CIT 3117: Introduction To Computers and Applications

Week 1 Students learning objectives

1. Define: - computer, system, data, information, data processing.
2. Differentiate between digital and analogue computers
3. Explain how computers are applied to: - business applications, office automation, science and engineering, healthcare, sports, education, artificial intelligence, government, homes, arts and humanities.
4. Define algorithms and explain their significance in computer science.
5. Understand how a computer is internally organized.

What is a Computer?

A Computer is a high-speed electronic device which when given data and instructions from an input device will process the data in accordance with the predefined program to produce the required results- the output

It can also be defined as an electronic device that accept data and instructions, stores them temporarily in its memory awaiting processing, automatically executes/obeys the sets of the issued instructions to produce information from the input raw data.

It is described as an electronic device because it uses electric energy in its logical operations.

What is a system?
A *system* is the entire set of components, both computer related, and non-computer related, that provides a service to a user. Or a system is a group of related parts/components that work together as a unit to realize a common goal/function.

What is data?
Data is simply the basic facts or raw facts including numbers and words, given to a computer during the input operation.

What is information?
Information is a term with many meanings depending on context, in computing, information can be defined as a collection of facts from which conclusions may be drawn. Information therefore refers to data that has been processed into a form that has meaning and is useful in decision-making.

What does a computer do?
Computers perform four major operations:
They are **input, process, output** and **storage**. In the processing phase, the computer manipulates the data in a predetermined manner to create information.

Information processing or electronic data processing is the production of information by processing data on a computer.

Computer Application Areas:

a) **Business Applications**
Computers are used to reduce inventory costs, analyze new markets, analyze the performance of sales people, make sophisticated financial analysis, determine production costs, forecast labor needs, and eliminate production bottlenecks.

The typical business procedures that utilize computers include the following:

(i.) Accounts Receivables: To maintain and process records on money owed to a company by customers or clients.
(ii.) Accounts payable: To maintain and process records on money owed by the company to vendors.
(iii.) Payroll: To maintain employee payroll records and process payroll checks.
(iv.) Inventory control: To maintain records on items or goods on hand, on quantities ordered, and in general to maintain inventory files by producing purchase orders on out-of –stock items, o determine economic order quantities

Computers are widely applicable in the following Business areas:

(i.) Banks:

- Banks use computers to process the huge amount of checks and credit cards transactions that take place daily.
- The Automated teller machines allow the banking transactions to be carried out day and night. The customer uses a plastic card and selects the transactions by pressing a series of buttons.
- Electronic Funds Transfer (EFT): This is the automatic recording of account transactions and money transfers. However, no money actually exchanges hands.

(ii) Retailing:

- By use of the Universal Product Code (UPC), and Point –of- Sale (POS) terminals, computers can greatly enhance the performance of retail stores. The UPC is a standardized bar code found on most products in retail outlets. POS terminals are used to record product sales. The sales person using POS terminal passes the product's UPC by using an optical scanner programmed to read the code. The scanner interprets the code, looks it up on the computer files, and retrieves the product name and price. The computer then records the transaction and a customer is provided with a receipt.

- Retail computers using POS terminals are also used to update inventory levels and calculate the sales figures.
- In addition, these systems allow determination of the customer's credit status. A credit card number can be entered into the system and the computer checks the customer's account and determines if the transaction is acceptable.

(iii) Manufacturing.

- Many programs are available to manufacturing facilities. Inventory control is handled by a complex system called Materials Requirement Planning (MRP). This system allows the manufacturers to enter future demands into computer and receive a report that lists the scheduling dates and raw materials needed to manufacture the product to meet the demands.
- Computer assisted design and computer assisted manufacturing (CAD/CAM) have greatly assisted the manufacturing jobs.
- Process control: Computers are used to process continuous flow materials such as chemicals, petrol, energy etc. Which are complex activities in nature. Computer equipment is used in these industries to measure continuously the key variables such as flow of fluid, pressure and temperature. If the measured quantities deviate from a prescribed standard, the computer will either notify the supervisor via a terminal of the discrepancy or automatically make the necessary adjustments.
- Numerical Control: This is the use of computers to automatically produce machine tools to required specification. Numerical control devices can automatically drill, grind, and shape metals according to some required specifications.

b) **Office Automation**

Computers perform word processing, electronically handles mails and messages and handles electronic voice storage and forwarding (using telephone to dial up a computer to leave messages for other people).

c) **Science and Engineering**

Computers are used to make millions of complex calculations in seconds. They are also used in guidance and light control, voice print identification, earthquake detection, image processing (using the computer to enhance better understanding of images or pictures), stolen vehicles identification etc.

d) **Healthcare**

- Computers are used in hospitals for clerical and administrative functions.
- Personal computers have been used to diagnose potential problems and prescribe their remedies at the scene of an accident. They have also been used in ambulances to locate invalids quickly.
- *Information retrieval functions:* many hospitals have recently automated their operations. The patient sits in front of a television like terminal, where questions are displayed on the screen. The patient answers the questions by using a pointing device to point to the correct answer on the screen. Depending on the answer, the computer can ask more questions. The use of this automated system has greatly reduced the amount of time required of the patient and the doctor.

- *Computer Assisted Diagnosis*: One of the latest innovations in medical care is the concept of *multiphasic* testing. *Multiphasic* testing occurs when computer equipment is used to perform a series of tests, store the results of the test, and report the result to the doctor.
- Trained technicians and paramedics use the computer equipment to perform physical examinations.
- *Multiphasic* centers use computer equipment to perform electrocardiograms, X-rays, blood tests vision and hearing tests blood pressure tests and height and weight measurements.
- The use of Computed Axial Tomography (CAT Scanners)
- A relatively new diagnostic technique is CTA Scan which has provided doctors with the ability to obtain information about organs that were previously obtainable only through surgery. The CAT scanning technique basically involves rotating an X-ray tube around a specific area of the body, thereby producing a detailed photographic slice of the anatomy. Many hospitals use the computer to develop colorful and graphic CT scans that can show slices through the brain or any other part of the body.

e) **Sports**
Used to analyze and design new plays, make draft picks, scheduling competitors etc.

f) **Entertainment and Leisure** e.g. Musical sounds, compute games etc.

g) **Education**
Computer aided instructions (CAI) is used to help the students learn other subjects. Multiple-choice questions appear on the screen for a student to answer .If the student answers correctly the computer responds appropriately and asks another question. CAI helps in teaching in all the subjects.

