Information and Communication Technology

Teachers' Guide
Grade 7

(Effective from 2018)

Department of Information Technology
National Institute of Education
Maharagama
Sri Lanka

www.nie.lk

Information and Communication Technology
Grade 7 –Teacher's Guide

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Message from the Director General

With the primary objective of realizing the National Educational Goals recommended by the National Education Commission, the then prevalent content based curriculum was modernized, and the first phase of the new competency based curriculum was introduced to the eight year curriculum cycle of the primary and secondary education in Sri Lanka in the year 2007

The second phase of the curriculum cycle thus initiated was introduced to the education system in the year 2015 as a result of a curriculum rationalization process based on research findings and various proposals made by stake holders.

Within this rationalization process the concepts of vertical and horizontal integration have been employed in order to build up competencies of students, from foundation level to higher levels, and to avoid repetition of subject content in various subjects respectively and furthermore, to develop a curriculum that is implementable and student friendly.

The new Teachers' Guides have been introduced with the aim of providing the teachers with the necessary guidance for planning lessons, engaging students effectively in the learning teaching process, and to make Teachers' Guides that will help teachers to be more effective within the classroom. Further, the present Teachers' Guides have given the necessary freedom for the teachers to select quality inputs and activities in order to improve student competencies. Since the Teachers' Guides do not place greater emphasis on the subject content prescribed for the relevant grades, it is very much necessary to use these guides along with the text books compiled by the Educational Publications Department if, Guides are to be made more effective.

The primary objective of this rationalized new curriculum, the new Teachers' Guides, and the new prescribed texts is to transform the student population into a human resource replete with the skills and competencies required for the world of work, through embarking upon a pattern of education which is more student centered and activity based.

I wish to make use of this opportunity to thank and express my appreciation to the members of the Council, and the Academic Affairs Board of the NIE the resource persons who contributed to the compiling of these Teachers' Guides and other parties for their dedication in this matter.

Dr. (Mrs.) Jayanthi Gunasekara

Director General

National Institute of Education

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Introduction

Information and Communication Technology has been identified worldwide as a tool that can be used to improve productivity, efficiency and effectiveness of organizational work and the daily activities of individuals. Therefore, providing an adequate level of ICT knowledge and skills, at different levels of education, is important for the students to progress and contribute towards national development.

The current Sri Lankan Secondary Education System has been substantially exposed to ICT through various programs including CAL, ICT for GCE (O/L), GIT for grade 12 and ICT as a component for the A/L Technology stream. Consequently, to maintain the progression in competencies, the need has arisen now for implementation of learning the subject ICT from grade 6 to 9.

As grade 6 to 9 is a formative study period, it is desirable to arouse curiosity and motivation by teaching students more practical areas than the theoretical aspects of computing. Therefore, a balance between theory and practical areas is achieved. To achieve this balance, the latest technologies have been included in the content.

It has been the focus of the curriculum committee to make this balance of competencies in theory and practice in order to lay a foundation for higher studies in ICT, to apply the competencies of day to day practical situations, to improve ICT literacy and to expose them to international standards.

National Goals

1. Based on the concept of respecting human values and understanding the differences in any between the Sri Lankan multi-cultural society, building up the nation and confirming the identity of Sri Lanka by promoting national integrity, national unity, national coherence and peace

2. While responding to the challenges of the dynamic world, identifying and conserving the National heritage.

3. Creating an environment which comprises the conventions of social justice and democratic life to promote the characteristics of respecting human rights, being aware of the responsibilities, concerning each other with affectionate relationships.

4. Promoting a sustainable life style based on the people's mental and physical well-being and the concept of human values

5. Promoting the positive feelings needed for a balanced personality with the qualities of creative skills, initiative, critical thinking and responsibility.

6. Through education, developing the human resources, needed for the progress of the well-being of an individual, the nation as well as the economic growth of Sri Lanka.

7. Preparing people for the changes that occur in a rapidly changing world by adapting to it and controlling them; developing the abilities and the potentialities of the people to face complex and unexpected occasions.

8. Sustaining the skills and attitudes based on justice, equality, mutual respect which are essential to achieve a respectable place in the international community.

National Education Commission Report (2003).

Basic Competencies

The competencies promoted through education mentioned below might help to achieve the above mentioned National Goals.

1. Competencies in Communication

This first set of competencies is made up of four subsets - Literacy, Numeracy, Graphics and information communication skills:

Literacy: listening carefully, speaking clearly, reading for comprehension, and writing clearly and accurately.

Numeracy: Using numbers to count, calculate, code and to measure, matter, space and time

Graphics: Making sense of line and form, expressing and recording essential data, instructions and ideas with line, form, color, two and three-dimensional configurations, graphic symbols and icons

ICT Competencies:

Knowledge on computers, and the ability to use the information communication skills learning in work as well as in private life

2. Competencies relating to Personality Development

- Generic skills such as creativity, divergent thinking, initiative, decision making, problem-solving, critical and analytical thinking, team work, inter-personal relationships, discovering and exploring
- Values such as integrity, tolerance and respect for human dignity
- Cognition

3. Competencies relating to the Environment

This is the second set of competencies related to the Social, Biological and Physical Environments.

Social Environment: Awareness, sensitivity and skills linked to being a member of society, social relationships, personal conduct, general and legal conventions, rights, responsibilities, duties and obligations.

Biological Environment: Awareness, sensitivity and skills linked to the living world, man and the ecosystem, trees, forests, seas, water, air and plant -life, animal and human life.

Physical Environment: Awareness, sensitivity and skills relating to space, energy, fuels, matter, materials and their links with human living, food, clothing, shelter, health, comfort, respiration, sleep, relaxation, rest, waste and excretion, media of communication and transport. Included here are the skills in using tools to shape and materials for living and learning

4. Competencies relating to preparation for the world of work

Employment related skills to maximize their potential and to enhance their capacity to contribute to economic development; to discover their vocational interests and aptitudes; to choose a job that suits their abilities and to engage in a rewarding and sustainable livelihood.

5. Competencies relating to religion and ethics

This fourth set of competencies is laden with values and attitudes. It is essential for individuals to assimilate values, so that they may function in a manner consistent with the ethical, moral and religious modes of conduct, rituals, practices in everyday living, selecting the most appropriate.

6. Competencies in play and use of leisure

Competencies that link up with pleasure, joy, emotions and such human motivations. These find expression in play, sports, athletics and leisure pursuit of many types. These also link up with such values as cooperation, team work, healthy competition in life and work. Here are included such activities as are involved in aesthetics, arts, drama, literature, exploratory research and other creative modes in human living.

7. Competencies relating to 'Learning to learn'

These competencies flow directly from the nature of a rapidly changing, complex, interdependent and crowded world whatever one learns, that learning will need updating and review. This requires that one should be aware, sensitive and skillful in sustained attention, and be willing to persevere and attend to details that matter in a given situation.

Objectives of the Subject

This syllabus enables students to:

- Develop basic skills useful to access ICT resources.
- Inculcate basic good practices in the use of ICT resources
- Inculcate basic computer literacy and develop a base for further pursuit of Information Technology and Communication Technology studies.

Proposed number of periods for each unit

Term	Competency Level	Number of periods
1st Term	1.1, 1.2	02
	2.1, 2.2,2.3, 2.4	05
	3.1, 3.2	02
	4.1	01
2nd Term	5.1, 5.2, 5.3, 5.4	08
	6.1	02
3rd Term	6.1	03
	7.1, 7.2, 7.3, 7.4	07
Total		30

Grade 7 Syllabus **Information and Communication Technology**				
Competency	Competency level	Content	Learning outcomes	Duration/ Periods
1. Identifies the organization of the Computer	1.1 Identifies the components of a CPU	• Different types of CPU	i. Explains functions of Arithmetic and Logical Unit (ALU) and Control Unit (CU)	01
	1.2 Describes the evolution of computers	• Brief history of Processor element (vacuum Tube, transistor, IC etc.) : clock Speed, size, heat, power consumption, cost etc.	i. Lists land marks of CPU development ii. Identifies the change of processor speed and other features	01
2. Explores the functions of Operating systems	2.1 Describes the different types of operating systems	• Windows, Mac OS, Linux, Android, mobile OSs	i. Lists various operating systems ii. Identifies operating systems in various devices	01
	2.2 Identifies computer storage as a collection of digital data on different media	• Hard drive, Flash Drive, CD, DVD	i. Describes the usage of hard drive, flash Drive, CD, DVD	01
	2.3 Creates folders Save/open/edit/ delete/ re-name/ copy/move/ files	• Manipulation of Folders and Files o Copy, and move files from one storage unit to another	i. Saves and opens files in folders ii. Organizes files as per purposes	02
	2.4 Explores file properties	• Identification of size, type, modified date	i. List out properties of file ii. Explains properties of files	01

3. Uses various Safety precautions in a computer laboratory	3.1 Uses various precautionary methods to protect physical components of a computer	• Surge protection and protection against voltage drops (Fuses and UPS) • Protection against physical damage (dust, humidity, insects etc.) • Protection against overheating inside the computer	i. Identifies hardware security issues. ii. Takes precautions to minimize risk to hardware components	01
	3.2 Uses various precautionary methods to protect software components of a computer.	• Use of Anti-virus and other measures against malware. • Access Controls (physical locks and passwords)	i. Identifies software security issues ii. Takes precautions to minimize damages to software	01
4. Uses text editing software to type effectively	4.1. Uses computers efficiently by developing typing skills	• Use of proper techniques in typing (touch typing) • Use of typing practice software to develop typing skill	i. Demonstrates skills in the English keyboard ii. Demonstrates skills in the Sinhala/Tamil keyboards	01
5. Uses programming language to develop simple programs (Using Scratch)	5.1 Analyzes simple problems by decomposing and connecting them logically .	• Use of flow charts. o Sequence o Selection (Concept of Selection) o Iteration (Concept of Iteration)	i. Demonstrates critical and analytical thinking techniques ii. Describes sequence in flowcharts iii. Demonstrates the use of sequence in flowcharts appropriately	02
	5.2 Develops simple programs using visual development environment (Using Scratch)	• Introduction to Interactive Development Environment – Interface (IDE) to develop computer programs • Developing simple programs(sequence type) using visual supports of programming language (using an Interface)	i. Uses Scratch programming IDE ii. Applies basic instructions sequentially to develop simple programs	03

		Specially designed to teach programming to children		
	5.3 Describe the concept of variables in programs	• Definition of variable • Use of variables in programs	i. Describes the use of variables in a program ii. Writes programs with variables appropriately	02
	5.4 Identifies the concept of errors in a program as bugs	• Introduction of an error to an error-free programs and observation of the output	i. Describes the effect of errors in a program and takes precautions to avoid errors	01
6. Uses Presentation software to create presentation	6.1Uses basic functions of Presentation software in creating a presentation.	• Create, open, save and close a Presentation • Add Slide • Inserting files/objects (text, picture, shapes, clip art, word art etc.) • Formatting of Text • Add Multimedia and charts to a slide • Slide Designs • Move, duplicate, Hide and Delete Slides • Slide transitions	i. Creates presentation using Presentation software	05
7. Uses the services of the Internet and develops web pages	7.1 Uses resources available in the Internet (text, images, audios, videos etc.)	• WWW, URL • Download images, audio, video etc. • Accessing earth maps • Trusted and untrusted websites • Authentic and reliable information	i. Uses Internet for information gathering ii. Identifies trusted and untrusted websites iii. Identifies authentic and reliable information	01
	7.2 Uses offline (E-mail) and online (Chat) Communication	• Web based free E-mail • Creation of accounts. o Use of e-mail: Subject, To, Bcc, Cc, Attachments, Forward,	i. Communicates via e-mails ii. Communicates via online conferencing	02

		Inbox, Outbox. Draft, Trash, Spam, Reply • Online conferencing		
	7.3 Develops web pages using HTML	• Creation of a web page using text, images o Text formatting o Colors o Lists • Creating links to the other pages & web sites.	i. Designs a simple website ii. Creates a simple website	02
	7.4 Uses the Internet safely, securely and ethically	• Protection against unauthorized access and malware o Hacking o Virus attacks o Software piracy • Protection in using the Internet against crime o Cyber bullying o Stealing others data • Online safety precautions against unknown parties (Email, social media etc.)	i. Uses the Internet safely ii. Uses the Internet securely iii. Uses the Internet ethically	02
			Total	30

The Learning Teaching process

Information and Communication Technology is a rapidly changing subject and students are eager to use the latest technology. Provide actual hands on experience for each student using practical exercises. Allow them to convince theoretical basis through practical exercises.

It is essential that the proposed method of teaching should be student-centered as this subject is essentially practice-oriented. There is the need for special attention to be paid to encourage the student for self-study. Guide the student to apply the achieved ICT competencies to improve the learning process of other subjects.

Primitive social values and legal constraints related to the subject carry with them the imperatives of a sense and spirit of self-discipline. It is essential that the learning-teaching evaluation process is so organized as to highlight the importance of computer use.

Students should be motivated and inspired to attend group activities to learn new things and do collaborative activities to share and convey their findings with others through ICT and manual mediums.

