Introduction to Computers

Computer Literacy

- Involves having current knowledge and understanding of computers and their uses.

- Since technology is always changing, one must keep up with this changes to remain literate.

What is a computer?

- A computer is an electronic device, operating under the control of instructions stored in its own memory, that can accept data, process the data according to specified rules, produce results, and store the results for future use.

Data and Information

- Data is a collection of unprocessed items, which can include text, numbers, images, audio, and video.

- Information conveys meaning and is useful to people.

Information Processing Cycle

- Computers process data (input) into information (output).

- Instructions are the steps a computer takes to process the data and produce the information.

- Software is related instructions organized for a common purpose.

The Components of a Computer

- The electric and mechanical components of a computer are known as hardware.
- Hardware includes input devices, output devices a system unit, storage devices, and communication devices.

Input Devices

- Any hardware component that allows you to enter data and instructions into the computer.

- The most common types of input devices are the keyboard, mouse, microphone, scanner, and web cam.

Output Devices

- Any hardware component that conveys information to one or more people.
- Common output devices are the monitor, speakers, and the printer.

System Unit

- A case that contains the electronic components of the computer that are used to process data.
- Composed of the motherboard, CPU, and memory.

Storage Devices

- Storage media is where a computer keeps data, instructions, and information.

- These include hard drives, USB flash drives, optical discs, and memory cards.

- A storage device records and/or retrieves (reads and/or writes) items to and from storage medium.

Communication Devices

- A hardware component that enables a computer to send and receive data, instructions, and information to and from one or more computers and mobile devices.

- Most common communication devices is a modem.

Advantages of Computers

- Speed: Data flows incredibly fast making computing, sorting, and organizing quicker.
- Reliability: Components of computers are dependable because they rarely break or fail.
- Consistency: Given the same input, a computer will produce the same results.
- Storage: Enormous amounts of data can be stored for future use.
- Communications: Most computers of today can communicate with other computers.

Disadvantages

- Health Risks: Prolonged or improper use can lead to injuries or disorders of the hands, wrists, elbows, eyes, neck, and back. Also, behavioral risks such as computer addiction and technology overload.

- Violation of Privacy: If not protected properly, information can be stolen.

- Public Safety: Sharing of information that can be used to identify or locate a person.

Disadvantages (cont.)

- Impact on Labor Force: The skills of many have been replaced by the usage of computers.

- Impact on Environment: Computer manufacturing processes and computer waste are depleting natural resources and polluting the environment.

Green Computing

- Involves reducing the electricity consumed and environmental waste generated when using a computer.
- Strategies such as recycling, regulating manufacturing processes, extending life of computers, and donating or properly disposing of replaced computers.

Networks and the Internet

- A network is a collection of computers and devices connected together via communications devices and transmission media.

- When connected to a network, the computer is said to be online.

The Internet

- The Internet is a worldwide collection of networks that connects millions of businesses, government agencies, educational institutions, and individuals.
- More than one billion people around the world use the Internet daily.
- The Web, or World Wide Web (www), contains billions of documents called Web pages, which can contain text, graphics, animation, audio, and video.
- A Web site is a collection of related Web Pages.

Computer Software

- Also called programs, consist of a series of related instructions, organized for a common purpose, that tells the computer what tasks to preform and how to preform them.

- With a graphical user interface (GUI) you can interact with the software using text, graphics, and visual images.

System Software

- Consists of the programs that control or maintain the operations of the computer and its devices.

- It serves as the interface between the user, the application software, and the computer's hardware.

Operating System

- A set of programs that coordinates all the activities among computer hardware devices.

- Such as, Microsoft's Windows and Apple's Mac OS.

Utility Program

- Allows users to perform maintenance-type tasks usually related to managing a computer, its devices, or its programs.

Application Software

- Consists of programs designed to make users more productive and/or assist them with personal tasks.

- These include web browsers, word processors, spreadsheets, database, and presentation software.

Installing and Running Programs

- Installing is the process of setting up software to work with the computer, printer, and other hardware.

- Running is instructing the computer to load a program from storage to memory. Once in memory, the computer can carry out, or execute, the instructions in the program so the user may use it.

Software Development

- A programmer, also called a developer, is someone who develops software or writes instructions that direct the computer to process data into information.

