>COMMUNICATION NETWORKS</b>	
Sub-strand 3.1:	Computer Networks	138
Sub-strand 3.2:	Internet and Social Media	164
Sub-strand 3.3:	Information Security	178
Sub-strand 3.4:	Web Technologies	190
<b>STRAND 4</b>	<b>COMPUTATIONAL THINKING</b>	
Sub-strand 4.1:	Introduction to Programming	201
Sub-strand 4.2:	Algorithm	214
Sub-strand 4.3:	Robotics	226
Sub-strand 4.4:	Artificial Intelligence	234
<b>Appendix A</b>	<b>GLOSSARY</b>	243

## Strand 1 Introduction to computing



**Sub-strand 1:** Components of computers and computer systems  
**Sub-strand 2:** Technology in the community  
**Sub-strand 3:** Health and Safety in Using ICT Tools



## Sub-strand 1.1:

### Components of computers and computer systems

#### Content standard

- B7.1.1.1 Identify parts of a computer and their uses.
- B7.1.1.2 Demonstrate the use of the features of the Windows Desktop.



#### Indicators

- B7.1.1.1.1 Discuss the second and third generation of computers.
- B7.1.1.1.2 Demonstrate understanding of the use of input devices (wireless keyboard, and mouse, light pen, Touchscreen).
- B7.1.1.1.3 Demonstrate understanding in the use of output devices (Cathode Ray Tube, LED Monitor, etc)
- B7.1.1.1.4 Describe Storage devices: full-sized external hard drives, Hard Drive Speed, Disk Caching).
- B7.1.1.2.1 Discover the new Windows Operating System (Start screen, Use of files, Taskbar buttons, Preview thumbnails).
- B7.1.1.2.2 Practice file management techniques (file and folder management).



#### Introduction

The history of computers is very interesting. From the use of simple abacus to the complex computers we have today, computers have gone through various generations. In this lesson, we will continue to study more about the history of computers specifically, second and third generation of computers. We will also look at some wireless input devices such as wireless keyboard and mouse. We will learn about the hard disk drive as a storage device and continue to discover new techniques in Windows operation and file management.



#### Teaching strategy

Discussion and demonstration methods of teaching are recommended for this lesson. Discuss the features of the second and third generation of computers with learners and let them identify the major components on the motherboard. Show pictures of the parts of the system board and let learners identify a transistor. Guide learners to identify input devices and explore their use. Let learners discuss features of magnetic storage devices and explore the differences in the various Hard Disk Drives. Show the desktop, tiles, taskbar to learners and demonstrate how to preview thumbnails. This will help learners to develop

their desktop operation skills. Guide learners to demonstrate file management techniques by following the naming conventions, organising files in folders and subfolders.



#### Content link

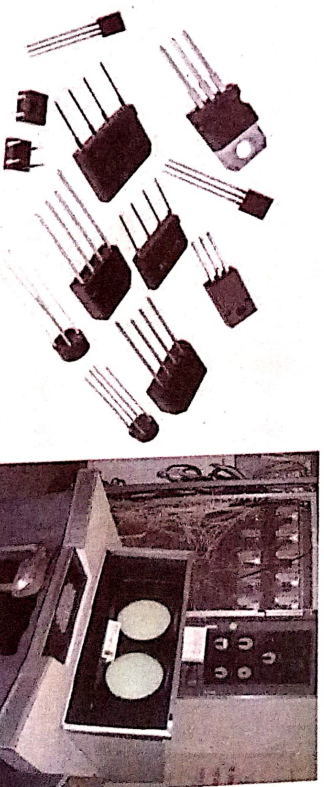
At this level, we will discuss second and third generation of computers, learn about wireless input devices, magnetic storage devices, and practice file management techniques. In Basic 8, we will continue this discussion and learn about fourth generation computers. We will also discuss more input devices such as barcode readers and scanners. We will learn more about optical storage devices and discuss the uses of output devices. We will continue the discussion of file management techniques and learn more about features of the taskbar, users and accounts. Probabilistic data structures and distinct value sketches will also be introduced.

#### B7.1.1.1.1 The second and third generation of computers.



#### Second generation (1956 - 1963)

The second generation of computers saw the use of **transistors** instead of vacuum tubes. Transistors were widely used in computers from 1956 to 1963. Transistors were smaller than vacuum tubes and allowed computers to be smaller in size, faster in speed, and cheaper to build. These second-generation computers are more reliable and compact than the first generation of computers.



(a) Transistors

(b) Second generation computers

The first computer to use transistors was the TX-0 and was introduced in 1956. Other computers that used transistors include the IBM 7070, Philco Transac S-1000, and RCO 501.

#### Features of Second Generation

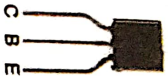
1. Transistors were used.



2. Core Memory was developed.
3. Faster than First Generation computers.
4. First Operating System was developed.
5. Programming was in Machine Language and Assembly Language.
6. Magnetic tapes & disks were used.
7. Computers became smaller in size than the First-Generation computers.
8. Computers produced less heat and consumed less electricity.

### What is a transistor?

A **transistor** is a semiconductor device used to amplify electronic signals or to switch electronic devices. A transistor has three legs namely **base (B)**, **emitter (E)** and **collector (C)**. See figure below.



The components of a transistor

### Uses of transistors

- Transistors are used to amplify electronic signals.
- They are used as switches.
- They are used as rectifiers in circuits.
- They regulate current or voltage in a circuit.



### Third generation (1964 - 1971)

The third generation of computers introduced the use of IC's (integrated circuits) in computers. Using IC's in computers helped reduce the size of computers even more. Third generation computers are also smaller and faster than the second generation of computers due to the introduction of IC's to replace transistors. Likewise, IC's made computers smaller, more reliable and more efficient.



(a) Integrated circuits



(b) Third generation computer

Nearly all computers since the mid to late 1960s have utilized IC's. While the third generation is considered by many people to have spanned from 1964 to 1971, IC's are still used in computers today. Over 45 years later, today's computers have deep roots going back to the third generation.

### Third Generation Features

1. Integrated circuits developed.
2. Power consumption was low.
3. Small Scale Integration (SSI) and Medium Scale Integration (MSI) Technology was used.
4. High-level languages were used.

### Differences between second and third generations of computer

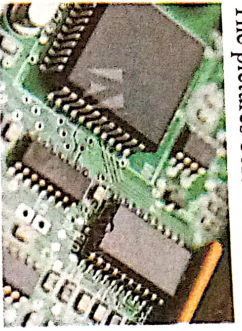
Second generation computers	Third generation computers
They are based on transistors.	They are based on Integrated circuit chips.
They are costly compared with third generation computers.	They cost less compared with second generation computers.
They are slower compared with third generation computers.	They are faster compared with second generation computers.
They are bulky in size.	They are smaller in size.
They are less efficient in running programs.	They are more efficient in running programs.
Less memory capacity.	Large memory capacity.



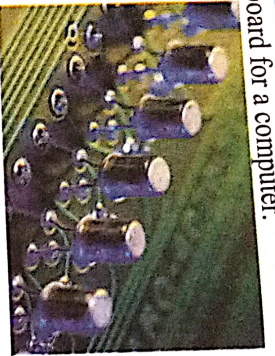


## Activity

The pictures below is a mother board for a computer.



(a)



(b)

1. Identify the types of motherboards labelled (a) and (b) in relation to the generations of computers.
2. State and explain the board that has the capacity to produce more reliable and efficient work.

### B7.1.1.1.2 The use of input devices (wireless keyboard, and mouse, light pen, Touchscreen).

An input device is a peripheral used to provide data and control signals to a computer. The following are some commonly used input devices.

- Keyboard
- Mouse
- Light pen
- Touchscreen

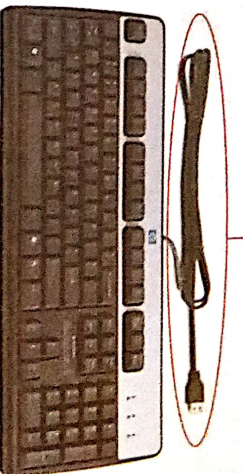
Some computer keyboard and mouse are connected to the computers without a wire or cable. They are called wireless keyboard and mouse.

#### Wireless keyboard

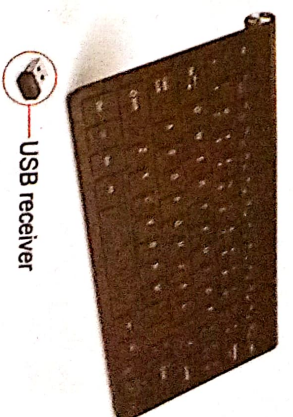
A keyboard is an input device that is used to key in alphanumeric symbols and issue commands into the computer. There are various types of keyboards. They include standard wired keyboards, wireless keyboards, among others. Keyboard layouts also include QWERTY and DaVinci Concept, each of which suits different environments.

A wireless keyboard is a regular keyboard that is not connected to the computer by any cables. Instead, wireless keyboards use either radio waves or infrared laser technology to connect to a wireless USB receiver that is plugged into the computer's USB port.

cable



(a) Wired keyboard



(b) Wireless keyboard

USB receiver

#### Uses

- Input of data into applications software (for example, text into word processors, numbers into spreadsheets, etc.).
- Typing in commands to the computer (for example, Print Scrn, Ctrl+P to print out etc.).

#### Advantages

- **Portability**  
Wireless keyboards offer portability and flexibility to the user as the user can move the keyboard around without having to keep it directly on a desk.