h) **Artificial Intelligence and Expert Systems**
Using sophisticate programs and computer systems artificial intelligence makes the computer act like a person making intelligence decisions and judgments.

i) **Government and Military**
- Use of computerized graphics that reconstruct an accident can be used in court to counter the police account of what happened. In military, computers are being used to design both conventional and strategic weapons.
- *Military* Every branch of the armed forces is involved in the military planning and decision-making. Many of the decisions are made by high-level officials with the use of computer-generated information. Computers are also used by military planners to simulate wars. Military commanders can practice making decisions based on the lifelike situation that the computer presents. This allows them to gain experience without engaging in real battles..
- Law enforcement agencies and intelligence gathering agencies use the computer systems to store information plan their operations, and track criminals.

j) **Computer in the Home**
CB stimulators (CompuServe online chat program) allows one to talk to another person using a personal computer. It is similar to CB radio but uses a computer.

k) **Computers in the arts and the humanities.**

- Arts: Computers are used by artists to produce art forms.
- Music: Computer generated music is made possible with the use of music synthesizers.

Benefits of Computers

The following are the features that make a computer a good tool for information processing.

a) **Types of information:** Computers can process many types of information e.g. Data, texts, voice, pictorial etc.

b) **Speed:** It works at a very high speed in taking in data and outputting the information.

c) **Storage:** It is able to store large amount of information in manageable form.

d) **Communications:** Advances in telecommunications has made it possible for computers to communicate with one another over long distances to exchange information with seconds.

e) **Accuracy:** It is very accurate in its processing.

f) **Retrieval:** The information stored in the computer can be retrieved by more than one person.

g) **Updating of information:** It is possible to change stored information without having to retype.

The following are other advantages of a computer

h) Information analysis is very easy using computers.
i) Computers can work continuously without getting bored or tired.
j) They can operate in risky environments such as volcanic sites, lethal chemical plants, where human life is feared.
k) Using a computer system will reduce the number of persons required for performing various organizational activities.

Negative impacts of Computers to the society

- **Social activities**: A high percentage of people who sit at their computer for too long and some people lose reality as far as social activities and learning social skills.
- Computers can distract a person so much they lose contact with the reality around them such as taking time with family, friends and children.
- **Health:** Sitting behind a computer all day strains the eyes.
- **Creativity**: Being on the computer too much takes away the imagination, though some gain more imaginations as used in advertising, simulations and digital imagery.
- **Immorality**: the internet opens up to pornographic sites and other information.

- **Crime**: Internet crime has been reported to be on the increase and every day more crime is committed through the Internet.
- **Misinformation**: More misinformation by SOME people on the Internet can cause problems for the younger generation.
- **Privacy**: - It's impossible to know someone well over the Internet. E.g on www.facebook.com
- **Spam mail**: - this is unsolicited mail which are often annoying.
- Hackers can ruin your computer system and data over the internet.

A computer system is made up of three parts:

a) Hardware - physical components of a computer
b) Software - programs that allows the hardware to function.
c) Lifeware - the human being operating the computer.

A **Program** is a set of instructions and raw facts written in a computer language and used to make it perform specific tasks

TYPES OF COMPUTERS

There are several methods of classifying computers:

a) By the type of data accepted for processing and form in which output data/information appears (i.e. Digital, Analogue & Hybrid computers).
b) Classification by purpose.
c) Classification by generation/age of technology.
d) Classification by size and capabilities.
e) Classification by use.

1. CLASSIFICATION BY TYPE OF DATA ACCEPTED

a) Digital Computers
They process data that is represented in the form of discrete numbers or digits such as 0 and 1. Their arithmetic operations and logical comparisons are based on digits and on other characters that have been numerically coded.

b) Analogue Computers
They are computers that deal with variable/continuous data/quantities such as temperature, pressure, humidity etc. The output from them is often in form of graphs or smooth curves from which the information can be read. They perform arithmetic operations and logical comparisons by measuring changes in physical magnitudes such as electronic voltage, pressure changes.

c) Hybrid
These are the computers that have the combined features of digital and analogue computers. Both the digital and the analogue features are built within the sane processor.

2. CLASSIFICATION BY PURPOSE

1. **Special purpose;** These are computers designed for a particular job only. They solve problems of a restricted nature e.g. Weapon guidance systems or the ones used in digital watches.
2. **General Purpose;** These are computer designed to solve a wide variety of problems.

3. CLASSIFICATION BY SIZE

a) **Mainframe**

These are large general-purpose computers with extensive processing, storage and input/output capabilities. A large number of peripherals can be attached to them. Atypical application is the airline reservation system. The airlines have a mainframe computer at their head office where information of all the flights is stored. Small computers, installed at the booking offices, are attached to the central data bank so that up to date information of all flights is always available.

b) **Mini – Computers**

These are physically smaller computers as compared to mainframes. They are used for special purpose or small-scale general-purpose work.

c) **Micro – computers**

Various integrated circuits are replaced by a single integrated one. They can be categorized by size and relative capabilities into workstations, desktops and laptops.

d) **Super Computers;**

They are the largest and the fastest machines.

4. CLASSIFICATION BY USE

a) A personal computer (PC) - a microcomputer designed for independent use by an individual at work or in the home. Some PC's are portable.
b) A Home Computer - A low cost microcomputer of limited capabilities designed for domestic use with programs such as playing games on controlling family finances.

c) Embedded Computers - These computers are within some other devices/systems but are not accessed directly e.g. Small computers found in digital watches, video recorder, washing machines etc.

5. CLASSIFICATION BY GENERATION

The first electronic computers were made in 1940's. Since then a series of radical breakthroughs in electronics have occurred. The computer generations are the stages in the evolution of electronic circuitry, hardware, software, programming languages and other technological developments.

These include:

1) **First Generation.(1940- 1956) – Vaccum Tubes**

These computers used vacuum tubes as their electrical switching devices. Their CPU speeds were very low. The input devices were paper tapes or punched cards. Electronic typewriters, programmed to type by a paper tape or punched card reader were used for printing reports. They had between 1K and 4K of RAM. The computers received its instructions in machine language or electrical on/off signals. There were no programming languages.

The application software available was tabulating, now called spreadsheets. Since computers could only perform one task a time, the computer work was done in batches thus the operating system was called batch processing systems in 1950's.

2) **Second Generation (1956 - 1964) - Transistors**

These used transistors, which were much smaller cooler and reliable. Processing speed has improved by a factor of five.

