INFORMATION COMMUNICATION TECHNOLOGY

TEACHER GUIDE

GRADE 9

Federal Democratic Republic of Ethiopia
Ministry of Education

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INTRODUCTION TO THE TEACHER GUIDE

A perfect guide for an ICT teacher is one that provides support to the teacher to engage the students in joyful learning. Information and Communication Technologies (ICTs) refer to the possibilities offered by the convergence of data processing techniques, electronic media, and telecommunications, a convergence that has become evident over the past few years.

ICTs are grouped under two categories: *traditional* and *new*. Traditional ICTs are radio, television, and fixed line telephones etc., which have been gradually ingrained in the daily habits and lives of people and communities. New ICTs consist of computers and specific data processing applications accessible through those computers (e-mail, Internet, Word processing, and other data processing applications).

New ICTs are now found on the development agenda of African countries like Ethiopia, and strategies have been gradually implemented to integrate them into the development process. Many countries have initiated significant reforms in the telecommunications sector: privatizing companies, liberalizing and ending national monopolies in this sector.

This Teacher Guide will help the teachers to:

- explain how Information and Communication Technology (ICT) has the potential to make a real improvement to teaching and learning in schools.
- demonstrate a wide variety of ways in which ICT can be used to enhance learning, offering a fresh burst of inspiration for them *i.e.*, the busy school teachers.
- take a structured approach, ensuring that the students can be guided progressively through all the contents in order to achieve the required standards for achieving Qualified Teacher Status, and also to continue their development in ICT to an advanced level.
- analyze all the common ICT tools and explain how they can exploit these tools for effective learning.
- explore how students can learn with ICT, how their skills develop, and how these skills can aid their learning.
- provide a framework for planning, analyzing and evaluating teaching with ICT.
- use Internet, educational trips and other aids to support classroom teaching.
- prepare additional activities and assessments for the students.
- offer a range of innovative tasks, resources and methods of assessment.
- use key ideas, skills and techniques of ICT in other curriculum areas.

The guide also provides some suggested websites that have additional content for the teacher.

UNIT 1

INTRODUCTION TO ICT

(18 PERIODS)

UNIT OUTCOME

Students will be able to:

- know the term data, information, technology and the sources of information;
- understand the differences between computers of one generation from the other;
- recognize the types of computers used today and their difference;
- understand the computer system.

SUGGESTED LESSON PLAN

Sub-units	Number of Periods
1.1 Overview of ICT	3
1.2 Generation of Computers	2
1.3 Types of Computers	2
1.4 Introduction to Data Representation	4
1.5 Computer System	7

STRUCTURE OF THE UNIT

1.1 Overview of ICT

In this sub-unit, we will learn about basic concepts of ICT in an attempt to overview it. The topics to be learnt are:

- Data vs information
- Technology
- Information technology
- Sources of information
- Documentary sources
  - Primary documentary
  - Secondary documentary
  - Tertiary documentary
- Non-documentary sources

1.2 Generation of Computers

In this sub-unit, we will learn about the five generations of computers. The topic to be learnt is:

- First, Second, Third, Fourth, and Fifth generation

1.3 Types of Computers

In this sub-unit, we will learn about the types of computers. The topics to be learnt are:

- Super, Mainframe, Mini, Micro, Desktop, Laptop and Palmtop
- Characteristics of computer

1.4 Introduction to Data Representation

In this sub-unit, we will have an introduction to data representation. The topics to be learnt are:

- Number system (binary, octal, hexadecimal)
- Conversion of numbers from one number system to the other
- Computer coding system (BCD, ASCII, UNICODE)

1.5 Computer System

In this sub-unit, we will learn about computer system *i.e.*, hardware and software. The topics to be learnt are:

- Hardware components
  - Input devices
  - Output devices
  - System unit
  - Secondary storage devices
    - Compact disc CD
- Types of software
  - Systems software
    - Operating system software
  - Language software
    - Low level language
    - High level language
    - Compilers and interpreters
  - Others
    - Program utilities
    - Device drivers
- Applications software
  - General purpose (*e.g.*, Microsoft word)
  - Specialty software (*e.g.*, Peachtree)
  - Entertainment software
  - Educational software
- Features of Operating system
  - Creating folders
  - Copying files and folders
  - Moving files and folders
  - Rename files and folders
  - Deleting files and folders
  - Searching files and folders
  - Customize computer desktop

REVIEW OF THE UNIT

- Data is a collection of raw facts and figures or a raw input which when processed or arranged makes meaningful output.
- Information is the data that is organized, meaningful and useful.
- Technology is the usage and knowledge of tools, crafts, techniques, or systems, or methods of organizations.
- Information Technology (IT) refers to anything related to computing technology, such as networking, hardware, software, the Internet, or the people that work with these technologies.
- An information 'source' can be categorized by the type of information it contains. The types are primary, secondary and tertiary.
- The computers that used vacuum tube circuits were called the First Generation Computers.
- The computers that used transistors were called the Second Generation Computers.
- The Third Generation Computers used Large Scale Integration (LSI) circuits for processing.
- The computers that used Very Large Scale Integrated (VLSI) chips were called the Fourth Generation Computers.
- Recent research has focused on developing "thinking computers". These computers are called the Fifth Generation Computers. They would be able to work like humans do.
- Super computers are the most powerful computers among digital computers.
- Mainframe computers are designed to handle huge volumes of data and information.
- Minicomputers are small general purpose computers, also called *mid-range servers*.
- Microcomputers are also called Personal Computers (PCs). These are classified into desktops and portables.
- The main characteristics of a computer are: speed, accuracy, reliability, storage capacity, versatility, reduction in manpower and reduction in paper work.
- A digital computer works with binary number system.

- All the data that is entered into a computer is first converted into the binary form and after processing, it is again converted to human readable form.
- There are different types of number systems (binary, octal, hexadecimal) that are used to represent data.
- We can convert a number in one system to the other system by following rules specified by the number system.
- Some useful computer coding systems are BCD, ASCII and UNICODE.
- A computer system consists of hardware components and software components.
- Hardware are the physical parts of the computer that can be seen and touched.
- Software are the sets of instructions that instruct the computer to do different tasks, for example: word processing, games, painting, e-mail, spreadsheets.
- Software can be classified as systems and application software.
- Operating system is a bridge between the computer hardware and the user.

IMPORTANT FACTS AND FORMULAE, TABLES, CHARTS, ETC.

Conversion of Numbers from Decimal to Binary

There are *two* methods for converting (integers) from decimal to binary.

The first method of converting decimal to binary is **repeated-division** method. In this method, the number is successively divided by 2 until it becomes 0 and its remainders recorded. The final binary result is obtained by assembling all the remainders, with the last remainder being the Most Significant Bit (MSB). This method has been explained in the Student Textbook.

The second method requires a table of powers of 2 as shown below:

n	2^n
0	1
1	2
2	4
3	8
4	16
5	32
6	64
7	128
8	256
9	512
10	1024
11	2048
12	4096
13	8192
...	...

Because of this restriction, it is more useful for small numbers where these powers have been memorized. Starting with the decimal number to be converted, obtain the largest power of 2 *i.e.*, 2^n from the table without exceeding the given number. Record 1 at the $(n + 1)$th position (MSB). Then subtract the table obtained number from the original number. Repeat the process for the remainder, and continue until the remainder is 0. Fill 0s at those positions which have not been recorded with 1s. Finally read the binary digits *i.e.*, bits to get the result.

Example 1. *Convert 23_{10} to binary.*

Solution. From the table, 16 is the largest number without exceeding 23.

$2^4 = 16$ *i.e.*, put 1 at (4 + 1)th position (MSB).

5th	4th	3rd	2nd	1st
1				

$23 - 16 = 7$

From the table, 4 is the largest number without exceeding 7.

$2^2 = 4$ *i.e.*, put 1 at (2 + 1)rd position.

5th	4th	3rd	2nd	1st
1		1		

7 – 4 = 3

From the table, 2 is the largest number without exceeding 3.

$2^1 = 2$ *i.e.*, put 1 at (1 + 1)nd position.

5th	4th	3rd	2nd	1st
1		1	1	

3 – 2 = 1

From the table, 1 is the largest number without exceeding 1.

$2^0 = 1$ *i.e.*, put 1 at (0 + 1)st position.

5th	4th	3rd	2nd	1st
1		1	1	1

1 – 1 = 0

Now, the remainder is 0. Fill 0 at the 4th position, where 1 was not recorded. So, the various 1s and 0s obtained from the above process are as follows:

5th	4th	3rd	2nd	1st
1	0	1	1	1

Thus, $23_{10} = 10111_2$

Example 2. *Convert 167_{10} to binary.*

Solution. From the table, 128 is the largest number without exceeding 167.

$2^7 = 128$ *i.e.*, put 1 at (7 + 1)th position (MSB).

8th	7th	6th	5th	4th	3rd	2nd	1st
1							

167 – 128 = 39

From the table, 32 is the largest number without exceeding 39.

$2^5 = 32$ *i.e.*, put 1 at (5 + 1)th position.

8th	7th	6th	5th	4th	3rd	2nd	1st
1		1					

39 – 32 = 7

From the table, 4 is the largest number without exceeding 7.

$2^2 = 4$ *i.e.*, put 1 at (2 + 1)rd position.

8th	7th	6th	5th	4th	3rd	2nd	1st
1		1			1		

7 – 4 = 3

From the table, 2 is the largest number without exceeding 3.

$2^1 = 2$ *i.e.*, put 1 at the (1 + 1)nd position.

8th	7th	6th	5th	4th	3rd	2nd	1st
1		1			1	1	

3 – 2 = 1

From the table, 1 is the largest number without exceeding 1.

$2^0 = 1$ *i.e.*, put 1 at (0 + 1)st position.

8th	7th	6th	5th	4th	3rd	2nd	1st
1		1			1	1	1

1 – 1 = 0.

Now, the remainder is 0. Fill 0s at the 7th, 5th and 4th positions, where 1 was not recorded. So, the various 1s and 0s obtained from the above process are shown below:

8th	7th	6th	5th	4th	3rd	2nd	1st
1	0	1	0	0	1	1	1

Thus, $167_{10} = 10100111_2$

ROLE OF THE STUDENTS

In this unit, the students are supposed to have an introduction to ICT. The activity based method should be followed to understand the subject matter which is the best way of better understanding of the subject matter.

ICT has the potential to transform learning in and beyond the classroom. Some of the perceived benefits to learners are:

- They can access enormous amounts of information quickly;
- They can work at their own pace;
- Special needs, both remedial and extension, can be offered during the same lesson;
- Course material can be offered simultaneously in different languages;
- They can access quality material irrespective of their geographical location;
- Academic courses can be offered asynchronously;

- They can interact with peers and experts outside the classroom, town, and/or country;
- ICT can offer simulations where the student can experiment by changing the variables;
- ICT offers a host of different tools to demonstrate learning, suitable for divergent and different intelligences; and,
- Young students can easily accept the technology.

ADDITIONAL CLASS ACTIVITIES FOR GIFTED STUDENTS OR SLOW LEARNERS

ACTIVITY 1.1: Uses of Computers in the Educational Field

Students in their class will explain and discuss the uses of computers in the field of education.

Computers are an excellent way to make a class more exciting even though it can never take the teacher place. Computers are everywhere and you will be expected to have computer skills for any job that you go into after completion of your study.

Fig. 1.1: Students learning on a Computer

Computers in the Educational Field

Computers are used in a variety of settings within the educational field. They can be used by guidance counselors, administrators, web masters, library media specialists, students, teachers and clerical workers for many different reasons. Computers lend an organizational hand to schools, and they also improve productivity in several areas. For these reasons, computer technology has become an essential part of the educational system.

Clerical Staff

Educational clerical staff members use computers to store and maintain student records at various levels.

Guidance Counselors and Social Workers

Guidance counselors and school social workers use computer technology to communicate with teachers and parents, and they also use technology to keep and monitor student records.

Administrators

School administrators use computers to communicate electronically (*e.g.*, e-mails) with other staff members and parents, and they also use computers to generate letters and documents for parents, staff and education department.

Webmasters

Computers are also used in schools in order to maintain websites. School webmasters upload important documents to electronic document files, update calendars and important school information and provide helpful links to parents and teachers.

Library Media Specialists

School library media specialists use computer technology to catalogue books and keep student checkout records. Additionally, many school libraries maintain websites that serve as portals for their student populations.

Teachers

Teachers use computers for a variety of reasons. They use computers to keep electronic grade books; maintain and update personal websites to share information with families; communicate with other teachers, parents and administrators and use software to create classroom newsletters.

Students

In schools, students use computers to learn both with and from technology. Computers enable students to research a variety of subjects. Students can also use computers to view assignment guidelines and requirements at home and communicate with teachers about assignments.

ACTIVITY 1.2: Binary Code

Students in their class will explain and discuss the binary code inside the computers.

Do you know that all of the information that travels through your computer is based on two commands? It is true. The only data that a computer can understand is **ON** and **OFF**. But, the millions of combinations of those two commands given in series are what make a computer work. Let us have an idea of binary code.

Binary Code

Do you remember the power supply that is inside your computer and how it sends electricity to all of the components? That electricity is what creates an ON signal. The memory chips inside your computer are divided into thousands of tiny compartments called **bits**. Each bit has an electronic switch or **gate**. ON means the gate is open and letting electricity go through. The computer reads ON or OPEN switches as a number 1. Closed gates are OFF because the electricity is blocked and cannot get through. The computer reads OFF bits as 0. It is by grouping these bits together to form a series of 1/0 commands, that data is formed. Eight bits are grouped together to form a **byte**. In this group of eight, there are 256 possible combinations of 1/0. The grouping of 1/0 within a byte is called **Binary Code**.

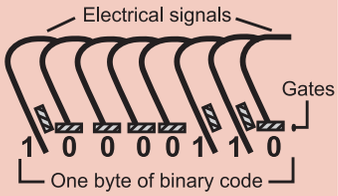


Fig. 1.2: Binary code

For example, when you type the letter A on your keyboard, electrical signals are sent from the keyboard to the CPU. The CPU turns the signals into binary code. Then, the computer reads the code and sends it on to the monitor to display the letter A (see Fig. 1.3).

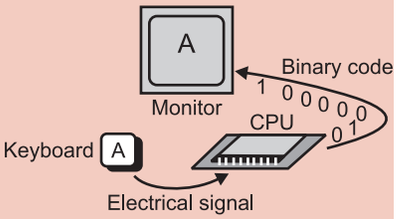


Fig. 1.3: Conversion of a letter into binary code and back

ANSWERS TO TEXTBOOK ASSESSMENTS

Assessment 1.1

Fill in the Blanks

1. Information and Communication Technology
2. Data
3. Technology
4. *primary, secondary, tertiary*

State Whether True or False

1. False 2. True 3. True 4. True

Answer the Following

1. *Data*: The term data refers to any raw collection of facts and figures that does not convey any meaning. Data serves as a raw material for obtaining the information. For example, collecting the data of names, ages and marks of students.

   Information: Information is the processed form of data *i.e.*, something obtained after applying a process on raw material. For example, we can extract various information about the marks, names and ages of students from the student table.

2. The differences between data and information are given below:

Data	Information
It is a collection of facts and figures.	It is a collection of final results.
It is in an unorganized (raw) form.	It is in an organized form.
It is not in directly useful form.	It is in directly useful form.
It needs processing.	It does not need any processing.
It is also termed as input.	It is also termed as output.
It requires observations and recordings.	It requires analysis.

3. *Technology*: Technology is the usage and knowledge of tools, crafts, techniques, or systems, or methods of organizations.

   Nowadays, technology is an integrated part of lives of human beings. For example, the technology in communications such as mobile phones help us to connect with the other people easily.

   Information Technology: Information Technology or "IT", refers to anything related to computing technology, such as networking, hardware, software, the Internet, or the people that work with these technologies.

   Information Technology uses computers, servers, database management systems and cryptography.

4. The different sources of information are discussed below:

   Primary Documentary

   Primary documentary sources of information are *original materials* that often convey new ideas, discoveries, or information. These sources originate from the time period under study. Examples of primary sources include:

   (*i*) original research studies (often in the form of journal articles in peer-reviewed publications), also called empirical studies (*e.g.*, psychology)

   (*ii*) patents, technical reports

   (*iii*) original documents such as diaries, letters, e-mails, manuscripts, lab data/notes

   (*iv*) newspaper articles from the time period under study

   (*v*) autobiographies, first-person accounts, case studies

   (*vi*) artifacts and archival material such as official documents, minutes recorded by government agencies and organizations, photographs, coins, fossils, natural specimens

   (*vii*) works of art such as literature, music, architecture, or paintings.

   Secondary Documentary

   Secondary documentary sources of information are based on *primary sources*. They are generally written at a later date and provide some discussion, analysis, or interpretation of the original primary source. Examples of secondary sources include:

   (*i*) review articles or analyses of research studies about the same topic (also often in peer-reviewed publications)

   (*ii*) analyses of original documents or archival material

   (*iii*) biographies, reviews, or critiques of an author.

   Tertiary Documentary

   Tertiary documentary sources of information are *based on a collection of primary and secondary sources*. Examples of tertiary sources include:

   (*i*) textbooks (sometimes considered as secondary sources)

(*ii*) dictionaries and encyclopaedias

(*iii*) manuals, guidebooks, directories, almanacs

(*iv*) indexes and bibliographies.

Non-documentary Sources

The non-documentary sources of information are also called Informal Information Sources. These include government departments, research organizations, learned professional societies, industries, universities, colleagues, corridor meetings at conferences and social gatherings. Examples of non-documentary sources are small groups, big groups, Blogs and Twitters etc.

Suggested Activities

Refer to sub-unit 1.1 of the Student Textbook for doing the activities.

Assessment 1.2

Fill in the Blanks

1. five
2. cost, size
3. vacuum tube
4. Fifth

State Whether True or False

1. True
2. False
3. True
4. True

Answer the Following

1. The generation of computers are given below:
   (*i*) First Generation (1940–1956)
   (*ii*) Second Generation (1956–1964)
   (*iii*) Third Generation (1964–1971)
   (*iv*) Fourth Generation (1971-present)
   (*v*) Fifth Generation (Future)
2. The comparison of various generations of computers is given in the following table:

Comparison of Generations of Computers

Generation	Period	Circuitry	Input	Storage	Output	Language	Examples
First	1940–56	Vacuum Tubes	Punched Cards	Magnetic tapes	Punch Cards	Machine Language	Univac, IBM 650, Burroughs 200
Second	1956–64	Transistors	Punched Cards, Magnetic tapes	Magnetic tapes	Punch Cards	Machine, Assembly	IBM 1400, Honeywell 200
Third	1964–71	Integrated Circuits (ICs)	Keyboards	Magnetic Disks	Monitor	Pascal, Fortran, Cobol, RPG	IBM System-360
Fourth	1971-present	Very Large Scale Integration (VLSI) of circuits	Mouse, Scanners, Sound, etc.	Magnetic Disks with higher capacity	Monitor, Printers	RDBMS, etc.	IBM System 3760, HP 3000
Fifth	Future	With Artificial intelligence					

Suggested Activity

ACTIVITY 1: Explain and Demonstrate (Pictorially or Physically) each Generation of Computers

Students in their class will explain and demonstrate the five generations of computers pictorially.