- **Lack of Clutter**  
Wireless keyboard does not create cluster of wires on the computer desk compared to a regular keyboard. Wireless keyboards can also be moved out of the way when the user wants to use their desk for other things such as paperwork.

#### Disadvantages

- **Reduced functionality**  
While wireless keyboards offer mobility and lack of clutter, they tend to be slower than regular keyboards. Computer users who type at a fast rate may experience problems with their wireless keyboard as it may hesitate to register keystrokes or no register some keystrokes at all.

#### Configuration

- **Configuration**  
Wireless keyboard has to be installed and configured before it can be used. Those with limited technical skills, may have a problem setting up their wireless keyboard. Regular keyboards, on the other hand, run on Plug and Play software and work immediately after they are plugged in.



## • Batteries

Wireless keyboard operates on battery power rather than using electricity from the computer. User needs to regularly replace batteries when using wireless keyboard.



## Wireless mouse

A mouse is an input device that is used to direct the cursor on the monitor and control icons on the monitor. The mouse comes in different varieties such as mechanical, optical, optomechanical and wireless.



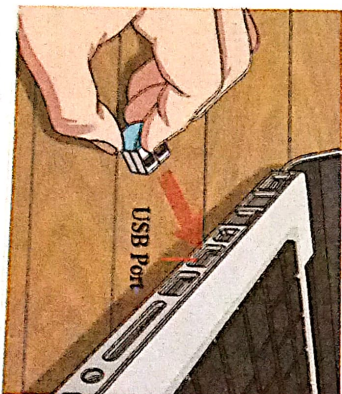
Wired mouse

Wireless mouse

A wireless mouse is a mouse that is not connected to the computer by a cable. It sends signals to the computer using Bluetooth and radio frequencies (RF). They usually come with their own USB receiver that is plugged into the computer to receive signals from the mouse. Wireless mouse is also called cordless mouse.



Wireless receiver



USB Port

Wireless mouse

**Wireless mouse** is connected to the computer by a receiver or Bluetooth. The wireless receiver is connected to the USB port of the computer. You have to insert a battery into the wireless mouse for it to work.

## Uses

- A mouse is used to control the position of the cursor on the screen.
- A mouse is used for opening or launching programs on the computer.

- It is used for moving pictures on the screen.
- It is used for selecting text on the computer screen.
- It is used for drawing and painting pictures.

## Advantages

- Easy to use and portable.
- More convenient and versatile.
- No cables needed with reduced cluster of wires on the computer desk.
- It can be used at distance away from the receiving device.
- It can be used with other devices such as a tablet and smart televisions.

## Disadvantages

- A bit slower than wired mouse.
- Susceptible to interference from other wireless connections such as Wi-Fi.
- More expensive than wired mouse.
- Need batteries. This means that extra money must be spent to replace batteries regularly.
- The receiver can be lost.

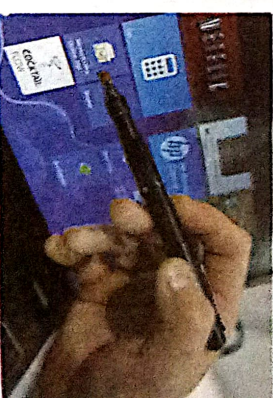


## Light Pen

A light pen is a pointing device similar to a pen that is connected to the computer system. It consists of a photocell and an optical system placed in a small tube that can be detected by the monitor screen. When the tip of a light pen is moved over the monitor screen and the pen button is pressed, its photocell sensing element detects the screen location and sends the corresponding signal to the computer.

## Uses of the light Pen

- It is used to select a displayed menu item on the monitor screen.
- It is used to draw pictures on the monitor screen.



Using a light pen to select the menu item on the monitor screen



### Advantages

- Greater accuracy than touch screens.
- Easy-to-use technology just like writing with a pen.

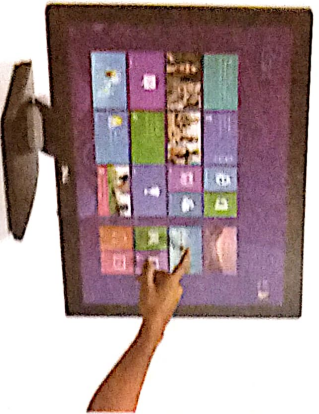
### Disadvantages

- Problems with lag when drawing on screen.
- Not that accurate when drawing.



### Touchscreen

A touchscreen enables the user to choose an option by simply touching a button/icon on the screen. The selection is automatically made without the need for any pointing device.



Touchscreen computer

### Uses

Touchscreens are used in variety of devices. The following are some examples.

- Mobile phones for entering text and commands.
- Self-service tills, for example at petrol stations, where the user just touches
- The screen to select the fuel grade and payment method.
- Automatic teller machines (ATMs) to choose from on-screen options.
- Point-of-sale terminals at, for example, restaurants.
- Public information systems at airports, railway stations, tourist offices, etc.
- Personal digital assistants (PDAs), mobile phones and satellite navigation systems.
- Interactive white boards in education.
- Computer-based training (CBT) where answers are selected during on-screen testing.
- They can obviously also be used as an output device, since they still work as a flat screen monitor.

### Advantages

- Faster entry of options than using keyboard or mouse.
- Very easy method for choosing options.
- User-friendly - no training necessary in its use.

### Disadvantages

- Can lead to problems such as straining of arm muscles if the user has to use the system frequently.
  - The screen can get very dirty with constant touching. This can reduce its responsiveness and can also make it more difficult to read in strong light.
- Physically challenged users with no hands cannot use touch screen.



### Barcode reader

A barcode reader is a hardware input device capable of reading a barcode and printing out the details of a product or log information about that product into a database. A barcode is simply a numeric code represented by a series of lines. When a barcode is scanned, the numeric code is then used to query a database to fetch details such as product name, price, manufacturer, etc. It can then automatically deduct the purchased item from the stock in the shop.



Barcode reader

### Uses

It is used in supermarkets, shops, libraries and other companies to read information in the form of barcodes marks on product casings.



### Advantages

- Scanning barcodes is much faster than keying in data manually.
- Less data entry errors are made when using barcode readers.
- Enables automatic stock control.
- When the price of an item changes, only the central database needs to be updated.
- No need to change the prices individually on each item.

### Disadvantages

- It is relatively expensive to setup and manage since every item in the shop needs a barcode and an entry in database.
- Need computers or point of sale terminals to work which means extra cost.
- System failure may cause more delay.
- Scratched or crumpled barcodes may cause problems.
- Large amount of data need to be coded into the barcode.

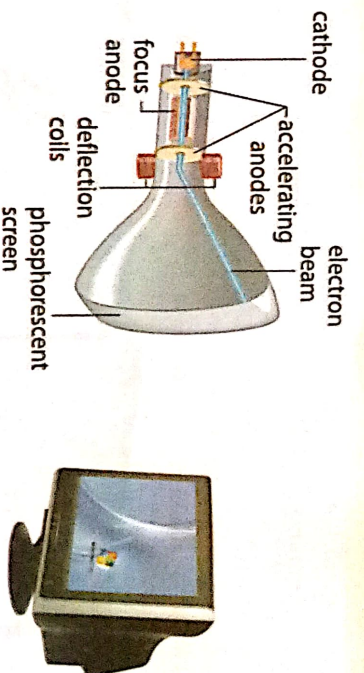
## B7.1.1.3 The use of output devices (Cathode Ray Tube and, LED Monitor, etc.)

Output devices are hardware devices that allow data to be output from a computer. Some devices hold the data temporarily such as in a monitor whereas others produce permanent output in the form of a hard copy such as a printer producing output on paper.



### Cathode ray tube Monitor

A cathode-ray tube is a device that uses a beam of electrons in order to produce an image on a screen. Cathode-ray tubes, also known commonly as CRTs, are widely used in a number of electrical devices such as computer screens and television sets. Cathode ray tube (CRT) monitors are the least expensive type of monitor, although they are becoming increasingly rare as flat screen monitors are now taking over. They come in various sizes and make use of an electron gun firing against a phosphor screen. The picture is made up of tiny dots that are coloured red, green or blue - the intensity of each coloured dot makes up the vast range of colours interpreted by the eye.



### Uses

- They were used as the primary output device for computers so the user can see immediately what they are typing in.
- They are used with light pens, for example, to allow designs to be created on screen.

### Advantages

- The angle of viewing is still better than with most TFT monitors.
- They work with light pens in computer aided design (CAD) applications.

### Disadvantages

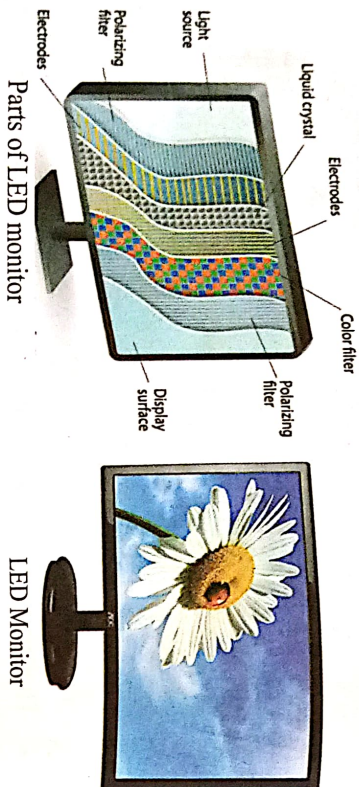
- They tend to be rather heavy and present a safety hazard if not supported properly.
- They run very hot and can cause fires if left unattended (especially as they get older).
- They consume considerably more power than modern TFT monitors.
- They can flicker, which can lead to headaches and eyesight problems with prolonged use.