They utilized keyboards and video display monitors. The first light pen was used as an input device for drawing on the face of the monitor. High-speed printer came into use.

RAM grew from 4K to 32K, making it possible for the computer to hold more data and instructions. Use of magnetic tapes and disks was introduced to replace permanent storage on computer cards. The IBM 1401 didn't have an operating system; instead it used a special language called **Symbolic Programming System** (SPS) to create programs. This generation marked the common use of high-level languages. FORTRAN (1957) was used for scientific purposes and COBOL (1961) for business purposes. There were also improvements in system software. Almost every computer had its unique operating system, programming language and application software.

3) **The Third Generation (1964-1971) – Integrated circuits**

Started with the introduction of IBM 360 in about 1960s which used integrated circuits (a number of electrical components on a single slice of silicon) termed as hybrid integrated technology where separate transistors and diodes were inserted into circuits.

There were several improvements such as:-

- Increased processing speeds
- Increased accuracy.
- Integration of hardware and software.
- The ability to perform several operations simultaneously
- Data communication advances.

Many high level programming languages were developed among them BASIC and Pascal. IBM created os/360 operating system. Software growth enhanced due to **unbundling**, or selling the software separate from the hardware.

4) The Fourth Generation (1971 - 1988) - Microprocessors

Large-scale integration, a technique for packing more and more circuitry in a single chip was developed. "4th generation brought major advances in 2nd generation mainframes, in 3rd

generation minicomputers and added a brand new category of machine; the microcomputer or personal computer. There was dramatic increase in processor speed. The keyboard and the video monitor have become standard 1/0 devices. The mouse began playing a major role.

There was introduction of fourth - generation languages programs.

5) The Fifth Generation (1983 .....) – Artificial Intelligence

Super chip development is truly at the Center of the fifth generation. (A chip is a thin piece of silicon on which electronic components are etched). Much advancement is still going on e.g. use of object-oriented languages, artificial intelligence.

The use of parallel processing and superconductors is helping to make artificial intelligence a reality. The goal of fifth-generation computing is to develop devices that respond to natural language input and are capable of learning and self-organization.

Questions

1. Describe the advantages of third generation over the 2nd generation computer.
2. What were the major problems with using vacuum tubes in computers?
3. Describe the fourth generation and the start of the fifth generation.
4. What is the primary difference between the first and second-generation computers? What were some of the advantages of the second-generation computers over the first generation computers?
5. What are the negative impacts of computers to society?

Week 2 Students learning objectives

1. Explain what each part of a computer hardware does: - input, output, processing and storage devices.
2. Understand the basic building blocks of logic
3. Manipulate data in binary, octal and hexadecimal.
4. Understand and appreciate the concept of Boolean algorithms.
5. Understand and appreciate basic logic gates and their applications in computer architecture.

COMPUTER ARCHITECTURE

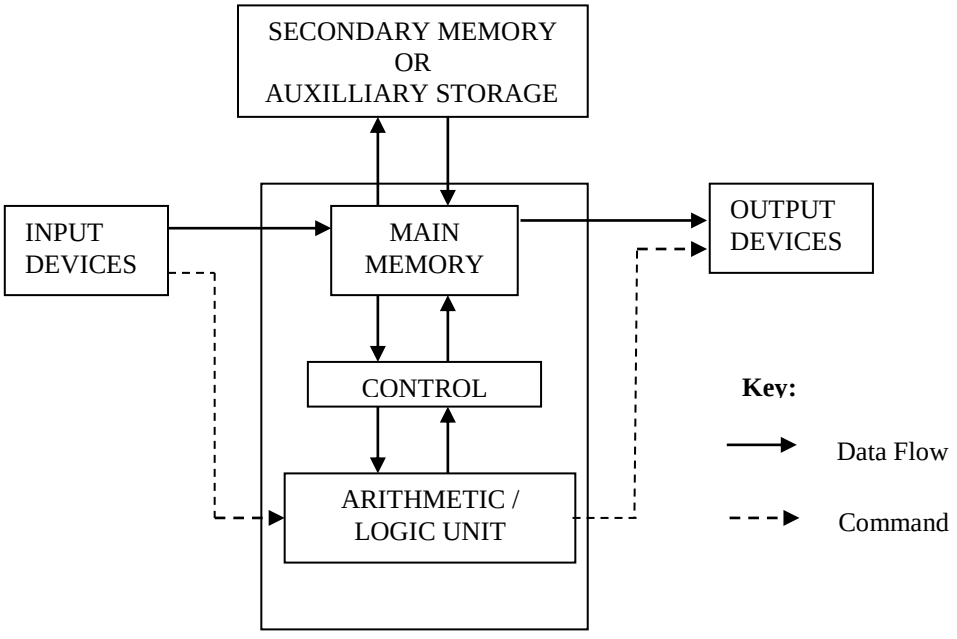
Computer architecture refers to the design and construction of a computer system.

Computer System Components

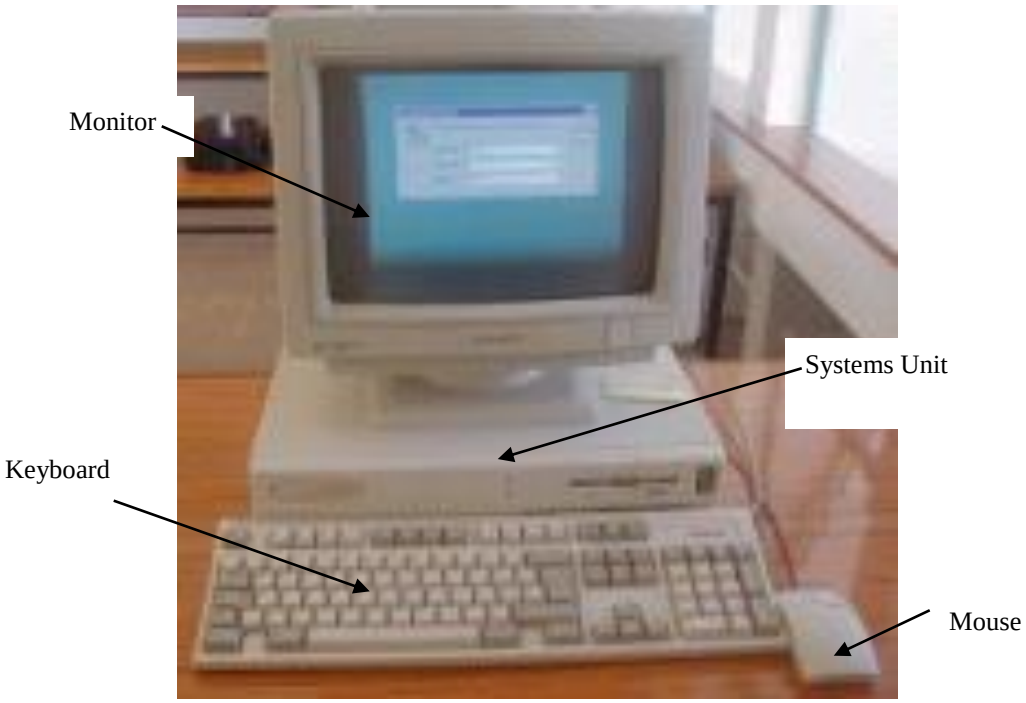
A computer set has the following major elements:-