Evolution of Computers

While it would not be wrong to say that the evolution of the computer began with the man's need to count, the actual growth of this field happened in a short span of thirty years. This rapid development was characterized by phases of growth, which have come to be called computer generations. Major technological developments in each generation led to smaller, cheaper, more powerful, more efficient and reliable computers.

Five Generations of Computers

The five generations of computers are explained and demonstrated below:

First Generation (1940–1956): Vacuum Tubes

The first generation computers used valves leading to huge size and cost. The UNIVAC and ENIAC computers are examples of first-generation computing devices. The UNIVAC was the first commercial computer delivered to a business client, the U.S. Census Bureau in 1951.

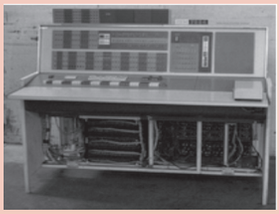


Fig. 1.4: First Generation Computer

Second Generation (1956–1964): Transistors

The second generation computers used transistors. In span of ten years, transistors that were more efficient and cheaper replaced valves.

Fig. 1.5: Second Generation Computer

Third Generation (1964–1971): Integrated Circuits

The third generation computers used Integrated Circuits (ICs). In the early sixties, a major breakthrough was achieved when hundreds of transistors could be placed on single silicon chip. This Integrated Chip (IC) became the basis of the Third Generation.

Fig. 1.6: Third Generation Computer

Fourth Generation (1971–Present): Microprocessors

The fourth generation computers used microprocessors. With the introduction of VLSI (Very Large Scale Integration), thousands of transistors could be placed on a single chip. In 1981, IBM introduced its first computer for the home user, and in 1984, Apple introduced the Macintosh. Fourth generation computers also saw the development of Graphical User Interfaces (GUIs), the mouse and handheld devices.

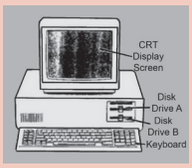


Fig. 1.7: Fourth Generation Computers

Fifth Generation (Present and beyond): Artificial Intelligence

The fifth generation computer tries to infuse artificial intelligence into computers. The development of these computers is still in its infancy, but examples can be cited of various speech recognition systems and robots.

Fig. 1.8: Fifth Generation Computer

Assessment 1.3

Fill in the Blanks

1. Computers
2. Super computers
3. Desktops
4. pocket calculator

State Whether True or False

1. False
2. True
3. False
4. True

Answer the Following

1. The various types of computers used today are classified as:
   (*i*) Super computers
   (*ii*) Mainframe computers
   (*iii*) Minicomputers
   (*iv*) Microcomputers
      (*a*) Desktop
      (*b*) Laptop
      (*c*) Palmtop
2. The characteristics of each type of computer are given below:
   (*i*) *Speed*: Computers work at an amazing speed without any mistakes. The work, which a normal person would complete in a few hours can be done within fractions of a second by a computer. Speed of computers is measured in terms of milliseconds (10^{-3} seconds), microseconds (10^{-6} seconds) or nanoseconds (10^{-9} seconds).
   (*ii*) *Accuracy*: A computer performs its task with great accuracy. It never commits mistakes in processing the data. It produces errors when we enter inaccurate input, *i.e.*, Garbage In Garbage Out (GIGO).
   (*iii*) *Reliability*: Computers are more reliable than human beings as they do not get bored of the repetitive tasks and never get tired.
   (*iv*) *Storage Capacity*: A computer can store large amount of data. It can store various documents, articles, pictures, etc., in its memory which can be used whenever required. On the other hand, a human being can keep only a limited information in his/her mind and rest of the things, he/she forgets.
   (*v*) *Versatility*: A computer can perform various types of jobs. On a computer system, we can listen to songs while typing text or play games while working on any other package, do calculations, make drawings, surf the net, send e-mail, etc.
   (*vi*) *Reduction in Manpower*: Earlier, the work in industries/factories was done by a number of persons. But with computers, it can be completed by a few persons and that too more accurately and efficiently. The advent of computer has reduced the need of manpower.
   (*vii*) *Paper Work can be Reduced*: The use of computer reduces the burden of paper work in any organization. For example, record of each student of a school can be kept in the computer itself rather than keeping manual files for each student. Also, information regarding any student can be obtained easily and quickly with the help of a computer.

Suggested Activity

Refer to sub-unit 1.3 of the Student Textbook for doing the activity.

Assessment 1.4

Fill in the Blanks

1. binary
2. byte
3. 1024
4. **A**merican **S**tandard **C**ode for **I**nformation **I**nterchange.

State Whether True or False

1. False
2. True
3. True
4. False

Answer the Following

1. A computer handles non-numeric data in addition to numeric data, that is, alphabets, punctuation marks and other special characters. Some predefined codes are used to represent the numeric and non-numeric characters. These codes are known as *alphanumeric codes*. Any data or information is represented internally using the bits 0 and 1.

   The various codes for data representation are: BCD, ASCII and UNICODE, etc. All the data that is entered into a computer is first converted into the binary form and after processing, it is again converted to human readable form.

2. The number systems are discussed in brief as:

Binary Number System: It consists of two digits namely 0 and 1. These binary digits are called *bits*. The *base* or *radix* of binary number system is *2* as it uses two digits only. It may be noted that the base digit namely 2, is not the fundamental or basic digit of the system. Thus, all the numbers in binary system are written with the help of these two digits namely, 0 and 1. The positional value or place value of each digit in a binary number is twice the positional value of the digit on its right. This number system is identical to decimal number system with the base replaced by 2. For example, $(1011)_2$. Binary number system is used by the computers.

Octal Number System: It has *base* or *radix 8*. The basic digits of this system are 0, 1, 2, 3, 4, 5, 6 and 7. It may be noted that the base 8 is not the basic digit of the system. It is commonly used as a shorthand way of expressing binary quantities. Also the numbers represented in octal number system can be used directly for input and output operations.

The octal number system is also a positional value system, wherein each octal digit has its own value or weight expressed as a power of 8. For example, $(517)_8$.

Hexadecimal Number System: It is popularly known as Hex System. It consists of sixteen symbols and therefore has the *base* or *radix* as *16* or *H*. It is very well suited for big computers. The hexadecimal number system represents the data/information in the concise form. The sixteen symbols used in this system are:

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F.

It is also positional value system, wherein each hexadecimal digit/letter has its own value or weight expressed as a power of 16. For example $(1C)_{16}$.

3. (*i*) $(101011)_2 = ?_{10}$

$$= 1 \times 2^0 + 1 \times 2^1 + 0 \times 2^2 + 1 \times 2^3 + 0 \times 2^4 + 1 \times 2^5$$

$$= 1 + 2 + 0 + 8 + 0 + 32$$

$$= 43$$

Therefore, $(101011)_2 = (43)_{10}$

(*ii*) $(25)_{10} = (\ )_2$

		Remainder
2	25	
2	12	1
2	6	0
2	3	0
2	1	1
	0	1

= 11001

Therefore, $(25)_{10} = (11001)_2$

(*iii*) $(759)_{10} = (\ )_8$

		Remainder
8	759	
8	94	7
8	11	6
8	1	3
	0	1

= 1367

Therefore, $(759)_{10} = (1367)_8$

(*iv*) $(746)_8 = (\ )_2$

$(746)_8 =$ 7 4 6

111 100 110

as 111 = 7, 100 = 4 and 110 = 6 in decimal

Therefore, $(746)_8 = (111\ 100\ 110)_2$

(*v*) $(59F)_{16} = (\ )_2$

$5 = (0101)_2$

$9 = (1001)_2$

$F = (1111)_2$

Therefore, $(59F)_{16} = (101\ 1001\ 1111)_2$

(*vi*) $(9D)_{16} = (\ )_{10}$

$= 13 \times 16^0 + 9 \times 16^1$ (Here, D = 13)

$= 13 + 144$

$= 157$

Therefore, $(9D)_{16} = (157)_{10}$

(*vii*) $(11101)_2 = (\ )_8$

= 011 101 (0 added to the left to complete the group)

= 3 5

as $011 = 1 \times 2^0 + 1 \times 2^1 + 0 \times 2^2$

$= 1 + 2 + 0 = 3$

and $101 = 1 \times 2^0 + 0 \times 2^1 + 1 \times 2^2$

$= 1 + 0 + 4$

$= 5$

Therefore, $(11101)_2 = (35)_8$

(*viii*) $(47)_8 = (\ )_{10}$

$= 7 \times 8^0 + 4 \times 8^1$

$= 7 + 32$

$= 39$

Therefore, $(47)_8 = (39)_{10}$

(*ix*) $(79)_{10} = (\ )_{16}$

		Remainder	Hexadecimal equivalent	
16	79			
16	4	15	F	= 4F
	0	4	4	

Therefore, $(79)_{10} = (4F)_{16}$

4. (*i*) *BCD*: *Binary Coded Decimal* (BCD) code is one of the early computer codes. The idea of this coding scheme is to convert each digit of a decimal number into its binary equivalent instead of converting the entire decimal value into a binary number. This makes the conversion process easier. All the decimal digits are represented in BCD by 4 bits. For example,

$$12_{10} = \frac{0001}{1}\ \frac{0010}{2}$$

or 0001 0010 in BCD

Computer designers commonly use six bits to represent BCD code. With six bits, it is possible to represent 64 (2^6) different characters. For example,

In BCD notation:

I = 111001 C = 110011

T = 010011

Hence, the binary digits

$$\frac{111001}{I}\ \frac{110011}{C}\ \frac{010011}{T}$$

will record the word ICT in BCD.

(*ii*) *ASCII*: Pronounced "ask-ee", ASCII (**A**merican **S**tandard **C**ode for **I**nformation **I**nterchange) is the binary code most widely used with microcomputers. It has replaced many of the special codes that were previously used by computer manufacturers.

ASCII 7-bit code can represent up to 128 characters. A letter, digit or special symbol is called a character. It includes upper-case and lower-case alphabets, numbers, punctuation marks, special characters and control characters.

ASCII 8-bit code can represent up to 256 characters.

(*iii*) *UNICODE*: Unicode uses two bytes (16 bits) for each character. It can handle 65,536 character combinations. Thus, it allows almost all the written languages of the world to be represented using a single character set. Formally,

Unicode provides a unique number for every character,

no matter what the platform,

no matter what the program,

no matter what the language.

Unicode standard covers the principal written languages of the America, Europe, the Middle East, Africa, India and Asia.

Suggested Activity

Refer to sub-unit 1.4 of the Student Textbook for doing the activity.

ANSWERS TO REVIEW QUESTIONS

Fill in the Blanks

1. computer
2. CD, DVD
3. System
4. Device drivers

State Whether True or False

1. False
2. True
3. True
4. False

Multiple Choice Questions

1. (*b*)
2. (*d*)
3. (*a*)
4. (*c*)

Match the Following

1. (*d*)
2. (*f*)
3. (*e*)
4. (*i*)
5. (*h*)
6. (*b*)
7. (*c*)
8. (*g*)

Answer the Following

1. *Computer System*: A computer is an electronic device that can accept data and instructions, store and process it to produce the required result.

The computer mainly consists of hardware and software components. Both of these work together to process data. Figure 1.9 illustrates these two components:

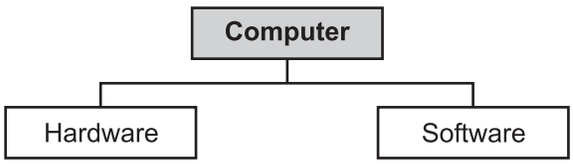


Fig. 1.9: Hardware and Software

Hardware consists of all machinery and equipment in a computer system. Hardware runs under the control of software and is useless without it. However, hardware contains the circuitry that allows processing.

The hardware components are: *input devices, output devices* and *system unit*. *Software* also called programs are step-by-step electronically encoded instructions that tell the computer how to perform a task. Without software, hardware is useless.

Software is divided into two main categories: *System software* and *Application software*.

2. The major hardware components of a computer system are listed below:

   Input Devices: Keyboard and mouse.

   Output Devices: Monitor, printer and sound speakers.

   System Unit: CPU, memory chips, motherboard and some secondary storage devices—floppy-disk drive, hard-disk drive and CD or DVD drive.

3. *System Software*: Software that helps the computer perform essential operating tasks. It consists of several programs. The most important is the operating system, the master program that runs the computer. For example, Windows XP, Windows 7, Unix, Linux and the Macintosh operating system.

   Application software cannot run without system software.

   Application Software: Software that has been developed to solve a particular problem, perform useful work on general-purpose tasks, or provide entertainment.

   Application software such as word processing, spreadsheet, presentation, desktop publishing, database management, graphics and communications packages are commonly used tools for increasing user's productivity.

4. Operating system is the master control program that runs the computer. For example, Windows XP. The features of an operating system are:

   (*i*) Manipulates the files and folders on a computer.

   (*ii*) Transfers files from one folder to another.

   (*iii*) Finds a file or folders using a 'search' facility.

   (*iv*) Customizes the computer desktop.

Suggested Activities

Refer to sub-unit 1.5 of the Student Texbook for doing Activity 2

ACTIVITY 1: Demonstrate and Explain in Brief a Computer System

Students in their class will demonstrate and explain in brief a computer system.

Computer

A computer is an electronic device that can accept, store and process data under the control of set of instructions (see Fig. 1.10).

Fig. 1.10: A computer system

csgthseh

As computer pioneer John Von Neumann has said, the device should not be called the computer but rather the "all-purpose machine". It is not just a calculating machine but it can be put to *any number of uses*.

The computer mainly consists of hardware and software components. Both of these work together to process data.

Hardware

It refers to the devices you can physically see and touch in and on the computer. The hardware components are:

Input Devices: These allow people to put data into the computer in a form that the computer can use, for example, keyboard, mouse, and microphone (see Fig. 1.11).

Keyboard

Mouse

Microphone

Fig. 1.11: Input devices

Output Devices: These translate information processed by the computer into a form that humans can understand—print, sound, graphics or video. For example, monitor, printer, sound speakers and headphone (see Fig. 1.12).

Monitor

Printer

Sound speakers

Headphone

Fig. 1.12: Output devices

System Unit: It is also known as case. It is the box that houses the CPU, the memory chips and the motherboard with power supply, as well as some secondary storage devices—floppy-disk drive, hard-disk drive and CD or DVD drive (see Fig. 1.13).

Fig. 1.13: Case or system cabinet

Software

It refers to the operating instructions and applications that allow computers to process the numbers, pictures, sounds and text we enter into them. Software is generally divided into two main categories: System software and Application software. The system software are generally concerned with the various operations of a computer system and the application software are concerned with provided services to the users. For example, Windows XP, Microsoft Word 2007, etc.

We can touch the disk that contains the software, but not the lines of programming code that make up the software.

Useful Tip

To identify the processor, clock speed and amount of RAM (Random Access Memory) in a computer system having Windows XP operating system:

Click **Start** → **Control Panel** → **Performance and Maintenance System**

ALTERNATIVE TEACHING APPROACHES, ENRICHMENT MATERIAL

The ICT teachers can use Internet, charts, models, worksheets, go for educational field trips and subject experts can be called for seminars to enrich the teaching level and in turn help the students in learning ICT.

ADDITIONAL QUESTIONS

1. What is the relation between data and information?
2. List sources of information.
3. What is information? What are its features?
4. Write the name of the dominating circuit element of each generation of computers.
5. What are the bases of decimal, octal, binary and hexadecimal number systems?
6. What is the difference between hardware and software?
7. What are the main types of software? Explain with appropriate examples.
8. Write short note on the following:
   (*i*) Utility Software
   (*ii*) Device drivers.

UNIT 2

APPLICATION SOFTWARE

(15 PERIODS)

UNIT OUTCOME

Students will be able to:

- understand how to open word processing software, and create, and save a document;
- recognize how to format a document in a desired way;
- apply any of formatting features in their document;
- understand how to open presentation software, and create and save a document;
- recognize how to create a slide show using animation and sound.

SUGGESTED LESSON PLAN

Sub-units	Number of Periods
2.1 Word Processor	8
2.2 Presentation Software and Techniques	7

STRUCTURE OF THE UNIT

2.1 Word Processor

In this sub-unit, we will learn about basics of Word Processor. The topics to be learnt are:

- Open word processor
- Creating new document
- Saving a document
- Closing a document
- Editing a document
- Formatting a document
  - Character formatting
  - Paragraph formatting
  - Page formatting
  - Spell checking
  - Inserting tables
  - Inserting pictures (clipart, drawing object)

2.2 Presentation Software and Techniques

In this sub-unit, we will learn about basics of Presentation Software and Techniques. The topics to be learnt are:

- Features of a presentation package
- Creating slides using text and images
- Formatting text and background
- Inserting and deleting slides
- Presenting a slide show
- Create a slide show using animation and sound
- Change slide layout

REVIEW OF THE UNIT

- Word processing software allows to create, edit, format, print and store text material.
- MS-Word is a Windows based application.
- A file created using MS-Word is known as a document.

- Text can be entered anywhere in a document area by placing the cursor at that place.
- The *Undo* option is used to undo the previous action and the *Redo* option will repeat the previous *Undo* action.
- Formatting means changing the appearance of text.
- Presentation software is a tool used to create visual presentations.
- A presentation package helps both: the speaker with an easier access to his/her ideas and the participants with visual information.
- We can make slides using features such as creating slides, inserting text, formatting text, inserting clipart, formatting background, inserting slides, deleting slides and inserting images from other files.
- Presenting a slide show is the most useful view of PowerPoint. It is used to display the slides in a desired sequence.
- The slide layout in PowerPoint is the arrangement of all the items that make up your slide, such as title, graphics or text boxes.

ROLE OF THE STUDENTS

In this unit, the students are supposed to learn the basic concepts of Word Processing, Presentation Software and Techniques. The activity-based method should be followed by understanding the subject matter which is the best way of better understanding of the subject matter.

Different type of technologies can be used by the students to support and enhance learning. There are many resources which can help schools to plan for technology that will have a positive impact on student achievement. Various technologies deliver different kinds of content and serve different purposes in the classroom. For example, word processing promotes communication skills and presentation software promotes presentation skills of students. So, it is important to consider how these electronic technologies differ and what characteristics make them important as vehicles for learning ICT.

ADDITIONAL CLASS ACTIVITIES FOR GIFTED STUDENTS OR SLOW LEARNERS

ACTIVITY 2.1: Create a Calendar Using MS-Word 2007

Students in groups will create a calendar using MS-Word 2007 and present it in their class.

Calendars help the students stay on top of project schedules, important school dates, and daily planning. Curriculum-related calendars include "This Day in History," temperature or weather calendars (daily, weekly, or monthly logs), weekly spelling words, and vocabulary challenges for each week of a month.

To create a calendar using MS-Word 2007, perform the following steps:

1. Open MS-Word 2007.
2. Click the *Office Button*. A menu appears.
3. Click *New*.
4. In *Templates*, under *Microsoft Office Online*, click *Calendars*. Search online to find the largest variety of calendar templates. You may also find calendar templates in *Installed Templates*.
5. Now, in the center pane, you can:
   (*i*) Click a calendar category to view thumbnails.
   (*ii*) Click a thumbnail to view details in the right pane.
   (*iii*) Click the arrows at the top of the pane to navigate between levels.
6. When you find a calendar you want to use, in the right pane, click *Download* (see Fig. 2.1). The template is downloaded to your computer and opens in a new document.