Competency 1 **:** Identifies the organization of the Computer

Competency Level 1.1 **:** Identifies the components of a CPU

Time **:** 01 period

Learning Outcome:

- Explains the functions of Arithmetic and Logical Unit (ALU) and Control Unit (CU)

Content:

- Different types of CPU

Concepts and terms to be highlighted:

- CPU
- ALU
- CU
- Identifies the CPU in the Computer System
- Components of a CPU
- Function of ALU and CU
- Identifies different types of CPU

Guidance for lesson plans:

- Divide the students in the class into four groups Identify the searched components in the computer system and other available types in the laboratory
- Discuss with students the components of CPU
- Discuss the functions of CPU

Guidance for assessment and evaluation:

- Identify the different types of operations
- Identify the different devices which are controlled by the CPU

Quality inputs:

- Internet facility, Computer

Reading Material

CPU

A central processing unit (CPU) is the electronic circuitry within a computer that carries out the instructions of a computer program by performing the basic arithmetic, logical, control and input/output (I/O) operations specified by the instructions.

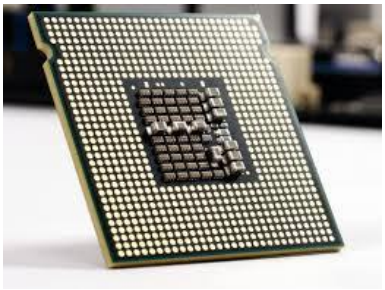


Fig. 1.1.1 - Processor

Components of a CPU

The three typical components of a CPU include the following:

- The arithmetic and logic unit (ALU),performs arithmetic and logical operations.
- The control unit (CU), which extracts instructions from memory and decodes and executes them, calling on the ALU when necessary
- The primary job of the memory unit is to store data or instructions and intermediate results. Memory unit supplies data to the other units of a CPU.

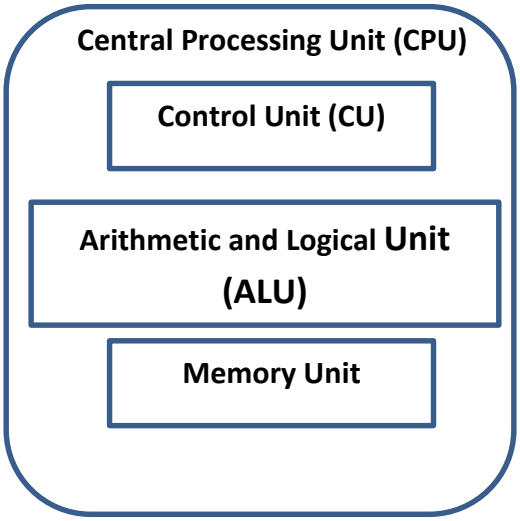


Fig. 1.1.2 - Components of a CPU

Different types of CPU

There are many different processors on the market. There are two primary manufacturers of computer microprocessors. Intel and Advanced Micro Devices (AMD) lead the market in terms of speed and quality. Intel's desktop CPUs include Celeron, Pentium and Core. AMD's desktop processors include Sempron, Athlon and Phenom.

Competency 1 : Identifies the organization of the Computer

Competency Level 1.2: Describes the evolution of computers

Time : 01 period

Learning Outcome:

- Lists land marks of CPU development
- Identifies the change of processor speed and other features

Content:

- Brief history of Processor Element (Vacuum Tube, Transistor, IC etc.) : Clock Speed, Size, Generated Heat, Power Consumption, Cost etc.

Concepts and terms to be highlighted:

- Vacuum Tube
- Transistor
- IC
- Clock Speed

Guidance for lesson plans:

- Brief history of Processor Element (Vacuum Tube, Transistor, IC etc.): Clock Speed, Size, Generated Heat, Power Consumption, Cost etc.

Guidance for assessment and evaluation:

- Divide students in to four or five groups. Give a worksheet for each group. Each worksheet contains block diagram of a CPU and mark arithmetic and logical unit, control unit then explain its functions.
- List generation vs technology used in CPU development
- First generation –Vacuum tube
- second generation-Transistors
- Third generation-IC
- Fourth generation-VLSI

Quality inputs:

- Printed materials, internet

Reading Material

Evolution of Computers

FIRST GENERATION (1945 – 1955)

- Program and data reside in the same memory
  (Stored program concepts – John von Neumann)
- Vacuum tubes were used to implement the functions (ALU & CU design)
- Magnetic core and magnetic tape storage devices were used
- Used electronic vacuum tubes, as the switching components

SECOND GENERATION (1955 – 1965)

- Transistors were used to design ALU & CU
- Invention of the transistor which was faster, smaller and required considerably less power to operate

THIRD GENERATION (1965- 1975)

- IC technology improved
- Improved IC technology helped in designing low cost, high speed processor and memory modules
- DOS allowed efficient and coordinate operation of computer system with multiple users

FOURTH GENERATION (1975- 1985)

- CPU – Termed as microprocessor
- INTEL, MOTOROLA, TEXAS, NATIONAL started developing microprocessor using semiconductors
- Interconnection of different computers for better communication LAN, MAN, WAN
- Computational speed increased by 1000 times

BEYOND THE FOURTH GENERATION (1985 – TILL DATE)

- ARM, AMD, INTEL, MOTOROLA
- High speed processor - GHz speed
- Because of submicron IC technology lot of added features in small size

Competency 2 **:** Explores the functions of the Operating System

Competency Level 2.1: Describes different types of operating systems

Time **:** 01 period

Learning Outcome:

- Lists various operating systems
- Identifies operating systems in various devices

Contents:

- Windows, Mac OS, Linux, Android, semiconductors Mobile OSs

Concepts and terms to be highlighted:

- Operating System
- Windows
- Linux
- Android
- Mac OS
- Mobile OS
- Explain Different type of operating systems
- Identifies operating system for different devices

Guidance for lesson plans:

- Take the students about the school, different administration buildings in the school and explain the school administration system such as principal's office, administration office and which area can be used by the students and teachers and explain why there are some important data that cannot be handled by every person. Similarly explain the role of the computer operating system and its main concept.

Guidance for assessment and evaluation:

- Describe the various systems in an operating system in a computer. Explain different types of operating systems and its functions. Discuss various systems requiring operating systems. For example school system, hospital system, railway system, transport system. From this discussion discuss various types of machines have operating systems.

Quality inputs:

- Computers with different operating systems

Reading Material

Operating System

An operating system (OS) is a system software that manages the computer hardware and the software resources and provides common services for computer programs and a convenient interface for the computer users.

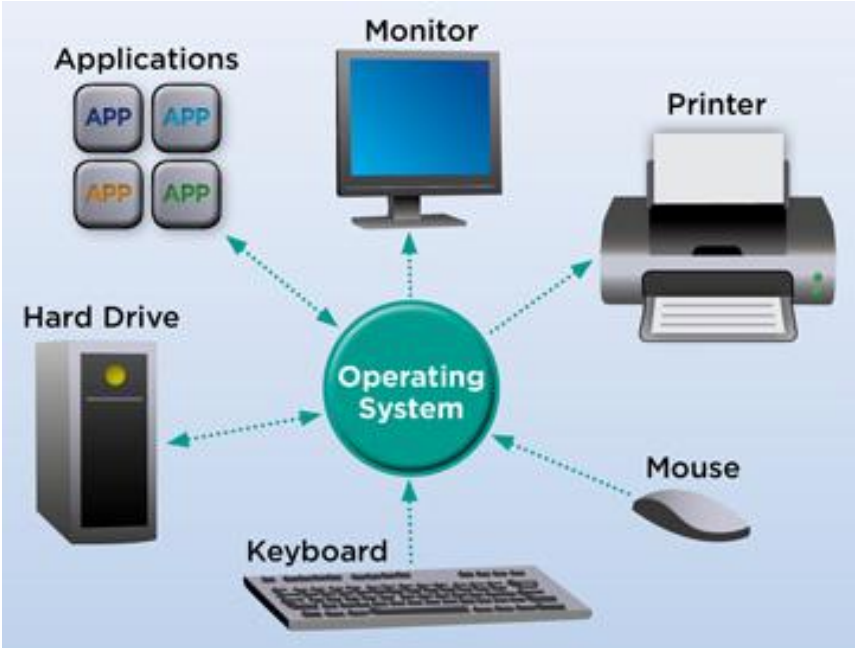


Fig. 2.1.1 – manages hardware and software resources from operating system

Different types of operating systems

- Windows
- Linux
- Android
- Mac OS
- Mobile OS

Functions of OS

- Interface between User and Hardware
- Hardware management
- Software management
- Memory management
- Process management
- System resource management
- Network Management
- Program control

Competency 2	**:**	Explores the functions of the Operating system
Competency Level 2.2	**:**	Identifies computer storage as a collection of digital data on different media
Time	**:**	01 period

Learning Outcomes:

- Describes the usage of Hard drive, Flash Drive, CD, DVD

Contents:

- Hard drive, Flash Drive, CD, DVD

Concepts and terms to be highlighted:

- Storage
- Storage Unit
- Computer Storage
- CD,DVD
- Flash Drive
- Hard Drive

Guidance for lesson plan:

- Discuss why storing is important for our day to day activities
- Divide students into groups and get groups to observe the computer lab
- Give some storage devices to the groups and discuss this

Guidance for assessment and evaluation:

- Give some storage devices to students

Quality inputs:

- Storage devices (CD, DVD, Flash Drive)

Reading Material

Basic concept of storage

Show the picture to students and discuss the picture.

Fig. 2.2.1

Computer Storage devices

A storage device is any computing hardware that is used for storing, retrieving and extracting data files and objects. It can hold and store information both temporarily and permanently, and can be internal or external to a computer, server or any similar computing device.

Secondary storage

Fig. 2.2.2 - Storage devices

Competency 2 **:** Explores the functions of an Operating System

Competency Level 2.3 : Creates folders save/open/edit/ delete/ re-name/ copy/move/ files

Time **:** 02 periods

Learning Outcome:

- Saves and opens files in folders
- Organizes files as per purposes

Contents:

- Manipulation of Folders and Files
    - Copying and moving files from one storage unit to another

Concepts and terms to be highlighted:

- Storage devices
- Drive
- Folder and File
- Manipulation of folder
    - Create and name the folder
    - Rename the folder
- Manipulation of file
    - Create a file
    - Rename the file
    - Save the file
    - Open the file
    - Modify the file
    - Save as the file
- Save the file in a defined path

Guidance for lesson plans:

- Divide the students in to groups and guide them to follow the following steps
- Provide a working computer for each pair.
- Instruct them to follow these steps
    - Create a new folder
    - Create a file in the folder and save it
    - Rename the file
    - Edit the file
    - Save the file
    - Open an existing file
    - Modify some text
    - Save as under a different name/extension/location
    - Copy the file and paste it in a specific place (folder)
    - Move the file to a different place (folder)

  Guide the students to copy the file and paste in another place (folder), move to another folder. Student should be able to understand that protected files cannot opened by others without permission.

Guidance for assessments and evaluations:

- Divide the students pairs and ask each pair to do the following activities.
    - Create a folder and name it "Grade7"
    - Create a sub folder in the created folder and name it "ICT"
    - Copy the ICT folder and paste it in the same location.
    - Rename the folder "Maths".
    - Open the text editor (e.g. notepad) and type the name of your school and save it in the folder "ICT" - file name as 'school'.
    - Close the file.
    - Open the file and type the address of the school after the school name and save it.

Quality inputs:

- Computer

Reading Material

- Create a Folder in Windows
    - Windows button→Search→ Windows Explorer.
    - Select "Windows Explorer" from the list that appears.
    - Select the specific path that the specific folder has to be created
    - Right click in any empty space in the right pane
    - Select New →select folder on the list and it will expand any way

- Rename the folder/file
    - Right-click on the item and select Rename, or select the file and press F2.
    - Type the new name and press Enter or click Rename.

- Move file or folder from one place to another
    - Copy & paste
        - Select the folder or file→copy(click Icon/Short cut Ctrl+C/ select copy , right click popup dialog box)
        - Select the Specific place →paste(click Icon/Short cut Ctrl+V/ select paste, right click popup dialog box)
    - Cut & paste
        - Select the folder or file→copy(click Icon/Short cut Ctrl+X/ select Cut right click popup dialog box)
        - Select the Specific place →paste(click Icon/Short cut Ctrl+V/ select paste right click popup dialog box)
    - Drag and Drop
        - Select the item (Folder/File) → Drag and drop in a different place with or without Ctrl key

Competency 2 : Explores the functions of the Operating System

Competency Level 2.4: Explores file properties

Time : 01 period

Learning Outcome:

- List out properties of files
- Explains the properties of files

Contents:

- Identification of size, type, modified date

Concepts and terms to be highlighted:

- Files
- Properties
    - Name
    - Type
    - Size
    - Modified date

Guidance for lesson plans:

- Divide the students into groups of two
- Provide a folder which includes different files and folders
- Discuss about specific properties of files and folders
- Perform ‘Sort by’ and ‘Group by’ folders and files

Guidance for assessment and evaluation:

- Divide the students into groups of two
- Provide a folder which includes different files, folders
- Ask about specific properties of files and folders.