### Light-Emitting Diode (LED) monitor

Light-Emitting Diode (LED) monitor is a flat screen, flat-panel computer monitor or television. The days of CRT monitors are almost gone. These days, most monitors and television sets are made using LED technology. The LED monitors and television sets are made using Liquid Crystal Display/Diode (LCD) technology. The front layer of the monitor is made up of liquid crystal diodes. These tiny diodes are grouped together in threes or fours, which are known as pixels (picture elements). The three colours that are grouped together use red, green and blue diodes. Those systems that use groups of four include a yellow diode which makes the colours more vivid. Because LCD does not emit



any light, some form of backlight technology needs to be used. Modern LCD monitors are backlit using light emitting diode (LED) technology. This gives the image better contrast and brightness.



### Uses

- They are used as the primary output device for computers so the user can see immediately what they are typing in.
- They are an integral part of laptop computers.

### Advantages

- They are lightweight and don't pose the same risks as CRT monitors.
- They produce less glare than CRT monitors and also emit less radiation.
- They consume much less power and don't generate as much heat as a CRT monitor.

### Disadvantages

- The angle of viewing a TFT is fairly critical otherwise the image isn't very clear (for example, if several people are looking at a screen at the same time).
- Definition is sometimes not as good as a CRT monitor.



### Activity

Draw and label the following output devices and state their uses:

- Cathode Ray Tube
- LED Monitor and

## B7.1.1.1.4 Storage devices: full-sized external hard drives, Hard Drive Speed, Disk Caching.

Storage devices are devices that can be used to store data/information temporarily or permanently and at the same time retrieve information from them.



### Uses of storage devices

- They are used to store data and information.
- They are used to create backup of relevant information.
- They are used to transfer information from one computer to the other.
- They are used to duplicate and share information.

### Types of secondary storage devices

There are three types of secondary storage devices, these are:

- **magnetic storage devices**
  - Magnetic storage devices utilize magnetic patterns to represent information. Examples of magnetic storage devices are floppy diskette, hard disk drive, magnetic tapes and zip diskette. Magnetic storage devices are commonly used for large volumes of data (e.g., video, image or remote sensing data) e.g. hard disk drives.
- **optical storage devices**
  - Optical storage devices read and write data on disc using low-powered laser (light) beam. Examples are Blu-Ray disc, CD-ROM disc, CD-R, CD-RW disc, DVD-R, DVD+R, DVD-RW disc.
- **solid state storage devices**
  - Solid state storage drives use flash memory to read and write data. Examples are pen drive (flash disk/jump disk), memory cards and solid-state drive (SSD),

Let us discuss hard disk drive (HDD) in details.



### Hard Disk Drive (HDD)

A hard disk drive (sometimes abbreviated as hard drive, HD, or HDD) is a hardware device that permanently stores and retrieves data on a computer. A hard drive is a secondary storage device that consists of one or more platters to which data is written using a magnetic head, all inside of an air-sealed casing. Hard disks are tightly sealed within an enclosure metal casing to prevent any foreign matter from getting inside.



## Types of HDD

There are two types of HDD which are internal and external HDD. The internal HDD is installed inside the computer while the external are portable HDD that are used to transfer data from one computer to another.

### Internal hard disk

An internal hard drive is a hard drive that resides inside the computer. Most computers come with a single internal hard drive, which includes the operating system and pre-installed applications. The internal hard drive is a key component of a computer since it stores the user's software and personal files.



(a) Internal hard disk drive (opened)



(b) Internal hard disk drive inside a computer

### External hard disk

An external drive is a hard disk that comes in a case that connects to your computer with a USB cable. This allows you to add and remove a particular disk as needed, or have multiple external drives connected to your system.



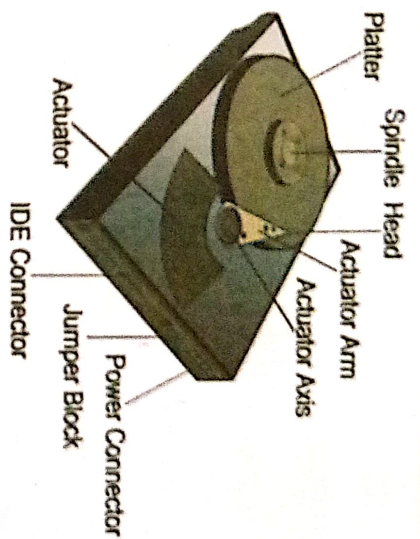
(a) External hard disk drive



(b) External hard disk connected to a laptop computer

### Parts of the hard disk drive

There are many parts of the hard disk drive that make it possible to store data. The figure below shows the internal parts of the hard disk drive.



Internal parts of the hard disk drive

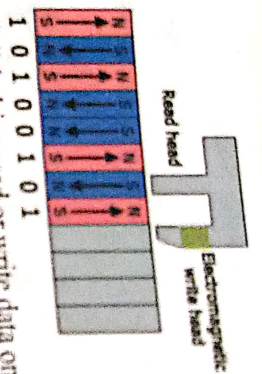
### Functions of the parts of hard disk drive

- Platters hold written binary data.
- The spindle spins the platters spin at high speed.
- The head uses electromagnets to read and write data.
- Actuator arm moves the heads across the platter surfaces
- Actuator axis is a small spindle that permit the motion of the read-write arms
- Actuators move the actuator arms accurately
- External plug connectors (Integrated Development Environment (IDE) connector, Jumper block and Power connector) let users connect the drive to the computer motherboard.

### How a hard drive works

The hard drive contains a spinning platter with a thin magnetic coating. A head moves over the platter, writing zeros (0) and ones (1) as tiny magnetic North or South pole on the platter. This means that magnets are well suited to be used to store binary numbers, with a "North" representing a "0", and a "South" representing a "1". Hard disk drives use this method to store data. To read the data back, the head goes to the same spot, notices the North and South poles and reads the stored data as 0's and 1's





How the hard disk drive read or write data on the platter.

A Modern hard drive can store well over a trillion 0/1 bits per platter, so the individual North/South spots are quite small

### Hard disk drive speed.

The speed of the hard disk drive depends on the rotational speed the spindle motor. The speed of the HDD measured in revolutions per minute (RPM). The faster the platter spins the faster an HDD can perform. Typical laptop drives today spin at either 5400 RPM (Revolutions per Minute) or 7200RPM. Some server-based platters spin at up to 15,000 RPM.

### Disk caching

A disk caching is a mechanism for improving the time it takes to read from or write to a hard disk.

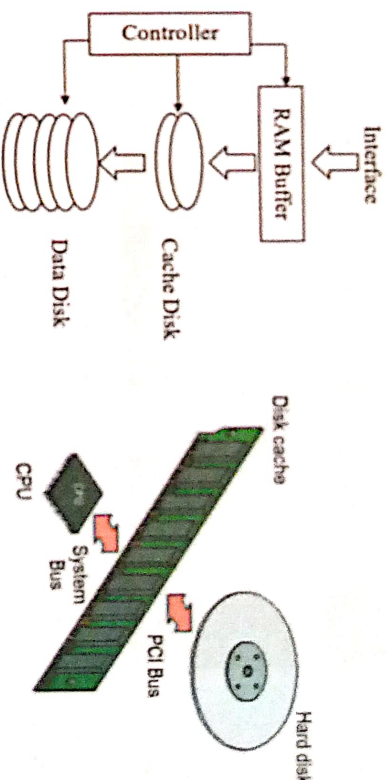
A disk cache is a memory that is used to speed up the process of storing and accessing data from the host hard disk. It enables faster processing of reading/writing, commands and other input and output processes between the hard disk, the memory and computing components.

A disk cache is a section of the main memory or memory in the hard disk controller that bridges the disk and the central processing unit (CPU). Disk cache is usually included as part of the modern hard disk. The size of disk cache ranges from 128 MB in standard disks to 1 GB in solid state disks. A disk cache stores the most recent and frequently used programs and data. When a user or program requests data, the operating system first reviews the disk cache. If the data is found, the operating system and memory quickly deliver the data to the program. A disk cache can also be a soft disk cache when it is implemented on the Random Access Memory (RAM) rather than the hard disk drive.

### How disk caching works

- When the disk is read, a larger block of data is copied into the cache that is immediately required.

- If subsequent reads find the data already stored in the cache, there is no need to retrieve it from the disk, which is slower to access.
- The disk cache can also be a specified portion of the Random-Access Memory (RAM).
- The disk cache holds data that has recently been read and, in some cases, adjacent data areas that are likely to be accessed next.



Disk Cache



### Activity

Identify five (5) features of the HDD and discuss how the hard disk stores data.