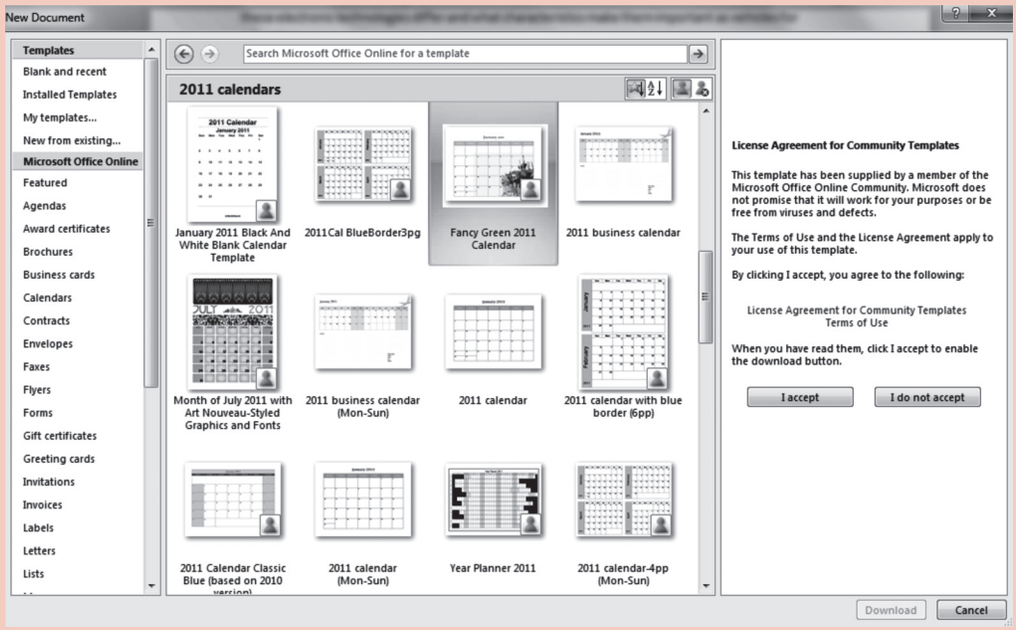


Fig. 2.1: Clicking download

7. The calendar looks finished, but you can customize any part of it to fit your needs. If you click the template, you will see that it is built from basic MS-Word 2007 objects, like text boxes, shapes, and tables. Figure 2.2 shows part of a downloaded calendar. To modify a part of the calendar, select the object and use the options in the tabs that open in the ribbon, or type new text. You can also click the *Insert* tab and add objects, like pictures and SmartArt.
8. You can leave your calendar blank or add your own important information, such as a school event, a holiday, or project details.
9. When you finish, click the *Office Button* and then click the *Save* button. You can save the calendar as a document. Or if you want to create more documents based on the calendar, click *Save as type* in the *Save As* dialog box and then select *Word Template* (*.dotx*). Enter a *File name*, and click *OK*.

Fig. 2.2: Part of a downloaded calendar

Useful Tip

With the Calendar Wizard, you can create a calendar from scratch. Under *Templates*, click *Calendars*. In the center pane, click *Other Calendars*, click *Calendar Wizard*, and then click *Download*. A new document opens and the wizard starts. Move through the pages of the wizard, and select a style, the print orientation, whether to leave room for a picture, and a date range. The wizard is added to your Templates folder.

ACTIVITY 2.2: Presenting a Slide Show

Students in groups will prepare presentations and demonstrate the slide show in the class.

First of all prepare a presentation on any given topic of your choice. You can add transitions (a transition is how one slide is removed from the screen during a presentation and the next slide is displayed) and sounds with options in the *Animations* tab. Here, we have prepared the presentation on "Ethiopian National Parks".

To start the Slide Show, perform the following steps:

1. Start PowerPoint.
2. Click on *Office Button*. A menu appears.
3. Click *New*. Select the appropriate file name and press *Enter key* or *Double-click* on the file. The desired file will be opened.
4. Click the *Slide Show* tab.
5. Click the *From Beginning* icon in the *Start Slide Show* command group or press F5 key. PowerPoint displays the first slide of your presentation (see Fig. 2.3).

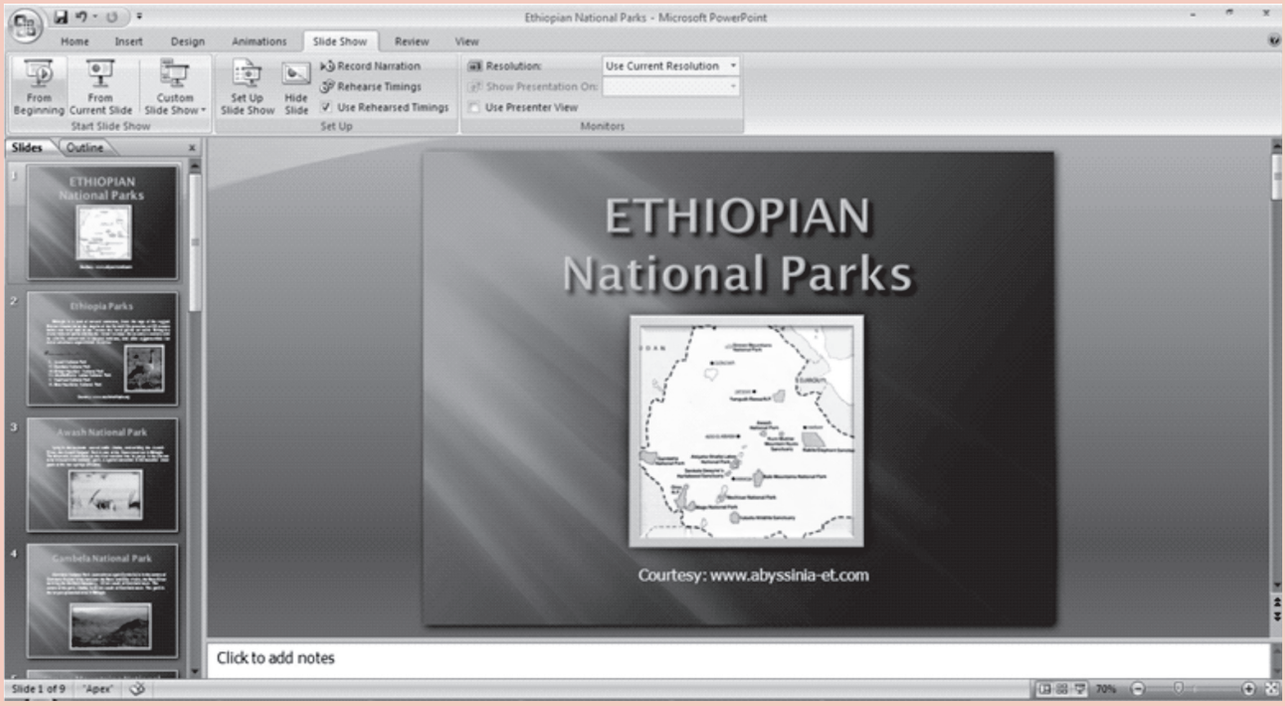
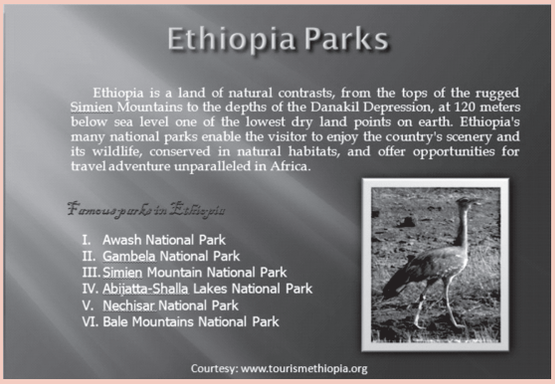


Fig. 2.3: Getting ready for presenting a Slide Show

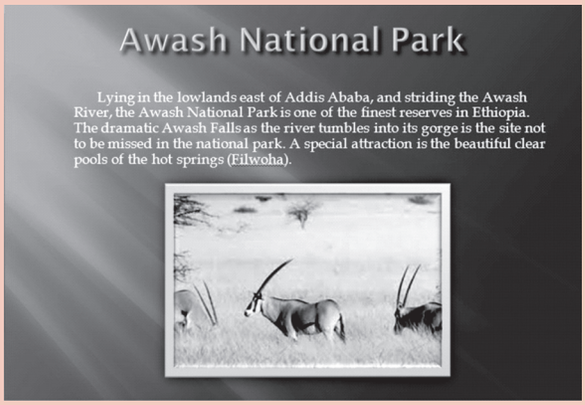
6. Run the presentation by clicking the left mouse button at each slide. At the black screen, click the left mouse button again.

   The slides in the presentation are shown in Fig. 2.4.

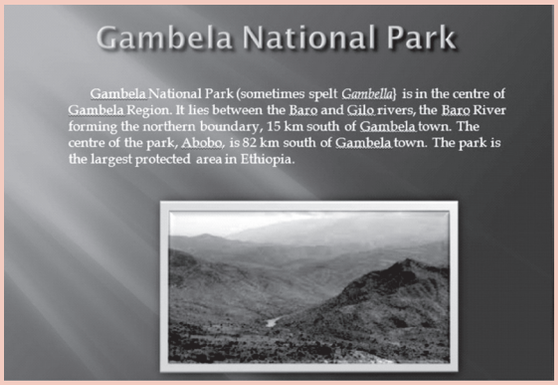
Slide 1



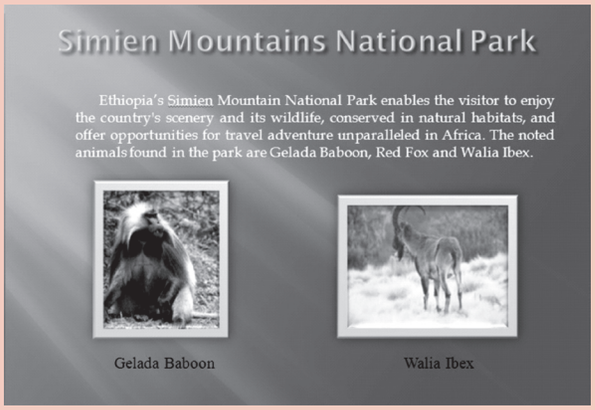
Slide 2



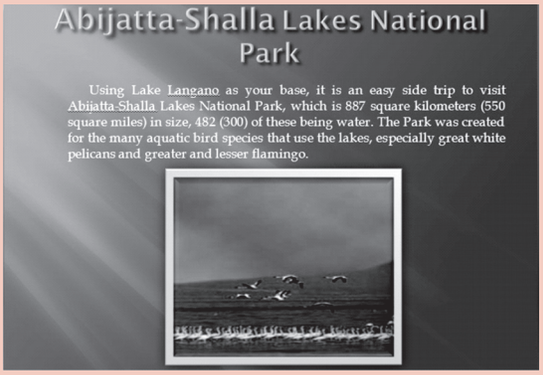
Slide 3



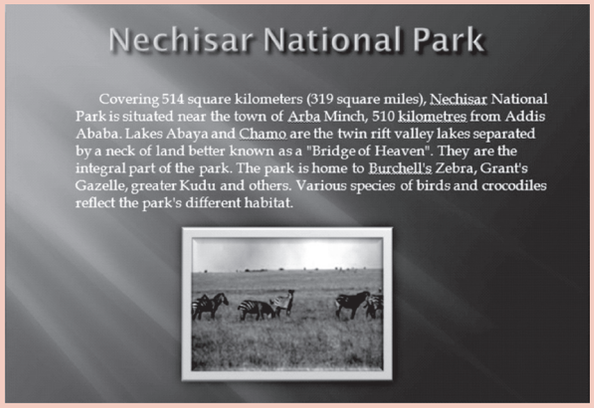
Slide 4



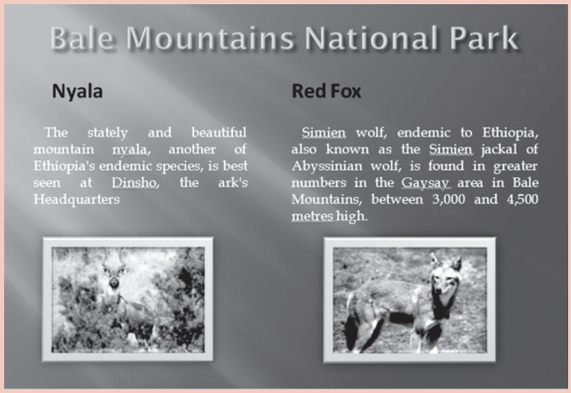
Slide 5



Slide 6



Slide 7



Slide 8

Slide 9

Fig. 2.4: Slide Show

7. Press *Esc* to exit the Slide Show.

ANSWERS TO TEXTBOOK ASSESSMENT

Assessment 2.1

Fill in the Blanks

1. What You See Is What You Get
2. blank document
3. *Create*
4. Editing

State Whether True or False

1. False
2. True
3. True
4. False

Answer the Following

1. To create and save a word document, the steps are:
   (*i*) Open MS-Word 2007.
   (*ii*) Click the *Office Button*. A menu appears.
   (*iii*) Click *New*. The New Document dialog box appears.
   (*iv*) Click *Blank document*.
   (*v*) Click *Create*. A new blank document opens. Now, you can type the desired text in the document.
   (*vi*) Click Save or Press *Ctrl + S*. The *Save As* dialog box appears if you are saving your document for the first time.
   (*vii*) Specify the correct folder in the *Save In* box.
   (*viii*) Name your document by typing "Document Name" in the File Name box.
   (*ix*) Click *Save*.
2. *Formatting* includes tasks such as changing the font, aligning and indenting text, changing line and paragraph spacing and inserting elements such as bullets, numbers, tables and pictures etc., in a document.

   The *Home* tab is very useful in formatting a word document. Some of the formatting commands of MS-Word are explained below:

   First of all select the text to be formatted either by using the keyboard by pressing shift key with arrow keys or using the mouse.

   Bold: Click the **B** button or press (Ctrl + B) to make the selected text bold.

   Italic: Click the *I* button or press (Ctrl + I) to italicize the selected text bold.

   Underline: Click the U button or press (Ctrl + U) to underline the selected text.

   Font Face: Press (Ctrl + Shift + F) to change the font face.

   Font Size: Press (Ctrl + Shift + P) to change the font size.

Align Text Left: Click the button or press Ctrl + L to align text to the left.

Center Text: Click the button or press Ctrl + E to center text.

Align Text Right: Click the button or press Ctrl + R to align text right.

Justify: Click the button or press Ctrl + J to align text to both the left and right margins, adding extra space between words as necessary.

Similarly on the *Home tab*, the *Clipboard*, *Styles* and *Editing* groups as well as the other buttons on the *Font* group and *Paragraph* group can be used for formatting a document.

The *Insert tab* can be used for inserting Tables, Pictures, applying Header and Footer in a document.

3. Spell checking in MS-Word:

   We can use MS-Word's spelling checker to find and correct the misspelled words and find duplicate words (such as and). The spelling checker compares words in the document to be spell checked with the words in its dictionary. If a match is found, the word is passed over. If no match is found for the word, the spelling checker stops, selects the word, and offers replacements. It can help in creating a well-written document but do not replace the need for proofreading.

   To spell check in MS-Word 2007, perform the following steps:

   (*i*) Open the document to be spell checked in MS-Word.

   (*ii*) Place the cursor at the beginning of the text in the document.

   (*iii*) Click *Review* tab.

   (*iv*) Click the *Spelling* & *Grammar* button in *Proofing* panel or press F7.

   (*v*) Ignore or change as per need.

   (*vi*) Click *OK*.

   (*vii*) *Save* and *Close* the document.

4. Inserting a table in MS-Word 2007 has changed slightly from previous versions of Word; however it is very easy with the new Ribbon user interface.

   To insert a table in MS-Word 2007, perform the following steps:

   (*i*) Open the document in which the table is to be inserted.

   (*ii*) Click *Insert* tab.

   (*iii*) Click *Table* button.

   (*iv*) Drag in grid to select the desired number of columns and rows.

   (*v*) Click *OK*.

   (*vi*) Now fill the table as per your requirement.

   (*vii*) *Save* and *Close* the document

Suggested Activities

Refer to sub-unit 2.1 of the Student Textbook for doing the activities.

ANSWERS TO REVIEW QUESTIONS

Fill in the Blanks

1. presentation 2. conferencing
3. Formatting 4. sound

State Whether True or False

1. False 2. True 3. False 4. True

Multiple Choice Questions

1. (*d*) 2. (*b*) 3. (*c*) 4. (*d*)

Match the Following

1. (*b*) 2. (*a*) 3. (*d*) 4. (*c*)

Answer the Following

1. *Creating a Presentation*: To create a presentation in PowerPoint 2007 you can either use a predefined template or create it from scratch. Creating from scratch is useful if you are not sure how you want your presentation to look.

   To create a presentation in PowerPoint 2007, perform the following:

   Open PowerPoint, a blank presentation is immediately created.

   Or

   (*i*) Click the *Office Button*. A menu appears.

   (*ii*) Click *New*.

   (*iii*) In the *Blank and recent* under category select *Blank Presentation*.

   (*iv*) Click *Create*.

The new presentation will default to the name of Presentation1, Presentation2, Presentation3 etc. (the number increments each time you create one).

To rename it click the *Office Button*. Click *Save*, and type in the desired name into the *File Name* box. Click *Save* or Press (*Ctrl* + *S*) on the keyboard.

Now, you are ready to start adding to your presentation.

2. *Preparing and presenting a slide show*:

   For preparing a presentation keep in mind the following basic guidelines:

   (*i*) Determine the main purpose of the presentation.

   (*ii*) Determine the output.

   (*iii*) Show one idea per slide.

   (*iv*) Maintain a consistent design.

   (*v*) Keep slides easy to read and uncluttered.

   (*vi*) Determine printing needs.

   Let us assume that you have already created a presentation. To present a slide show, perform the following steps:

   (*i*) Click the *Open Button* on the Quick Access Toolbar. If the Open button does not display on the Quick Access Toolbar, click the Customize Quick Access Toolbar button that displays at the right side of the toolbar and then click *Open* at the drop-down list.

   (*ii*) At Open dialog box, double-click on the desired presentation.

   (*iii*) Click *Slide Show* tab.

   (*iv*) Click *From Beginning* button or *From Current Slide* button.

   (*v*) Run the presentation by clicking the left mouse button at each slide. At the black screen, click the left mouse button again.

   (*vi*) Press *Esc* to exit the slide show.

3. *Creating a presentation using design techniques*:

   To create a presentation using design techniques, perform the following steps:

   (*i*) Open PowerPoint.

   (*ii*) At the PowerPoint window, click the *Design* tab.

   (*iii*) Click the *More* button located at the right side of the *Themes* icons.

   (*iv*) Click desired themes at drop-down gallery.

   (*v*) For adding slide(s), click *Home* tab and then click *New Slide* button.

   (*vi*) Save the presentation using the *Save* button on Quick Access toolbar.

4. *Steps to change the layout of a slide*:

   To change the layout of a slide, perform the following steps:

   (*i*) Open PowerPoint.