- Input devices
- Output devices
- The processors (CPU)
- The storage devices

The organization of computer Hardware is based on the **Von-Newman Architecture**, which is based on the concept of **binary representation** of numbers in the computer. This organization, also known as the **computer theoretical organization**, describes how the different types of computer hardware interact with each other, in the processing of data, so that the desired results can be achieved. The figure below illustrates the architecture:



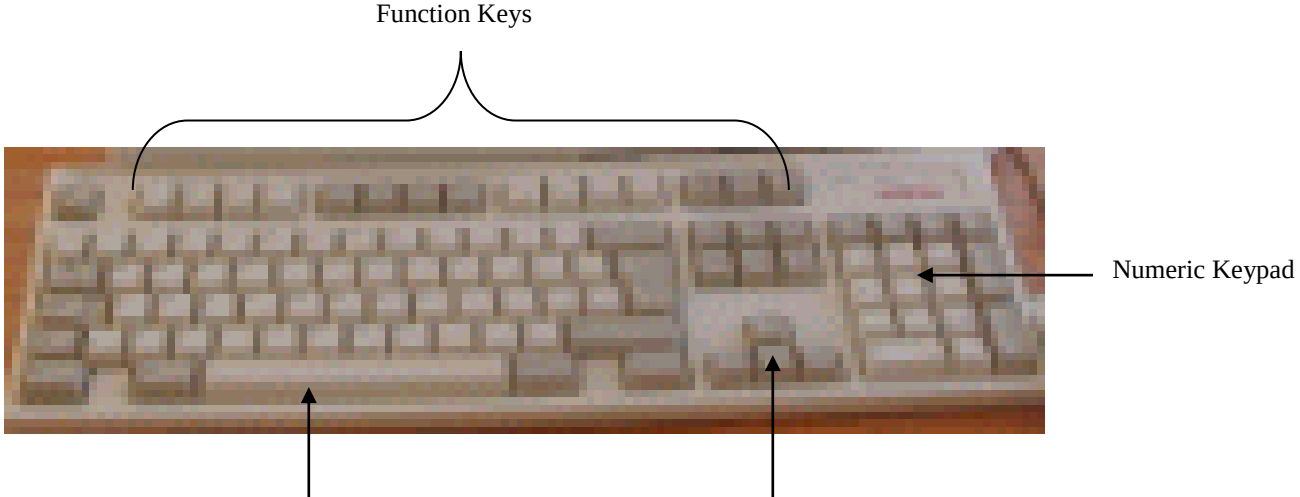
Peripheral devices
These are equipment that are used with the computer but are not integral part of it. They include printers, keyboards, monitors, mice, disk drives.



<u>Input Devices</u>
Input refers to the process of entering programs, commands, user responses and data into main memory. The most common input devices are:

a) **Keyboard**:
Users input data to a computer by pressing the keys on the keyboard. As the user enters the data on the Keyboard it displays on the screen. It has several keys such as:-

- The function keys labeled with letters F1 - F12. Which perform different tasks depending on the software program you are using.
- The arrow keys/cursor control keys used to move the cursor.
- The Data Keys used to enter the letters, numbers and symbols.
- Special purpose keys e.g. Backspace, Del. Shift, Alt., Ctrl, Enter ,Esc., Pause etc.



b) **Mouse**
This is a small lightweight device that easily fits in the palm of your hand. Software programs designed to use mouse display a mouse pointer on the screen. The pointer may be an arrow, small rectangle, an I-beam or even a hand with a pointed finger.

To move the pointer, you gently slide the mouse around the mouse pad. Mouse has a language of its own.

E.g.

Point - to move a pointer to a desired spot.
Click - press and release the left hand button.
Double click - press and release button twice as quickly as possible.
Drag - press and hold the right mouse button while moving the pointer to another Location.
Drop - release the mouse button after dragging.

c) Trackball
It is a pointing device that is used as an alternative to a mouse. You roll the ball to position the pointer on the screen. Unlike the mouse, a trackball doesn't move on the desk and therefore requires less space.

d) **Scanners**
Scanners convert texts, characters or images into a form that can be processed by the computer.

Other input devices include
e) Touch screens
f) Graphic input
g) Optical character reader (OCR)
h) Optical mark reader (OMR)
i) Magnetic ink character recognition (MICR)

The System Unit
The system unit also known as a **base unit**, is the main body of a desktop computer of the computer system.

The front part has the following buttons:-

- Reset button – used to restart the system without disconnecting the Power supply.
- Power indicator – indicates that the system has been powered.
- Power switch – Used to switch on the PC.
- Hard disk/floppy disk/CD indicators – are LEDs that come on when respective disk is being read or written.

Inside the System Unit

In a typical microcomputer, the system unit contains the power supply, storage devices and the main circuit board with the computer's main processor and memory.

The Power Supply

This component converts the AC electricity from the outlet to the DC electricity for PC uses. A fan keeps the power supply and other components in the system unit from overheating.

The Main board/Motherboard.

This is the main circuit board that houses the integrated circuits in the system unit. It contains the microprocessor, the RAM, expansion cards and is connected to peripheral devices that collect input and produce output.

Memory

Memory is electronic circuitry that holds the data and program instruction. It is sometimes called primary storage. There are four major types of memory, namely random access memory (RAM), virtual memory, CMOS memory and read-only memory (ROM).

Random Access Memory (RAM)

This is an area in the computer system unit that temporarily holds data before and after it is processed. For example, when you enter a document, the characters you type usually are not processed right away. They are held in RAM until you tell the software to carry out process such as printing.