## B7.1.1.2.1 Windows Operating System (Start screen, Use of tiles, Taskbar buttons, Preview thumbnails).



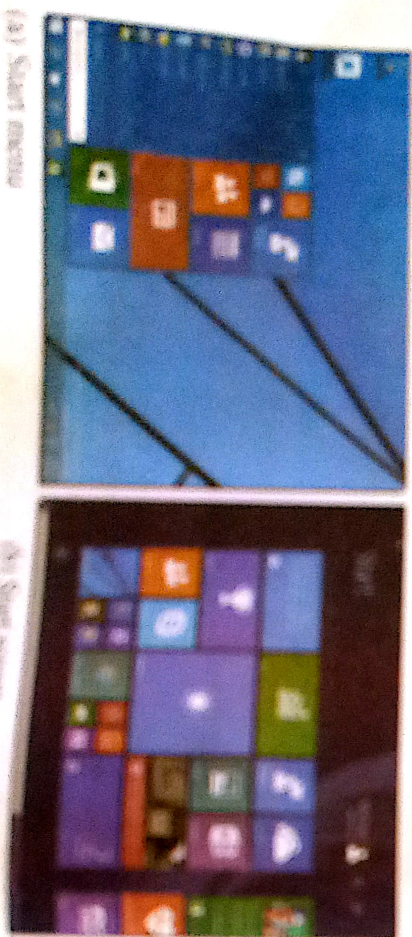
### Desktop

The desktop is the main interface screen which displays icons that provide quick access to programs and information. All tasks are performed from the desktop. Application programs and windows are opened and run from the desktop. The desktop usually shows icons of commonly used programs. Windows 10 desktop is shown in the figure below.





The start screen provides a central launching point for computer programs. It can be modified to suit the user's needs. The start screen is a right-clickable area.



(a) Start menu

(b) Start screen

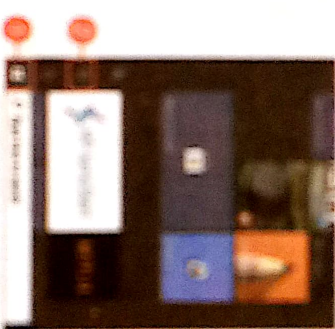
The start screen shows much larger tiles for programs and features. The start screen also displays a list of pinned applications. The start screen also displays a list of pinned applications. The start screen also displays a list of pinned applications.

Windows 10 allows users to customize their Start menu and taskbar. The Start menu can be customized by clicking the search button on the Start bar and can also be brought up by a keyboard shortcut. To see the Start menu, the Start button is the first button that a user sees upon login.

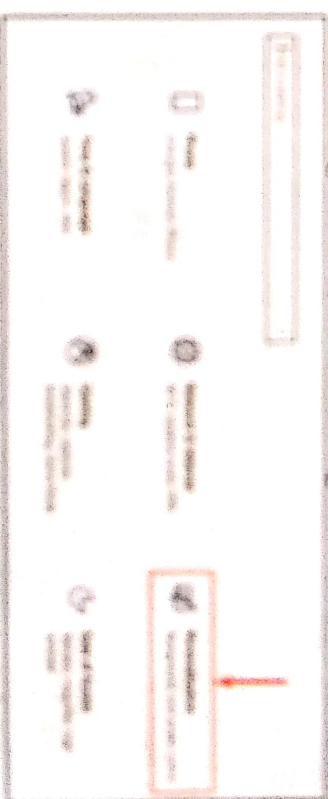
Your device will determine whether the Start menu or Start screen is the default option in the new version of Windows. On a PC, the Start menu will be turned on by default when you log into Windows 10. On a phone or tablet, the Start screen will be the default.

### How to enable Windows start menu and start screen

1. Click the Start button
2. Click the Settings command

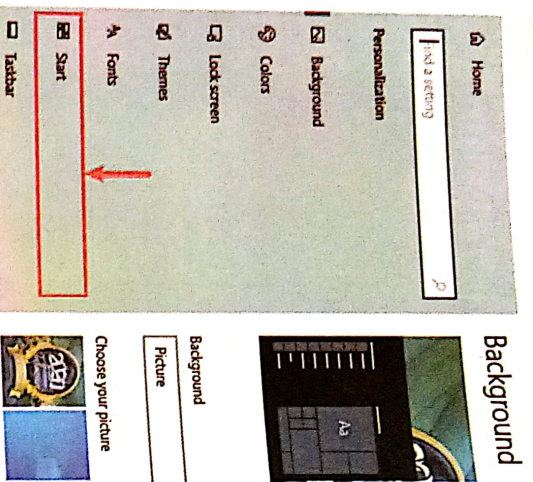


3. At the Settings window, click the setting for Personalization

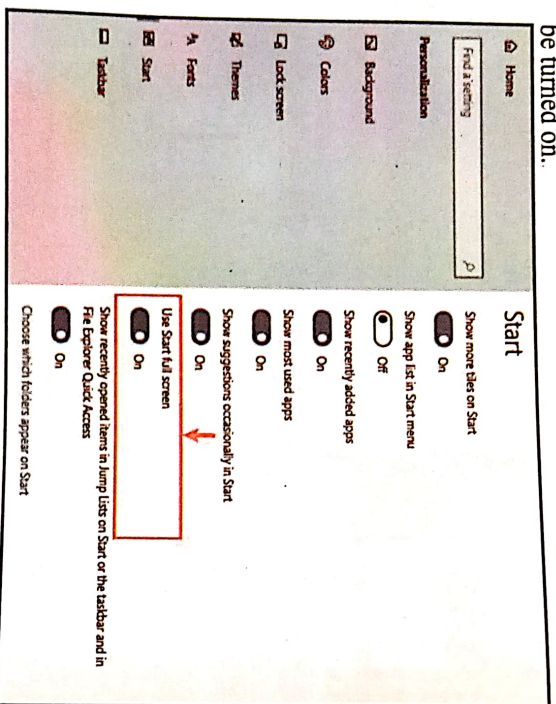


4. At the Personalization window, click the option for Start

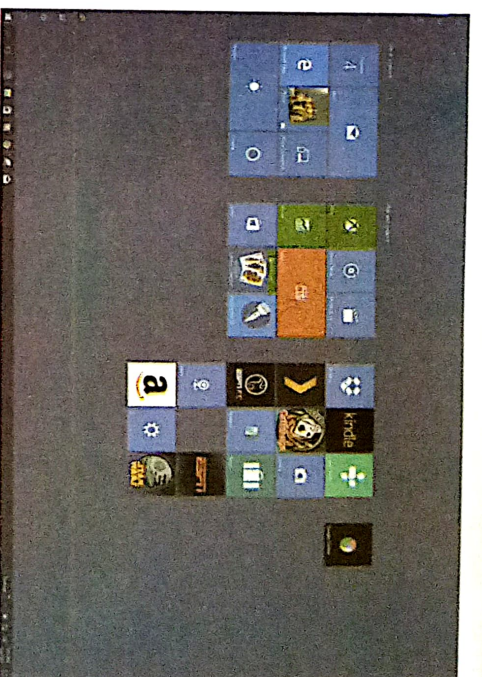




5. In the right pane of the screen, turn on the settings for "Use Start full screen" be turned on.



6. Now click the Start button, and you should see the Start Screen.

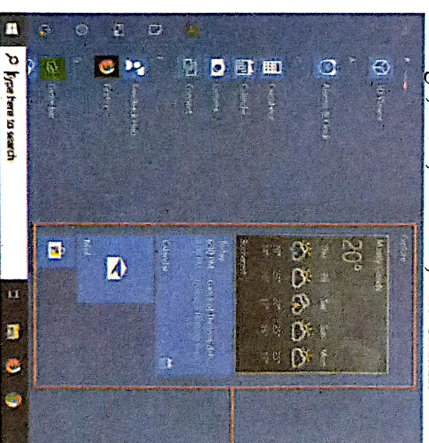


**Note:** To reverse the settings to the Start Menu, just turn off the settings for "Use Start full screen"



### Tiles

A tile is a type of shortcut you can only find in a grid, on the right side of your Windows 10 Start Menu. Tiles are colorful, sometimes animated, and larger than the regular sized icons used for desktop shortcuts. Windows tiles come in four different sizes. You can learn how to resize tiles in Windows 10 and manage groups of tiles, organizing the Start Menu according to your needs and preferences. Depending on their size, Windows tiles can display plenty of information from the application they represent, or they can be as small as a simple medium-sized icon. In the screenshot below, you see all the sizes that tiles can have in Windows 10: large, wide, medium, and small.

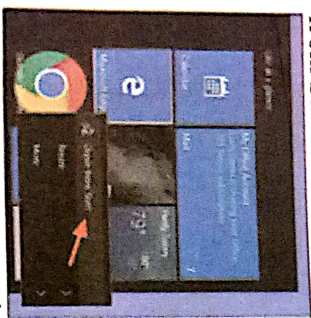


The sizes tiles can use



## Pin and Unpin Tiles on the Start Menu in Windows 10

You can easily pin and unpin tiles by right-clicking on each one and selecting “Unpin from Start.”

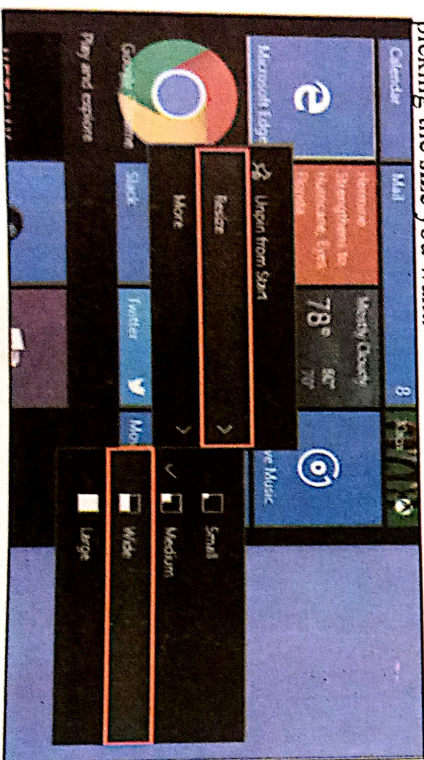


If there is an application that is not pinned, you can create a tile for it by right-clicking the application and select “Pin to Start.”