   (*ii*) Make the desired slide active.

   (*iii*) Click *Home* tab.

   (*iv*) Click *Layout* button.

   (*v*) Click desired layout at drop-down list.

   (*vi*) Click *Save*.

Suggested Activities

Refer to sub-unit 2.2 of the Student Textbook for doing the activities.

ALTERNATIVE TEACHING APPROACHES, ENRICHMENT MATERIAL

The ICT teachers can use Internet, charts, worksheets, models, go for educational field trips and subject experts can be called for seminars to enrich the teaching level and in turn help the students in learning Application Software.

ADDITIONAL QUESTIONS

1. What is the difference between Save and Save As commands in MS-Word?
2. How will you apply bullets and numbers to display ordered or unordered list in MS-Word?
3. How will you insert and delete a page break and page number in a document?
4. What are the main uses of presentation software?
5. What kind of help is available with a presentation software?
6. How will you create a slide show using animation and sound?

UNIT 3

INFORMATION AND COMPUTER SECURITY

(3 PERIODS)

UNIT OUTCOME

Students will be able to:

- understand the responsible behaviour in the computer laboratory;
- recognize the nature of computer virus and measures to protect.

SUGGESTED LESSON PLAN

Sub-unit	Number of Periods
3.1 Information and Computer Security	3

STRUCTURE OF THE UNIT

3.1 Information and Computer Security

In this sub-unit, we will learn about basic concepts of Information and Computer Security. The topics to be learnt are:

- Responsible behaviour in the computer lab
- School ICT policy
- Nature of computer viruses
  - Measures to protect

REVIEW OF THE UNIT

- Security of information and related computer systems is a big concern for the computer users.
- Computer laboratory contains delicate and expensive equipment.
- In computer lab; students must behave in a calm manner and not damage any machines or furniture; they must not touch any electrical connections for any reason.
- School ICT policy means rules prepared by the school and students must live with it.
- Computer viruses are software programs which are proving to be main cause of crashing computer system. The best way to protect computer viruses is installing antivirus software.

ROLE OF THE STUDENTS

In this unit, the students are supposed to learn the basic concepts of Information and Computer Security. The activity-based method should be followed to understand the subject matter which is the best way of better understanding of the subject matter.

Information and computer security plays a vital role in most of the organizations. Students are the one of the groups most targetted by identity thieves and computer hackers. Students work in many different computing environments and are often among the least protected against intrusions. They also frequently lack the knowledge that would help keep them safe. So, the students must know that Information and Computer Security is an important issue to protect themselves, even after completion of their education.

Note: Computer and information systems managers oversee a variety of workers, including systems

analysts, support specialists, and software engineers. They are aware of the latest ICT developments to ensure that the organization remains competitive. They may advance to progressively higher leadership positions in an ICT department or non-technical areas such as marketing, human resources and sales, etc.

ADDITIONAL CLASS ACTIVITY FOR GIFTED STUDENTS OR SLOW LEARNERS

ACTIVITY 3.1: Computer Viruses and Protection

Students will form groups in their class to discuss about computer viruses and protection.

Computer Virus

A computer virus is a "deviant" program, stored on a computer floppy drive, hard drive, or CD, that can cause unexpected and often undesirable effects, such as destroying or corrupting data. For example, boot-sector virus, file virus, multipartite virus, macro virus, and logic bomb, etc.

Ways of Virus Passing

Viruses are passed in the following two ways:

1. **By floppy disk:** The first way is via an infected floppy disk, perhaps obtained from a friend or a repair person.
2. **By the Internet or some other network:** The second way is via a network such as, download (make copies of file) information from the Internet and other computer networks, or open files attached to e-mail.

   Figure 3.1 shows the working of viruses (Courtesy: *www.contemposervices.com*).

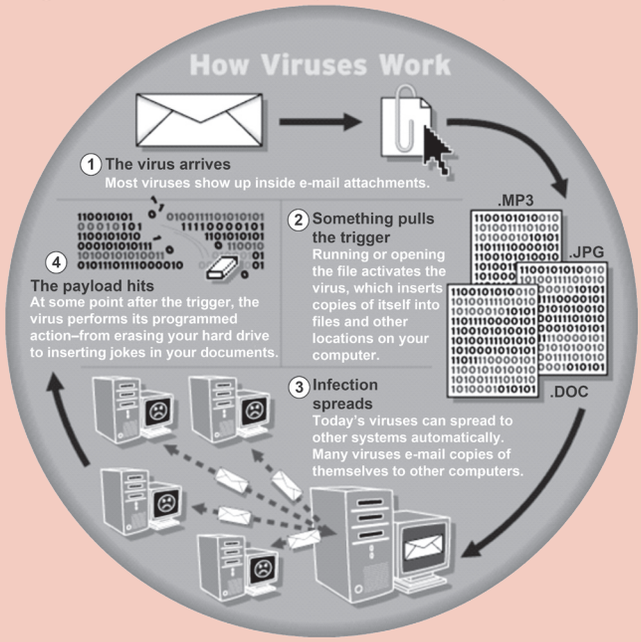


Fig. 3.1: Working of Computer Viruses

Protection

For every individual computer user, the primary motive is PC protection. In other words, they must protect their computers from viruses. A virus can expose the information or stop your computer from working. To help avoid computer viruses, it is essential that you keep your computer current with the *latest updates, antivirus tools* (antivirus *software* is a utility program that scans hard disks, floppy disks, and memory to detect

viruses), stay informed about *recent threats*, and follow a *few basic rules* when you surf the Internet, download files, and open attachments.

Once a virus is on your computer, its type or the method used to get there is not as important as *removing it and preventing further infection*. One important thing you can easily do is back up your files regularly (make sure they are not infected).

A good antivirus software comes with features like a built-in firewall and usually offers an access to online data backup. Firewalls are systems which help protect computers and computer networks from attack and subsequent intrusion. Visit the website *www.mobrien.com* for more information on Firewalls.

Figure 3.2 shows Kaspersky Antivirus website.

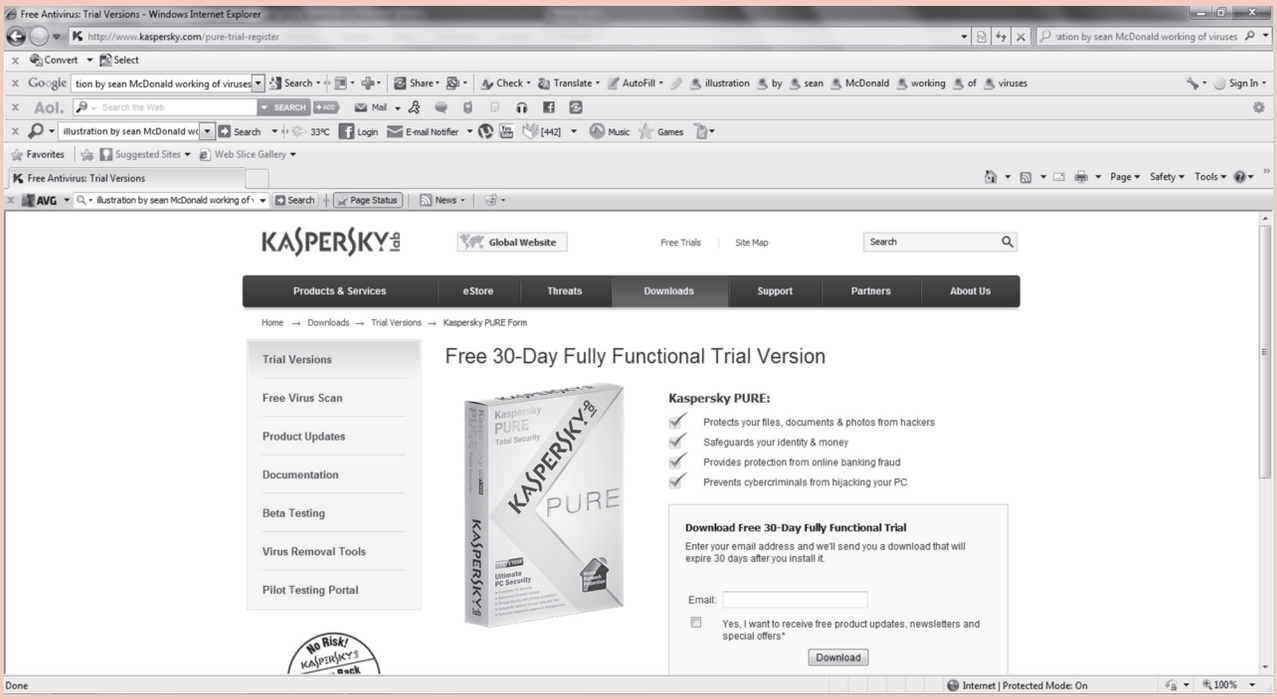


Fig. 3.2: Kaspersky Antivirus website (www.kaspersky.com)

Some of the best antivirus software are:

1. Kaspersky
2. Avast
3. Norton 2011
4. Microsoft Security Essentials
5. AVG
6. Comodo
7. McAfee
8. Trend Micro
9. Avira AntiVir
10. BitDefender

So, it is totally up to you to select which one is the best antivirus for you as per your requirement and your system configurations. Visit the following websites for more information on antivirus software:

- en.softonic.com
- www.freedownloadscenter.com
- www.brothersoft.com
- www.microsoft.com

ANSWERS TO REVIEW QUESTIONS

Fill in the Blanks

1. delicate, expensive 2. electrical
3. computer virus 4. antivirus

State Whether True or False

1. False 2. True
3. False 4. False

Multiple Choice Questions

1. (*d*) 2. (*a*)
3. (*b*) 4. (*c*)

Match the Following

1. (*b*) 2. (*c*)
3. (*d*) 4. (*a*)

Answer the Following

1. A computer laboratory contains delicate and expensive equipment. Students must behave in a calm manner and not damage any machines or furniture; they must not touch any electrical connections for any reason. The guidelines to be followed in the computer lab are:
   - (*i*) Students are not allowed in the computer lab unless directly supervised by a computer teacher or any other staff member.
   - (*ii*) Never share your password, even with your best friend.
   - (*iii*) No gum, snacks or drinks are allowed in the computer lab, electronic equipment does not like to get wet or sticky.
   - (*iv*) Listen to directions given by your computer teacher.
   - (*v*) Review your notes, on-line materials and of course the HELP option in all programs.
   - (*vi*) Use the Internet only as instructed. Do not click on links that seem suspicious or give offers of anything "free".
   - (*vii*) Do not use the mouse or keyboard as a toy, that is, do not randomly click on the mouse or hit the keys on the keyboard without a purpose.
   - (*viii*) Do not change computer preference settings or endeavour to "hack" into unauthorized areas.
   - (*ix*) Always use print preview before you print.
   - (*x*) Take permission from your computer teacher before printing.
   - (*xi*) Before leaving from the computer lab you should follow these procedures:
     - (*a*) Exit any programs you are using. The login screen should be showing on the desktop. Return supplies (if any).
     - (*b*) Straighten your work area and retrieve your books from the book shelf.
     - (*c*) Log Off/Turn Off your computer and push in your chair.
2. **Safe online behaviour:** Netiquette, or "network etiquette" means safe or appropriate online behaviour.

   In general, safe online behaviour has two basic rules:
   - (*a*) do not waste people's time, and
   - (*b*) do not say anything to a person online that you would not say on his or her face.

   Some other specific rules of safe online behaviour are given below:
   - (*i*) Consult FAQs (Frequently Asked Questions) which have expected norms of online behaviour for particular groups.
   - (*ii*) Avoid flaming, that is, writing an online message that uses derogatory, obscene, or inappropriate language. You can use emoticons—Keyboard-produced pictorial representations of expressions for smooth online communications.
   - (*iii*) Do not SHOUT, that is, avoid use of all capital letters except when they are required for emphasis of a word or two (as when you cannot use italics in your e-messages).
   - (*iv*) Be careful with jokes as some people take these as insults or criticism.
   - (*v*) Avoid sloppiness, but avoid criticizing others' sloppiness, that is, avoid spelling and

grammatical errors. However, do not criticize these same errors in others' messages. (As they may not have English as a native language.) Use the spell-checking capability of the e-mail software.

(*vi*) Do not send huge file attachments, unless requested as it may take a long time to download a massive file. Also, the receipent must have the appropriate software to open your attachment.

(*vii*) When replying, quote only the relevant portion.

(*viii*) Do not "over forward," that is, check the e-mail contents before using automatic forwarding.

3. *School ICT Policy*: The school ICT policy means the rules prepared by the school to use ICT. When deciding on the school's aims for ICT, internal, local and national factors should be considered.

   The school's overall aim for ICT is to enrich learning for all students. The school management must ensure that ICT Co-ordinator and computer teachers develop confidence and competence to use ICT as a tool aiding effective teaching across the curriculum.

   The school ICT policy must identify the important issues and guide the students to live with it. Some of these include:

   (*i*) A statement defining ICT capability.

   (*ii*) The aims for ICT in the school.

   (*iii*) Guidance on record-keeping, assessment.

   (*iv*) Guidance on health and safety.

   (*v*) Specific rules for the use of Internet and e-mail.

   (*vi*) Statement of the school's position on copyright, data protection.

   (*vii*) Information regarding maintenance/repair/viruses.

   (*viii*) Date for review.

4. *Computer Virus*: A computer virus is a malicious program that is designed to corrupt or delete the information stored in the computer. Computer viruses are spread through transportable secondary storage devices and networks.

   Measures to Protect Computer Virus: The best way to protect computer viruses is installing antivirus software. *Antivirus* software consists of computer programs that attempt to identify, thwart and eliminate computer viruses and other malicious software (malware).

   A good antivirus software comes with features like a built-in firewall and usually offers an access to online data backup. This antivirus software has the option to deactivate the malicious viruses.

   Firewalls are systems which help protect computers and computer networks from attack and subsequent intrusion.

   The computer users should follow these safety rules to protect against viruses:

   (*i*) Do not open unsolicited e-mails.

   (*ii*) Never download an attachment of an e-mail without scanning it for viruses first.

   (*iii*) Make sure you also use a firewall.

   (*iv*) Do not download free software or music.

   (*v*) Do not use free antivirus software.

   (*vi*) Search on Internet for antivirus reviews and analyse yourself for best antivirus software.

Suggested Activities

Refer to sub-unit 3.1 of the Student Textbook for doing the activities.

ALTERNATIVE TEACHING APPROACHES, ENRICHMENT MATERIAL

The ICT teachers can use Internet, charts, worksheets, models, go for educational field trips or subject experts can be called for seminars to enrich the teaching level and in turn help the students in learning Information and Computer Security.

ADDITIONAL QUESTIONS

1. What do you mean by security of a computer system?
2. What is the importance of responsible behaviour in the Computer Laboratory?
3. What does online mean?
4. Discuss the importance of school ICT policy.
5. How does a virus affect a computer system?
6. How does firewall work?

UNIT 4

APPLICATION SOFTWARE

(15 PERIODS)

UNIT OUTCOME

Students will be able to:

- recognize the uses of spreadsheets;
- understand the screen elements in the spreadsheet window;
- recognize how to create and use simple spreadsheet using text and numbers;
- understand how to format worksheets;
- recognize to use built in functions and create custom formula.

SUGGESTED LESSON PLAN

Sub-unit	Number of Periods
4.1 Spreadsheets	15

STRUCTURE OF THE UNIT

4.1 Spreadsheets

In this sub-unit, we will learn about basics of spreadsheets. The topics to be learnt are:

- Introduction
- Starting Spreadsheets
- Screen Elements of Spreadsheets
- Create and Use a Simple Spreadsheet
- Entering and Editing Text
- Saving the Worksheet
- Using the Four Mathematical Operators on Data to Create Custom Formula
- Addition
- Sum (dragging)
- Entering a Formula into a Cell
- Copying by Using the Fill Handle

REVIEW OF THE UNIT

- A spreadsheet is a document which helps you organize data in rows and columns that intersect to form cells.
- In a spreadsheet each cell can contain words, a number, or a formula.
- Some examples of spreadsheets are Microsoft Excel, Corel Quattro Pro, OpenOffice Calc, Google Spreadsheets and Lotus–123 etc.
- MS-Excel has screen similarities with MS-Word and other MS products; main differences in a spreadsheet are
  - (*i*) the formula bar which is used for operations on cells such as calculations
  - (*ii*) the working area.
- A function is a built-in formula that performs calculations on a range of values. Some examples of functions are SUM, AVERAGE, COUNT, MAX, MIN.

ROLE OF THE STUDENTS

In this unit, the students are supposed to learn the basic concepts of Spreadsheets. The activity based method should be followed to understand the subject matter which is the best way of better understanding of the subject matter.

Perhaps the most used software in accounting applications is an electronic spreadsheet, such as Microsoft Excel. Spreadsheets are extremely powerful in that they contain large amounts of data that can be summarized or displayed in many user-friendly formats. Creating a well-designed spreadsheet is often as much an art as science. The students generally have different levels of understanding for various topics. By the end of this unit, every student is expected to create user-friendly spreadsheets. Students having more advanced knowledge are expected to learn new skills as well as help their less-experienced classmates.

ADDITIONAL CLASS ACTIVITY FOR GIFTED STUDENTS OR SLOW LEARNERS

ACTIVITY 4.1: Navigating a Worksheet

In groups, the students will explain and demonstrate the navigation in a worksheet.

Scrolling Techniques

In large worksheets, you will need to scroll to the right or scroll down to locate cells with which you need to work. The horizontal and vertical scroll bars are used to scroll with the mouse. Scrolling by using the scroll bars does not move the position of the active cell. You can also scroll using the arrow keys or with keyboard commands. Scrolling by using the keyboard moves the active cell.

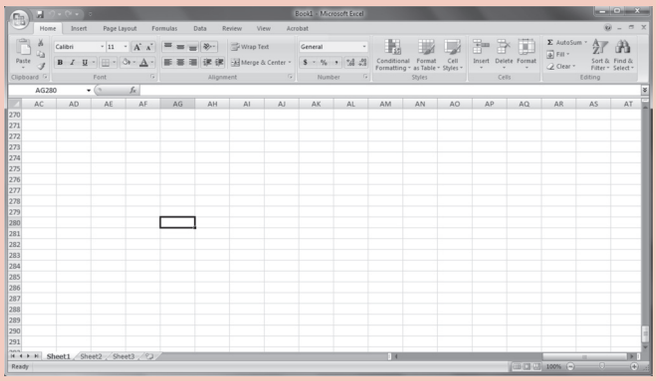


Fig. 4.1: Scrolling in a large worksheet

Keyboard Movement Commands

Table 4.1 shows some keyboard scrolling techniques:

Table 4.1: Keyboard Movement Commands

Press	To move to
Arrows keys	one cell up, down, left, or right
Ctrl + Home	A1
Ctrl + End	last cell in worksheet
Home	beginning of row
Page Down	down one screen
Page Up	up one screen
Alt + Page Down	one screen to the right
Alt + Page Up	one screen to the left

Go to Specific Cell

To go to specific cell in a worksheet, perform the following steps:

(*i*) Start Excel and open a workbook.

(*ii*) Click the *Home* tab.

(*iii*) Click the *Find & Select* button in the *Editing* group (see Fig. 4.2)

(*iv*) Click *Go To* at the drop-down list.