Quality inputs:

- Computer
- Specific folder

Reading Material

Windows Explorer

Windows Explorer is the file management application in Windows. Windows Explorer can be used to navigate your hard drive and display the contents of the folders and sub folders you use to organize your files on your hard drive.

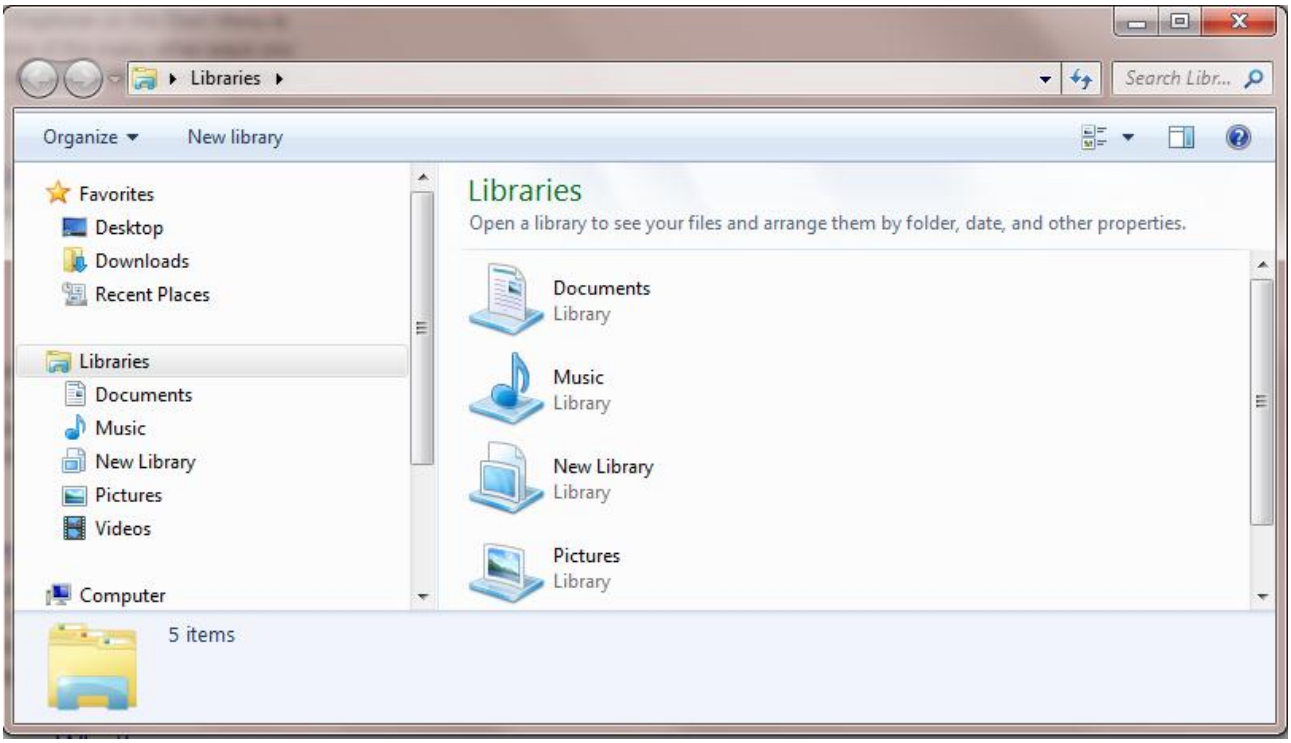


Fig. 2.4.1 - folders and files in windows explorer window

View the folders and files in many ways in Windows Explorer Window

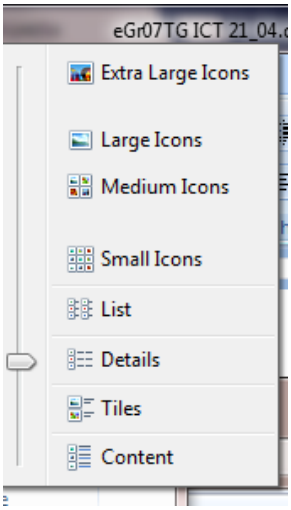


Fig. 2.4.2 - folders and files in many ways in windows explorer window

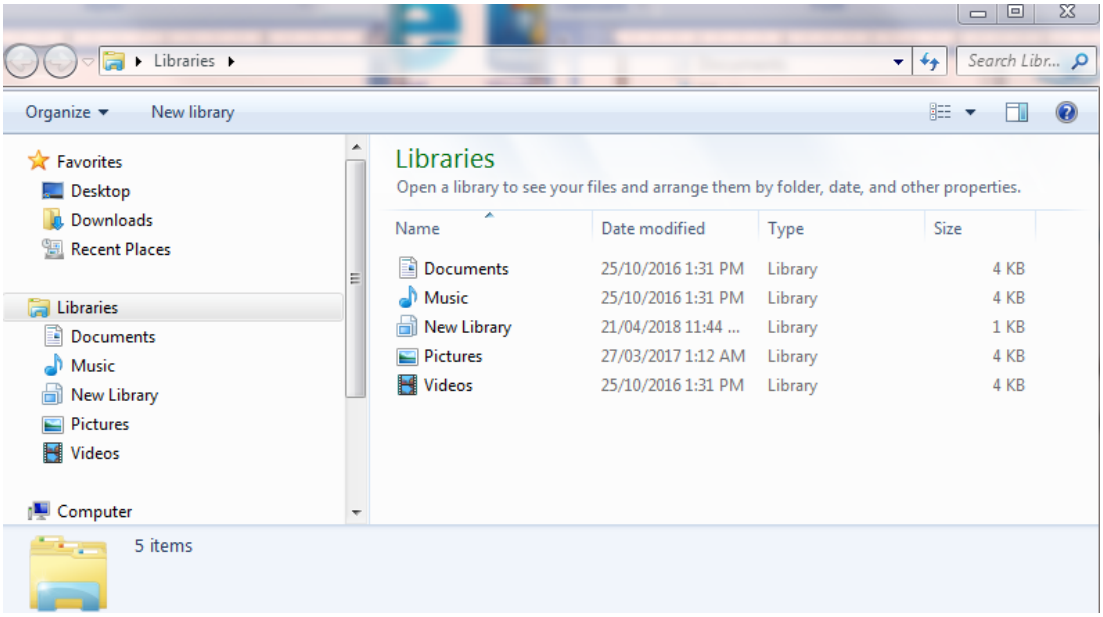


Fig. 2.4.3 - folders and files in many ways in windows explorer window

Folder

In computers, a folder is the virtual location for applications, documents, data or other sub-folders. Folders help in storing and organizing files and data in the computer.

File

A computer file is a computer resource for recording data discretely in a computer storage device. Just as words can be written on paper, so can information be written on a computer file. There are different types of computer files, designed for different purposes.

Folder Properties dialog box

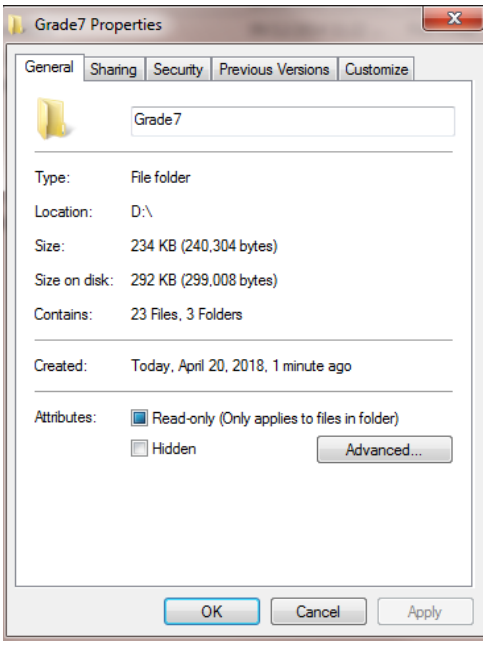


Fig. 2.4.4 - Folder Properties dialog box

File Properties dialog box

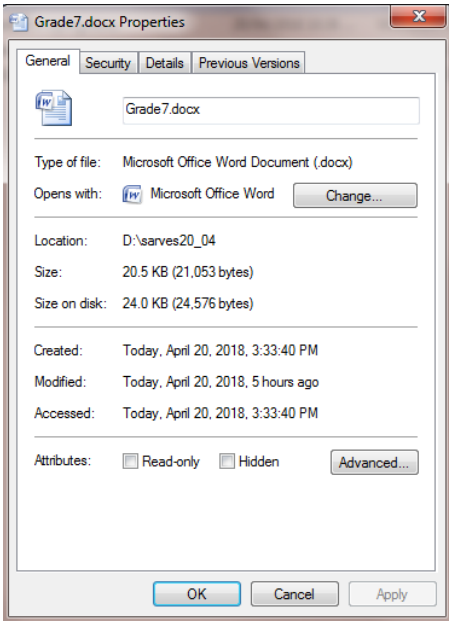


Fig. 2.4.5 - File Properties dialog box

File Type

This helps you to identify the type of the file, such as PDF document, Open Document Text, or JPEG image. The file type determines which application in used to open the file. For example, you cannot open a picture with a music player.

File Size

This field is displayed if you are looking at a file (not a folder). The size of a file tells you how much disk space it takes up.

Size of a single character in a word document is 1 Byte
Units of file size (KB, MB, GB, TB)

Date and Time Modified

The created date is the date on which the file was originally created and the modified date is the date on which the file was last modified.

Group by files and folders that are in a specific folder or directory

1. Open any directory in Windows Explorer.
2. Right-click and choose Group by > (None)
3. Select Group by
4. Select the Name/Date Modified/Type/Size and Ascending /Descending

Short BY files and folders that are in a specific folder or directory

1. Open any directory in Windows Explorer.
2. Right-click and choose Sort by > (None)
3. Select Group by
4. Select the Name/Date Modified/Type/Size and Ascending /Descending

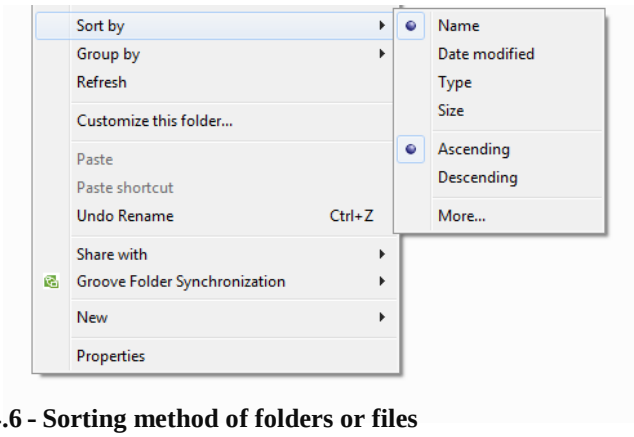


Fig. 2.4.6 - Sorting method of folders or files

Competency 3 : Uses various safety precautions in a computer laboratory

Competency Level 3.1: Uses various precautionary methods to protect the physical components of a computer

Time : 01 period

Learning Outcome:

- Identifies hardware security issues.
- Takes precautions to minimize risk to damage hardware components

Contents:

- Surge protection and protection against voltage drops (Fuses and UPS)
- Protection against physical damage (dust, humidity, insects etc.)
- Protection against overheating inside the computer

Concepts and terms to be highlighted:

- Voltage drop
- Physical damage
- Overheating
- Identify the things that are in the computer laboratory
- Identify what the electricity source is for the computer laboratory
- Identify the physical damage for the parts of the computer
- How to protect the computer laboratory from the physical damages

Guidance for lesson plans:

- Divide the students into groups and ask them to observe the computer laboratory
- Ask the groups to identify the electrical items in the computer laboratory
- Ask the groups to identify the physical components that can be damaged.
- Ask the groups to identify protection methods against physical damages
- Discuss with groups protection against overheating inside the computer
- Discuss with groups protection against physical damage

Guidance for assessment and evaluation:

- Ask each group to prepare a presentation about their findings in the computer laboratory.