In RAM, the microscopic electronic parts called capacitor hold the electronic signals for the binary codes that represent the data. RAM is volatile i.e. if the computer is turned off or the power goes out, all the data stored in RAM instantly and permanently disappears.

Functions of the RAM

The contents of RAM are necessary for the computer to process any data. The CPU receives instructions from RAM, uses the data in RAM for processing and keeps the results of processing temporarily in RAM until they are needed again or stored on disk.

RAM stores user data, operating system instructions and program instructions temporarily. Every time you turn on your computer, it copies a set of operating system instructions from disk into RAM. These instructions, which help control basic computer functions, remain in RAM until you turn the computer off.

RAM also holds program instructions. When you use a word processing program, the computer copies the instructions that turn your computer into a word processor from disk into RAM.

RAM capacity

The storage capacity of RAM is measured in megabytes (MB) or Gigabytes (GB). Most recent micro-computers have between 128 MB – 2 GB of RAM. The amount of RAM your computer needs depends on the software you use.

Virtual Memory

The computer sometimes uses space on the computers hard disk as an extension of RAM. A computer's ability to use disk storage to simulate RAM is called virtual memory.

Virtual memory allows computers without enough real memory to run large programs, manipulate large data files and run more than one program at a time. One disadvantage of a virtual memory is reduced performance.

Read Only Memory (ROM)

This is a set of chips containing instructions that help a computer prepare for processing tasks. These instructions also called firmware are permanent, and the only way to change them is to remove the ROM chips from the main board and replace them with another set.

When you turn on your computer, the CPU receives electrical power and is ready to begin executing instructions. But because the computer was turned on, RAM is empty with no instructions for CPU to process. This is when ROM finds its use.

When you turn on your computer, the CPU performs a series of steps by following instructions stored in ROM. This series of steps is called the boot process.

- Programmable read-only memory (PROM) - acts the same as ROM when it is part of the computer. I.e. it can only be read but its contents cannot be altered. However the data or programs are not stored in the memory when they are manufactured. Instead it can be loaded with special programs during installation.

- Erasable Prom (EPROM) - their data can be erased using special ultraviolet light device that destroys the bit settings within the memory.

CMOS Memory

Metal oxide semi conductor memory. This is a type of memory which is more permanent than RAM but less permanent than ROM which is used to store boot data such as the number of hard disk tracks and sections. CMOS require very little power to retain its contents and as such can be powered by battery. To change CMOS data, you usually run a CMOS configuration, or set up program.

The Central Processing Unit (CPU)

This is the circuitry in a computer that executes instructions to process data. CPU is the heart of the computer system. It retrieves instructions and data from RAM, processes them and places the result back into RAM so they can be displayed or stored.

CPU Architecture
The CPU consists of one or more integrated circuits. In microcomputer the CPU is a single integrated circuit called a micro-processor.

The CPU has two main parts; the arithmetic logic unit (ALU) and the control unit (CU).

The ALU performs arithmetic operations such as addition, subtraction, division and multiplication. It also performs logical operations such as comparing two numbers. It uses registers to hold the data that is being processed. In ALU, the results of an arithmetic or logical operation is held temporarily in the accumulator.

The CU (Control Unit) - directs and coordinates processing and places it in a special instruction register. The CU then interprets the instruction to find out what needs to be done. According to its interpretation, the control unit sends signals to the data bus to fetch data from RAM, and to the ALU to perform a process.

CPU Performance
CPU performance/speed is influenced by several factors such as clock rate, word size, cache and instruction set size.

Clock rate
A computer contains a system clock that emits pulses to establish the timing for all system operations. The "system clock" is not the same as "real-time clock" that keeps track of the time of day.

The system clock sets the speed for data transport and instruction execution. The clock rate set by the system clock determines the speed at which the computer can execute an instruction. The time to complete an instruction circle is measured in megahertz (MHz).

Word Size
This refers to the number of bits the CPU can manipulate at a time. e.g. CPU with 8 - bit word size is referred to as an 8 -bit processor. Today's faster computers use 32 bit or 64 - bit micro processors.

Cache
This is a special high-speed memory that give the CPU more rapid access to data. As you begin a task, the computer anticipates what data the CPU is likely to need and loads or caches this data into the cache area. The CPU then takes the data from cache instead of fetching it from RAM, which takes longer. Therefore more cache means faster processing.

Instruction Set Complexity
A computer with a complex instruction set is known as a complex instruction set computer (CISC). A computer whose CPU has a reduced instruction set called a reduced instruction set computer (RISC) has a limited set of instruction that it performs very quickly. Therefore RISC machine is more faster than CISC machine for most processing tasks.

Output Devices

Output is the data that has been processed into useful form/information that can be used by a person or a machine.
Most outputs are in form of reports or graphics. The most used output devices are:-

1. Printers

Printers can be classified by how they transfer characters from the printer to the paper.

Impact Printers
Transfer images into paper by some type of printing mechanism striking paper, ribbon, and character together.

Non-Impact Printers
Printing occurs w/o having a mechanism striking against a sheet of paper.
Speed
Another way of classifying printers is by speed:-

- Low speed- print one character at a time.
- Medium and high-speed printers - called line printers, can print multiple characters on a line at the same time.
- Very high-speed printers - can print excess of 3,000 lines per minute, often called page printers.

Types of Printers

1) **Dot Matrix Printers**
Create letters and graphics by striking an inked ribbon with a column of small wires called pins. By activating some wires in the column, but not activating others, the printer creates patterns for letters and numbers.
Advantages
- Low operating costs
- Low price
- Can print multi-part forms – Make carbon copies
- Durable

Limitations
- Noisy
- Low to medium quality output
- Slow

2) **Ink-jet Printers**
Produce characters and graphics by spraying ink onto paper. The print-head is a matrix of fire spray nozzles, patterns are created by activating selected nozzles.

Advantages

- Moderate price
- Inexpensive to operate
- High quality color printouts/high quality output.
- Quiet
- Durable

Disadvantages

- Slow
- Cannot print multi-part forms – cannot make carbon copies
- Poor quality colour compared to laser printers

3) **Laser Printers**

Use the same technology as the duplicating machines.