- Popular languages include C++, Java, and Visual C#.

Categories of Computers

- Personal Computers
- Mobile Computers and Devices
- Game Consoles
- Servers
- Mainframes
- Supercomputers
- Embedded Computers

Personal Computers

- Are computers that can perform all of its input, processing, output, and storage activities by itself.

- Two types of personal computers are desktop computers and notebook computers.

Desktop Computers

- Are designed so that the system unit, input devices, output devices, and any other devices fit entirely on or under a desk or table.

- This includes towers, gaming desktop computers, and home theater PCs (HTPCs).

Mobile Computers and Mobile Devices

- A mobile computer is a personal computer you can carry from place to place.

- A mobile devices is a computing devices small enough to hold in your hand.

Notebook Computers

- Also called laptop computers, are portable personal computers designed to fit on your lap. They are thin and light weight, yet they can be as powerful as desktop computers.

Tablet PCs

- A special type of notebook computer that allows the user to write or draw on the screen with a digital pen.

Mobile Devices

- Devices small enough to carry in a pocket, and usually lack disk drives. Instead, they store programs and data permanently on special memory inside the system unit or small storage media such as memory cards.

- Some are Internet-enabled, meaning they can connect to the internet wirelessly.

Smart Phones

- Internet-enabled phones that usually also provide personal information management functions such as a calendar, an address book, a calculator, and a notepad.

PDAs

- Personal digital assistants provide personal information management functions, such as a calendar, an appointment book, an address book, and a calculator.

Handheld Computer

- Also called an Ultra-Mobile PC (UMPC) is a computer small enough to fit in one hand.

Portable Media Players

- A mobile device on which you can store, organize, and play digital media.

Digital Cameras

- A device that allows users to take pictures and store photographed images digitally, instead of on traditional film.

Gaming Consoles

- A mobile computing device designed for single-player or multi-player video games.
- This includes Microsoft's Xbox 360, Nintendo's Wii, and Sony's PlayStation 3.
- There are also handheld gaming consoles that are small enough to fit in one hand, making it more portable than the standard game console.
- Two popular models are Nintendo DS Lite and Sony's PlayStation Portable (PSP).

Servers

- Control access to the hardware, software, and other resources on a network and provide a centralized storage area for programs, data, and information.
- Can support form two to several thousand connected computers at a given time.
- Servers can access information from other servers, and personal computers can access information from servers as well.

Mainframes

- Large, expensive, powerful computers that can handle hundreds or thousands of connected users simultaneously.
- They store tremendous amounts of data.
- Most major corporations use mainframes for business activities.
- Mainframes can act as servers on a network.

Supercomputers

- Are the fastest, most powerful computers, and also the most expensive.
- The fastest supercomputers are capable of processing more than one quadrillion instructions per second.
- Usually weighing over 100 tons.
- Stores 20,000 more times the amount of data of an average desktop computer.

Embedded Computers

- Are special-purpose computers that function as a component in a larger product.

- They are everywhere around the house (telephones, televisions, cameras, video records), the car, and at work.

Elements of an Information System

- Generating information from a computer requires:
  - Hardware
  - Software
  - Data
  - People
  - Procedures

Examples of Computer Usage

- Home User
- Small Office/Home Office User
- Mobile User
- Power User
- Enterprise User

Home User

- Spends time on the computer for different reasons that include personal financial management, Web access, communications, and entertainment.

Small Office/Home Office User

- A member of a company of fewer than 50 employees, or the self-employed who work from home.

- Generally these users access the Internet and operate basic business software, such as word processors and spreadsheets.

Mobile User

- Users who work on a computer or mobile device while they are away from their main office, home office, or school.

Power User

- Requires the capabilities of a workstation or other type of powerful computer.
- Power users often work with multimedia, combining text, graphics, audio, and video into one application.
- Their workstation often includes industry-specific software.

Enterprise User

- A member of an enterprise, which has hundreds or thousands of employees.
- Enterprises use computers and the computer network to process high volumes of transactions in a single day.
- Many employees of enterprises telecommute, which is a work arrangement in which employees work away from a company's standard workplace and often communicate with the office through the computer.

Computer Applications in Society

- Education
- Finance
- Government
- Health Care
- Science
- Publishing
- Travel
- Manufacturing