INTRODUCTION TO COMPUTERS

History of Computers

- 40 years ago - computer users were specially trained operators and engineers.
- Today - 70% of US households have at least one computer.
- Predicted to climb to nearly 85% by 2010

Computer Hardware History

- Non-electronic computing devices date back thousands of years

- Examples:

  Abacus

  Punch card tabulators

Time Line of Computer Milestones

Date	Milestone
1890	US Census results were tabulated using an electronic punch-card tabulator
1944	Howard Aiken of Harvard University worked with IBM to develop a 50-foot-long, 8-foot-high machine that was able to add, subtract, multiply, divide, and refer to data tables using punched paper tape.
1946	A machine for the US army's Ballistics Research Lab that weighted approximately 30 tons and covered about 1000 square feet of floor space. It was the first digital, reprogrammable computing device.
1947	A type of cathode-ray tube was developed to store data electronically. This type of storage was the dominant form for RAM until the 1950's

1951	UNIVAC, the first commercial computer, was developed and used to pick presidential winners. Eight of them were sold.
1958	The integrated circuit, the "chip," reduced the cost, size and processing time of existing computers.
1970	Intel produced the world's first available dynamic RAM chip.

Computer Speed

- Original IBM computers could perform about 2,000 instruction per seconds.

- Late 1980's - <u>MIPS</u>. (millions of instructions per second)

- Currently - <u>FLOPS</u>. (floating point operations per seconds.) = up to 1,000 trillion calculations per second.

- Software can run on many different platforms, such as PCs, Macs, and handheld devices.

- A <u>platform</u> is operating software that is used to run different types of computer devices.

- It allows us to do some of the following: accounting or voice recognition, e-mail and text messaging

History of the Internet

- developed to share information for the government and academic research.
- 1980's –became available for personal and commercial use.

The Computer System

Computer – an electronic device that can perform tasks and calculations based on the instructions it has been given.

Main Computer tasks

1. Input
2. Processing
3. Storage
4. Output

Computers need software to tell them what to do with this data or commands

Software

- <u>System Software</u>: controls the way computer parts work together
- <u>Application Software</u>: tells the computer how to perform a specific task.

Types of Computers

- <u>Personal Computer</u> (PC or Microcomputer)
- <u>Laptop Computers</u> (notebooks)
- <u>Supercomputers</u> : the fastest type of computers
  - Used by government agencies, educational institutions and large corporations

- <u>Mainframe</u>: less powerful and cheaper than supercomputers. Capable of storing and processing large amounts of data.
  - 100's of people can access it at one time
  - Used by universities, medical institution and large companies such as banks.
  - Can complete millions of daily transactions

- Minicomputer (Server) : smaller than a mainframe.
  - Can support multiple users at the same time. Medium-sized companies, manufacturing and schools use minicomputers.

Computer Performance Parts

- <u>RAM</u> (random access memory) - physical memory of the computer that helps control the speed of the computer

- <u>Processor</u>: The brain of the computer - measured in megahertz (MHz) and gigahertz v(GHz).

- <u>Hard Drive</u>: Storage device for software

    All three are needed for a computer to work

Parts of a Computer System

Hardware & Software

Hardware

- Physical parts of the computer and includes four main components:

  1. Input devices
  2. Processing unit
  3. Output devices
  4. Storage devices

Input Devices

- Keyboard
- Mouse
- Pointing stick
- Light pen
- Stylus
- Touchpad

- OCR (optical character recognition) program – translates scanned pages to words or images that can be edited

- Scanner

- Digital Camera

- Digital Video Camera

- Microphone

- Cell Phone

Processing Unit

- CPU (central processing unit)
  - The brain of the computer.
  - Contains the computer chips and circuits that control and manipulate data to produce information

Output Devices

- Printer
- Monitor
- Speaker

Storage Devices

- Hard Drive – internal computer storage
- Flash drive
- Compact Disk (CD)
- Digital Video Disk (DVD)
- Digital Audio Tape (DAT) – resembles a basic audio cassette. Hold large amounts of information. Used a lot at TV stations

Computer Software History

- First software programs were given away free - computers could not run without software.
- <u>Software</u> : a set of instructions written by programmers in machine language, or programming language, that tells the computer what to do, how to do it, and when to perform tasks based on input from the users

- Examples of programming language:
- FORTRAN
- COBOL
- BASIC
- C
- C++
- Java, JavaScript
- Visual Basic
- Visual C++….