(*v*) The Go To dialog box appears (see Fig. 4.3).

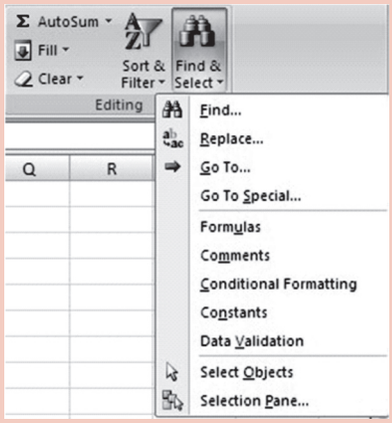


Fig. 4.2: Clicking Find and Replace

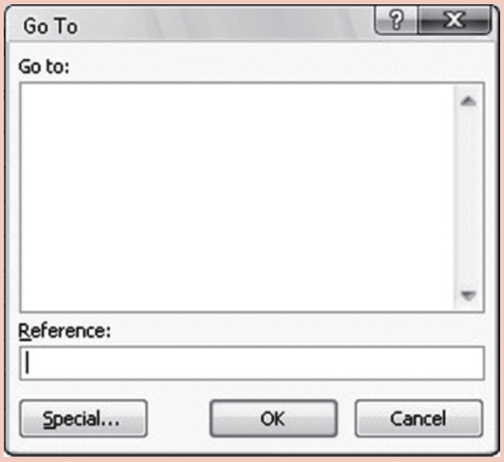


Fig. 4.3: Go To dialog box

(*vi*) Type cell address in the *Reference* text box.

(*vii*) Click *OK* or press *Enter* key.

(*viii*) Click the *Office Button*. A menu will appear.

(*ix*) Click *Close*.

ANSWERS TO REVIEW QUESTIONS

Fill in the Blanks

1. MS-Excel 2007
2. workbook
3. fill handle
4. built-in functions

State Whether True or False

1. True
2. False
3. True
4. False

Multiple Choice Questions

1. (*d*)
2. (*c*)
3. (*a*)
4. (*b*)

Match the Following

1. (*c*)
2. (*d*)
3. (*b*)
4. (*a*)

Answer the Following

1. *Spreadsheet*: A *spreadsheet* is a document which helps you organize data in rows and columns that intersect to form cells.

   Purpose of a spreadsheet: A *spreadsheet package* is a numeric data analysis tool, which not only allows us to quickly calculate and analyse numbers, but also lets us quickly explore a variety of possible outcomes. *The spreadsheet allows users to create tables and financial schedules by entering data and formulae into rows and columns arranged as a grid on a display screen*.

   Examples: Some examples of spreadsheets are Microsoft Excel, Corel Quattro Pro, OpenOffice Calc, Google Spreadsheets, Lotus-123, etc.

2. *Creating and saving worksheet in MS-Excel*: Suppose you are having MS-Excel 2007 installed on your computer.

   To create and save a worksheet in Excel 2007, perform the following steps:

(*i*) Double-click on the MS-Excel 2007 icon on the desktop.

OR

Click *Start* → *All Programs* → *Microsoft Office* → *Microsoft Office Excel 2007*

A workbook named Book1 will be created. A workbook can contain several worksheets. Now, you can enter the data as per your requirement.

(*ii*) Click *Office Button*.

(*iii*) Click *Save As*.

(*iv*) Type new workbook name.

(*v*) Click *Save* or press Enter key. Excel automatically adds the file extension .xlsx to the end of a workbook name.

3. *Inserting rows or columns in Excel*: We can insert rows or columns using options from the *Insert* button in the *Home* tab or from the context sensitive shortcut menu that displays on right-clicking a selected area. Inserted rows are placed above the active cell or selected rows and existing rows are shifted down. Columns are inserted left of the active cell or selected columns and existing columns are shifted right.

   To insert rows or columns in Excel 2007, perform the following steps:

   (*i*) Open the worksheet.

   (*ii*) Select required number of rows or columns.

   (*iii*) Click the *Home* tab.

   (*iv*) Click the *Insert* button arrow in the *Cells* group.

   (*v*) Click *Insert Sheet Rows* or *Insert Sheet Columns.*

   Deleting rows or columns in Excel: We can delete rows or columns using options from the *Delete* button in the *Home* tab or from the context sensitive shortcut menu that displays on right-clicking a selected area. When rows or columns are deleted, data automatically is shifted up or left to fill space and references in formulas are updated.

   To delete rows or columns in Excel 2007, perform the following steps:

   (*i*) Open the worksheet.

   (*ii*) Select rows or columns to be deleted.

   (*iii*) Click the *Home* tab.

   (*iv*) Click the *Delete* button arrow in the *Cells* group.

   (*v*) Click *Delete Sheet Rows* or *Delete Sheet Columns.*

   Inserting and deleting cells in Excel: We can insert new blank cells or delete a range of cells within the worksheet area.

   To insert cells in Excel 2007, perform the following steps:

   (*i*) Open the worksheet.

   (*ii*) Select the range of cells you need to add.

   (*iii*) Click the *Home* tab.

   (*iv*) Click the *Insert* button in the *Cells* group or click the *Insert* button arrow and then click *Insert Cells* at the drop-down list to open the *Insert* dialog box.

   (*v*) Using the dialog box, choose to shift the existing cells right or down.

   To delete cells in Excel 2007, perform the following steps:

   (*i*) Open the worksheet.

   (*ii*) Select the range of cells you need to delete.

   (*iii*) Click the *Home* tab.

   (*iv*) Click the *Delete* button in the *Cells Group* or click the *Delete* button arrow and then click *Delete Cells* at the drop-down list to open the *Delete* dialog box.

   (*v*) Using the dialog box, delete the selected range of cells to shift up the cells below the deleted range.

4. *Built-in functions in Excel*: A function is a built-in formula that performs calculations on a range of values. It allows you to perform mathematical, statistical and date-time functions. For example, Sum, Average, Count, Max, Min etc.

   The syntax of writing a function in Excel is:

   = <Function name>(<List of arguments>)

   SUM( ): Adds all the numbers in a range of cells. The syntax of SUM( ) function is:

   SUM(number1, number2, ...)

   Here,

   number1, number2, ... are 1 to 255 arguments for which you want the total value or sum.

For example,

= SUM(2,5) adds 2 and 5 (7)

= SUM("5",14,TRUE) adds 5, 14 and 1, because the text values are translated into numbers, and the logical value TRUE is translated into the number 1 (20)

= SUM(A2:E2) will find the sum (total) of numbers in the specified range.

AVERAGE( ): Returns the average (arithmetic mean) of the arguments. The syntax of AVERAGE( ) function is:

AVERAGE(number1, number2, ...)

Here,

number1, number2, ... are 1 to 255 numeric arguments for which you want the average.

For example,

= AVERAGE(10,7,9,27,2) will find the average of the numbers given as arguments (11)

= AVERAGE(A2:E2) will find the average of numbers in the specified range.

Suggested Activities

Refer to sub-unit 4.1 of the Student Textbook for doing activities 1, 2 and 3.

ACTIVITY 4: Explain and demonstrate cell reference: Absolute and Relative

In small groups the students will explain and demonstrate absolute and relative cell references.

Cell Reference

A cell reference consists of the *column* letter and *row* number that intersect at the cell's location (the column letter is always used first). It identifies a cell or a range of cells on a worksheet and tells Excel, about where to look for the values or data that you want to use in a formula. With references, you can use data contained in different parts of a worksheet in one formula or use the value from one cell in several formulas.

We can refer to a cell or range of cells in formulae in three ways: *relative* reference, *absolute* reference and *mixed* reference (a mixture of relative and mixed reference).

Relative reference

In Excel and other spreadsheets, a relative cell reference identifies the location of a cell or group of cells. The cell references are used in formulas, functions, charts, and other Excel commands. By default, a spreadsheet cell reference is *relative*. This means that as a formula or *function* is copied and pasted to other cells, the cell references in the formula or function change to reflect the function's new location, that is, Excel updates the cell references. For example,

1. Start Excel to start a new blank workbook
2. In cell D1, D2, enter 30, and 25 respectively.
3. In cell E1, enter = D1*2.
4. Press Enter.

   Cell E1 now returns the value 60.
5. If E1 is not the active cell, click it once.
6. Press Ctrl + C, or click the *Copy* button on the *Home* tab.
7. Click cell E2.
8. Press Ctrl + V, or click the *Paste* button on the *Home* tab.
9. If you see a moving marquee around cell E1, press the *Esc* key.

   Cell E2 should be the active cell, but if it is not, just click it once. Look at the Formula bar. The contents of cell E2 are = D2*2 (see Fig. 4.4) and not the = D1*2 that you copied.

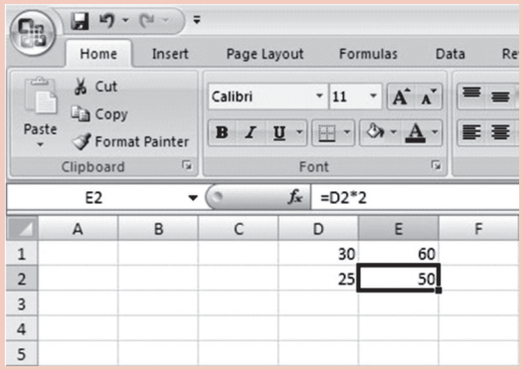


Fig. 4.4: Relative references adjust when a formula is copied

What has happened? Excel, in its wisdom, assumed that if a formula in cell E1 references the cell D1—one cell to the left—then the same formula put into cell E2 is supposed to reference cell D2—also one cell to the left.

Absolute reference

In Excel and other spreadsheets, an absolute cell reference identifies the location of a cell or group of cells. In an absolute cell reference, a dollar sign ($) precedes both the column letter and the row number. For example, = A1

An absolute cell reference is used when you want a cell reference to stay fixed on a specific cell. This means that as a formula or function is copied and pasted to other cells, the cell references in the formula or function do not change. For example, in the earlier example of relative reference, if in cell E1, you enter = D1*2 and repeat the copy/paste steps, Excel will show the same result in cell E2 as shown in cell E1? (see Fig. 4.5).

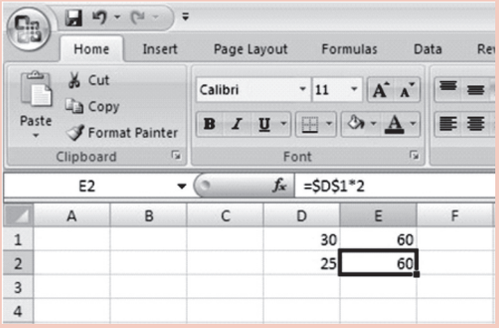


Fig. 4.5: Absolute references do not change when a formula is copied

Use shortcut keys to toggle through the dollar-sign permutations. Specifically, highlight the cell reference that you want to change in the formula bar. Press the F4 function key to toggle through the different possible placements of $.

ALTERNATIVE TEACHING APPROACHES, ENRICHMENT MATERIAL

The ICT teachers can use Internet, charts, worksheets, models, go for educational field trips and subject experts can be called for seminars to enrich the teaching level and in turn help the students in learning Application Software.

ADDITIONAL QUESTIONS

1. What can you do with an electronic spreadsheet that you cannot do with pencil and paper and a standard calculator?
2. What is editing? How editing is performed in Excel?
3. What is auto sum utility of Excel?
4. What is a fill handle? What are its uses?

UNIT 5

USING INTERNET

(10 PERIODS)

UNIT OUTCOME

Students will be able to:

- understand the Internet as a global network;
- recognize the meaning of some basic terms related to the Internet;
- recognize the work with a search engine to search for items;
- understand hotspots and hyperlinks;
- comprehend the meaning of some common e-mail terms.

SUGGESTED LESSON PLAN

Sub-units	Number of Periods
5.1 Using Internet	5
5.2 Using E-mail	5

STRUCTURE OF THE UNIT

5.1 Using Internet

In this sub-unit, we will learn about basics of Using Internet. The topics to be learnt are:

- Definition of Internet
- Uses and Services Available on the Internet
- Terms
- Types of Browsers Software
- Screen Elements of Internet Explorer
- Using Internet
- Browsing Information
- Saving Document
- Saving Images
- Printing Documents
- Searching Information

5.2 Using E-mail

In this sub-unit, we will learn about basics of Using e-mail. The topics to be learnt are:

- Creating an e-mail account
- Composing and sending an e-mail
- Receiving and replying to an e-mail
- Facilities of an e-mail system
- Distribution list
- Attachments
  - Sending
  - Receiving
- Auto Reply

REVIEW OF THE UNIT

- Internet is the network that is available to users across the globe.
- The major use of Internet is for searching the information stored in millions of computers of the Internet.

- A web browser, or simply browser, is software that enables users to locate and view web pages and to jump from one page to another. For example, Internet Explorer, Mozilla Firefox, Google Chrome etc.
- Screen elements of Internet Explorer are: Menu bar, Address bar, Standard toolbar, Workspace, Content window, Status bar etc.
- Examples of search engines are AltaVista, Lycos, Google and Yahoo.
- E-mail is the exchange of messages stored on computers, through a communication channel.
- To send and receive e-mail, you need to create an account with an e-mail service provider.
- Composing of an e-mail message is done very much like a paper letter.
- All e-mail systems have the ability to send, receive and discard mail.
- Auto Reply feature is useful when you are on holidays and want to inform people that you would not be checking your e-mail for a few days.

ROLE OF THE STUDENTS

In this unit, the students are supposed to learn the basic concepts of *Internet*. The activity based method should be followed to understand the subject matter which is the best way of better understanding of the subject matter.

The *Internet* is an extremely useful resource for students. There is a lot of information that can save a student from a trip to the library. There are many reputed websites with information about all sorts of subjects. Students must be very careful when searching information from the Internet, however, especially for work in a school assignment.

The *Internet* can be a resource in many other ways. Many ICT and other subject teachers will actually use the *Internet* for their classes. They may post information or assignments for their students on the *Internet*. Some of them will post marks/grades on the Internet or communicate with their students. Some important topics are taught by the ICT teachers on the Internet. In this way, the *Internet* can also be a good resource for students.

Using Internet, the students will be able to communicate effectively, that is, they will have a range of skills to express themselves through new environments (e-mail, websites, etc.).

ADDITIONAL CLASS ACTIVITY FOR GIFTED STUDENTS OR SLOW LEARNERS

ACTIVITY 5.1: Screen Elements of Mozilla Firefox Browser

Students in their class will explain and demonstrate the screen elements of Mozilla Firefox web browser.

Browser

A web browser, or simply browser, is software that enables users to locate and view web pages and to jump from one page to another. For example, Mozilla Firefox.

Screen Elements of Mozilla Firefox

Most browsers have a similar look and feel. The Mozilla Firefox web browser screen has five basic elements:

(*i*) Menu bar
(*ii*) Toolbar
(*iii*) URL bar
(*iv*) Workspace
(*v*) Status bar

To execute menu bar and toolbar commands, we use the mouse to move the pointer over the word, known as *menu selection*, and click the left button of the mouse. This will result in a pull-down menu of other commands for other options (see Fig. 5.1).

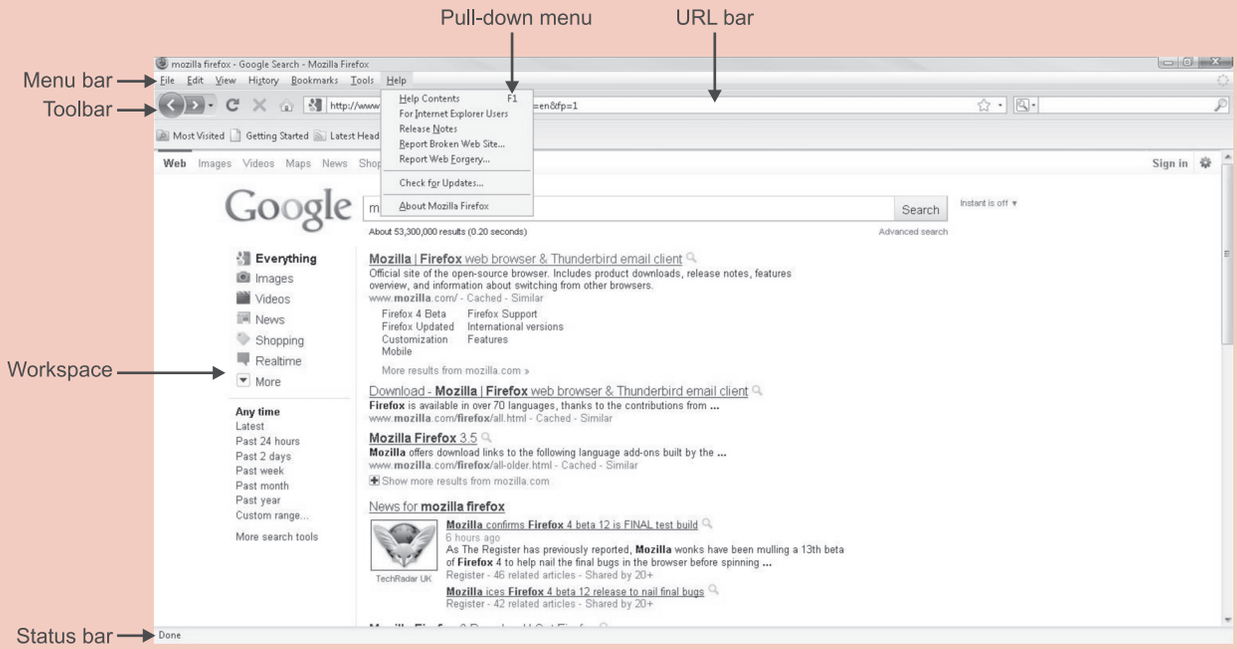


Fig. 5.1: Mozilla Firefox browser screen elements

Visit the website *www.mozilla.com* for Mozilla Firefox features.

Bookmarks or favorites

One great helper for the users is the bookmark or favorite system, which lets them store the URLs of web pages they frequently visit, so that they do not have to remember and retype their favorite addresses. For this, click on the *Bookmarks* or *Favorites* feature, which displays the URL on the screen, and then click on *Done* or *Add*, which automatically stores the address. Later on locate the site name on the *Bookmarks* menu, click on it, and the site will reappear. To delete the bookmark, use the right mouse button and select the *Delete* command.

ANSWERS TO TEXTBOOK ASSESSMENT

Assessment 5.1

Fill in the Blanks

1. Internet
2. website (site)
3. browser
4. search

State Whether True or False

1. False
2. True
3. False
4. True

Answer the Following

1. *Internet*: Internet is the network that is available to users across the globe. It is called "the mother of all networks".

   Who governs the Internet?

   No one governs the Internet. The Internet is coordinated by many volunteer organisations and no single organisation is having the complete control over it.

2. *Using Internet and WWW*: The *Internet* and *WWW* are not the same thing. The Internet is a massive network of networks, connecting millions of computers via protocols, hardware, and communications channels. The *WWW* is a means of accessing information available on the Internet using software called *browser*.

   An ISP (Internet Service Provider) helps the Internet users to connect to the Internet. The ISP functions as an interface between the user and the rest of the Internet. The Internet contains information in the form of web pages grouped into websites. The major use of the Internet is for searching the information stored in millions of computers around the world. It can keep the user updated about everything happening in the world. The user can search for the

information, take part in online text, audio or video conversation or can share the information with the other users of the Internet.