## Resizing Tiles

You can change the size of the tile by right-clicking it, pointing to “Resize,” and then picking the size you want.

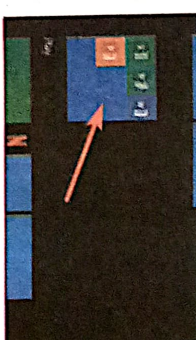


## Grouping Tiles into Folders

You can also group tiles on the Start menu into folders. To create a new folder, drag any tile and drop it onto another tile. Those tiles will then be grouped into a folder. You can then add other tiles to the folder by dragging them on top of the folder.



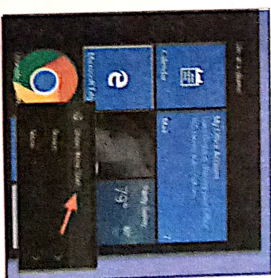
Once you have tiles in a folder, you just have to click the folder to expand it.



Then, you can click any tile inside to launch the application. Click the arrow above the folder to collapse it again. If you want to remove tiles from a folder, drag them back out of the folder and drop them directly on your Start menu.

## Removing Tiles from the start menu

If you do not like the tiles on your Start menu, you can remove them. To do this, right-click on the tile and then click “Unpin from Start” to remove them



## Activity

Explore the interface of any smart mobile phone. Discuss the similarities and difference between the smart mobile phone interface and that of the computer.



**Group work**  
In groups of five (5), discuss and present the functions of the taskbar, thumbnails, start screen, and tiles.

## B7.1.1.2.2 File and folder management



### Folder

Folders are containers for keeping programs, files and other folders. They are used to organize the information on the computer. A folder is represented in windows by a yellow folder icon. Folders allow people to organize their files in a way that makes sense to them. For example, a student might store all her photos in a folder named **Pictures** and all her homework in a folder named **Home Work**. All these folders might reside within a folder called **My Documents**. The operating system also uses folders to store data such as system files, library files and user preferences. Often the folders that the system uses are hidden meaning users cannot alter their contents.

Empty Folder icon



Folder with files icon



### File

A file is an object on a computer that stores **data, information, settings, or commands** used with a **computer program**. The icon of a file is usually related to the program that can open it. Unlike folders, files have different icons depending on the program they were created with as in the figure below.



To create a file a software program on the computer is used. For example, to create a text file you would use a text editor such as **Notepad**, to create an image file you would use

image editor such as **Paint** and create a document you would use a word processor such as **MSWord**.

### Differences between files and folders

File	Folder
A file contains only one document.	A folder contains many files and programs.
A file cannot contain other files.	A folder can contain other folders.
Files take space on computer memory.	Folders do not take spaces on computer memory.
Files can be commanded to print.	Folders cannot be commanded to print.
Files can be commanded to run.	Folders cannot be commanded to run.
Files require special types of software.	Folders do not require any special software to open.

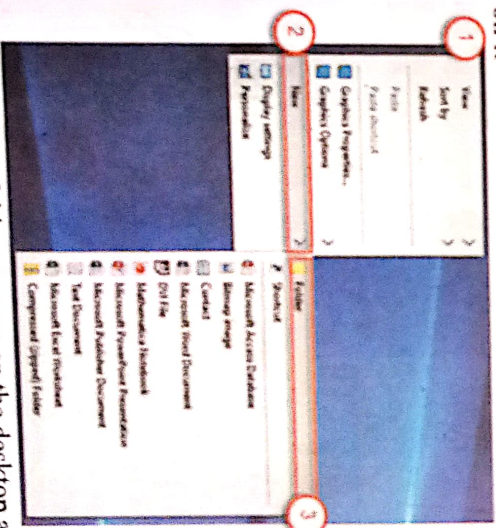


### How to create and name a folder on the desktop

Step 1. Right-click on an empty space on your desktop to display a sub-menu.

Step 2. In the sub-menu, move your mouse pointer and place it over **New**.

Step 3. In the New menu that appears, place your mouse pointer over **Folder** and click on it



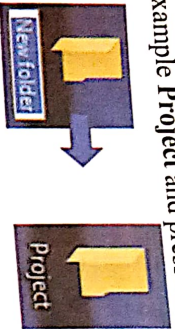
Step 4. A new folder appears on the desktop as shown below:





If you look at the folder, you will see that the words **New Folder** are highlighted and there is a cursor blinking next to it. This is where we type the name of the folder.

**Step 5.** Name the folder for example **Project** and press the Enter Key.

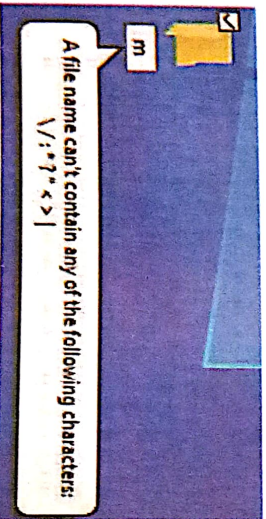


### File and folder naming conventions

File-naming conventions when saving files or creating a folder include

- Case sensitivity – upper and lower case are different (true in Linux and Unix variations, not in Windows)
- Maximum length (Windows 260 characters)
- Spaces allowed
- Digits allowed
- Characters that are not allowed include:
  - Asterisk (\*)
  - Question mark (?)
  - Colon (:)
  - Inverted comma (" ")
  - Less than and greater than (< >)
  - Pipe (|)
  - Forward slash (/)
  - Back slash (\)
  - File or Folder names not allowed (con, nul, prn)

The diagram below shows the characters that cannot be used for naming folders.



### File extension

A file extension is a **suffix** at the end of a computer file. It comes after the period, and is usually two-four characters long. If you have ever opened a document or viewed a picture, you have probably noticed these letters at the end of your file.



File extension

### Importance of file extensions

File extensions are used by the operating system to identify what apps are associated with what file types. In other words, what application opens when you double-click the file. For example, a file named "awesome\_picture.jpg" has the "jpg" file extension. When you open that file in Windows, for example, the operating system looks for whatever application is associated with JPG files, opens that application and loads the file.

The table below shows some coming file extensions

File	Extension	Meaning
Image	.JPEG	Joint Photographic Experts Group
	.TIFF	Tagged Image File Format
	.GIF	Graphics Interchange Format
	.Exit	Exchangeable image file format
	.BMP	Windows bitmap
	.PNG	Portable Network Graphics
	.BPG	Better Portable Graphics
Documents	.Doc/.docx	Word document
	.Xls/.Xlxs	Excel/spreadsheet
	.pdf	Portable document file
	.rtf	Rich text format
	.txt	Plane text
	.ppt/.pptx	PowerPoints
Audio	.m3u	Media Playlist File
	.m4a	MPEG-4 Audio File
	.mid	MIDI File
	.mp3	MP3 Audio File
	.mpa	MPEG-2 Audio File



.ra	Real Audio File
.wav	WAVE Audio File
.wma	Windows Media Audio File
.wmv	Windows Media Video File
.asf	Advanced Systems Format File
.asx	Microsoft ASF Redirector File
.avi	Audio Video Interleave File
.flv	Flash Video File
.mov	Apple QuickTime Movie
.aif	Audio Interchange File Format
.iff	Interchange File Format
.3g2	3GPP2 Multimedia File
.3gp	3GPP Multimedia File
.mp4	MPEG-4 Video File
.mpg	MPEG Video File
.rm	Real Media File
.swf	Shockwave Flash Movie
.vob	DVD Video Object File
.wmv	Windows Media Video File



### Group work

In groups of five, identify possible applications that produce the following file extensions: **docx, xls, pdf, jpg and ppt**.

### Summary

- The second generation of computers saw the use of transistors instead of vacuum tubes.
- A transistor is a semiconductor device used to amplify electronic signals or to switch electronic devices.
- The third generation of computers introduced the use of IC (Integrated Circuits) in computers.
- A wireless keyboard is a regular keyboard that is not connected to the computer by any cables.
- A touch screen enables the user to choose an option by simply touching a button/face on the screen.
- A hard disk drive is a hardware device that permanently stores and retrieves data on a computer.

- A disk caching is a mechanism for improving the time it takes to read from or write to a hard disk.
- The desktop is the main interface screen which displays icons that provide quick access to programs and information.
- The start menu consists of a column listing program folder, documents, favourites, control panel, search, run, help and shutdown.
- The start screen covers the entire screen and provides a central launching point for computer programs.
- A tile is a type of shortcut you can only find in a grid, on the right side of your Windows 10 Start Menu.
- Folders are containers for keeping programs, files and other folders. They are used to organize the information on the computer.
- A file is an object on a computer that stores data, information, settings, or commands used with a computer program.

### Knowledge-based assessment

#### Multiple Choice Questions 1

- This electronic device was used with second generation computers.  
A. Integrated circuits B. Vacuum tubes C. Diodes D. Transistors.
- Which of the following generation of computers used vacuum tubes?  
A. First generation B. Second generation  
C. Third generation D. Fourth generation.
- In which year was second generation computers introduced?  
A. 1945 B. 1956 C. 1975 D. 1995
- Which of the following devices is uses photocell to write on computer monitors?  
A. Wireless mouse B. Wireless keyboards  
C. Light Pen D. Touch screens
- Hard disk drive store data through the use of  
A. laser B. Flash memory C. Heat D. Magnetic patterns



## Theory

1. (a) What is a second-generation computer?  
(b) List five features of second-generation computers.  
(c) What is a transistor?  
(d) Mention *three* uses of a transistor in a circuit.
- 2 (a) Identify *two* (2) input devices that convert hard copy pictures or images into a digital format.  
(b) State *two* (2) input devices that are used for playing gaming programmes.  
(c) Briefly explain the purpose of input devices.  
(d) Draw *three* (3) input devices and state one function of each.
3. (a) What is a hard disk drive (HDD)?  
(b) Differentiate between internal and external hard disk drive.  
(c) Briefly explain how data is stored on a hard disk drive.  
(d) What is disk caching?  
(e) Explain how disk caching works in a hard disk drive.
4. (a) What is a file suffix?  
(b) In the table below, identify the type of file using its suffix

Suffix	File
.jpeg	
.doc	
.xls	

## Sub-strand 1.2:

### Technology in the community

#### Content standard

B7.1.2.1. Demonstrate the use of Technology in the community.