Advantages

- Quiet
- High quality output
- Fast
- High quality color
- Durable

Limitations

- Expensive color
- Cannot print multi-part forms
- More expensive to operate

Others

4) Daisy wheel printers
5) Thermal printers
6) Chain printers
7) Band printers

2. The Monitor (The Screen)

Also called cathode ray tube (CRT) or video display terminal (VDT). It lets you see the information you are exchanging with the computer. They can be either monochrome or color. Monochrome display only two colors, either black and white or green and black. The size is measured diagonally (like TV) in inches e.g. 14". Inside the monitor is a **video display** adapter, which is an expansion card that translates the signal, processed by the CPU into a format that the monitor can display.

3. Plotters

Used to produce high-quality line drawing, such as building plans, charts or circuit diagrams. The two types are (a) pen plotters - create image on a sheet of paper by moving the paper under the tip of pen (b) electrostatic plotters.

4. Computer Output Microfilm

COM is an output technique that records output from a computer as microscopic images on roll or sheet film.

5. Voice Output
Consist of spoken words that are conveyed to the user from the computer. The data that produces voice output is usually created in one of two ways:-

a) A person can talk into a device that will encode the words in digital pattern. The digital data is then stored on a disk. It can later be translated back from digital data into voice.

b) Voice Synthesizer:- can transform words stored in main memory into speech.

Auxiliary/Secondary Storage

Stores programs and data when they are not being processed. They are non-volatile ie. data and programs are retained when the power is turned off.

1) **Hard Disk:**
This is where most of the computer data is stored especially the programs and personal files. It consists of one or more rigid metal platters coated with a metal oxide material that allows data to be magnetically recorded on the surface of the platter.

2) **Floppy Disks/Diskettes/Floppies/Disks**
Consists of a circular piece of a thin Mylar plastic (actual disk) which is coated with oxide material. The circular piece is enclosed in a flexible square plastic jacket.

This type of storage is convenient, reliable and relatively low in cost. The storage capacity ranges between 360 K to 2.88 MB. They come in several sizes: Most common being 3½ inch.

3) **Magnetic Disk**
This is used for medium and large computers. They are similar to the devices used in PC's but have larger capacities.

COMPUTER SOFTWARE

Definition: Software refers to a group/set of instructions that enables the hardware to function:-

Types of Software
- systems software
- applications software

Application Software

Software that directs the computer to perform a specific task.

Types

a) Spreadsheets - manipulate rows and columns of number e.g. Lotus 123, Ms Excel.
b) Word processing - creates documents e.g. Word star, Ms Word.
c) Database - stores, organizes and retrieves data e.g. MS Access
d) Electronic mail - transmit electronic messages e.g. Ms Outlook
e) Desktop publishing - layout and create documents containing text and graphics e.g. PageMaker.
f) Graphics - pictorial representation of data e.g. Harvard graphics, Ms Power point.

System Software

These are the programs that monitor and control the operations of a computer. They run the computer system by performing a variety of fundamental operating such as:-

- Booting the computer and making sure all the aspects are operational.
- Performing operations such as retrieving, loading, executing and storing application programs.
- Storing and retrieving files.
- Performing a variety of system utility functions.

Operating system

This is a suit/collection of related computer programs that help manage the computer resources. It is an interface between the computer hardware and application programs.

Functions of Operating Systems

1. **Process Management**: - The operating system must keep track of all processes. It must schedule programs when needed, and monitor them incase of any error.
2. **Resource management**: - The operating system allocates system resources such as CPU, main memory and the input and output devices such as disk and tape drives and printers.
3. **Data management**: - Also called Input and output management. The operating system handles all movements of data between the main components of the computer. Any time an input or output of data occurs, a data management routine in the OS controls the transfer. For example, any time a number input devices try to send data to a computer, it is the operating system to manage all these I/0 processes. Because I/0 devices are very slow, the process of **spooling** prevents the data from being stored in the main storage. With spooling, a report is first written (saved) to the disk before being printed. The disk or tape acts as a buffer area between main storage which is extremely fast and I/0 devices which are relatively slow.
4. Monitoring system activities such as system performance and system security.
5. Error Correction

Types of Operating Systems

Operating Systems can be classified by two criteria:-

(i) Whether or not they allow more than one user to use the computer at the same time.
(ii) Whether or not they allow more than one program to run at the same time.

Single program/single user program
This allow only a single user to run a single program at one time e.g. MsDos.

Multiprogramming/Multitasking OS
Allow more than one program to be run at the same time. The CPU switches back and forth between programs. E.g. the computer could be performing a complex spreadsheet calculation at the same time downloading a file from another computer while the user is writing a memo.

Multiprogramming OS on PC's can usually support a single user running multiple programs. On some PCs and most mini and mainframe computers, the Multiprogramming/OS's can support more than one user running more than one program. This version of mp/os is called multi-user - multiprogramming operating system.

Multiprocessing
Computers that have more than one CPU are called **multiprocessors**. A multiprocessing operating system co-ordinates the operating of multiprocessor computer. They have an advantage that if one CPU fails, work can be shifted to the remaining CPUs. The ability to continue processing when a major component fails is called **fault tolerance**.

Virtual Machine: VM
VM operating system, available on some large computers, allows a single computer to run two or more different operating system. It allocates system resources to each operating system.

The advantage is that an organization can concurrently run different operating systems that are best suited for different tasks.

Popular Operating Systems
Many computer users move away from proprietary operating systems (privately owned) and toward portable operating system that will run on many manufacturer computers.

1) Personal computer operating systems.
E.g. Dos, Operating System 2, MultiFinder (Macintosh) - uses icon and graphics instead of command lime os2 and Dos. Win 95/98/ME/NT/2000/XP/Vista.

2) Minicomputer OS's
e.g. - UNIX
- VMS for XAX (virtual address extension) computers

3) Mainframe Operating Systems
E.g. MVS - Specializes in batch processing.

Utilities and Service Programs

Utilities also called service programs are system programs that provide useful service to the computer user by providing facilities for performing common tasks of a routine nature.

The common utility programs are:

- Sort
- Editors
- File copying
- Dump
- file maintenance
- tracing and debugging
- formatting disks and diskettes
- deletion, renaming etc.

Editing allow uses to make direct changes to programs and data.

Translators

These are the software that converts the source code/programs to their object code/program equivalence.

Types of translators

1) Assembler - A program that translates assembly language programs into machine code.
2) Compiler - A program that translates a high-level language program into machine oriented language program, often machine code.
3) Interpreter - A program which translates and executes each source statement in logical sequence as the program is executed. It looks at the program on a line to line basis.