Quality inputs:

- Pictures of the Computer Laboratory
- Computer laboratory

Reading Material

- Electrical items in the computer laboratory
    - Computers
    - Computer peripherals
    - Power cables
    - Data cobles
    - Network tools
    - Multimedia projector/s
    - Storage devices (CD,DVD)
- The possibilities of physical damages to the items in the computer lab
    - Computer parts with dust and moisture.
    - Broken Power cables
    - Computer and Peripherals placed at the edge of the table
    - Using computers during thundering and lightning
    - Using more than the recommended number of computers in a single plug point
- Rules for Protecting Equipment
    - Do not bring any food or drinks near the machine.
    - Turn off the machine, when you are done it.
    - Do not access external devices without scanning them for computer viruses.
    - Ensure that the temperature in the room stays cool, since there are a lot of machines inside a laboratory, and these can overheat easily. This is one of the many ways of ensuring computer safety.
    - Try not to touch any of the circuit boards and power sockets when something is connected to them and switched on.
    - Dust can affect computers adversely. Ensure that the machines are cleaned on a regular basis.
    - Disruption of power may lead to data loss/ corruption/ malfunction.
      Using standby power sources, UPS is mainly used as a Power Backup for a few minutes
- Rules for Protecting Yourself
    - Do not run inside the computer laboratory.
    - Take a note of all the exits in the room, and also take note of the location of fire extinguishers in the room (if available) for the sake of fire safety.
    - Keep bags and other items in the designated area, as they can cause people to trip if they are simply lying around the room.
    - Try not to type continuously for extremely long periods.
    - Look away from the screen once in a while to give your eyes a rest.
    - Do not touch any exposed wires or sockets.
    - Do not attempt to open any machines, and do not touch the backs of machines when they are switched on.
    - Do not spill water or any other liquid on the machine

- Conform with the following before using the computer laboratory
    - Check the main source and wall plug
    - Check that computer is connected through the UPS

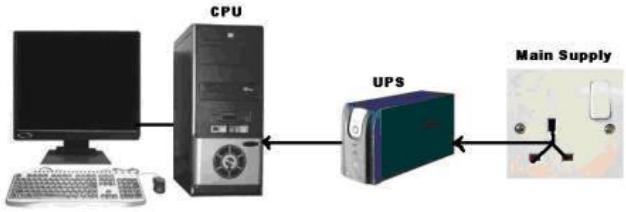


Fig. 3.1.1 -connecting computer through UPS

- Attend to the following after using the computer laboratory
    - Check that the UPS switch off
    - Check that the computer power plug is off
    - Check that the main switch is off
    - Do the necessary activity against dust, moisture and insects etc.

Competency 3 : Uses various Safety precautions in a computer laboratory

Competency Level 3.2 : Uses various precautionary methods to protect the software components of a computer.

Time : 01 period

Learning Outcome:

- Identifies software security issues
- Takes precautions to minimize damage to software

Contents:

- Use of Anti-virus and other measures against malware.
- Access Controls (physical locks and passwords)

Concepts and terms to be highlighted:

- Software
- Antivirus software
- Access Controls

Guidance for lesson plans:

- Discuss and describe the concept of software , Anti- virus, access control
- Demonstrate an example of the Anti- virus software by showing a presentation
- Divide student into groups and ask the student groups to identify the following topics and discuss them
    - Intellectual property acts (e.g. using software illegally)
    - effect of viruses
    - how to protect from illegal acts
    - use of anti-virus software
- Demonstrate some anti- virus software and access control methods

Guidance for assessment and evaluation:

- Provide some questions to students on anti-virus software and access control

Quality inputs:

- computer with anti-virus

Reading Material

- Unethical and illegal activities by users
    - See the others' document without consent
    - Change the others' documents without consent
    - Delete the others' documents
    - Move the others' document without consent

- Computer Viruses

  A virus is a computer code or program, which is capable of affecting your computer data badly by corrupting or destroying them.

  The ways that it can affect your computer are mentioned below
    - By downloading files from the Internet.
    - Through the pen drive.
    - Through e-mail attachments.
    - Through unprotected documents or poor administrator passwords.

  The impact of viruses on your computer system
    - Disrupts the normal functionality of the respective computer system.
    - Destroys data.
    - Disrupts computer network resources.
    - Destroys confidential data.

- Anti- virus software

  Anti-virus software is a computer software used to prevent, detect and remove viruses (malicious) software.

  Eg: McAfee Antivirus Plus, Symantec Norton Antivirus, Avast Pro A, Kaspersky

- Prevent the computer from viruses and other illegal acts
    - Install and be sure to update your anti-virus software
    - Backup your data
    - Do not open/access unreliable or suspicious web sites.
    - Use strong passwords

Competency 4 **:** Uses text editing software to type effectively

Competency Level 4.1: Uses computers efficiently by developing typing skills

Time **:** 01 period

Learning Outcome:

- Demonstrates skills at the English keyboard
- Demonstrates skills at the Sinhala/Tamil keyboard

Content:

- Use of proper techniques in typing (Touch Typing)
- Use of typing practice software to develop typing skill

Concepts and terms to be highlighted:

- Typing
- Typing skill
- Use the keyboard in a proper way
- Typing text correctly and efficiently

Guidance for lesson plans:

- Guide the student to sit on a computer chair properly
- Give a paragraph (letters in all the alphanumeric part on the keyboard including uppercase/capital and small) sheet to each student
- Open a typing software
- Guide the student to type in a proper way with accuracy and speed

Guidance for assessment and evaluation:

- Provide a simple paragraph for each student to type.
- Access typing skill of each student through the typing software

Quality inputs:

- Computer
- Typing software (https://merabheja.com/top-free-typing-software/)
- A paragraph typing

Reading Material

- Finger Positions

Fig. 4.1.1 - Finger Positions of a Keyboard

  - In their basic position, the fingers rest on the middle row of the keyboard- also called the "home row". The home row is the base from which all other keys can be reached.
  - Each key is pressed with the finger on the home row that is closest. After reaching a key away from the home row, the finger needs to return to its home row key
  - Use the right thumb for the space bar
  - Use the right little finger to press Enter key
  - Use the right hand shift key with the right hand little finger to type the uppercase letters that are on the left side

- Advantages of proper typing
  - Higher speed
  - Better accuracy
  - Less health issues
  - Job prospects

Competency 5 **:** Uses programming language to develop simple programs (Using Scratch)

Competency Level 5.1: Analyzes simple problems by decomposing and connecting them logically

Time **:** 02 periods

Learning Outcome:

- Demonstrates critical and analytical thinking techniques
- Describes sequence in flowcharts
- Demonstrates the use of sequence in flowcharts appropriately

Contents:

- Use of flow charts.
    - Sequence
    - Selection (Concept of Selection)
    - Iteration (Concept of Iteration)

Concepts and terms to be highlighted:

- Flow chart
- Control structure
    - Sequence
    - Selection
    - Repetition
- Using analytical thinking techniques in a problem and solving it
- Using the flowchart to solve the problem (only sequence type problem)

Guidance for lesson plans:

- Discuss how to face a problem.
- Discuss how to analyze the problem with analytical thinking techniques
- Introduce control structure (Sequence, Selection, Repetition)
- Divide the class into groups and give a scenario to analyze
- Ask the groups to draw a flow chat for the given scenario.

Guidance for assessment and evaluation:

- Assign the following each group
    - Analyzing the problem
    - Solving the problem using an algorithm
    - Drawing the flow chart.

Quality inputs:

- Flowchart symbols.
- Scenarios (only sequence) for the problem.

Reading Material

Represent analytical thinking (only sequence) with the flow chart

Analytical problem solving skill is an important skill when analyzing the problem input, process, and output are identified.

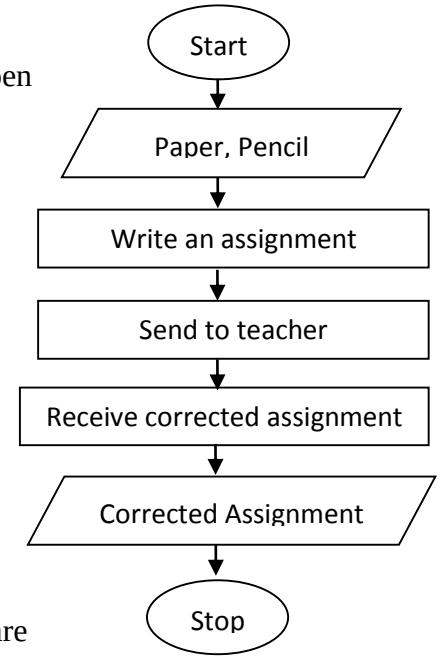
Understanding the flow chat symbols.
Using the flow chart symbols for the specific input, processing and output.
Interconnecting the flow chart symbols with sequential steps.

Example - Problem 1: Preparing an assignment which can be corrected by the teacher.

Input: A sheet of paper suitable to write the assignment and a pen

Process:

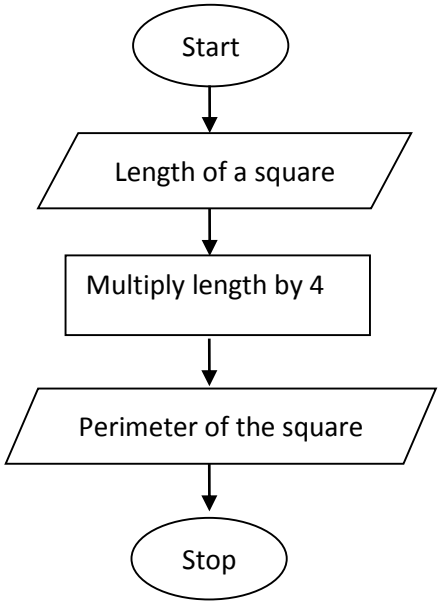
1. Write the assignment
2. Send the assignment to the teacher
3. Receive the corrected assignment



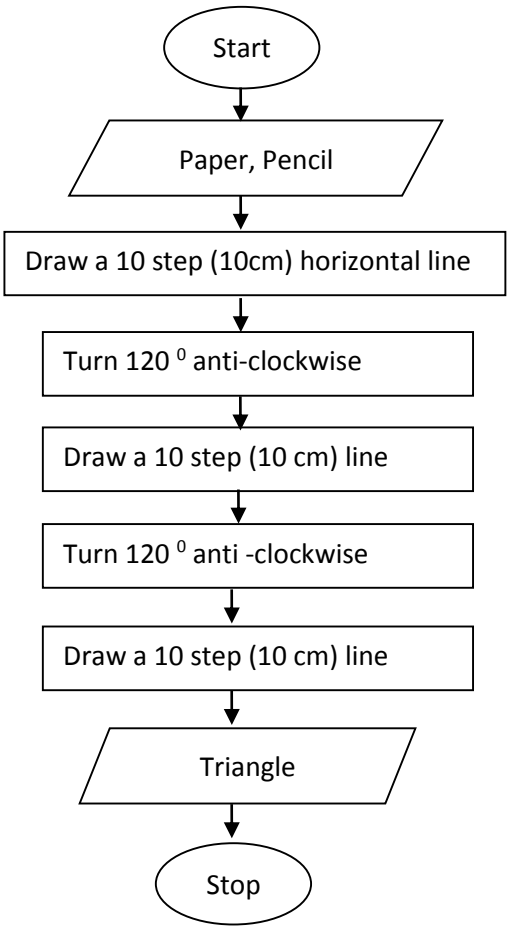
Output: The corrected assignment.

Examples

- Draw a flowchart to find the perimeter of a square



- Draw a triangle shape



- Draw a rectangle shape

Control structure

Problems are solved using three basic structures.

Sequence: It is a series of statements that are executed one after another.

Selection: It is used to execute different statements depending on certain conditions.

Repetition: It is used to repeat statements while certain conditions are met.

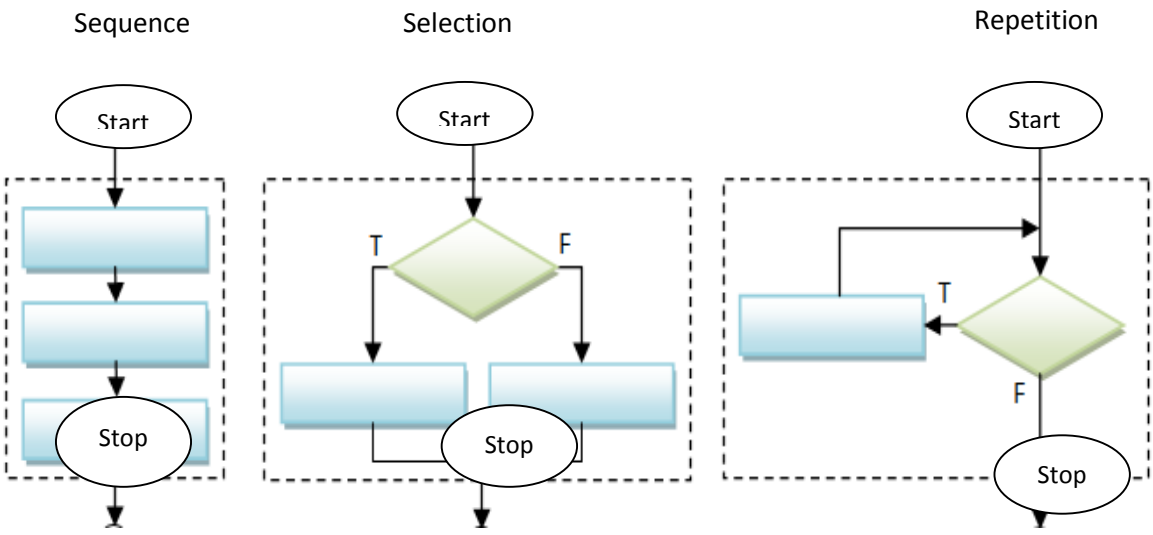


Fig. 5.1.1 - Control structures

Competency 5 **:** Uses programming language to develop simple programs (Using Scratch)

Competency Level 5.2: Develops simple programs using a visual development environment (Using Scratch)

Time **:** 03 periods

Learning Outcome:

- Uses Scratch programming IDE
- Applies basic instructions sequentially to develop simple programs

Contents:

- Introduction to Interactive Development Environment – Interface (IDE) to develop computer programs
- Developing simple programs(sequence type) using visual supports of programming language (using an Interface)
- Specially designed to teach programming to children

Concepts and terms to be highlighted:

- Programming Language
- Scratch Programming
- To analyze a problem to write an algorithm
- Draw the flow chart and use the Scratch software to implement the program

Guidance for lesson plans:

- Describe the a computer program
- Describe the Scratch Interface
- Describe a simple Scratch program (sequence only)
- Divide the students into groups and give a scenario to be analyzed
- Ask the groups to do a specific example in scratch interface.