#### Indicators

B7.1.2.1.1. Describe and give examples of at least five technology tools for learning in each subject (e.g., spreadsheets, Encarta, virtual museum, scrabble, presentation, scratch etc.)

B7.1.2.1.2. Demonstrate the use of at least three technology tools identified in B7.1.2.1.1.

B7.1.2.1.3. Discuss the benefits of using technology tools in learning.



#### Introduction

Over the years, new techniques, skills, methods, and processes are being developed to solve human problems. This is known as technology. We use technology in all area of our daily life including education, health, industry, communication and entertainment. In this lesson, we will focus on the use of technology for learning. We will look at some technology tools for learning and discuss the benefits of using technology tools in learning.



#### Teaching strategy

Exploratory and demonstration methods of teaching are recommended for this lesson. Let learners explore the various technology tools that can be used for learning. This can be done through learners surfing the Internet. Additionally, guide learners to brainstorm ICT tools that are used in learning. Let learners demonstrate the use of a technology tool in groups and present to the whole class how that tool works. Guide learners to discuss in pairs the benefits of using technology tools in learning.



#### Content link

At this level, we will describe and give examples of some technology tools used for learning and discuss their benefits. In Basic 8, we will examine the negative impact of



computer use on the environment. We will also learn about environmentally responsible use of computers and how to create a component form disposed computer parts.

### B7.1.2.1.1. Technology tools for learning in each subject

Technology is the application of scientific knowledge to create machinery and equipment to solve problems. It is also the sum of techniques, skills, methods, and processes used in the production of goods or services.

#### Technology tools for learning

In recent years, the technologies such as the computer have become very important in teaching and learning. The Internet and computers have become central tools for educational delivery. The advantage of using computers in schools is that they offer easier ways of explaining various concepts that students find hard to understand. For example, if you are studying about pollination, your teacher can get a simulation video on pollination and show it to you in class. Your teacher can also provide you with some Internet resources which give a better explanation of the concept.

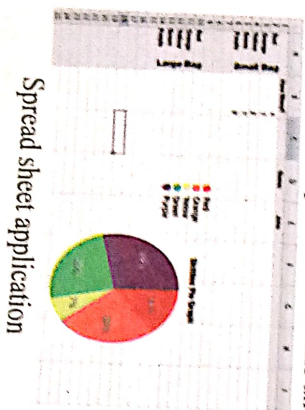
When used appropriately, technological tools have the potential to enhance students' achievement and assist them in meeting learning objectives. The following are some technologies that can be used for learning:

- Spreadsheet
- Encarta
- Virtual museum
- Scrabble
- Scratch



#### Spreadsheet

A spreadsheet is a data file comprising rows and columns that are used to sort data and allow a user to manipulate numerical data. A spreadsheet is an electronic ledger commonly used by people in the workplace to store information and manipulate it to make informed decisions. The worksheet is divided into alphabetic columns and numeric rows.



Spread sheet application

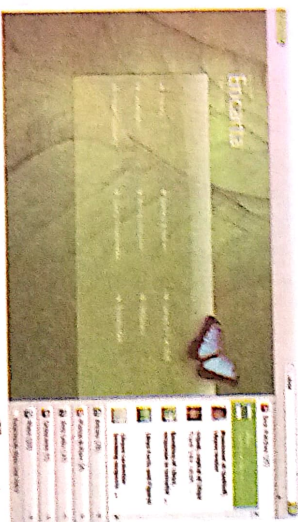
Spreadsheet applications include Microsoft Excel, Lotus and Quattro Pro. Spreadsheet application can be used to teach mathematical skills. These tools make students understand the processes involved in solving mathematical problems better and faster. They can also be used by students to learn graphs. When students use spreadsheet to organize data into a worksheet and manipulate it, they acquire essential skills which include:

- using computational strategies to calculate data
- generating graphical representations of data
- comparing sets of data using tables, graphs, and models
- examining patterns in data using charts and trend lines
- applying mathematical reasoning to investigate a problem
- applying problem solving strategies to develop a solution
- making connections to the real-world applications of mathematics



#### Encarta

Encarta is a multimedia encyclopedia program which provide users with a variety of features for research and activities for learning. It contains a huge database of information in all topics. Encarta software has multiple topics/articles on various topics. Because the software contains multiple topics, it has an effective search feature as an integral part of the software. You can simply type the title of the topic to locate it in the software.



Encarta software

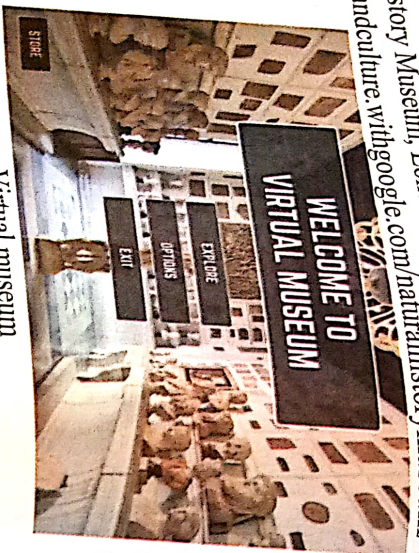


#### Virtual museum

A virtual museum is a collection of digitally recorded images, sound files, text documents, and other data of historical, scientific, or cultural interest that are accessed through electronic media. A virtual museum houses collection in digital form and exhibits them via the Internet. Due to hyperlinking, interactivity and multimedia capabilities of the World Wide Web, the exhibit can be linked to background information, related works, and other relevant sources. Users can listen to recorded speeches of historical figures and watch videos of historical events in virtual museums. Some virtual museums proved a three-dimensional digital tour of artifacts. Examples of virtual museums include:



- Vatican Museums, Rome:  
<https://www.youvisit.com/tour/vatican>
- Natural History Museum, London:  
<https://artsandculture.withgoogle.com/naturalhistorymuseum/>



Virtual museum

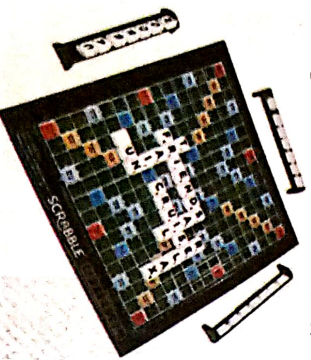
Virtual museums are powerful tools for comparative study and for research into a particular subject, material, or locality.



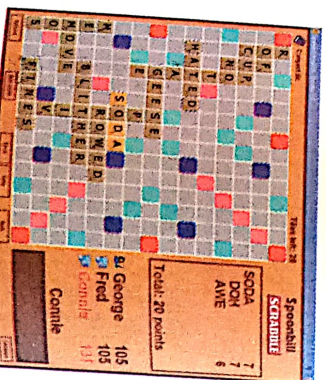
### Scrabble

Scrabble is a word game in which two to four players score points by placing tiles, each bearing a single letter to form words. When playing Scrabble, the objective is to score more points than other players. As words are placed on the game board, points are collected and each letter that is used in the game will have a different point value. The main strategy is to play words that have the highest possible score based on the combination of letters.

Scrabble is available as physical board game or as a software that can be installed on a computer or mobile device.



(a) Scrabble board game



(b) Scrabble software

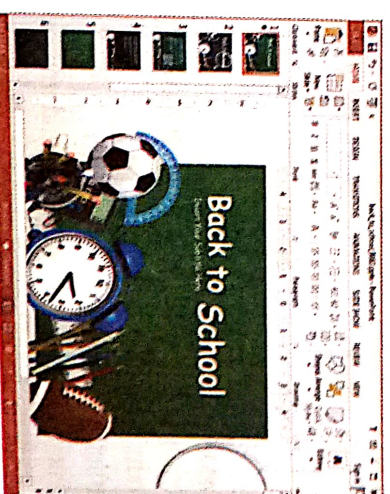
### Importance of playing scrabble

- **Improves spelling and vocabulary:** Scrabble improves the word spelling of learners. Many teachers at the school recommend parents to play scrabble with their children, especially those who are poor at spelling. While playing the game, you can teach the children the basic rules of spelling a word. They will definitely grasp the word and its spelling quickly. This game will also let children know new words and their meanings. While playing the game, if you put a new word on the board, the child would positively be inquisitive about knowing its meaning and for sure will remember the word. This way, they will increase their vocabulary too.
- **Improve the creativity of children:** The brilliant game of scrabble allows the children to use their own creativity to make new words from the letters provided. While playing the game, they are forced to creatively think of a fun and unique word than the ones already on the board, in order to score good and more than the other players. Some children also show a smart move by using their tiles to make new words in some specific area on the board to attain more points.
- **Improves mathematical skills:** Along with improving the English skills, the scrabble also teaches the children basic mathematics skills. Since each tile of the letters used in the game carries specific points, the children would have to multiply those points with the value given to the box. In short, the children would have to apply addition and multiplication methods after creating every word on the board. This calculation would improve their mathematical skills.
- **Entertains the kids:** Besides improving the vocabulary and mathematical skills of the children, scrabble also offers entertaining time to the entire family.