WWW or World Wide Web has changed the picture of the Internet after its creation. Earlier, Internet was used to share textual information only. There were no graphics, no animations and no links as you see in today's Internet. All credit goes to WWW which provides easy and effective way of storing and accessing information on the Internet. The e-mail is used to send and receive messages instantly.

3. *Website*: A computer with a domain name is called a *website* (*site*). The top-level domains are .com, .edu, .org, and .net. For example, www.google.com, www.microsoft.com.

   Webpage: A *web page* is a document on the World Wide Web that can include text, pictures, sound and video. The first page you see on a website is like the title page of a book. This is the *home page*, or welcome page, which identifies the website and contains links to other pages at the site.

   Browser: A *web browser*, or simply *browser*, is software that enables users to locate and view web pages and to jump from one page to another. It is what you use to get around the web. A web browser makes it easy to navigate (or "surf") the web and to download items. For example, Internet Explorer.

4. *Types of Browsers*: Browser is software that enables users to locate and view web pages and to jump from one page to another. More than one web browser can also be installed on a single computer. Some of the best-known browsers are:

(*i*) *Internet Explorer*: Internet Explorer is the most widely-used web browser by people around the world. It is commonly known as IE. The latest version is Internet Explorer 8.

(*ii*) *Mozilla Firefox*: Mozilla Firefox browser is coming up very fast *i.e.*, its users are increasing every day. It is the second-most famous browser after Internet Explorer.

(*iii*) *Google Chrome*: This web browser was developed by *Google*. Google Chrome is providing a tough fight to other web browsers and is very popular among users.

Suggested Activities

Refer to sub-unit 5.1 of the Student Textbook for doing Activity 1.

ACTIVITY 2: Explain that Each Website has a Unique Address; a Website Holds Information; Creation of Websites Briefly; there may be a few or many Pages on the Website

In groups the students will explain that each website has a unique address; a website holds information; creation of websites briefly; there may be a few or many pages on the website.

Website

A computer with a domain name is called a website (site). Figure 5.2 shows a website.

Fig. 5.2: A website

URL (Uniform Resource Locator)

The URL is a string of characters that points to a specific piece of information anywhere on the web. In other words, the URL is the website's unique address. For example,

http://www.selamta.net/national_parks.htm

is a URL for a website offered by Selamta for Ethiopian National Parks. A URL is not the same thing as an e-mail address.

A website holds information. For example, the website shown in Fig. 5.2 shows information about Ethiopian National Parks. Websites provide multimedia content to users.

Creation of Websites

The World Wide Web (WWW) is a great way to give information about yourself and your work to others. To do so, you need to have a web page and put it online. Professional web page designers can produce a website for you or you can do it yourself using a menu-driven program included with your web browser or a web page design software package.

Fortunately, providers offer some free, easy to use web authoring tools for creating simple websites. They help you create web pages using icons and menus to automate the process; you do not need to know HTML (Hypertext Markup Language) for it. These automated tools let you select a prepared, template web page design, type a few words, add a picture or two—and your work is done. To save the pages and make them accessible on the Internet, the provider grants you a certain amount of space on its web servers.

Some web design software packages are:

(*i*) Intuit Website Creator 2010
(*ii*) Web Easy Professional 8
(*iii*) Microsoft FrontPage
(*iv*) Web Studio 5.0
(*v*) Adobe Dreamweaver CS5

The *www.brothersoft.com* website offers many web design software (see Fig. 5.3).

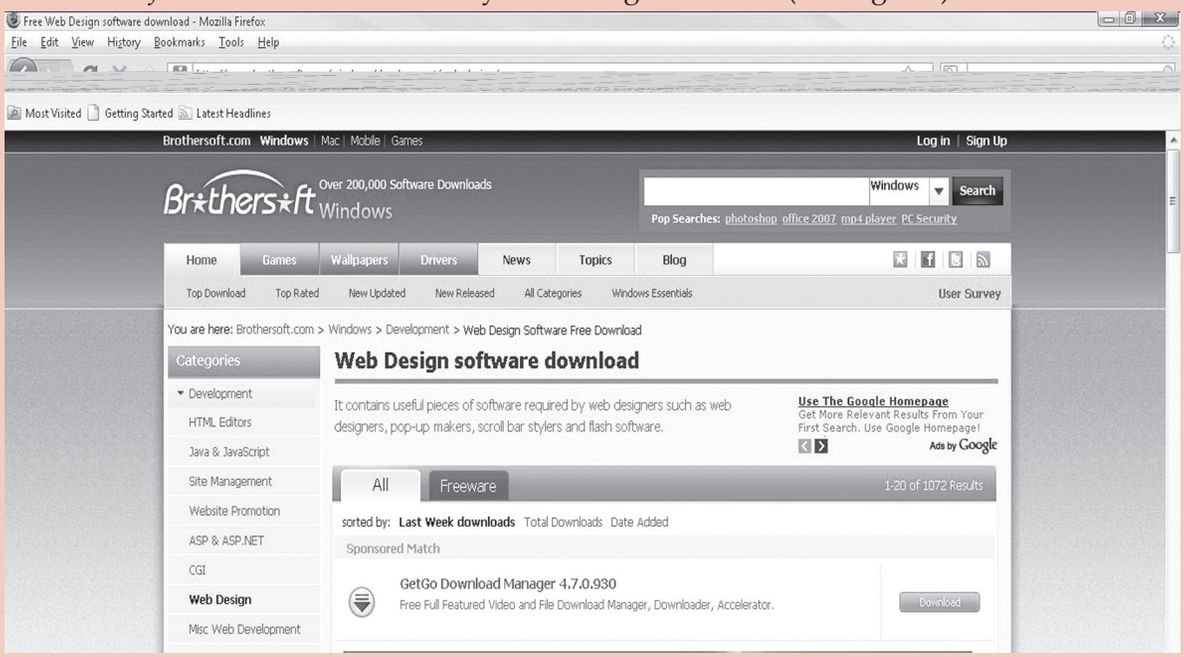


Fig. 5.3: Website www.brothersoft.com offers web design software

A website may consist of a single page—the home page. Large websites have a number of pages (in hundreds). Remember that the contents of home pages often change. Or they may disappear, and so the connecting links to them in other web pages become links to nowhere.

ACTIVITY 3: Explain and Demonstrate some Hyperlinks, and Returning Back to the Original Web Page

In groups, the students will explain and demonstrate some hyperlinks, and returning back to the original web page.

Hyperlink

A hyperlink (link) is a word, group of words, or image that you can click on to jump to a new web page or a new section within the current web page.

Using hyperlinks

Connect to the Internet using a browser. Here, we have used *Mozilla Firefox*. Using Google search engine (*www.google.com*) type "ethiopian food" in the *Search* box and press *Enter* key. The websites having information on the search topic are displayed in the Search results tab (see Fig. 5.4).

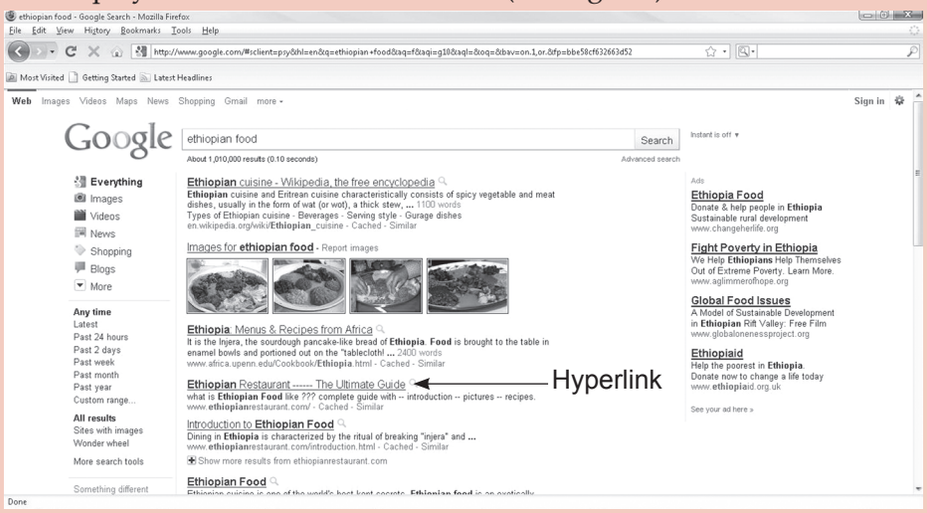


Fig. 5.4: Hyperlinks

When you move the cursor over a hyperlink in a Web page, the arrow will turn into a little hand. Clicking the left mouse button on underlined or color term transfers you to another web page (see Fig. 5.5).

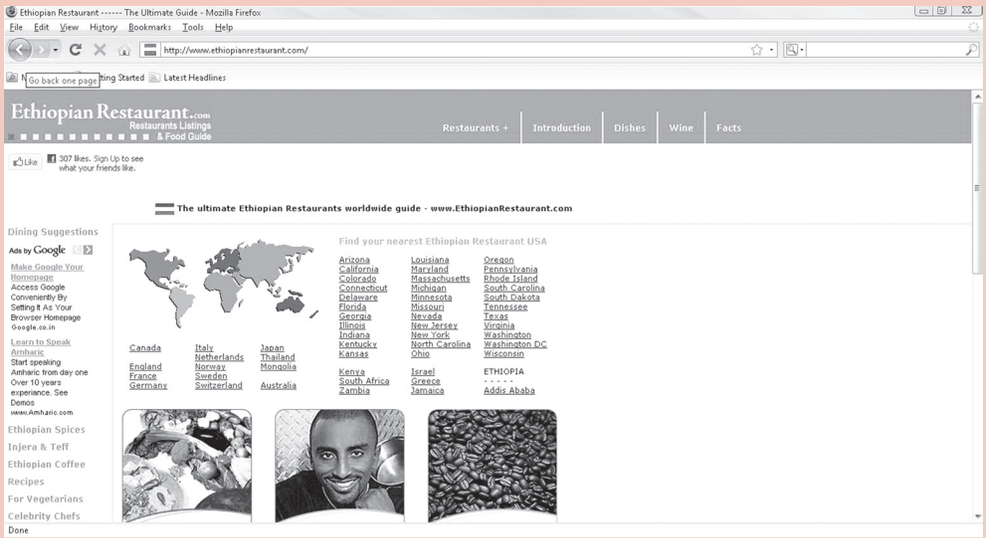


Fig. 5.5: Moving to another web page using hyperlink

To return back to the original web page click the Navigation button (see Fig. 5.6)

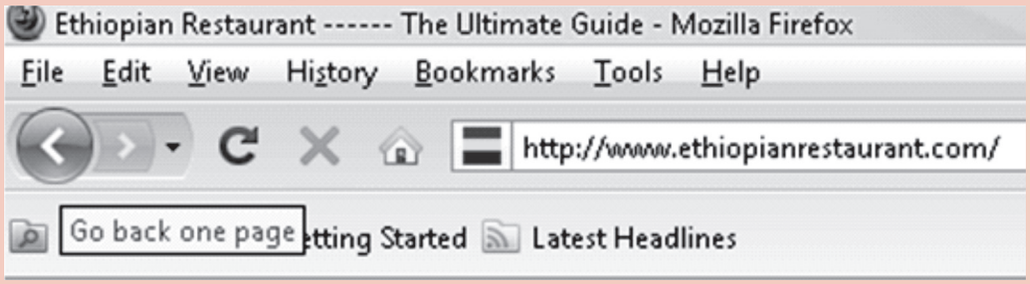


Fig. 5.6: Returning back to the original web page

So, you can use a hyperlink to connect to another page within the website or to another site on the Internet. Use the browser Toolbar for navigational aids.

Close the web browser when your work is over.

ANSWERS TO REVIEW QUESTIONS

Fill in the Blanks

1. Internet
2. online
3. attachments
4. distribution list

State Whether True or False

1. False
2. False
3. True
4. False

Multiple Choice Questions

1. (*a*)
2. (*b*)
3. (*d*)
4. (*a*)

Match the Following

1. (*b*)
2. (*a*)
3. (*d*)
4. (*c*)

Answer the Following

1. *E-mail*: E-mail or electronic mail is the exchange of messages stored on computers, through a communication channel.

   Steps to create an e-mail account: In today's world, an e-mail account is essential for communication. It allows users to communicate with others (*e.g.*, family, friends, and teachers), send resumes for employment online, and create memberships and accounts with different websites. There are many e-mail service providers to choose from. The most popular e-mail providers are Yahoo!, Gmail and Hotmail. One must use common sense while creating e-mail accounts.

   To create an e-mail account with *Yahoo! Mail*, perform the following steps:

   (*i*) Connect to the Internet.

   (*ii*) Go to *mail.yahoo.com*.

   (*iii*) Select "Sign Up" under the login fields.

   (*iv*) Create the Yahoo! mail account. Enter the name, gender, birth date, country and zip code. Enter the Yahoo! ID that will be used as the email address (*e.g.*, shibru2011@yahoo com). The "Check" button can also be selected to make sure that name is still available. If not available, chose another name or pick from the suggestions Yahoo! provides. Enter the password and select a security question in case you forget the password. Lastly, enter the captcha code.

   (*v*) Select the "Create Account" button and the new Yahoo! e-mail is now available for use.

2. *Steps to compose and send an e-mail*: Perform the following steps to compose and send an e-mail:

   (*i*) Connect to the Internet.

   (*ii*) Go to the e-mail program.

   (*iii*) Click the *Compose Mail*, *New Mail*, *Write Message* or similar button, depending on the application you are using to create a new e-mail message.

   (*iv*) Enter the address of the recipient in the *To* field.

   (*v*) Type a subject in the *Subject* field.

   (*vi*) In the message area, add a message to the body of the e-mail.

(*vii*) Click the *Send* button.

(*viii*) Close the e-mail program.

3. *Steps to receive and open an e-mail*: Perform the following steps to receive and open an e-mail:

   (*i*) Connect to the Internet.

   (*ii*) Go to the e-mail program.

   (*iii*) In *Inbox*, look for the received mail(s).

   (*iv*) Click on the desired mail in the list to open and read the e-mail message.

   (*v*) Close the e-mail program.

4. *Facilities provided in the e-mail system*: All e-mail systems have the ability to send, receive and discard mail. Most systems have facilities for storing mail which is to be kept rather than discarded. It is important for you to discard mail which does not need to be kept, as it uses storage space on disks. Mailboxes can soon accumulate a large number of mail messages making it difficult to read and process new mail, in addition to wasting disk space.

   There is almost always a connection between the e-mail system and the computer's standard file system which allows mail to be read from files or written to files. This enables greater flexibility in how the mail system is used. For example, a mail message may be prepared in a normal file using a familiar text editor and then sent by the e-mail system. Sections of other files may be included in the mail message as well.

   Most systems have a reply facility, although some of these do not always work as expected. A great care should be taken when using this facility in e-mail, as replies do not always go back to the sender.

Suggested Activities

Refer to sub-unit 5.2 of the Student Textbook for doing the activities.

ALTERNATIVE TEACHING APPROACHES, ENRICHMENT MATERIAL

The ICT teachers can use Internet, charts, worksheets, models, go for educational field trips and subject experts can be called for seminars to enrich the teaching level and in turn help the students in learning "Using Internet".

ADDITIONAL QUESTIONS

1. Write any two uses of Internet.
2. Why do we use a web browser?
3. What are search engines? Identify types of search engines.
4. Give some tips for searching the Internet.
5. Write main advantages of using e-mail.

UNIT 6

CONTROL AND LEARNING WITH LOGO

(7 PERIODS)

UNIT OUTCOME

Students will be able to:

- understand the LOGO language;
- recognize to produce a variety of diagrams using the LOGO language.

SUGGESTED LESSON PLAN

Sub-unit	Number of Periods
6.1 Control and Learning with LOGO	7

STRUCTURE OF THE UNIT

6.1 Control and Learning with LOGO

In this sub-unit, we will learn about Control and learning with LOGO. The topics to be learnt are:

- Using Primitives
- Writing Procedures Using Random

REVIEW OF THE UNIT

- LOGO stands for **L**ogic **O**riented, **G**raphics **O**riented.
- MSW LOGO screen is divided in two parts—Graphics window and Listener window.
- CS primitive clears the graphics screen.
- We can write a procedure in two ways using the "Input Box" or using the "Editor window".
- Procedures are small programs that can be called on again and again through one word without typing them all out.
- The file saved in LOGO will have an extension LGO.
- BYE primitive closes the LOGO.

ROLE OF THE STUDENTS

In this unit, the students are supposed to learn the basic concepts of "Control and learning with LOGO". The activity based method should be followed to understand the subject matter which is the best way of better understanding of the subject matter.

LOGO is considered the first step of learning programming language by the students. MSW LOGO is the perfect introduction to computer programming. It is easy to learn, easy to use, easy to read, but also powerful and able to cope with complex problems. It can be used to teach most computer science concepts. Many LOGO commands have mnemonic short forms; for example, FORWARD and RIGHT are coded FD and RT respectively. So, it is the first choice of the students to learn the programming concepts.

LOGO's best-known feature is the turtle, which is an on-screen *cursor* (derived originally from a robot of the same name), which can be given movement and drawing instructions, and is used

to programmatically produce line graphics. It is traditionally and most often represented pictorially either as a triangle or a turtle icon (though it can be represented by any icon). The students can easily produce a variety of diagrams using the LOGO language. They will also write procedures using Random.

ADDITIONAL CLASS ACTIVITY FOR GIFTED STUDENTS OR SLOW LEARNERS

ACTIVITY 6.1: Give Some MSW LOGO Primitives, their Purpose and Short Versions (if any)

In groups, the students will prepare a table of some MSW LOGO primitives, their purpose and short versions (if any) and explain these in the class.

Table 6.1 gives some MSW LOGO primitives, their purpose and short versions.