Guidance for assessment and evaluation:

- Ask the student groups to draw a pentagon in scratch interface with sequential steps.

Quality inputs:

- Computer
- Scratch software (https://download.cnet.com/Scratch/3000-2051_4-10680857.html)

Reading Material

Scratch Tutorial Introduction

SCRATCH is a new programming language that lets you create your own interactive stories, animations, games, music, and art.

Scratch is a simple environment designed by the Kindergarden Lifelong Learning Group at MIT to introduce some basic programming concepts in a fun and interactive manner. In Scratch, sprites (objects) are manipulated on the stage (background) using various scripts (small program segments). Each sprite has its own set of scripts to control its behavior and how it interacts with other sprites and events. Programming consists of snapping together individual blocks of preexisting actions to create a script. A program can be as simple as a single block or consist of multiple blocks stacked together that will run as a unit.

Scratch Interface

When Scratch starts up, you will see a screen similar to the one below. The different areas have been labeled.

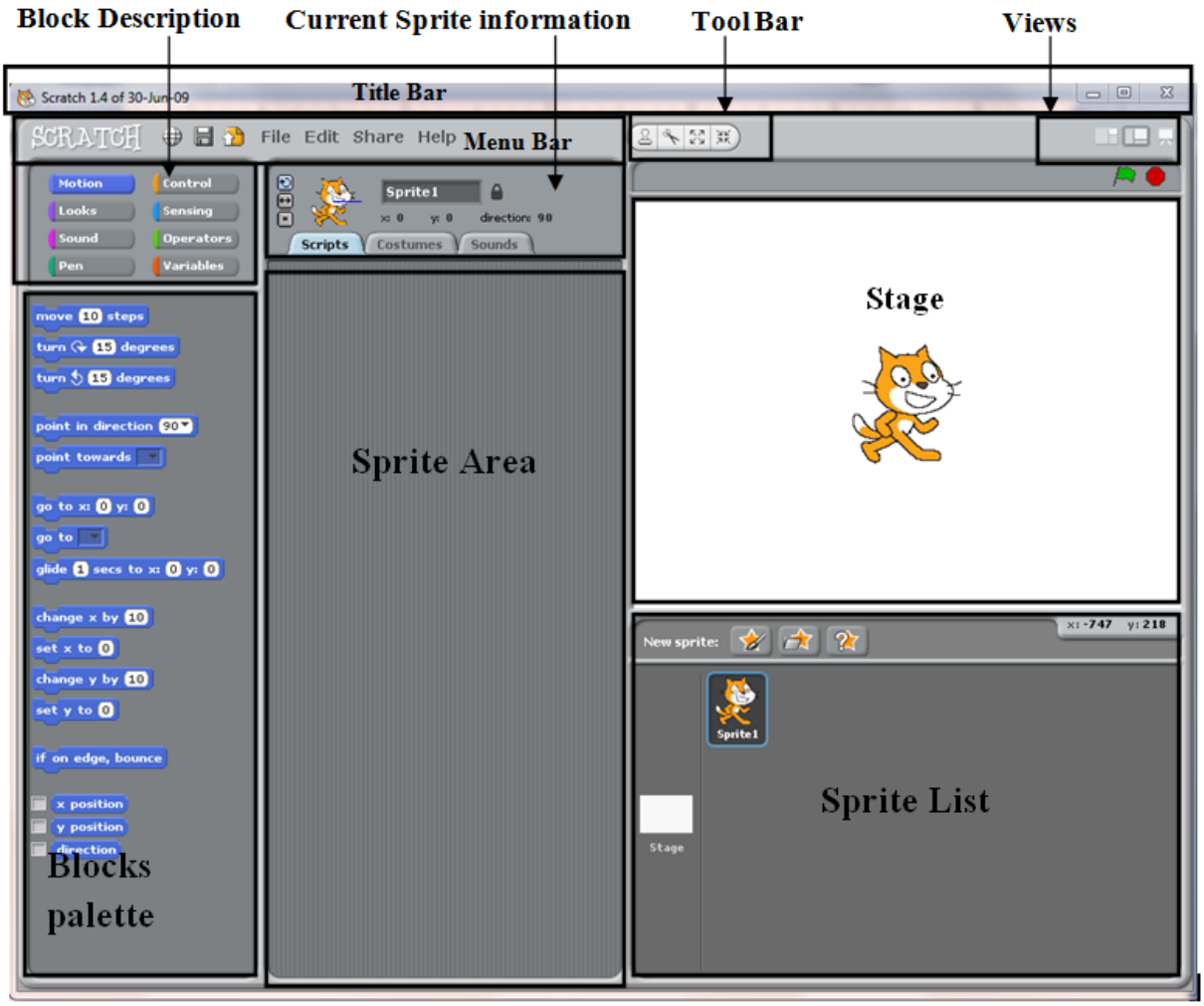


Fig. 5.2.1 - Scratch Interface

Menu Bar:

The menu bar including ‘New’ project, ‘Open’ or ‘Save’ an existing project, ‘Save (a new project) as’ whatever name you choose, ‘Undo’ a previous action, and obtain ‘Help’.

Block Descriptions:

The block description area lists the eight categories of blocks including Motion, Looks, Sound, Pen, Control, Sensing, Numbers and Variables. The block categories are all color coded so they can be found quickly to determine which category it came from.

Blocks Palette:

This area shows all the blocks available in the programming. Note that the blocks palette will change depending upon the current block category. When selecting a new block category, the blocks palette will change to reflect the new options available.

Scripts Area:

This is where you create and view the scripts pertaining to the current sprite.

Stage:

The stage is where all of the action takes place. The stage is 480 units wide by 360 units tall and the center of the stage is at x-y coordinate (0, 0). This means the lower left is at (-240, -180), the upper left is at (-240, 180), the upper right is at (240, 180), and the lower right at (240, -180).

Toolbar:

A number of tools exist for different purpose. The arrow is the default selection and it allows to pick up and move sprites and blocks of code around. There are also options for you to duplicate and delete items as well as grow and shrink your sprite.

Current Sprite Information:

Here find the name and picture of the current sprite together with its x-y position, direction, and rotation style.

Writing Simple Scripts

To create a script, we simply drag a block from the Blocks Palette onto the Scripts Area. To run it, we can double-click it and observe what happens on the stage. Let’s try At the moment, our current sprite is Sprite1 (the cat). By default, he is located in the center of the screen. You can drag him anywhere on the screen that you wish at any time.

Motion Blocks

- Move --- Steps

Move 10 steps (if -10 opposite direction)

Let's make him move 10 steps forward by selecting from the Blocks Palette and dragging it onto the Scripts Area. When you double-click the block, you should observe the cat move 10 steps to the right. You can double click the block as many times as you wish. The cat will continue to move.

Editing a text field:

You can edit the white text field portion of the block by clicking on the '10' and changing it to another number like '-10'. Double click it and see what happens. Now change it to '100' and observe the difference.

- turn …. degrees

Rotate clockwise 15 degrees

Rotate anticlockwise15 degrees

- Change x by---

Change x by a positive number, move by (10) the sprite to the right.
Change x by a negative number, move by (10) the sprite to the left.

- set x to

Jump to the x position. if it in 0 jump on the middle

PEN Block

- Clear

Clear all pen marks and stamps from the stage

- Pen Down

Start leaving a pen trail

- Pen up

Stop leaving a pen trail

Control

- When..Clicked

When the green flag is clicked do the following steps.

Eg:-

- wait.. secs

It does nothing for 1 second. Go to the next step after 1 second

Eg:-

Example 1: Draw a Triangle

Step 1:- Open Scratch Program
Step 2:- Click **Control Block** in Block description Area
Step3:- Click on 

and drag and drop in Scripts Area

Step4:- Click **Pen Block** in Block description Area
Step5:- Click on 

and drag and drop in Scripts Area
Step6:- Click on 

and drag and drop in Scripts Area

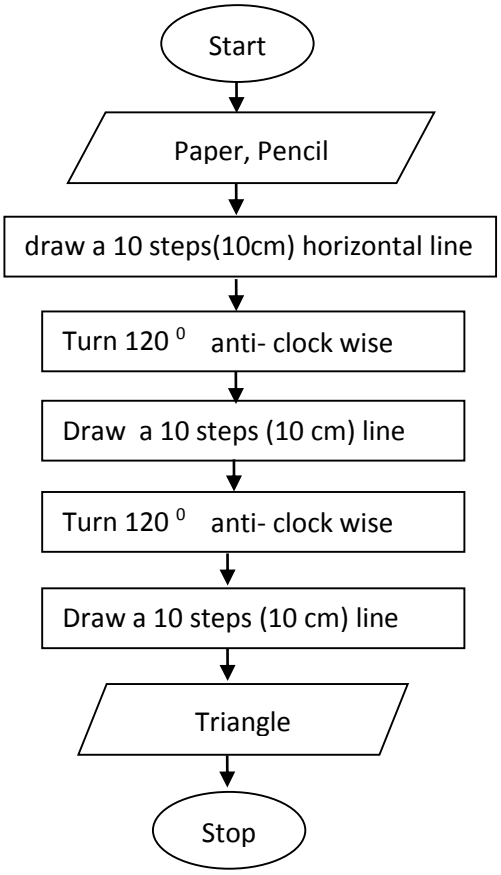
Step7:- Click **Motion Block** in Block description Area
Step8:- Click on 

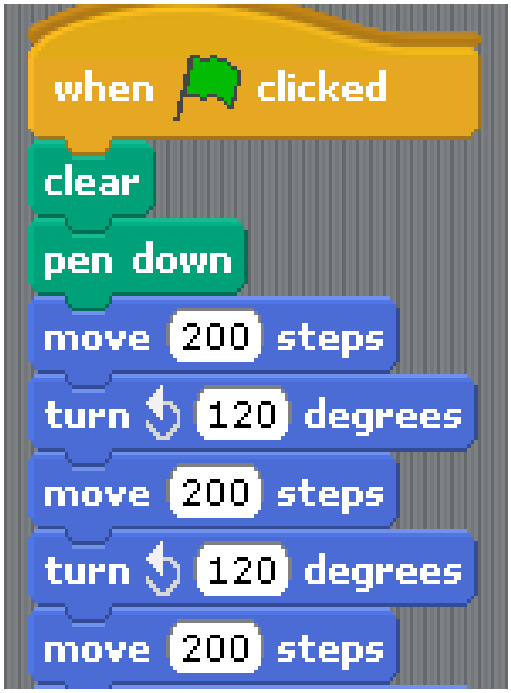
and drag and drop in Scripts Area

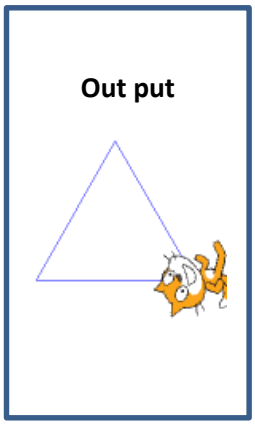
Step9:- Prepare the following scripts

Step10:- Click the Flack icon above the stage

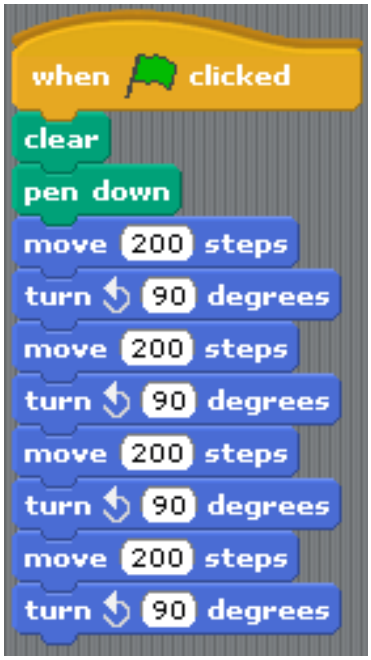
Step11:- Save the program in a specific place

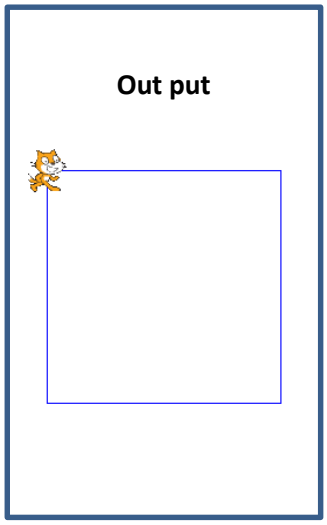






Example 2 : Draw a Rectangle





Competency 5 **:** Uses programming language to develop simple programs (Using Scratch)

Competency Level 5.3: Describes the concept of variables in programs

Time **:** 02 periods

Learning Outcome:

- Describes the use of variables in a program
- Writes programs with variables appropriately

Contents:

- Definition of variable
- Use of variables in programs

Concepts and terms to be highlighted:

- Variable
- Variable in stretch program
- Use variables in computer programs.