### Presentation software

Presentation software such as PowerPoint is used to show information to a large number of audiences using projectors. Teachers integrate PowerPoint in their classroom instructions to facilitate student learning.



PowerPoint presentation software



It helps in many ways:

- **Importance of PowerPoint**
- PowerPoint is an easy tool for giving presentations. It helps in many ways: Multiple
- Improves the audience's focus.
- It allows working with other people in a collaborative manner.
- It allows collaborating and contributing to a presentation with learners through
- people can share the PowerPoint presentation with learners through
- The teacher can share the PowerPoint presentation with learners through
- the use of pen drives and CDs.
- PowerPoint has multimedia capabilities. Content can be presented in text,
- audio, video, and images to make it more appealing.
- PowerPoint presentations help learners to creatively express themselves.
- PowerPoint presentations help learners to creatively express themselves.
- The visuals and audio cues may also help the teacher to be more
- interactive with the audience.



### Scratch

Scratch is a free object-oriented software development kit (SDK) that allows children to create animations, interactive stories, games and music without needing to know a specific programming language. Scratch consists of a script, paint and sound editor. It is a zero-code interface, which means that users do not have to write source code for the programs they create. Instead, they assemble component blocks that are actually units of code represented by different interconnecting shapes. Each block has a specific command and unique function, and once the user has connected a series of blocks, he or she can click a green flag to start the script and see what the program does.



Scratch software

### Importance of learning with scratch.

- It makes coding and programming simple, fun and enjoyable for learners.
- It fosters coding literacy in learners
- It helps learners to solve logical problems.
- It helps learners to work collaboratively and improve communication skills.
- It boosts the creativity of learners to implement new ideas.
- Learners develop essential skills in project management

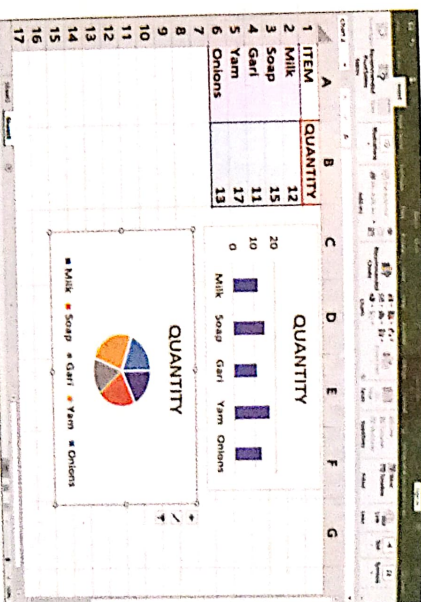
## B7.1.2.1.2. Demonstrate the use of at least three technology tools identified in B7.1.2.1.1.



### Spreadsheet activity

In groups of five learners, each group should enter the data below in MS Excel. Each group should plot the bar chart and pie chart for the data in the table below.

ITEM	QUANTITY
Milk	12
Soap	15
Gari	11
Yam	17
Onions	13



### Hint:

Type the tables in Excel.  
Select the whole table with is A1:B6  
On the Insert tab, click on bar chart or pie chart to insert it.



### Virtual museum activity

In groups of five learners, each group should visit the virtual museum using the web address: <https://www.youvisit.com/tour/vatican>



### Importance of PowerPoint

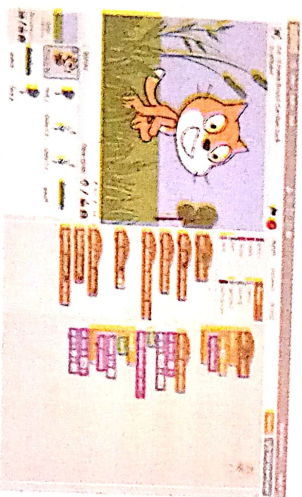
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Scratch software

### Importance of learning with scratch.

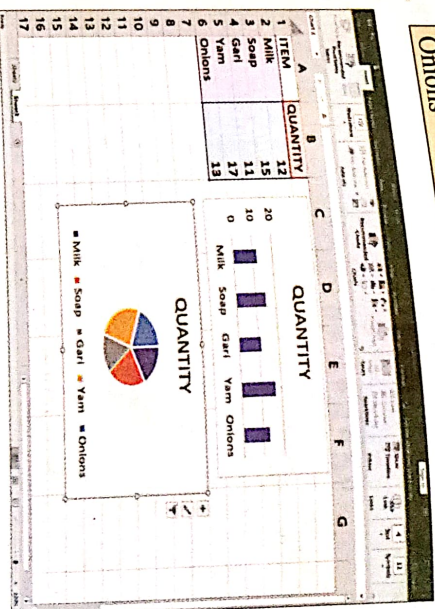
- It makes coding and programming simple, fun and enjoyable for learners.
- It fosters coding literacy in learners
- It helps learners to solve logical problems.
- It helps learners to work collaboratively and improve communication skills.
- It boosts the creativity of learner to implement new ideas.
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### B7.1.2.1.2. Demonstrate the use of at least three technology tools identified in B7.1.2.1.1.



Spreadsheet activity  
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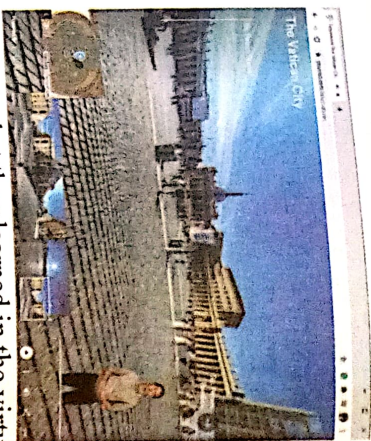
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### Virtual museum activity

In groups of five learners, each group should visit the virtual museum using the web address: <https://www.youvisit.com/tour/vatican>



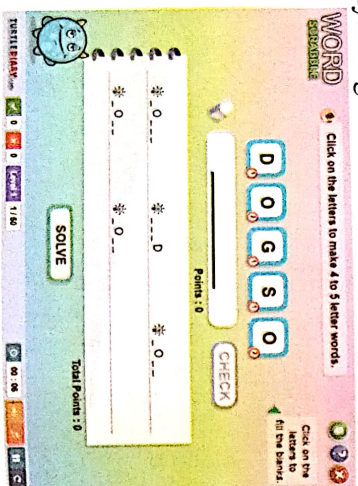


Each group should write about what they learned in the virtual museum



### Scrabble game activity

In groups of four learners, each group should play the scrabble game and tell the You can use the scrabble board game or play it online using the web address. <https://www.hurtlediary.com/game/word-scrabble.html>



Online scrabble game

## B7.1.2.1.3. Benefits of using technology tools in learning.

### Distance education

Technology enables students to learn at anywhere and anytime regardless of distance in the area of learning, science has improved in many folds with the use of television research tools, such as Encarta Encyclopedia. For example, you can view Science quizzes on the television and increase your science knowledge. ICT tools have made information quickly and easily available.

### Virtual learning

Virtual learning provides you with a virtual real-life environment to perform tasks for a course. For example, if you need to learn the different parts of a computer

virtual learning platform can provide you with a list of computer parts in text and pictorial form.

### Interactive tasks

Animations have greatly impacted the way education is provided. You can interact with the computer that responds to you based on your action. You can perform various tasks required to understand a concept. For example, if you need to learn the different parts of a computer, the computer will provide you with a list of computer parts in text and pictorial form.

### Learn at your own pace

Using a computer, each student can learn at his/her own pace. Slow learners can take their time to understand a topic.

### Prompt feedback

One of the major benefits of using technology in education is that you view your test results immediately.

### Online trainings

There are various training programs that are pre-recorded and available online to those who have applied for them. This allows you to undertake the training at your own time.

### Summary

- Technology is the application of scientific knowledge to create of machinery and equipment to solve problems.
- A spreadsheet is a data file comprising rows and columns that are used to sort data and allow a user to manipulate numerical data.
- A spreadsheet is used for calculating data, graphs, and mathematical reasoning.
- Encarta is a multimedia encyclopedia program which provide users with a variety of features for research and activities for learning.
- A virtual museum is a collection of digitally recorded images, sound files, text documents, and other data of historical, scientific, or cultural interest that are accessed through electronic media.
- Scrabble is a word game in which two to four players score points by placing tiles, each bearing a single letter to form words.
- Presentation software is used to show information to a large number of audiences using projectors.



- Scratch is a free object-oriented software development kit that allows children to create animations, interactive stories, games and music without needing to know a specific programming language.
- The benefits of technology in learning include distance education, virtual learning, interactive task, self-paced learning, prompt feedback and online training.

### Knowledge-based assessment

#### Multiple Choice Questions

- PowerPoint is an example of \_\_\_\_\_.  
A. spreadsheet B. presentation software  
C. virtual museum D. word Processing
- One of the following can be used to write computer games and programs.  
A. Scrabble B. Scratch C. PowerPoint D. MS Word
- One of the following software is used for creating presentations  
A. Scrabble B. MS Word C. Scratch D. PowerPoint
- Which of the following is a word game?  
A. Scrabble B. Scratch C. PowerPoint D. MS Word
- All the following are importance of playing scrabble except \_\_\_\_\_.  
A. learning mathematics B. improve vocabulary  
C. improve creativity D. learning programming

#### Theory

- What is technology?
  - List five technology tools for learning.
  - What is a spreadsheet?
  - List four ways by which a spreadsheet software is used to learn.
- What is virtual museum?
  - Mention two examples of virtual museums.
  - Mention two things that can be learned from virtual museums.
- What is scrabble?
  - Explain three importance of scrabble as a learning tool.
  - What is a presentation software?
  - List five importance of presentation software.