Table 6.1: MSW Logo Commands (Primitives)

LOGO Command	Purpose	Short Version
FORWARD 50	Turtle moves forward the specified number of units.	FD 50
BACK 100	Turtle moves back the specified number of units.	BK 100
RIGHT 45	Turtle turns clockwise the number of degrees specified.	RT 45
LEFT 90	Turtle turns counterclockwise the angle specified.	LT 90
PENUP	Turtle's pen is up. (Does not draw as it moves.)	PU
PENDOWN	Turtle's pen is in the down position.	PD
PENERASE	Turtle erases as it moves.	PE
HIDETURTLE	Removes the Turtle 'triangle' from the screen.	HT
SHOWTURTLE	Makes the Turtle visible again.	ST
CLEARSCREEN	Erases the screen and returns the Turtle to its "home" position in the centre of the drawing screen.	CS
HOME	Returns the Turtle to the "home" position without erasing the screen. (Issue a PU command before HOME to prevent it drawing its return path as it goes.)	HOME
BYE	Exits MSW Logo	BYE

ANSWERS TO REVIEW QUESTIONS

Fill in the Blanks

1. Seymour Papert
2. Turtle
3. FD or FORWARD
4. LT or LEFT

State Whether True or False

1. True 2. True 3. False 4. True

Multiple Choice Questions

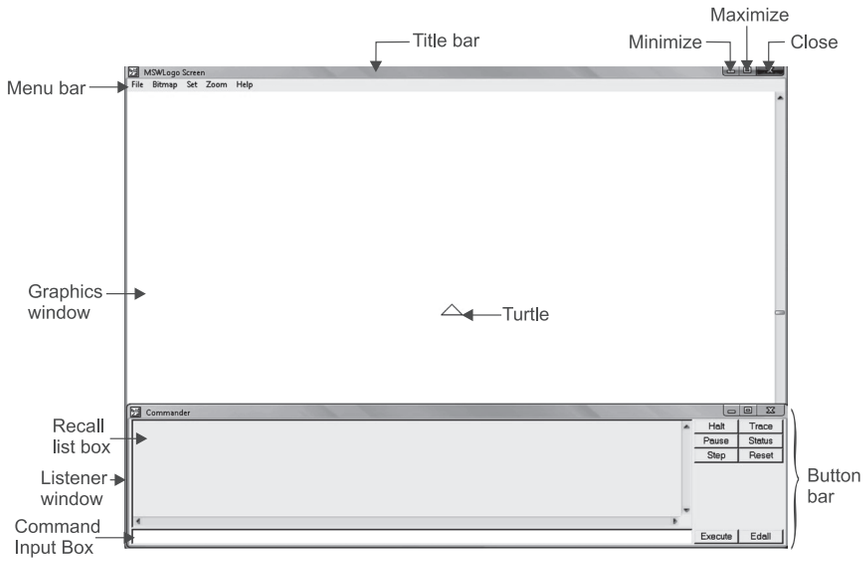
1. (*a*) 2. (*d*) 3. (*b*) 4. (*b*)

Match the Following

1. (*d*) 2. (*c*)
3. (*b*) 4. (*a*)

Answer the Following

1. LOGO (Logic Oriented, Graphics Oriented) is a high level programming language specifically designed for its ease of use and graphics capabilities. LOGO was developed in 1967 by Seymour Papert and a team at Massachusetts Institute of Technology (MIT) in United States.
2. The LOGO window is labeled as shown below:



3. *LOGO Primitives*: LOGO commands are known as the 'Primitives'. The primitives are typed in the white space at the bottom left corner of the screen known as the Command Input Box. For example, FD, BK, RT, LT, BYE etc.

   Four LOGO primitives to draw shapes are explained below:

   (*i*) *Forward* (*FD*): The FD primitive moves the turtle in the forward direction with the number of steps mentioned with the primitive. The turtle draws a line while moving. For example, to draw a line of 100 steps type the following command in the Command Input Box and press the Enter key:

   FD 100

   or

   FORWARD 100

   (*ii*) *Back* (*BK*): The BK primitive moves the turtle in the backward direction (where it has its back) and draws a line of specified number of steps. For example, to draw a line of 60 steps in backward direction, type the following command in the Command Input Box and press the Enter key:

   BK 60

   or

   BACK 60

   (*iii*) *Right* (*RT*): The RT primitive turns the Turtle in right or clockwise direction. It needs number of degree to know the angle of turn. For example, to turn the Turtle in right direction by 90 degrees, type the following command in the Command Input Box and press the Enter key:

   RT 90

   (*iv*) *Left* (*LT*): The LT primitive turns the Turtle in left or anti-clockwise direction. It needs number of degree to know the angle of turn. For example, to turn the Turtle in left direction by 90 degrees, type the following command in the Command Input Box and press the Enter key:

   LT 90

4. The following procedure draws circles randomly using RANDOM command.

```
TO DRAWCIR
; Procedure DRAWCIR to draw circles
    CS    ; Clear Screen
    REPEAT 5 [CIRCLE RANDOM 80]
    HT    ; Hide Turtle
END
```

Suggested Activities

Refer to sub-unit 6.1 of the Student Textbook for doing Activities 1 and 3.

ACTIVITY 2: Write a Procedure to Include a Random Number Generator e.g., Throwing a Die

Students in their class will write and explain the procedure to include a random number generator, *e.g.*, throwing a die (a small cube having numbers 1 to 6 on its faces).

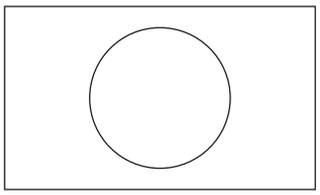
```
TO RANDNUM
; Procedure RANDNUM to generate a number randomly
    CS ; Clear Screen
    ; Show random nonnegative integer less than 7
    ; Ignore 0 as a die has numbers from 1 to 6
    PRINT RANDOM 7
END
```

ALTERNATIVE TEACHING APPROACHES, ENRICHMENT MATERIAL

The ICT teachers can use Internet, charts, worksheets, models, and subject experts can be called for seminars to enrich the teaching level and in turn help the students in learning "Control and learning with LOGO".

ADDITIONAL QUESTIONS

1. What is the use of LOGO language?
2. Who developed LOGO and when?
3. Write a short note on the following LOGO primitives:
   (*i*) FD (*ii*) RT (*iii*) CS (*iv*) PU
4. Draw an equilateral triangle of side 200 steps, using the LOGO primitives.
5. Write a LOGO procedure to draw a square of 70 steps using REPEAT.
6. What is the extension of LOGO files?
7. Write a LOGO procedure to draw the following figure:



GRADE 9
MINIMUM LEARNING COMPETENCIES (MLCs)

S.No.	Units	Minimum Learning Competencies
1.	**Introduction to ICT**	• Define data and information • Explain the term technology and information technology • List sources of information • List computers generation • Compare the difference among each generation of computers • Classify types of computers used today • List the characteristics of computer each type of computer • Explain how data is represented in the computer • List major hardware components • Classify software as Systems or Applications software • Give examples and explain uses of some Applications software • Manipulate their files and folders on a computer • Transfers files from one folder to another • Find a file or folders using a 'search' facility • Customize their computer desktop
2.	**Application Software**	• Create and save the word processing document • Format a character as required • Index a paragraph • Index text in desired direction • Align text by using icons on the menu bar and by selecting paragraph from formatting menu • Apply bullets and numbers to display ordered or unordered list • Change the styles of bullets and numbers effectively • Insert and delete a page break and page number in a document • Add and delete headers and footers in a document • Use tables and pictures by inserting • Create a presentation • Prepare and present a slide show • Create a presentation using design techniques

S.No.	Units	Minimum Learning Competencies
3.	**Information and Computer Security**	• Identify responsible behaviour in the computer laboratory • Identify safe online behaviour • Identify the school ICT policy and live with it • Describe computer virus • Identify the measure to protect computer virus
4.	**Application Software**	• Identify the purpose of a spreadsheet • Identify the screen elements in the spreadsheet window • Manipulate rows and columns • Manipulate data in a cell • Save the worksheet • Use auto sum • Use mathematical operators on data to perform addition, sum and others • Use the function of the Fill handle • Apply different effects to a cell and its contents
5.	**Using Internet**	• Identify the internet and the world wide web • Explain how Internet and WWW are used • List and describe some different types of browser • Open a browser and identify the screen elements • Use web addresses to access websites • Describe some different types of browser • Create an e-mail account • Compose and send an e-mail • Receive and open an e-mail • Use the facilities provided in the e-mail system
6.	**Control and Learning with LOGO**	• Use the LOGO primitives to draw a variety of shapes • Write procedures to include repeat and RND

GRADE 9 SYLLABUS

INTRODUCTION

In the long term, the students entering Grade 9 will have good practical IT skills. They will be familiar with the major facilities of the most widely used applications, and be able to decide which application to use to fit a certain purpose.

In Grade 9, the students will briefly cover the development of computers and communications technology. Then they will study three areas in greater depth: desktop publishing, database application and finally networks and communications. By the end of Grade 9, students will be able to use a desktop publishing package effectively to produce a variety of documents such as brochures, visiting cards and newsletters.

In Grade 10, they will continue the work on databases and will be able to interrogate a database and produce reports.

The assessments for both Grades 9 and 10 will be more complex and longer than previous assessments, and they will require more time spent in the computer laboratory.

After finishing Grade 10 the students will take the National Examinations. Those who pass the examination will either join a Preparatory School or will follow the Technical and Vocational stream of their choice. This could be Information Technology. In either case, students who have completed Grade 10 will have excellent IT skills which will serve them well in their future studies.

In the short term, the Grade 9 syllabus will be taught in the first year of implementation, followed by the Grade 10 syllabus a year later. After 4 years, new Grade 9 students will have covered Grades 5–8.

UNIT 1: INTRODUCTION TO ICT

(18 PERIODS)

Unit Outcome: Students will be able to:

- know the term data, information, technology and the source of information;
- understand the differences between computers of one generation from the other;
- recognize the types of computers used today and their difference;
- understand the computer system.

Competencies	Contents	Suggested Activities
• Define data and information. • Explain the term technology and information technology. • List sources of information.	**1.1 Overview of ICT** • Data vs Information • Technology • Information Technology • Sources of Information • Documentary sources – Primary documentary – Secondary documentary – Tertiary documentary • Non-documentary	• Explain and demonstrate the terms data, information and technology. • Students should define the terms data, information and technology. • Students in group try to list and share their ideas with their friends. • Explain and demonstrate the different sources of information.
• List computers generation. • Compare the difference among each generation of computers.	**1.2 Generation of Computers** • First, Second, Third, Fourth, and Fifth generation	• Explain and demonstrate (pictorially or physically) each generation of Computers and introduction to Artificial Intelligence.
• Classify types of computers used today • List the characteristics of each type of computer	**1.3 Types of Computers** • Super, Mainframe, Mini, Micro, Desktop, Laptop and Palmtop • Characteristics of computer	• This can be researched by the students and written as a report to be submitted to the teacher about computer generations. • Explain that computers are categorized in terms of size, processing speed and capacity only. • Give some uses of computers, e.g., traffic control system, ticket machines, cash machines in banks.

Competencies	Contents	Suggested Activities
• Explain how data is represented in the computer.	**1.4 Introduction to Data Representation** • Number system (binary, octal, hexadecimal) • Conversion of numbers from one number system to the other • Computer coding system (BCD, ASCII, UNICODE)	• Introduce an idea of the complexity of data representation in computer. It should be done qualitatively only. Such as representing 1 bit, Binary system, Letters and symbols: ASCII code and Bytes and associated quantities (KB, MB, GB, TB).
• Describe the computer system.	**1.5 Computer System** • Hardware • Software	• Demonstrate and explain in brief that a computer system consists of hardware components and software components (diagram). • Define hardware and software in simple and understandable words. • Define hardware: The physical parts of the computer that can be seen and touched. • Define software: The sets of instructions that instruct the computer to do different tasks for example: word processing, games, painting, e-mail, spreadsheets.
• List major hardware components.	• Hardware components ▪ Input devices ▪ Output devices ▪ System unit ▪ Secondary storage devices – Compact disk CD	• Use diagram to show the linkage between hardware components; explain each part of the diagram. • Students name all the input, output and storage devices that they know. • Explain that some secondary storage devices are also input and output devices. Demonstrate some of these examples. • System unit contains the motherboard, power supply, hard disk. The motherboard contains the 'Central Processing Unit', or CPU, the 'brain' of the computer, and RAM.

Competencies	Contents	Suggested Activities
• Define systems software and applications software. • Classify software as Systems or Applications software. • List and explain the uses of systems software.	• Types of software ▪ Systems software – Operating system SW ▪ Language SW – Low level language – High level language – Compilers and interpreters ▪ Others – Program utilities – Device drivers	• Explain that Systems Software keep the computer system working. • Explain that Applications Software allow the user to perform specific tasks. • Define and explain the difference between Systems Software and Applications Software. (Use diagram – see resources). • Give broad definitions and outlines of the function of each of these: Operating system is a bridge between the computer hardware and the user; Program utilities carry out general tasks such as formatting disks, storing files, virus checking; Device drivers are programs which allow hardware devices such as the keyboard, printers to interface with the computer.
• Give examples and explain uses of some Applications software.	• Applications software ▪ General purpose (e.g. Microsoft word) ▪ Speciality SW (e.g. Peachtree) ▪ Entertainment or Educational SW	• Demonstrate some of the features of as many of the applications software packages mentioned as possible. Such as word processing package, spreadsheet package, database package, desktop publishing package, e-mail package and presentation package.
• Manipulate their files and folders on a computer. • Transfer files from one folder to another. • Find a file or folder using a 'search' facility. • Customize their computer desktop.	• Features of Operating system – Creating folders, – Copying Files and Folders – Moving Files and Folders – Rename Files and Folders – Deleting Files and Folders – Searching Files and Folders – Customize computer desktop	• Organize a logical filing system on a personal computer or laptop. • Search for a file containing particular string. • Rename a file to include the author's initials and date. • Change the desktop wallpaper, screensaver, etc.

ASSESSMENT

The teacher should assess each student's work continuously over the whole unit and compare it with the following description, based on the specific objectives, to determine whether the student has achieved the minimum required level.

Students At Minimum Requirement Level

A student working at the minimum requirement level will be able to: List sources of information, Identify the dominating circuit element of each generation, Classify types of computers used today, explain how data is represented in the computer, describe the computer system, and List major hardware components, Classify software as Systems or Applications software, Give examples and explain uses of some Applications software and Manipulate their files and folders on a computer.

Students Above Minimum Requirement Level

Students working above the minimum requirement level should be praised and their achievements recognized. They should be encouraged to continue working hard and not become complacent.

Students Below Minimum Requirement Level

Students working below the minimum requirement level will require extra help if they are to catch up with the rest of the class. They should be given extra attention in class and additional lesson time during breaks or at the end of the day.

UNIT 2: APPLICATION SOFTWARE

(15 PERIODS)

Unit Outcome: Students will be able to:

- understand how to open word processing software, and create, and save a document;
- recognize how to format a document in a desired way;
- apply any of formatting features in their document;
- understand how to open presentation software, and create and save a document;
- recognize how to create a slide show using animation and sound.

Competencies	Contents	Suggested Activities
• Create and save word processing document. • Format a character as required. • Index a paragraph. • Index text in desired direction. • Align text by using icons on the menu bar and by selecting paragraph from formatting menu. • Apply bullets and numbers to display ordered or unordered list. • Change the styles of bullets and numbers effectively.	**2.1 Word Processor** • Open word processor • Creating new document • Saving a document • Closing a document • Editing a document • Formatting a document – Character Formatting – Paragraph Formatting – Page formatting – Spell checking – Adding tables – Adding pictures – Inserting tables – Inserting pictures (clipart, drawing object)	• Students should locate where the word processing software in the computer and create, save and close the document. • Students should insert, remove unwanted items and/or change existing ones in the document and also apply Undo and Redo. • Explain and demonstrate how to change the appearance of text changing Font, Style, Size, Color and changing font style. • Students should apply paragraph format such as alignment, indent, line spacing, bullets and numbers, and drawing borders around paragraphs. • Demonstrate setting text and paragraph alignment Left, Right, Centre, Justify. • Explain and demonstrate powerful formatting features including header and footer, margins and the steps involved to insert and delete bullets, a page break, a header and footer, page numbers and date and time on a document that they have already produced.

Competencies	Contents	Suggested Activities
• Insert and delete a page break and page number in a document. • Add and delete headers and footers in a document. • Protect their document from unauthorized access. • Use tables and pictures by inserting.		• Student should check spell of paragraph and page and identify color application.
• Create a presentation. • Prepare and present a slide show. • Create a presentation using design techniques. • Create a slide show.	**2.2 Presentation Software and Techniques** • Features of a presentation package • Creating slides using text and images • Formatting text and background • Inserting and deleting slides • Presenting a slide show • Create a slide show using animation and sound • Change slide layout	• Student should use tables and pictures by inserting. • The students should make slides using each feature as it is explained and demonstrated such as creating slides, inserting text, formatting text, inserting clipart, formatting background, inserting slides, deleting slides and inserting images from other files. • Explain various design techniques listed such as design templates, animation scheme, color schemes and adding sound. • Each group of students to present their slide shows to the class, giving explanations as necessary. presentation software, spare paper, magazines, newspapers, reference books etc.

ASSESSMENT

The teacher should assess each student's work continuously over the whole unit and compare it with the following description, based on the specific objectives, to determine whether the student has achieved the minimum required level.

Students At Minimum Requirement Level

A student working at the minimum requirement level will be able to: Create and save the word processing document, Format a character as required, Index a paragraph, Index text in desired direction, Apply bullets and numbers to display ordered or unordered list, Insert and delete a page break and page number in a document, Add and delete headers and footers in a document, Create a presentation, Prepare and present a slide show and Create a presentation using design techniques.

Students Above Minimum Requirement Level

Students working above the minimum requirement level should be praised and their achievements recognized. They should be encouraged to continue working hard and not become complacent.

Students Below Minimum Requirement Level

Students working below the minimum requirement level will require extra help if they are to catch up with the rest of the class. They should be given extra attention in class and additional lesson time during breaks or at the end of the day.

UNIT 3: INFORMATION AND COMPUTER SECURITY

(3 PERIODS)

Unit Outcome: Students will be able to:

- understand the responsible behavior in the computer laboratory;
- recognize the nature of computer virus and measures to protect.

Competencies	Contents	Suggested Activities
• Identify responsible behavior in the computer laboratory. • Identify safe online behavior. • Identify the school ICT police and live with it. • Describe computer virus. • Identify the measure to protect computer virus.	**3.1 Information and Computer Security** • Responsible behaviour in the computer lab • School ICT Policy • Nature of computer viruses o Measures to protect	• Explain that the laboratory contains delicate and expensive equipment; students must behave in a calm manner and not damage any machines or furniture; they must not touch any electrical connections for any reason. • Explain that students should not give either their own or another's personal data to anyone; email addresses should not be given to anyone. • Explain and demonstrate some of the school ICT policies which means rules prepared by the school. • Discuss what a computer virus can do to a computer system and show the students how the computers they use have been protected against virus.

ASSESSMENT

The teacher should assess each student's work continuously over the whole unit and compare it with the following description, based on the specific objectives, to determine whether the student has achieved the minimum required level.

Students At Minimum Requirement Level

A student working at the minimum requirement level will be able to: Identify responsible behavior in the Computer Laboratory, Identify safe online behavior, Identify the school ICT policy and live with it, describe computer virus and identify the measure to protect from computer virus.

Students Above Minimum Requirement Level

Students working above the minimum requirement level should be praised and their achievements recognized. They should be encouraged to continue working hard and not become complacent.

Students Below Minimum Requirement Level

Students working below the minimum requirement level will require extra help if they are to catch up with the rest of the class. They should be given extra attention in class and additional lesson time during breaks or at the end of the day.

UNIT 4: APPLICATION SOFTWARE

(15 PERIODS)

Unit Outcome: Students will be able to:

- recognize the uses of spreadsheets;
- understand the screen elements in the spreadsheet window;
- recognize how to create and use simple spreadsheet using text and numbers;
- understand how to format worksheets;
- recognize to use built in functions and create custom formula.