Guidance for lesson plans:

- Discuss with students about a variable with real life example
- Describe the variable in Scratch Interface
- Describe a simple Scratch program with a variable
- Divide the students of the class into groups and give an examples to do a Scratch program
- Discuss with students to do a Scratch program with a variable
- Ask the groups to do a specific example in Scratch interface.

Guidance for assessment and evaluation:

- Ask the groups to draw a flow chart to draw a rectangle with variable then use the a Scratch program to draw a rectangles with variables.

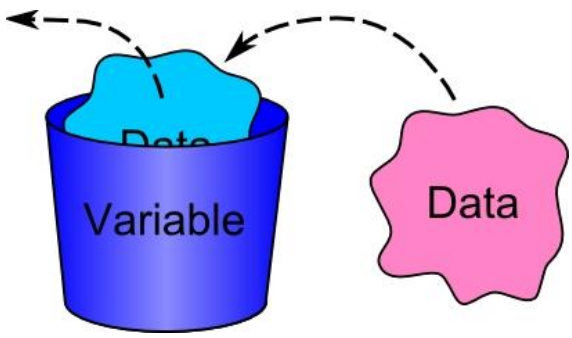
Quality inputs:

- Computer
- Scratch Program (https://download.cnet.com/Scratch/3000-2051_4-10680857.html)

Reading Material

Variable

Variables are memory pieces that can contain values of data it can be used again and changed later.



In programming, a variable is a value that can change, depending on conditions or on information passed to the program. Typically, a program consists of instructions that tell the computer what to do and the data that the program uses when it is running. The data consists of *constants* or fixed values that never change and variable values (which are usually initialized to "0" or some default value because the actual values will be supplied by a program's user). Usually, both constants and variables are defined as certain data types. Each data type prescribes and limits the form of the data. Examples of data types include: an integer expressed as a decimal number, or a string of text characters, usually limited in length.

Variable name

Variable names are the names you give to computer memory locations which are used to store values in a computer program

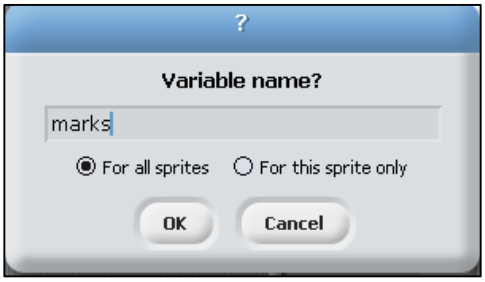
Eg:- length, width, marks, height, score, count, total

Create Variable in Scratch

There are two buttons displays in the block **Blocks Palette**. When clicked on the variable block, the following image will be shown.

When clicked **Make a variable** in the **Blocks Palette** the following dialog box will be displayed.

Type the Variable name in the dialog box and select one of the radio buttons and click OK.



For all sprites : Create a new variable that all sprites can see (Such as Marks)
For this sprite only: Creates a new variable that only this sprite can see.

Once a variable is created the following five blocks appears on the **Blocks Palette**.

Reports the value

Stores a value (variable name:- Marks, initial value:-0

Changes the value (variable name:- Marks, add 1 each time)

Shows the variable monitor on the stage

Hides the variable monitor on the stage

Example

Draw a flow chart to draw a square with a variables and then use scratch program to draw the square with variables.

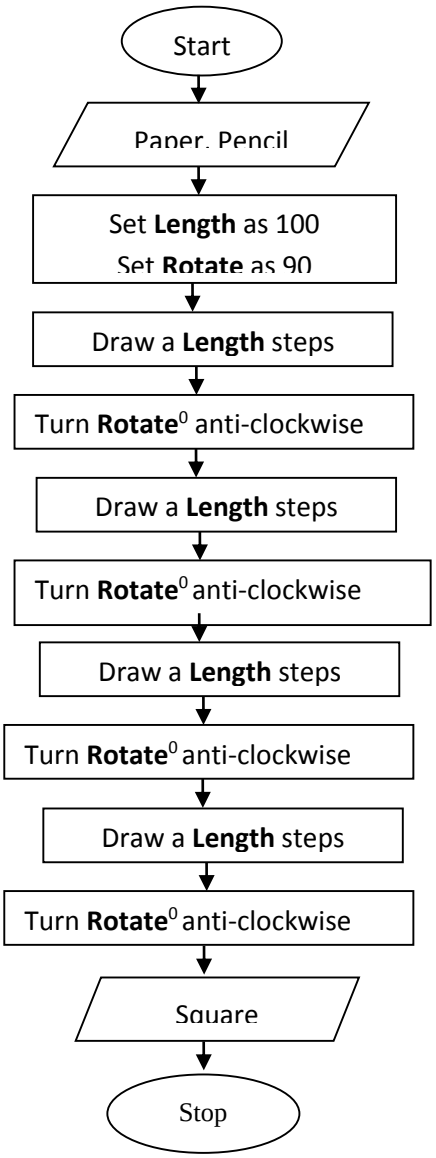
Create two variables such as “Length”, “Rotate”.

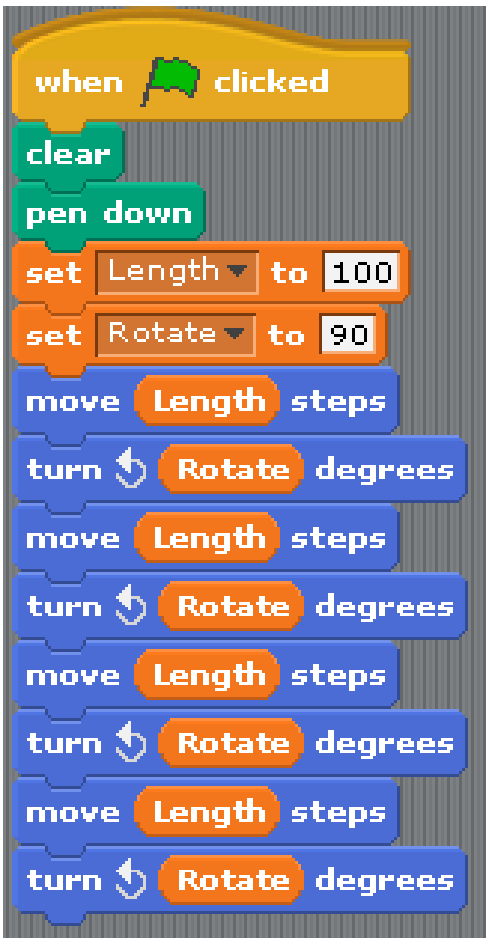
Click the set Blocks in **Blocks Palette** and Drag and Drop in **Sprite Area**.

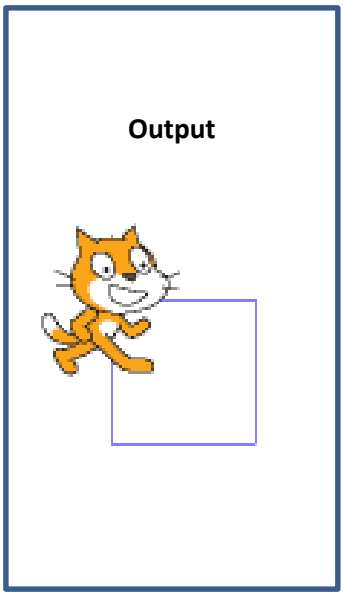
Click variable box and select the variable name (Length).

Click variable value box Type 100.

Do the above steps for the “Rotate” variable.







Competency 5 **:** Uses programming language to develop simple programs (Using Scratch)

Competency Level 5.4: Identifies the concept of errors in a program as bugs

Time **:** 01 period

Learning Outcome:

- Describes the effect of errors in a program and takes precautions to avoid errors

Contents:

- Introduction of an error to an error-free program and observation of the output

Concepts and terms to be highlighted:

- errors
- error-free program
- expected output

Guidance for lesson plans:

- Explain about error in a real life process. Then explain errors in programming.

Guidance for assessment and evaluation:

- Provide a relevant to the scratch program.
- Ask students to find the errors and correct them.

Quality inputs:

- Scratch Program(https://download.cnet.com/Scratch/3000-2051_4-10680857.html)

Reading Material:

Errors

An 'error' is a deviation from accuracy or correctness. A 'mistake' is an error caused by a fault: the fault being misjudgment, carelessness, or forgetfulness. There are following types of errors in computer programming languages.

Syntax errors:
To understand syntax errors in programming, it helps to think about syntax errors in a natural (human) language like English. Syntax is the part of grammar that deals with how the words in a language are arranged to create sentences. In Scratch program there are blogs of syntax to drag and drop so syntax errors are less.

Semantic errors: errors due to an improper use of program statements.

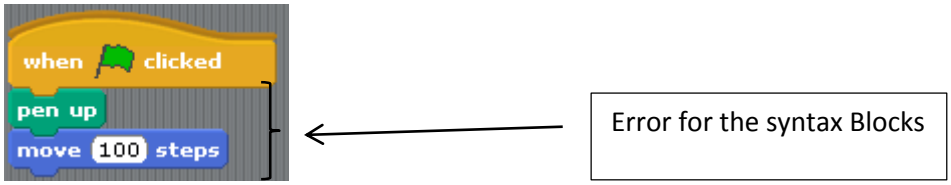
Logical errors: errors due to the fact that the specification is not respected.

Eg: In a Scratch program we use only the scratch program Blocks so that Syntax and Semantic errors are less. Sometimes the expected output does not displayed the logical errors.

Bug

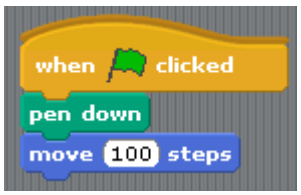
A software bug is an error, flaw, failure or fault in a computer program or system that causes it to produce an incorrect or unexpected result, or to behave in unintended ways. Bugs have been present ever since the dawn of computer software.

Example 1:-



This is a structure in the Scratch program that one object moves 100 steps with line. However, there is no line only the object moves 100 steps. So the Expected output is not displayed.

The structure of the Scratch has to be changed for the expected output. The correct structure of the Scratch program is as follows.



Example 2:-

This is a structure in the Scratch program where one object goes in x: 50 and y: 50. However, it was a mistyped as x: 500 and y: 500. So when it runs the object goes to the object on x: 269 and y: 218 because it is the maximum of x, y values. The correct structure of the Scratch program is as follows.

Competency 6 **:** Uses Presentation software to create a presentation

Competency Level 6.1: Uses basic functions of presentation software in creating a presentation

Time **:** 05 periods

Learning Outcome:

- Create presentation using Presentation software

Contents:

- Create, open, save and close a Presentation
- Add Slide
- Inserting files/objects (text, picture, shapes, clip art, word art etc.)
- Formatting of Text
- Add Multimedia and charts to a slide
- Slide Designs
- Move, duplicate, Hide and Delete Slides
- Slide transitions

Concepts and terms to be highlighted:

- Presentation
- Slide
- Add Multimedia and object into the slide
- Slide design
- Editing Slide
- Slide Transition
- Prepare an attractive presentation

Guidance for lesson plans:

- Discuss about presentations
- Discuss about electronic presentations
- Discuss on how to create a good presentations
- Discuss the characteristics of presentation software
- Explain the concept of presentation with presentation software.
- Divide the students into groups and give each group a specific task to create a presentation with presentation software.

Guidance for assessment and evaluation:

- Divide the students in to groups.
- Provide a task to prepare a presentation.
- Ask students to present the presentation.
- Assess the presentation

Quality inputs:

- Computer
- Assessment Tools
- Sample presentation

Reading Material

Presentation

Presentation is used to sharing the views, options, ideas and knowledge with a large group of people. There are many techniques, methods, multimedia and other tools to create Presentations effectively.

The characteristics of a good quality presentation

Number of lines
Font-size
Correct use of grammar and language
Use of color
Animation and videos
Attention on target group

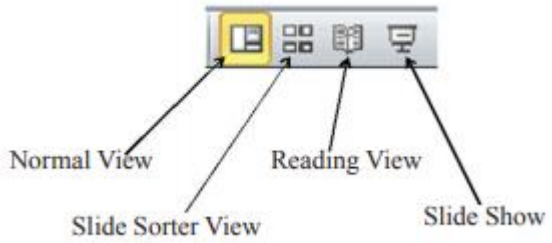
Presentation Software

The software used to present the multimedia contents are called presentation software. There are many presentation software available; open source software and proprietary (commercial) software.