Operation System Software

- Controls the basic operation of the computer
- Manages the computer's files and programs

Application Software

- Interacts with the user to perform tasks and can run only when the operation system software (such as Windows XP or Vista) is installed and running

- Example : Microsoft Word, Excel, PowerPoint, Video Games

Types of Application Software

- Word Processing : edit text, create and print documents

- Spreadsheets: used for analysis and reporting of statistics and numbers

- Database : allows the user to collect, store, organize, modify and extract data

- Presentation: used to create slides that can be shown to accompany a speech or lecture

- Accounting: used for organizing and managing money

- Collaborative groupware: helps groups of users communicate and organize activities, meeting and events

- Communication: used to transmit and receive information between computers (IM)

- Internet browser: used to locate and display WebPages

- E-mail: used to send and retrieve email from a mail server

- Online service: provides subscription with the ability to communicate with one another through email, get news, weather and sports information

- Voice recognition: used to create, edit and format documents by speaking into a microphone attached to the computer

- Web Page: used to design and manage Web sites

- Graphics: used to create charts, pictures, illustrations, drawing and 3-D images

The Internet

- The <u>Internet</u> is a global network of smaller computer networks with its own unique IP (Internet Protocol) address

- To access the internet, you must purchase services from an ISP (internet service provider)
  - Examples: Adams, Comcast, AT&T

Uses of the Internet

- Advertising
- Research
- Shopping
- Banking
- Find a job
- Socialize

Web Sites

- Stored on a web server : a computer that stores and delivers the information for that site

- Parts of a web address
  - URL = www.website.com
  - Domain name = website.com
  - Domain suffix = .com

Domain Suffix Examples

- (.com) Commercial
- (.org) Noncommercial
- (.gov) Government
- (.edu) Education
- (.mil) Military
- (.net) Network

- <u>HTML</u> (Hypertext Markup Language) – programming language that is translated into readable format on websites.
- <u>FTP</u> (File Transfer Protocol) – used to transfer data from one computer device to another

Telecommunications

- To transmit data over a phone line, you need a modem.

- A <u>modem</u> is a device that connects a computer to a phone line or cable, allowing data to be transmitted from one computer to another.

- <u>Fax Modem</u>: transmits data, graphics and documents similarly to a fax machine.

Ways to transmit data

- <u>Network System (intranet):</u> users can send one or more messages to many email users.
- <u>Fax</u>: a machine connected to a telephone that scans a document and translates the image
- <u>Electronic bulletin board</u>: can be used to exchange information with others for free
- <u>Teleconferencing</u>: allows people in different locations to see and hear one another

Networks

- <u>Network</u>: a group of linked computers.
- <u>Intranet:</u> a network whose access is limited to employees of a company, students in a school, or others with authorization.
- <u>LAN</u> (local area network): an intranet that is confined to a relatively small space such as a building or campus.

- <u>File server</u>: intranet can connect users to a common file server that allows all of the computers connected to access the same hard drive
- <u>WAN</u> (wide area network): when a user of a network goes to the internet, they go to WAN

Telecommuting

- Allows employees to used technology to perform regular work activities from a remote location, such as a home or a hotel during business travel

Wireless Computing

- Allows you to make a connection between a computer or device and a remote network
- PDA: a handheld device that combines computing, telephone/fax, email, and networking features
- Some cell phones allow wireless computing
- To access wireless internet you need a wireless router, hot spot or cell phone access

Computers and Society

Computer applications allow us to do some of the following:

Calculate taxes

Budget

Calculate interest on a loan

Banking

Pay bills

- Shop online
  - Ecommerce: the business of selling and purchasing items over the internet
- Computers are also in thermostats, watches, cars, toys, washing machines, microwaves, answering machines, dishwasher and 100's of other items.

Future Technology

- Virtual reality (VR): software that uses three-dimensional graphics and special devices such as a data glove and VR goggles to allow the user to interact with a computing environment in "real space."

Vacations, video games, theme parks and more

- More accurate voice recognition
- Web TV (webcasting)

Using a Computer Responsibly

- Protect private information: social security numbers, tax records, credit card info, medical and legal records

- Hackers: irresponsible or unethical individuals discover ways to break codes and gain access to classified files

- Hacking is a criminal offense – a felony

Pirating/Plagiarism

- It is illegal to
  - Download music and ringtones that you haven't paid for
  - Copy software
  - Download or share media (music and video) without the owner's permission
  - Copying someone else's work for papers or presentations without citing the work in the work you are using

  Doing any of these could result in a very large fine or jail time

Care of Your Computer

- The system case (tower or laptop) should be cleaned both inside and out.
- Wipe the outside case clean with a damp cloth
- Use a compressed-air can or small vacuum to remove the dust from the inside
- Check the power supply fan to make sure the computer is getting good ventilation

Care of Monitors

- Clean monitors using a soft, damp cloth at least one a week
- Never spray clean directly on the monitor
- Check the monitor vents to ensure they are not blocked
- Use a screen saver to instruct your computer to hibernate when not in use

CD Drives

- The drive's read/write heads should be cleaned every few months using alcohol or special cleaning kits

Keyboards

- Develop a "no eating and drinking" policy when using the computer
- Clean the key caps at least once every six months
- Use compressed air to blow out dust from between the keys

The Mouse

- If the mouse has a ball inside, use a damp cloth to clean it and the rollers inside once a month

- Optical Mice do not need internal cleaning

Care of Media

- CDs should not be stored above 100°F.
- Do not handle the surface of the CD
- Moisture and liquids will not harm a CD
- CDs are not affected by magnet fields
- CDs can be cleaned with a damp, soft cloth

Care of Data

- Save data frequently
- Click the Safely Remove Hardware button when removing a flash drive
- Close all open applications before shutting down computer
- Install a virus-scanning program
- Delete unwanted files from your hard drive monthly