Competencies	Contents	Suggested Activities
• Identify the purpose of a spreadsheet. • Identify the screen elements in the spreadsheet window. • Manipulate rows and columns. • Manipulate data in a cell. • Save the worksheet. • Use auto sum. • Use mathematical operators on data to perform addition, sum and others.	**4.1 Spreadsheets** • Introduction • Starting spreadsheets • Screen elements of spreadsheets • Create and use a simple spreadsheet • Entering and editing text • Saving the worksheet	• Explain that a spreadsheet is a document which helps you organize data in rows and columns that intersect to form cells. • Students should identify each cell can contain words, a number, or a formula. • Students should recognize Screen elements of spreadsheets: such as Title bar, Menu bar, Formula bar, Standard toolbar, Worksheet, Inserting, Renaming, Deleting, Move or Copy, Columns, Rows, Cells, Fill handle and Cell address. • Show examples of spreadsheets. • Explain and demonstrate title bar etc. It can be seen that there are screen similarities with Word and other MS products; main differences in a spreadsheet are (*i*) the formula bar which is used for operations on cells such as calculations (*ii*) the working area. • Explain what the cell address is (column letter, row number).

Competencies	Contents	Suggested Activities
• Use the function of the Fill handle • Apply different effects to a cell and its contents	• Using the four mathematical operators on data to create custom formula: • Addition • Sum (dragging) • Entering a formula into a cell • Copying by using the Fill handle	• Explain and demonstrate: Can adjust either by freehand or using format box from format menu, how to insert rows and columns and deleting rows or columns. • Instruct students to open a work book and in sheet one has to enter three digit numbers in few cells horizontally or vertically. They should calculate the sum manually (on paper). • Explain and demonstrate how to calculate the sum (total). • Explain and demonstrate how to calculate sum (total) using auto sum. • Explain and demonstrate formatting text and numbers in a cell using the Cell dialog box from the Format menu. • Adding background to a worksheet, Formatting Cells, Number, Alignment, Font, Borders, Pattern and Cell reference: Absolute and Relative.

ASSESSMENT

The teacher should assess each student's work continuously over the whole unit and compare it with the following description, based on the specific objectives, to determine whether the student has achieved the minimum required level.

Students At Minimum Requirement Level

A student working at the minimum requirement level will be able to: Identify the screen elements in the spreadsheet window, Manipulate rows and columns, Manipulate data in a cell, save the worksheet, Use some built-in functions to calculate totals and averages, use the function of the Fill handle and Apply different effects to a cell and its contents.

Students Above Minimum Requirement Level

Students working above the minimum requirement level should be praised and their achievements recognized. They should be encouraged to continue working hard and not become complacent.

Students Below Minimum Requirement Level

Students working below the minimum requirement level will require extra help if they are to catch up with the rest of the class. They should be given extra attention in class and additional lesson time during breaks or at the end of the day.

UNIT 5: USING INTERNET

(10 PERIODS)

Unit Outcome: Students will be able to:

- understand the internet as a global network;
- recognize the meaning of some basic terms related to the Internet;
- recognize the work with a search engine to search for items;
- understand hotspots and hyperlinks;
- comprehend the meaning of some common e-mail terms.

Competencies	Contents	Suggested Activities
• Identify the internet and the World Wide Web. • explain how Internet and WWW are used. • Define website, web page. • Define a browser. • List and describe some different types of browser. • Open a browser and identify the screen elements. • Use web addresses to access websites. • Describe some different types of browser.	**5.1 Using Internet** • Definition of Internet • Uses and services available on the Internet • Terms • Types of browsers SW • Screen elements of Internet Explorer • Using Internet • Browsing information • Saving document • Saving images • Printing documents • Searching information	• Explain the difference between a website and web pages; show some sites and pages. • Define browser. • List, describe and demonstrate the different types of browsers. • Explain and demonstrate the screen elements of a browser. • Explain that each website has a unique address; a website holds information; creation of websites briefly; there may be a few or many pages on the website. • Explain and demonstrate some hyperlinks, and returning back to the original web page. • Students practice accessing websites using addresses. • Students will investigate four search engines (for example, AltaVista, Lycos, and Google. Yahoo), explaining the features of search engines, and write a report on their preferred search engine, giving reasons why they prefer it.

Competencies	Contents	Suggested Activities
• Store Favourite addresses. • Create an e-mail account. • Compose and send an e-mail. • Receive and open an e-mail. • Use the facilities provided in the e-mail system.	**5.2 Using E-mail** • Creating an e-mail account • Composing and sending an e-mail • Receiving and replying to an e-mail • Facilities of an e-mail system • Distribution list • Attachments – sending – receiving • Auto reply	• Identify functions on the compose e-mail page; students compose and send e-mail. • Identify and explain the outbox/sent items. • Explain the facilities in the e-mail system. • Explain why distribution lists are useful; and demonstrate how to implement. • Explain and demonstrate how to attach a file to an e-mail, and how to open an attachment on an incoming e-mail. • The teacher will check that each student: ▪ has an e-mail address and has received and sent mail (by checking inbox and sent items). ▪ can create a folder for filing the same kind of mail. ▪ can create a distribution list. ▪ can attach a file to an e-mail.

ASSESSMENT

The teacher should assess each student's work continuously over the whole unit and compare it with the following description, based on the specific objectives, to determine whether the student has achieved the minimum required level.

Students At Minimum Requirement Level

A student working at the minimum requirement level will be able to: Identify the internet and the world wide web, define website, web page, and browser, describe some different types of browser, Open a browser and identify the screen elements, Use web addresses to access websites, Store Favorite addresses, identify types of search engines, create an e-mail account, Compose and send an e-mail and receive and open an e-mail.

Students Above Minimum Requirement Level

Students working above the minimum requirement level should be praised and their achievements recognized. They should be encouraged to continue working hard and not become complacent.

Students Below Minimum Requirement Level

Students working below the minimum requirement level will require extra help if they are to catch up with the rest of the class. They should be given extra attention in class and additional lesson time during breaks or at the end of the day.

UNIT 6: CONTROL AND LEARNING WITH LOGO

(7 PERIODS)

Unit Outcome: Students will be able to:

- understand the LOGO language;
- recognize to produce a variety of diagrams using the LOGO language.

Competencies	Contents	Suggested Activities
• Use the LOGO primitives to draw a variety of shapes. • Write procedures to include repeat and RND.	**6.1 Control and Learning with LOGO** • Using primitives • Writing procedures – Using RND	• Draw equilateral triangles using the primates. • Write a procedure to draw on equilateral triangles. • Write a procedure to include a random number generator e.g., throwing a die. • Teacher will observe printed version and dribble file and necessary. • Use Full version of LOGO language.

ASSESSMENT

The teacher should assess each student's work continuously over the whole unit and compare it with the following description, based on the specific objectives, to determine whether the student has achieved the minimum required level.

Students At Minimum Requirement Level

A student working at the minimum requirement level will be able to: Use the LOGO primitives to draw a variety of shapes and Write procedures to include repeat and RND.

Students Above Minimum Requirement Level

Students working above the minimum requirement level should be praised and their achievements recognized. They should be encouraged to continue working hard and not become complacent.

Students Below Minimum Requirement Level

Students working below the minimum requirement level will require extra help if they are to catch up with the rest of the class. They should be given extra attention in class and additional lesson time during breaks or at the end of the day.

GLOSSARY

A

Absolute Reference: Commonly used in spreadsheet applications, it is a formulated cell reference that will not adjust when used to calculate the sum of specific cells.

AI (Artificial Intelligence): It is the branch of computer science concerned with making computers behave like humans.

Analog: It is any fluctuating, evolving, or continually changing process that represents data by measurement of a continuous physical variable.

Application Software: A program that is designed to perform specific tasks.

ASCII: American Standard Code for Information Interchange. It is pronounced (as-kee).

B

Backup: To copy files or data to a second source or media so as to safeguard it.

Bandwidth: A measurement of how much data (bits per second) can be sent through a connection.

BCD: Binary Coded Decimal.

BIT (Binary DigIT): It is the smallest unit of processing of computerized data in terms of 1s or 0s.

Blog: (Slang term for a Weblog) A blog is a personal journal that can be accessed publicly and allow people to comment on the previously posted comments.

BMP (pronounced "bimp"): Microsoft Windows image file format is the only graphics format where compression actually enlarges the file.

Byte: A combination of 8 bits to represent computer data transfer or data storage measurement.

C

Cell: Intersection of a row and column in a worksheet.

CD-ROM (Compact Disc Read-Only Memory): A durable and low cost circular optical storage device widely used to store large amounts of information.

Computer: A computer is an electronic device that accepts, process, stores and outputs data under the control of a set of instructions.

CPU (Central Processing Unit): A processor on an IC chip (called a microprocessor) that serves as the 'brain' of the computer.

Cursor: A movable, blinking symbol that indicates the position on a computer screen where user action is needed.

D

Data: A collection of raw facts and figures or a raw input which when processed or arranged makes meaningful output.

Data Communications: The moving or sharing of encoded information between two or more data sources using an electronic medium.

Digital: A system that defines data in a discrete, non-fluctuating (*i.e.*, non-analogue), numerical digits, specially 1s or 0s.

Directory: An organizing unit in a computer's file system for storing and locating files. In a hierarchical file system, directories can contain subdirectories as well as files.

Distribution List: Also called a mailing list, is a collection of e-mail addresses that allows you to e-mail multiple people at one time.

Domain Name System: An addressing system in which abbreviations are used to indicate the type of organization or entity instead of whole name, for example, .edu for educational institution.

DVD: Digital Versatile Disc or Digital Video Disc.

E

E-Commerce: Buying and selling or business transaction conducted on the Internet.

E-Mail: Stands for Electronic Mail. This is a system of relaying messages across the Internet, from one Internet user to another.

EPROM: Erasable Programmable Read-Only Memory ("ee-prom"). It is a memory chip whose contents can be erased by a mechanism using ultraviolet light and reprogrammed for other purposes.

F

Firmware: A microprogram stored in read-only memory (ROM), designed to implement a function that had previously been provided in software.

Format: The arrangement of data for computer input or output, such as the number and size of fields in a record or the spacing and punctuation of information in a report. It is also used to prepare a disk for reading and writing.

Freeware: This is a shortened version of Free Software. Programmers offer their work without wanting pay in return.

FTP (File Transfer Protocol): A software protocol for exchanging information between computers over a network.

G

Gigabyte (GB): 2 to the 30th power (1,073,741,824) bytes. One gigabyte is equal to 1,024 megabytes.

GIGO: It is an acronym that stands for Garbage In, Garbage Out.

GUI (Graphical User Interface): A program interface that takes advantage of the computer's graphics capabilities to make the program easier to use. Well-designed graphical user interfaces can free the user from learning complex command languages.

H

Hardware: The physical equipment used in a computer system, such as the CPU, peripheral devices and memory.

Home Page: The initial page of a site on the World Wide Web.

HTML: Hypertext Markup Language. It is a collection of structuring and formatting tags used to create Web pages.

HTTP (Hyper Text Transport Protocol): The standard protocol for transferring hypertext documents on the World Wide Web.

Hyperlinks: A word or graphic display on one web page that allows a computer to shift to another related web page.

Hypertext: A method of storing data through a computer program that allows a user to create and link fields of information at will and to retrieve the data non-sequentially.

I

Icon: A picture or symbol to represent a command on a computer screen.

ICT: Information and Communication Technology.

IDE (Integrated Development Environment): A programming environment integrated into an application.

Information: Meaningfully organized data.

IT (Information Technology): The development, implementation, and maintenance of computer hardware and software systems to organize and communicate information electronically.

Integrated Circuit (IC): A circuit of transistors, resistors, and capacitors constructed on a single semiconductor wafer or chip, in which the components are interconnected to perform a given function.

Interpreter: It translates and executes source program, written in high level language, statement-by-statement.

Internet: The Internet is a network of networks all of which use the same set of communications protocols.

Intranet: A private network for communications and sharing of information that, like the Internet, is based on TCP/IP but is accessible only to authorized users within an organization. An organization's

intranet is usually protected from external access by a firewall.

ISP (Internet Service Provider): A company that provides access to the Internet.

J

JAVA: A high-level programming language developed by Sun Microsystems.

JPEG (pronounced "J-Peg", stands for Joint Photographic Experts Group): It is an image format that allows for compression when stored.

K

Kilobyte (KB): This is about a thousand bytes of space. In reality, it is two to the 10th power or 1,024 bytes.

L

LAN (Local Area Network): A network that links together computers and peripheral equipment within a limited area, such as a building or a group of buildings.

Language Processor: Software that converts a high level language or assembly language code into machine understandable form.

LCD (Liquid Crystal Display): A method of displaying readings continuously using a liquid-crystal film, sealed between glass plates that changes its optical properties when a voltage is applied.

Login: To attach to a computer using the user's ID.

LOGO (Logic Oriented, Graphics Oriented): A high level programming language specifically designed for its ease of use and graphics capabilities.

M

Mainframe: Second largest computer available after the supercomputer.

Megabyte (MB): About a million bytes of space. Actually it is 2 raised to the 20th power or 1,048,576 bytes of space.

Memory: Internal storage areas in the computer.

Microcomputer: A category of computer that is generally used for personal computing, for small business computing, and as a workstation attached to large computers or to other small computers on a network.

Microprocessor: An integrated computer circuit that performs all the functions of a CPU.

MODEM: Stands for MOdulator and DEModulator. It is a device that changes data from digital (computer language) to analog (phone line language) and then back again.

Motherboard: The main circuit board of a microcomputer.

MPEG (Motion Picture Experts Group): A format to make, view, and transfer both digital audio and digital video files.

MS-Excel: Spreadsheet application software, provided by Microsoft.

MS-PowerPoint: Presentation software, provided by Microsoft.

MS-Word: Word processing application software, provided by Microsoft.

N

Nanosecond: A billionth of a second. Many computer operations, such as the speed of memory chips, are measured in nanoseconds. Nanosecond is often abbreviated as ns.

Netiquette: The rules of etiquette that apply when communicating over computer networks, especially the Internet.

Newsgroup: An online discussion community found on the USENET system. These groups cover thousands of different topics of information and are offered free of charge.

Node: In networks, a processing location. A node can be a computer or some other device, such as a printer.

O

Operating System: A system software program that works as a bridge between computer hardware and the user. Operating systems perform basic tasks, such as recognizing input from the keyboard, sending output to the display screen, keeping track of files and directories on the disk, and controlling peripheral devices such as disk drives and printers.

Output Device: A device that translates information processed by the computer into a form that humans can understand.

P

PDF (Portable Document Format): A technology developed by Adobe and was designed to capture all of the elements of a printed document and place it in a single image file.

Pen Drive: A secondary storage device that can be used to easily transfer files between USB-compatible systems.

Pixel: The smallest element of an image that can be individually processed in a video display system.

Plotter: A computer output device that draws images on paper using a pen.

Primitives: The LOGO commands are known as 'Primitives'.

Procedure: The sequence of actions or instructions to be followed in solving a problem or accomplishing a task. It may be used at one or more points in a computer program.

Processor: A device that processes programmed instructions and performs tasks. The speed at which the CPU processes information internally is measured in MegaHertz (MHz) and GigaHertz (GHz). 1 GHz is equal to 1,000 MHz.

Programmable Read-Only Memory (PROM): A special memory chip that is blank when first purchased. It can be written to by the user by using a special hardware program. Once the data is written to it, it cannot be erased or changed.

Protocol: A set of rules governing the format of messages that are exchanged between computers.

Q

Query: Used to retrieve information on a certain condition from a database.

R

RAM (Random Access Memory): A volatile computer memory available to the user for the temporary storage and manipulation of data.

Relative Reference: The default reference in a spreadsheet package.

ROM (Read-Only Memory): A memory in which program instructions, operating procedures, or other data are permanently stored, generally on electronic chips during manufacture, and that ordinarily cannot be changed by the user or when power is switched off.

Router: A device in a network that handles message transfers between computers.

S

Scroll Bar: A widget found in graphical user interface and used to show and control which portion of a document is currently visible in a window. A window may have a horizontal or, vertical scroll bar, or both.

Screen Saver: A moving picture or pattern that appears on the screen when you have not used the mouse or keyboard for a specified period of time.

Serial Port: A port or interface that can be used for serial communication, in which only 1 bit is transmitted at a time. Most serial ports on personal computers conform to the RS-232C or RS-422 standards.

Server: This is a mainframe computer that serves the other computers attached to it.

Sheet Tab: In spreadsheet applications, this refers to a tab at the bottom of a worksheet that acts as a means to identify or access different sheets within a workbook.

Slide Show: Used to display the slides in a desired sequence.

SMS (Short Message Service): A popular wireless service that is used for sending and receiving short messages up to a maximum of 160 characters. The service is used for text messaging between cell phones that are on a GSM (Global System for Mobile) network.

Source Code: Program code written in a high level language.

Software: The set of instructions used to direct the operation of a computer, as well a documentation giving instructions on how to use them.

Spam: The disruptive unwanted messages, especially commercial messages posted on a computer network or sent as e-mail.

Spreadsheet: A document which helps to organize data in rows and columns that intersect to form cells.

Supercomputer: High-capacity computer with thousands of processors that is the fastest calculating device ever invented.

Switch: In networks, a device that filters and forwards packets between LAN segments.

System: A combination of the hardware, software, and firmware. A system typically consists of components (or elements) which are connected together in order to accomplish a specific function or set of functions.

System Software: It is a set of master programs that keeps the computer system working.

T

Task bar: The bar that contains the start button and appears by default at the bottom of the desktop.

TCP/IP: Acronym for Transmission Control Protocol/Internet Protocol, the suite of communications protocols used to connect hosts on the Internet.

Terabyte (TB): 2 to the 40th power (1,099,511,627,776) bytes.

Toolbar: A row or rows of buttons on a display screen that are clicked on to select various functions in a software application or web browser.

Topology: In networking, this refers to the physical or logical arrangement of a network.

Trojan: A type of computer virus that is loaded into an unsuspecting users system via a host program such as a free game.

Turtle: A triangular shape pointer used in LOGO that helps in drawing figures.

U

UNICODE: Binary coding scheme that uses 2 bytes (16 bits) for each character. It allows almost all the written languages of the world to be represented using a single character set.

Uploading: It means transmitting data from a local computer to a remote computer, as from your PC to a website you are constructing.

UPS (Uninterruptible Power Supply): It is a backup power unit that provides continuous power when the normal power supply is interrupted.

User: Someone attached to a server or host.

Utility Program: A program developed to run within an Operating System to perform a specific service.

V

Virus: A program or piece of code that is loaded onto your computer without your knowledge and runs against your wishes.

W

WAN (Wide Area Network): A network in which computers are connected to each other over a long distance, using telephone lines and satellite communications.

WAV: Stands for WAVeform sound format. Microsoft's format for encoding sound files.

Web page: A single, usually hypertext document on the World Wide Web that can incorporate text, graphics, sounds, etc.

Web server: A computer that runs specific software to serve web pages to the Internet.

Website: A connected group of pages on the World Wide Web regarded as a single entity, usually maintained by one person or organization and developed to a single topic or several closely related topics.

Wizard: A utility that provides guided sequence to perform complex task easily and quickly.

Word Processor: Software that processes textual matter and creates organized documents.

WWW (World Wide Web): Series of servers or computers that are interconnected through hypertext.

WYSIWYG: What You Say Is What You Get.

X

XML (eXtensible Markup Language): It is a markup language, not limited to Web documents.

Z

Zip Disks: The disks with a special high-quality magnetic coating that have a capacity of 100, 250 or 750 megabytes.

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