Questions

1. What kind of software is the Operating System
2. Define the following terms
   a) Multitasking
   b) Fault tolerance
   c) Multi-user system
3. Identify 5 functions of an operating system
4. How does an operating system use time slice?
5. List the various types of operating systems and briefly describe their capabilities.
6. What do we mean by a VM OS
7. What advantage does a virtual machine Os have
8. What do you understand by the term spooling?

Week 3 Students learning objectives

1. Differentiate between a LAN, WAN and MAN.
2. Define and classify computer networks.
3. Explain the concept of virtual machines as used in computing.
4. Outline advantages disadvantages of using virtual machines.
5. Explain how virtual machines are applied to business.
6. Explain how the internet works and outline its uses.
7. Differentiate between internet and the World Wide Web.

COMPUTER NETWORK

A computer network is a collection of computers and other devices that communicate to share data, hardware and software.

LAN
A local area network (LAN) is a computer network covering a local area, like a home, office or small group of buildings such as a college. LANs are distinguished from other kinds of networks by three characteristics: (1) their size, (2) their transmission technology, and (3) their topology.

MAN
Metropolitan Area Networks or MANs are large computer networks usually spanning a campus or a city. They typically use wireless infrastructure or optical fiber connections to link their sites.
For instance a university may have a MAN that joins together many of their campus local area networks (LANs) around a city.

WAN
A wide area network or WAN is a computer network covering a wide geographical area, involving a vast array of computers. The best example of a WAN is the Internet. WANs are used to connect local area networks (LANs) together, so that users and computers in one location can communicate with users and computers in other locations. Many WANs are built for one particular organization and are private.

We can have two types of networks (configurations).

- ***Client/server*** network where we have one server and many clients.
- ***Peer-to-peer*** network – all computers have the same capability and can communicate with each other.

Network Hardware for LAN

1. Network interface card (NIC)

This is the key hardware component for connecting a computer to a LAN. It is a small circuit board designed to plug into an expansion slot on a computer main-board. The NIC sends data from your

workstation out over the network and collects incoming data for your workstation. Most recent computers have them integrated onto the motherboard.

2. *Connecting cables*:-
The cables commonly used for interconnecting PCs are the twisted pair copper wires, either Category 5 (CAT 5) or Category 6 (CAT 6) cables. Or fiber optic conections.

Instead of using cables, some wireless networks use radio or infrared signals to transmit data from one network device to another. The NIC on a wireless network contain the transmitting device necessary to send data to other devices on the LAN.

3. Network Servers
These are different kinds of network servers.
A dedicated file server is devoted only to the task of delivering programs and data files to workstations. It does not process data or run programs for the Workstations. Instead programs run using the memory and processor of the workstation.

Non-dedicated server (peer-to-peer capability) here a network computer performs a dual role as both file server and workstation.

4. *Print server* – stores files in a print queue and sends each queued file to the network printer. A print job is a file that has been sent to the printer.

Application server is a computer that runs application software and forwards the results of processing to workstations as requested. It makes it possible to use the processing power of both the server and the workstation.

5. *Modem* - These are devices that modulate and demodulate data. Modulation is the process of conversion of the computer data into analog signals before being transferred over a standard telephone line.

Demodulation refers to converting back the data to digital form. The quality of a modem is determined by its transmission speed. It can be either internal or external.

Software for Network
Network operating system
A network requires network software or network operating system to control the flow of data, maintain security, and keep track of user accounts.

Examples:
Network Operating Systems such as Novell Network, Banyan lines, and LANtastic are software packages designed to control data flow.

Network software is sometimes included as a component of popular computer Operating systems such as windows for workgroup, windows 9x, UNIX, OS. A network OS has both the server and client software.

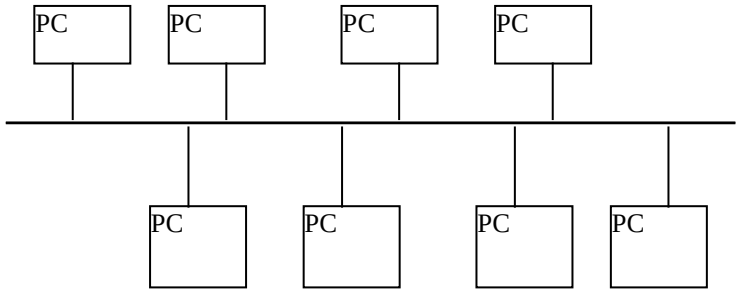
Standalone Applications
Most applications designed for standalone computers can be installed on a network server, which sends them to individual workstations as requested.

GroupWare
A workgroup is basically two or more people who work on the same project. GroupWare is application software that support collaborative work, usually on a LAN.

Network permits use of application programs by multiple people on a network.

Network Topologies
This refers to how devices on LAN are connected to each other.

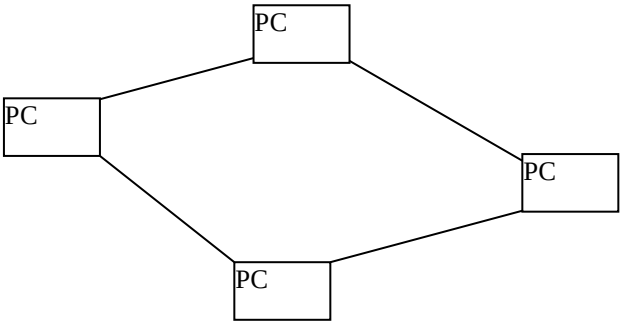
a) ***Bus-topology***
Here the new nodes are easily added to a bus and all nodes may directly communicate with each other, we use the coaxial cable to connect the workstations:



Advantages
- Easy to implement and extend
- Well suited for temporary networks (quick setup)
- Typically the cheapest topology to implement
- Failure of one station does not affect others

Disadvantages
- Difficult to administer/troubleshoot
- Limited cable length and number of stations
- A cable break can disable the entire network
- Maintenance costs may be higher in the long run
- Performance degrades as additional computers are added

b) ***Ring topology***
Here every node is connected to two other nodes. Movement of data on the ring is normally in one direction to prevent signals from interfering with each other.