### Sub-strand 1.3:

### Health and Safety in using ICT tools

#### Content standard

B7.1.3.1. Demonstrate how to apply Health and Safety measures in using ICT Tools

#### Indicators

- B7.1.3.1.1 Describe health measures and current regulatory requirements and potential computing-related disorders  
B7.1.3.1.2 Describe Safety measures in using ICT tools

#### Introduction

Computers and electronic gadgets have become part of our daily lives. As we use computers, we sit at one place for a long time or we look at digital screens for long period. This way of using computers affect our health and leads to a range of health problems called potential computing-related disorders. In this lesson, we will learn more about some potential computing-related disorder, their causes and how to prevent them.

#### Teaching strategy

Activity method of teaching is recommended for this lesson. Let learners watch videos on the health hazards of prolonged use of computing devices or show pictures of bad postures and other hazards in using computing devices. Show some computing devices to learners and let them identify the health hazards associated with each device. Guide learning to understand the preventive measures of the stated health and safety issues.

#### Content link

At this level, we will learn about the current regulatory requirements and potential computing-related disorders. In Basic 8, we will continue this discussion and learn about workstation risk assessment. We will also learn about the measures that will help eliminate workstation hazard.

A hazard describes anything or situation that could be harmful to the user as they use a computer. For example, prolonged and improper use of the keyboard and mouse can cause



repetitive strain injury. Additionally, using the wrong body posture can lead to body pain and other health issues over time.

### **B7.1.3.1.1 Describe Current Regulatory Requirements and Potential Computing-Related Disorders**

The long-term use of computers has been linked to a range of health problems which are called **computing related disorders (CRDs)**.



#### **Potential computing related disorders**

Computers have become part of our life. We all use computers to play, work, communicate and even shop. When we use computers, sometimes we do complain about wrists pain, eyes getting irritated or our **backache**. These problems arise when we do not use computer parts properly or when we use the computer for many hours. The health problems most highly associated with the use of computer equipment are upper limb disorders, eye problems, stress and fatigue, and skin complaints.

#### **Computer radiation**

Computer radiation is the electromagnetic wave that is emitted by the computer. It can cause damage to human health.

#### **Effects of computer radiation**

- Exposure to the heat from the laptops can result in skin burns and wrinkled skin
- Computer radiation can cause infertility especially when laptops are placed on lap near the reproductive organs.

#### **Repetitive strain injury (RSI)**

Repetitive strain injury (RSI) is damage to the fingers, wrists and other parts of the hand caused by repeated movements over a long period of time.

#### **Causes**

- Typing or using the mouse for long periods of time
- Using too much force on your fingers when typing
- Using a poorly designed keyboard
- Workstation or chair at the wrong height such that arms are in an unnatural position

#### **Symptoms in the arms and hands include**

- aching
- pain in arms/wrists even after rest
- weakness

- swelling
- tenderness
- numbness
- burning sensation in the shoulders and neck:
- stiffness
- aching

#### **Prevention**

- Ensure workstation and chair are the correct height.
- Support wrists by using wrist rests.
- Keep elbows close to your sides.
- Observe a five-minute break from typing at least every hour.

#### **Eye strain**

Eye strain is when the eye becomes tensed after staring at a computer screen for a long time. This occurs when working in bad light, in glare or with a flickering screen.

#### **Symptoms include**

- burning or itching eyes
- blurring or double vision
- headache
- nausea
- Eye fatigue
- Eye irritation

#### **Prevention**

- Use monitors which do not flicker.
- Fix blinds at the windows so that the sun does not shine directly on the screen.
- Use suitable lights bulb that disperse light evenly.
- Use a screen filter.
- Keep your eyes at least 46 cm from the screen.
- Regularly look away from the screen and focus on something in the distance.
- Take regular breaks.
- Have regular eye tests and wear glasses if prescribed.

#### **Backache and neck pain**

Backache and neck pain are problems that occur due to poor posture or awkward position while sitting at a computer.

#### **Symptoms include**

- stiff back and neck
- back and neck pains
- headaches



### Prevention

- Use a fully adjustable chair. The height of the chair and the seat position should be easy to change.
- Use footrests so that the legs are kept at a more natural angle.
- Use a monitor which is adjustable. Position it so that the neck does not have to bend too far.
- Take regular breaks and walk about.
- Sit with the back straight and the head up. Do not slouch.

### Deep vein thrombosis (DVT)

DVT occurs when you sit for prolonged periods of time causing the veins that are inside the legs to become compressed. This compression hinders their natural pumping action that returns blood back to the heart. If this compression continues, the blood begins to stagnate and form a clot. This clot is known as deep vein thrombosis (DVT). Whilst DVT itself is very painful and requires medical treatment, it can potentially become life threatening. Small bits of the clot can break off and travel through the blood system where they lodge in the brain they can result in stroke. If they lodge in the lungs, they are called pulmonary embolus. Either of these two can kill you.

### Causes

- Sitting for long periods of time
- long periods of inactivity

### Symptoms

- Swelling in the affected leg
- Localized heat in the affected leg
- Pain in the affected leg

### Prevention

- Take regular breaks.
- Stand up and move around to allow the blood flow in your legs to return to normal.
- Use an adjustable chair and ensure that your feet are firmly on the floor.
- Sit with a suitable posture – do not cross your legs for long period.

### Computer vision syndrome (CVS)

Computer vision syndrome (CVS) describes a group of eye and vision related problems that result from prolonged use of devices with screen with digital screens such as personal computers, laptops, tablet, e-reader and smart phone. Many individuals experience discomfort and vision problems when viewing digital screens for extended periods.



Computer Vision Syndrome

### Causes

Computer vision syndrome occurs as a result of prolonged use of digital screen. Digital screens cause a person's eyes to work harder than normal. Several factors are responsible for this, including:

- the screen content being less sharp or focused
- poor contrast of the screen's content against its background
- reflections or glare bouncing off the screen

The following factors may also contribute to CVS:

- viewing the screen in low light conditions
- being too close to or too far from the screen
- positioning the screen at an angle that causes eye strain
- taking insufficient screen breaks

Together, these factors put greater demands on the eyes' ability to track and focus.

### Symptoms

The symptoms of CVS may differ from one person to another. Some common symptoms include:

- eye strain
- dry and itchy eyes
- blurry vision
- double vision
- difficulty focusing
- short sightedness, also called myopia
- headaches
- neck or shoulder pain and stiffness
- backache



working on the computer. A typical example of this software is Mavis Beacon Te Typing program. It is also important to do some exercises and stretches after sitting at the computer for long hours. These exercises reduce the risk of injury when working with a computer. The various exercises and stretches are illustrated below.

### B7.1.3.1.2 Safety measures in using ICT tools

#### Electrocution

Since ICT tools need to be connected to power source, we run the risk of being electrocuted. This is caused by

- spilling drinks over electrical equipment;
- faulty equipment (bare wires, etc.);
- opening up an electrical device when you do not know what you are doing.

#### Prevention

- Keep drinks and water away from ICT equipment.
- Make sure wires are insulated.
- Report any malfunctioning equipment to a technician
- Never open up an electrical device
- Do not tamper with electric cables.

#### Tripping over wires and cables

Most devices have wires and cables. When these are on the floor, it is likely that you will trip over them

#### Prevention

- Hide wires in cable ducts.
- Tuck wires under desks or carpets.
- Use wireless devices.
- Avoid stepping on electrical wires or any other computer cables.

#### Falling heavy objects

Some ICT tools are very heavy such as monitors and printers. They can cause severe injury if they were to fall on you.

#### Prevention

- Make sure equipment is placed away from edge of tables or desks.
- Place equipment on strong desks/tables which can support the weight with ease.

#### Fires

ICT tools are connected to power sources. If too many plugs are connected to one socket, the circuit overloads and overheats, causing an electrical fire.



Overloaded socket

Covering air vents of devices such as laptops can also cause fires.

#### Prevention

- Make sure that your room has many outlets
- Do not plug too many devices into the same outlet.
- Leave air vents on devices uncovered.

#### Summary

- Computing related disorders (CRDs) are health problems associated with the long-term use of computers.
- CRDs includes wrist pain, eyes irritating, backache, stress, fatigue and repetitive strain injury.
- Deep vein thrombosis (DVT) occurs why you sit for prolonged period of time.
- CRDs can be reduced by correct body posture, correct hand posture, compute desk stretches and using correct chair posture when working with the computer.

#### Knowledge-based assessment

#### Multiple Choice Questions

1. Health problems associated with the long-term use of computers is known as \_\_\_\_\_.  
A. regulatory requirements B. computer related disorders  
C. public health D. computer health
2. Which one of the following is not a health problem associated with the long-term use of computers?  
A. eyes irritation B. Backache C. Fever D. fatigue
3. Exposure to heat from laptops can cause \_\_\_\_\_.  
A. headache B. skin burns C. fever D. stress
4. RSI stands for \_\_\_\_\_.  
A. resistance strain illness B. repetitive skull injury  
C. resistance stomach illness D. repetitive Strain Injury
5. All the following are cause of RSI except \_\_\_\_\_.