Eg: Open office Impress - open source
Microsoft Office Power Point - proprietary (commercial) software

Fundamentals of presentation software

- Open a presentation software
- Understand the interface of the software
- View of the software



- **Slide in a presentation software**
  Slide is a basic part in a presentation

  Create a Slide
  Home→ Click **new slide** Icon

  Insert object in to slide
  Select the slide→ Insert→click picture or chart or shape or table

  Duplicate Slide
  Select the slide→ click copy→select the position that you want to duplicate→ click paste

  Move Slide
  Select the slide in slide layout panel → Drag and Drop where you want

Slide Transaction
Change the way of transaction from one slide to another.

Slide Layouts
Home → New slide or Slide Layout
Select theme from the given template

- Save the Presentation
  Home→Save → Give suitable name
  Different types of file extension available in Microsoft PowerPoint (.pptx, .ppsx)

- Close the presentation
  Home→close

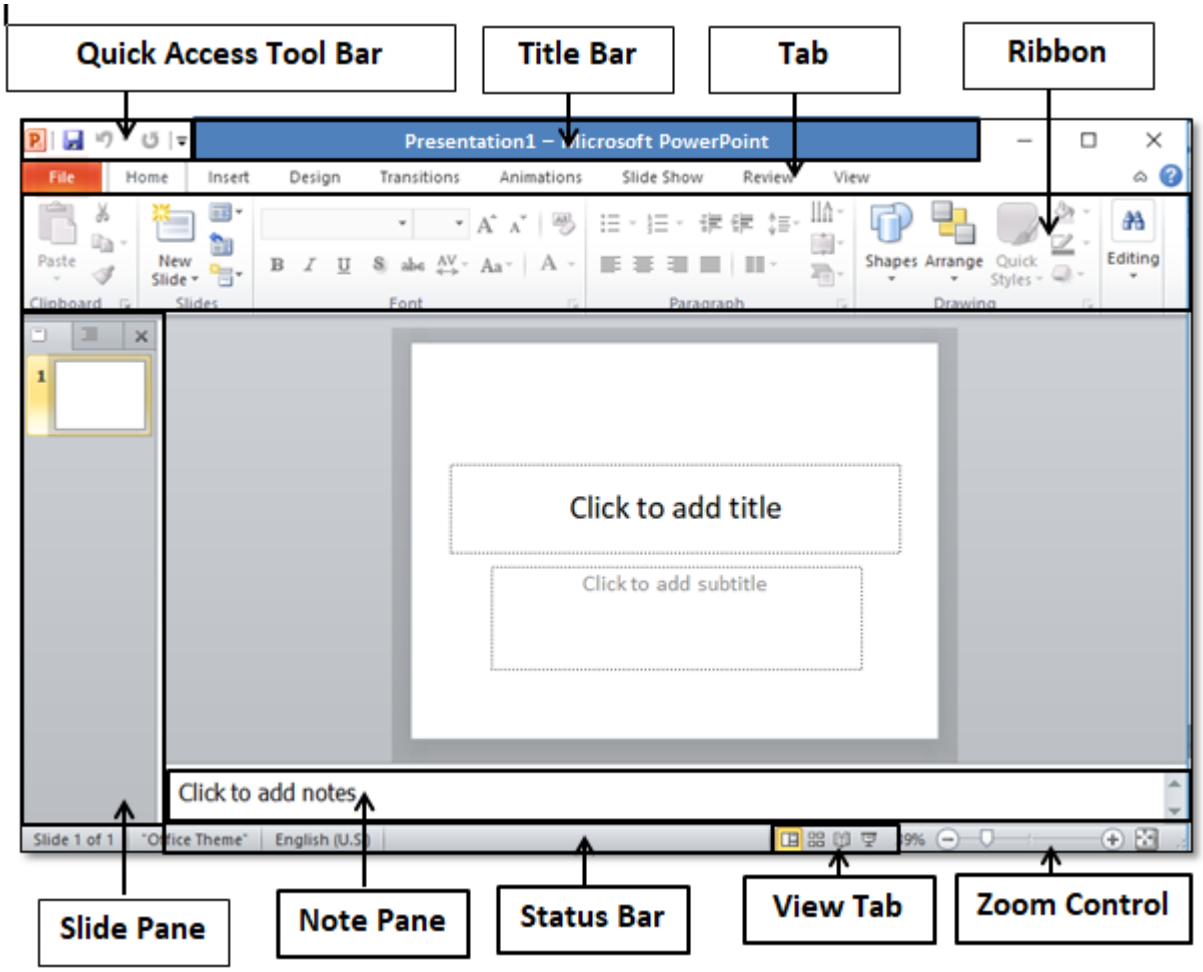


Fig. 6.1.1 – Microsoft PowerPoint Interface

Competency 7 **:** Uses the services of the Internet and develops web pages

Competency Level 7.1: Uses resources available in the Internet
(Text, images, audios, videos etc.)

Time **:** 05 periods

Learning Outcome:

- Uses the Internet for information gathering
- Identifies trusted and untrusted websites
- Identifies authentic and reliable information

Contents:

- WWW, URL
- Download images, audio, video etc.
- Accessing earth maps
- Trusted and untrusted websites
- Authentic and reliable information

Concepts and terms to be highlighted:

- Internet
- WWW
- URL
- web browses
- Web page and web side
- Download documents, images, audio, video etc.
- Accessing earth maps
- Trusted and untrusted websites
- Authentic and reliable information

Guidance for lesson plans:

- Divide the students in to groups.
- Provide a task to access from the internet
- Discuss and demonstrate how to access data from the internet
- Demonstrate web browsers to use the Internet with specific URL (Eg: www.nie.lk)
- Direct the students to browse for a specific web side
- Ask and discuss with student groups about following questions:
    - How to find whether the Internet connection is available on the computer?
    - Which browser will be used to open a website?
    - What is the URL of a given website?
    - What is the difference between the web page and the web site?
- Ask the student groups to find and save the NIE logo from the NIE website

- Ask the student groups to find and save a picture of a Rose flower from anywhere in the Internet
    - Discuss the search engine with examples (Eg: Google website)
    - Explain how to search with a specific keywords
    - Discuss how to find images from the Internet
    - Explain how to save a picture downloaded from the Internet, in a specific location
- Discuss with the students about advantages of the search engines in finding different files, images, data and information
- Introduce websites useful and interesting for students (e.g: Accessing earth maps)
- Discuss with students the trusted and genuine websites
- Discuss with students the authentic and reliable information

Guidance for assessment and evaluation:

- Provide some assessment heading (Eg: flowers, pets, temples etc.) to prepare a presentation with presentation software with the help of the Internet

Quality inputs:

- Computer with internet connection
- List of some useful websites

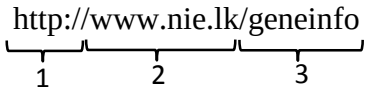
Reading Material

- **Internet**
  The Internet, sometimes called simply "the Net," is a worldwide system of computer networks - a network of networks in which users at any one computer can, if they have permission, toget information from any other computer. There are many services provided by the internet.
  - WWW
  - E-mail
  - Chat and Messaging
  - Telnet
  - Newsgroup
  - E-Commerce
  - E-Learning
  - Blogs
  - Social Networking

- **WWW**
  The World Wide Web (WWW) is a network of online content that is formatted in HTML and accessed via HTTP. The term refers to all the interlinked HTML pages that can be accessed over the Internet. The World Wide Web was originally designed in 1991 by Tim Berners-Lee while he was a contractor at CERN

- **URL**
  A URL (Uniform Resource Locator) is a form of URI and is a standardized naming convention for addressing documents accessible over the Internet and the Intranet. An example of a URL is http://www.nie.lk/, which is the URL for the NIE website.

  Below is some additional information about each of the sections of the http URL for this page.



1 Protocol
2 Domain
3 Webpage

- **Web Browser**
  A web browser is a software program that allows a user to locate, access, and display web pages.
  Eg:-
  - Google Chrome
  - Mozilla Firefox
  - Internet Explorer
  - Opera
  - Safari

- **Web Page**
  A webpage is an independent page of a website. For example, a webpage would be the testimonials page. It can be accessed by typically one URL in a browser. A Web page can be accessed and displayed on a monitor or mobile device through a Web browser.

- **Website**
  A website is a collection of Web pages that are under one domain (such as nie.lk). One website has a many related web pages.
  For example, if there is a school that owns a website that will have several Web pages like Home, About Us, Contact Us, Staff, Teachers, Results, Performance, and others. All of these pages together make up a Website.

- **Download documents, images, audio, video etc.**
  Download is a term used to describe the process of copying data from another computer, either over a network or modem. For example, each time you visit a web page on the Internet, you download the information on the page, including any pictures, to your computer. The term download is often associated with pictures, songs, videos, and programs.

- **Download Image**

Any picture or image on the Internet can be saved to your computer (downloaded). As an example, the following steps will show you how to download the Computer Hope logo that you see to the right.

1. Right-click on the image.
2. From the drop-down menu that appears, select Save image as... or Save Picture as.
3. Choose the location in which you want to save the image.

- **Download Audio**

Downloading an audio file (e.g., an MP3) from a link is just like downloading any other basic file from the Internet. For sites that utilize streaming audio or have the audio embedded into a web page, different downloading techniques must be used, some of which are detailed on the page linked below.

For sites that offer an MP3 download link. Save the MP3 by right-clicking on the link and choosing the option to save link as, save target as, or the Save linked content as link. Once the file is saved, it will appear in you downloads folder.

Download Video

Downloading a movie file (e.g., an MP4) from a link is similar to all other file downloads. Right-click on the link and choose Save link as, Save target as, or the Save linked content as. If the movie is embedded in the web page with an arrow pointing down next to the audio controls, use that link to download the movie. Other streaming movie services that do not have a download link may require additional software to capture the video; the link below has further instructions

Download YouTube video

YouTube has been designed to only allow users to watch and view videos on their website. Many users want to download or save their favorite YouTube videos to their computer so they can watch them without being connected to the Internet or on other devices. Below are the steps required for downloading and watching YouTube videos on your computer for free.

1. First, go to the YouTube page containing the video you want to download. When you have found the page,
2. Type savefrom.net/ in front of any YouTube address (URL).or type ….. between www and the address in the specific URL
3. If done properly, below the link mentioned above, you will see a preview of the video (as shown below), along with a green Download button and the video format. The default format for downloading the video is either Low or Medium quality.

Also, the attention must be given to the following points

- Accessing earth maps
- Trusted and untrusted websites
- Authentic and reliable information

Competency 7 **:** Uses the services of the Internet and develops web pages

Competency Level 7.2: Uses offline (E-mail) and online (Chat) communication

Time **:** 02 periods

Learning Outcome:

- Communicates via e-mails
- Communicates via online conferencing

Contents:

- Web based free E-mail
- Creation of accounts.
    - Use of e-mail: Subject, To, Bcc, Cc, Attachments, Forward, Inbox, Outbox. Sent, Draft, Trash, Spam, Reply
- Online conferencing

Concepts and terms to be highlighted:

- Basics of mail concept
- E-mail
- Properties of E-mail
    - To, Bcc, Cc, Attachments, Forward, Inbox, Outbox, Sent, Draft, Trash, Spam, Reply
- Online and offline communication
- Web based free E-mail
- Creation of accounts.
- Online conferencing

Guidance for lesson plans:

- Discuss with snail mail
- Discuss with students about the steps to follow to send a letter to someone.
- Ask some questions from the students to find out the steps to send a letter.
- Explain E-mail
- Divide the students in to groups and explain how to create an E-mail
- Send and receive E-mail between the groups
- Send E-mail with attachment
- Use CC and BCC to send E-mail to other groups
- Explain how to chat with other groups.

Guidance for assessment and evaluation:

- Ask the student groups to send an attachment to an e-mail to a specific e-mail address.

Quality inputs:

- Computer with the Internet connection

Reading Material

E-mail

Short for electronic mail, e-mail or email is the exchange of information stored in a computer between two users over telecommunications. More plainly, e-mail is a message that may contain text, files, images, or other attachments sent through a network to a specified individual or group of individuals.

In order to use email facility you are required to create an email account using an email software such as Gmail, yahoo, Hotmail etc.

Advantages of e-mail

There are a number of advantages of e-mail and the usage of e-mail versus postal mail. Some of the main advantages are listed below.

- Free delivery - Sending an e-mail is virtually free, outside the cost of Internet service. There is no need to buy a postage stamp to send a letter.
- Global delivery - E-mail can be sent to nearly anywhere around the world, to any country.
- Instant delivery - An e-mail can be instantly sent and received by the recipient over the Internet.
- File attachment - An e-mail can include one or more file attachments, allowing a person to send documents, pictures, or other files with an e-mail.
- Long-term storage - E-mails are stored electronically, which allows for storage and archival over long periods of time.
- Environmentally friendly - Sending an e-mail does not require paper (paperless), cardboard, or packing tape, conserving paper resources.

Video Conferencing

Videoconferencing (or video conference) means to conduct a conference between two or more participants at different sites by using computer networks to transmit audio and video data. Video calls are no longer a luxury but more of a necessity. After all, face to face conversations definitely add more personal touch to conversations than just simple audio calls. Be it catching up with our parents, best friends or partner, it definitely reduces geographical distances between us and our loved ones.

Fig. 7.2.1 – Video Conference

Skype

Undoubtedly the most popular name on this list, Skype has been around for a long time now. Skype has a come a long way, and has only been notching up in offering the best video calls over the years. The Skype interface is still the same, simple and easy to use, but has with time added many more useful features. Skype offers both free and paid call facility. The paid version allows the user to call any number across the world at a nominal price. You can not only make voice calls but also video calls. So, stay in touch with your loved ones by downloading the software on your Windows PC

Viber

Viber is one of the popular social media. It has multiple features despite a simple interface. The app is cost free and allows you to call any Viber user across the globe. Apart from video calls, the software lets user chat with other Viber users. It has some of the most adorable stickers that you can send while chatting with your loved ones. You can also sync your mobile Viber app with your Windows PC. To start exploring what Viber has in store for you, click on:

Competency 7 **:** Uses the services of the Internet and develops web pages

Competency Level 7.3: Develops web pages using HTML

Time **:** 02 periods

Learning Outcome:

- Designs a simple website
- Creates a simple website

Contents:

- Creation of a web page using text, images
  - Text formatting
  - Colors
  - Lists
- Creating Links to the other pages and web sides

Concepts and terms to be highlighted:

- Web page
- Web site
- Introduction of HTML
- HTML basic Tags
- HTML formatting Tags
- Insert an image in a web page
- connect

Guidance for lesson plans:

- Discuss with students about the website
- Discuss with students about the webpage
- Discuss with students about things and items on a web page.
- Explain the web page
- Divide the students in to groups, explain and direct the students to create a webpage
- Explain the concept of web site creation.

Guidance for assessment and evaluation:

- Ask the student groups to develop a web site

Quality inputs:

- Computer
- Browser software
- Text editing software (Notepad)

Reading Material

Web page

A web page is a document commonly written in HyperText Markup Language (HTML) that is accessible through the Internet or other network using an Internet browser. A web page is accessed by entering a URL address and may contain text, graphics, and hyperlinks to other web pages and files
To view a web page requires a browser (e.g., Internet Explorer, Edge, Safari, Firefox, or Chrome). Once in a browser, you can open a web page by entering the URL in the address bar.

Website
A website refers to a central location that contains more than one web page. For example, Computer Hope is considered a website, which includes thousands of different web pages

The difference between a website and a web page is that a website is a collection of web pages with information on a subject, and a web page is a smaller part of a larger website usually containing more specific information.

HTML

HTML is the standard markup language for creating Web pages.

- HTML stands for Hyper Text Markup Language
- HTML describes the structure of Web pages using markup
- HTML elements are the building blocks of HTML pages
- HTML elements are represented by tags
- HTML tags label pieces of content such as "heading", "paragraph", "table", and so on
- Browsers do not display the HTML tags, but use them to render the content of the page

Basic HTML Tag

- The <html> element is the root element of an HTML page
- The <head> element contains meta information about the document
- The <title> element specifies a title for the document
- The <body> element contains the visible page content
- The <h1> element defines a large heading
- The <p> element defines a paragraph

Heading Tags

Headings are defined with the <h1> to <h6> tags.

<h1> defines the most important heading. <h6> defines the least important heading.

Tag	Examples	Display
<h1>	good	**good**
<h2>	good	**good**
<h3>	good	**good**
<h4>	good	**good**
<h5>	good	**good**
<h6>	good	**good**

Table 7.3.1 - Heading Tags

Step by step to create a simple web page

Example 1 (ex1.html)

step 1: Open a note pad

step 2: Type the following tags

```
<html>
        <head>
                <title>First Page </title>
        </head>
        <body>
                <h1>My first web page</h1>
                <h1>Welcome every one</h1>
        </body>
</html>
```

Step 3: save with .html extension (ex1.html)

Step 4: Go to the saved location

Step 5: Double click the file icon that you save or right click→ open with → click the browser name

Text Formatting tags

Tag	Description	Example	Display
	Define Bold Text	good	**good**
	Define Italic Text	good	*good*
<u>	Define Underline Text	<u> good</u>	<u>good</u>

Table 7.3.2 - Text formatting tags

 tag use for brake line

Example 2 (ex2.html)

```
<html>
        <head>
                <title>Text formatting</title>
        </head>
        <body>
                <h1>Animals</h1><br>
                <b>  Elephant<b><br>
                <u>  dog</u><br>
                <i>  cat</i>
        </body>
</html>
```

Insert image

Images can improve the design and the appearance of a web page. In HTML, images are defined with the <img> tag. The <img> tag is empty, it contains attributes only, and does not have a closing tag. The src attribute specifies the URL (web address) of the image:

<img src="image name with extension"> image and the file be same folder

Color

In HTML, a color can be specified by using a color name (red, tomato, orange, gray, blue, violet, slate blue). HTML supports 140 standard color names.

Change the web page color with bgcolor attribute

<body bgcolor="red">

Example 3 (ex3.html)

step 1: Open a note pad

step 2: Copy a cat image and paste it same folder that you save html file and rename as cat

step 3: Type the following tags

```
<html>
        <head>
                <title>Image </title>
        </head>
        <body bgcolor="violet">
                <h1>Cat</h1>
                <img src="cat.jpg">
        </body>
</html>
```

Cat

Step 4: save with .html extension (Ex3.html)

Step 5: Go to the saved location

Step 6: Double click the file icon that you save or right click→ open with → click the browser name

HTML List

Basically there are two types of lists.

Unordered List:

Unordered HTML List starts with the <ul> tag. Each list item starts with the <li> tag.

- cat
- dog
- elephant

```
<ul>
        <li>cat</li>
        <li>dog</li>
        <li>elephant</li>
</ul>
```

Ordered List:

Ordered HTML List starts with the <ol> tag. Each list item starts with the <li> tag.

1. cat
2. dog
3. elephant

```
<ol>
        <li>cat</li>
        <li>dog</li>
        <li>elephant</li>
</ol>
```

Example 4 (ex4.html)

```
<html>
	<head><title> List </title>
	</head>

	<body>
		<h2>Unordered List</h2>
		<ul>
			<li>cat</li>
			<li>dog</li>
			<li>elephant</li>
		</ul>
		<h2>Ordered List</h2>
		<ol>
			<li>cat</li>
			<li>dog</li>
			<li>elephant</li>
		</ol>
	</body>
</html>
```

Unordered List

The list items will be marked with bullets (small black circles) by default:

HTML Links - Hyperlinks

HTML links are hyperlinks.
When click on a link and jump to another document.
When you move the mouse over a link, the mouse arrow will turn into a little hand.

In HTML, links are defined with the <a> tag:
link text

Example 5 (ex5.html)

Conform ex1, ex2, ex3, ex4, ex5, cat.jpg, header.jpg, picture2.jpg in same folder

```
<html>
	<head><title> website  </title>
	</head>

	<body bgcolor="tomato">
		<img src="header.jpg">

		<h2>My first Website </h2>
		<ul>
			<a href="ex1.html"><li> Heading</li><a>
			<a href="ex2.html"><li> Formatting</li><a>
			<a href="ex3.html"><li> Image </li><a>
			<a href="ex4.html"><li>List</li><a>
		</ul>
		<img src="picture2.jpg">
	</body>
</html>
```

Competency 7 : Uses the services of the Internet and develops web pages

Competency Level 7.4 : Uses the Internet safely, securely and ethically

Time : 02 periods

Learning Outcome:

- Uses the Internet safely
- Uses the Internet securely
- Uses the Internet ethically

Contents:

- Protection against unauthorized access and malware
    - Hacking
    - Virus attacks
    - Software piracy
- Protection in using the Internet against crime
    - Cyber bullying
    - Stealing others data
- Online safety precautions against unknown parties (Email, social media etc.)

Concepts and terms to be highlighted:

- Unauthorized access
- Protection against unauthorized access
- Malware
    - Hacking
    - Virus attacks
    - Software piracy
- Protection in using the Internet against crime
    - Cyber bullying
    - Stealing others' data
- Online safety precautions against unknown parties (Email, social media etc.)

Guidance for lesson plans:

- Discuss with students unauthorized access through internet
- Discuss with students malware.
- Explain how to protect against unauthorized access
- Provide some presentation for protection in using the Internet against crime

Guidance for assessment and evaluation:

- Ask and guide the student to list out the following tasks with the help of a search Engine.
    - List 5 Virus names
    - List 5 Antivirus names
    - Write down 3 malware

Quality inputs:

- Computer with internet connection

Reading Material

Malware

Malware, or malicious software, is any program or file that is harmful to a computer user. Malware includes computer viruses, worms, Trojan horses and spyware. These malicious programs can perform a variety of functions, including stealing, encrypting or deleting sensitive data, altering or hijacking core computing functions and monitoring users' computer activity without their permission.

Types of malware

There are different types of malware that contain unique traits and characteristics. A virus is the most common type of malware, and it's defined as a malicious program that can execute itself and spreads by infecting other programs or files.

A worm is a type of malware that can self-replicate without a host program; worms typically spread without any human interaction or directives from the malware authors.

A Trojan horse is a malicious program that is designed to appear as a legitimate program; once activated following installation, Trojans can execute their malicious functions.
Spyware is a kind of malware that is designed to collect information and data on users and observe their activities without the users' knowledge.

- **Hacking :**
  Hacking is unauthorized intrusion into a computer or a network. The person engaged in hacking activities is generally referred to as a hacker. This hacker may alter systems or security features to accomplish a goal that differs from the original purpose of the system.

- **Virus attacks**
  The most potent and vulnerable threat to computer users is virus attacks. Virus attacks hamper important work involved with data and documents. It is imperative for every computer user to be aware about the software and programs that can help to protect the personal computers from attacks
- **Software piracy**
  Software piracy is all but impossible to stop, although software companies are launching more and more lawsuits against major malpractices. Originally, software companies tried to stop software piracy by copy-protecting their software.

How to prevent unauthorized computer access

Most users are interested in taking steps to prevent others from accessing their computer. Whether it be to protect yourself from malware or to ensure that your private information is safe, having a secure computer can definitely provide peace of mind. The following sections detail many ways by which you can secure your computer against others. To proceed, you may read through each section or choose one that interests you from the list below.

- **Passwords**
  Make sure a password has been set for your computer's operating system. The best way to keep someone out of your accounts and personal information is to not let them on your machine in the first place. You can always create additional accounts for guests. Information on how to carry out these actions can be found in the following linked pages.

- **Get a hardware or software firewall**

  Computer users are recommended to install a firewall in their computers. There are two ways a firewall can protect your computer and network.

  Hardware firewall - A hardware firewall is a physical device that is connected to your network. Often, many users who have a home network can use their network router as a firewall solution.

  Software firewall - A software firewall is a software program that you install on your computer to help protect it from unauthorized incoming and outgoing data. Keep in mind that a software firewall is only going to protect the computer on which it has been installed. Additionally, many antivirus scanners include their own version of a firewall program.

- **Malware protection**

  Trojans, viruses, spyware, and other malware can monitor your computer and log keystrokes to capture sensitive data such as passwords and credit card information.
  To help protect your computer from these threats, we suggest installing both virus and spyware protection programs.

- **Know how to handle e-mail**

  Today, e-mail is one of the most popular features on the Internet. Being able to identify threats sent through e-mail can help keep your computer and your personal information safe. Below are some of the most common threats you may encounter while using e-mail.

  Attachments - Never open or run e-mail attachments from addresses with which you are not familiar. Viruses, spyware, and other malware are commonly distributed through e-mails that have attachments. For example, an e-mail may want you to open an attachment of claiming to be a funny video, when it's really a virus.

  Phishing - Phishing or an e-mail phish is a message that appears to be from an official company (such as your bank) indicating you need to log onto the site to check your account settings. However, the e-mails are really sites set up to steal confidential information such as your passwords, credit card information, social security information, etc. See the phishing definition for additional information about this term as well as examples of these e-mails.

- **Alternative browser**

  Before the release of Microsoft Windows XP SP2 and Internet Explorer 7.0, Microsoft Internet Explorer was notorious for security and spyware related issues. Although it has improved since then we still highly recommend considering an alternative browser such as Mozilla's Firefox or Google's Chrome.

- **Install Antivirus Software**

  Antivirus is other means to protect the computer. It is software that helps to protect the computer from any unauthorized code or software that creates a threat to the system. Unauthorized software includes viruses, key loggers, Trojans etc. This might slow down the processing speed of your computer, delete important files and access personal information. Even if your system is virus free, you must install antivirus software to prevent the system from further attacks of virus.

  Antivirus software plays a major role in real time protection; it is an added advantage of detecting threats helps.

- **Install Anti-Spyware Software**

  Spyware is a software program that collects personal information or information about an organization without their approval. This information is redirected to a third party website. Spyware are designed in such a way that they are not easy to be removed. Anti-Spyware software is solely dedicated to combat spyware. Similar to antivirus software, anti-spyware software offers real time protection. It scans all the incoming information and helps in blocking the threat once detected. Comodo Free Antivirus comes with spyware protection built in.