Advantages

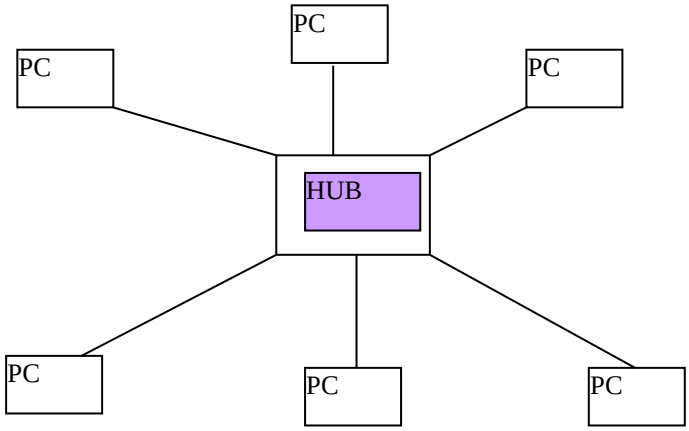
- Growth of the system has minimal impact on performance
- All stations have equal access
- Each node on the ring acts as a repeater, allowing ring networks to span greater distances than other physical topologies.
- Because data travels in one direction high speeds of transmission of data are possible

Disadvantages

- Often the most expensive topology
- Failure of one computer may impact others

c) ***Star topology***

Here all the messages pass through a central switch/hub. It allows any node to communicate with every other node by sending messages to the hub.



Advantages

- Easy to implement and extend, even in large networks
- Well suited for temporary networks (quick setup)
- The failure of a non central node will not have major effects on the functionality of the network.

Disadvantages

- Limited cable length and number of stations
- Maintenance costs may be higher in the long run
- Failure of the central node can disable the entire network.

Exercise
Read and make short notes on:

d) Mesh topologies
e) Tree topologies

Network Protocols:
A communication protocols is a set of rules that ensures the orderly and accurate transmission and reception of data. The most widely used network communications protocol are:
TCP/IP (Transmission control protocol/Internet protocol) which is used on minicomputer, micro computer and mainframe networks. It is frequently used in UNIX and Win. NT systems and is the basis for a communication on the network.

IPx (Internet-work packet exchange) is the protocol used by Novell NetWare, the most popular microcomputer network software.

COMPUTER VIRUSES

A computer virus is a program that has the ability to reproduce/replicate itself without the user's knowledge. For example, it may attach itself to the DOS program FORMAT and run every time you format a diskette.
There are other types of software that can cause problems in a PC. However, no other software can replicate and it is this characteristic that makes a program a virus.

Effects of Viruses:

- A virus can destroy/delete or corrupt data e.g. those on specific applications such as all Excel files or all word files e.g. Sircam worm deletes data.
- Display irritating message, or otherwise disrupt computer operations. Most viruses stay in your PC's memory where they can cause problems by interfering with other software you are trying to run.
- Disable hardware, making the computer unusable.
- It can perform dangerous operations like formatting the hard disk.
- It consumes the disk space, memory and wastes the processor time.
- Once you have a virus, it is very likely that you will pass it on to a colleague or a customer, who may well lose confidence in you and your company.

Types of Viruses:

File viruses:
A file virus infects the executable program files on your computer system. These usually, but not always, have COM or EXE file extensions. When you run an infected program, your computer also runs the attached virus instructions to replicate or to deliver its payload. The term payload refers to the ultimate mission of a virus. For example, the payload of the "stoned" virus is the message," your Pc is now stoned".

Only a few viruses such as Cinderella and Frodo, are designed to infect data files. Because a virus needs to be executed to spread, a data file can only be a carrier, it cannot deliver the payload.

Boot Sector Viruses
These infect the system files your computer uses every time you turn it on. The boot sector is the part of every hard disk and diskette, which is read by the computer every time you start it up. The partition sector, also called the Master Boot Record (MBR), is the first part of the hard disk to be read after the system has started up. It contains information such as the number of sectors in each partition and the location of all the partitions.

If your booting disk is infected and you try to boot your computer with it then the following message is likely to be displayed.

- Non-system disk or disk error
- Replace and press any key when ready.

By this time the virus has already run and your PC may already be infected. In most cases, the virus loads itself into memory and infects the partition sector of the hard disk. It replaces the original partition sector with its own code. If this partition sector is infected, when the PC is rebooted from the hard disk, the virus is loaded into memory. Any diskette subsequently accessed is infected.

Companion Viruses
If you have a COM file and an EXE file of the same name, Dos always runs the COM file in preference to the EXE file is not file extension is given. Companion viruses make use of this fact by creating COM files with the same name as the legitimate EXE files, thus ensuring they are executed. They then pass control to the original EXE file which runs normally.

Symptoms of the Viruses
The symptoms of a virus infection depend on the virus. The following symptoms might indicate that your computer has contracted a virus. However, some of these symptoms can have other causes.

- Your computer displays annoying messages such as “Gotcha! Arf Arf! “You are stoned”
- Your computer develops unusual visual or sound effects. For example, characters begin to disappear from your screen or the sound of a flushing toilet comes for your computer’s speakers.
- You have difficulty saving files.
- Your computer suddenly seems to work very slowly.
- Files are mysteriously missing.
- Your computer reboots unexpectedly.
- Your executable files unaccountably increases in size.

Viruses are just one type of program in a large category of software designed by hackers to disrupt or damage the data on computers.

Other Potential Problems are:

Trojan Horse

A Trojan horse is a computer program that appears to perform one function while actually doing something else. They are less widespread than viruses because they do not replicate, but they can represent a threat when copied. A Trojan horse sometimes, but not always, harbors a virus.

For example, a hacker may write a program to format hard disk drives and embeds this program in a file called sched**.**exe. He then distributes the disk containing this Trojan and posts it to computer bulletin boards where other users are likely to assume that it is a free scheduling program, just to realize that it has deleted all the files upon execution. This Trojan horse does not harbor a virus because it does not replicate itself.

Another popular Trojan horse looks like the login screen on a network. However, as a user logs in, the Trojan horse collects the user's ID and password. These are stored in a file that hackers can access later. Armed with a valid user ID and password, the hackers can access the data stored on the network.

Time Bombs and Logic Bombs

A time bomb is a computer program that stays in your system undetected until it is triggered by a certain event in time, such as when a computer system clock reaches a certain date. It is usually carried by a Trojan horse or a virus.

A notorious time bomb appeared in December 1989. Many hospitals and medical clinics received in innocent looking package containing "ADS information" software from a company called PC Cyborg. The process of installing the software also installed a time bomb. After the computer was booted a certain number of times, the time bomb scrambled the data on the hard disk. Next, the bomb displayed an invoice demanding payment before the method for unscrambling the hard disk was revealed.

A logic bomb is a computer program that is triggered by a specific set of conditions, such as the number of files in a disk, or a certain sequence of characters being entered. It can be carried by a virus or a Trojan horse. But it could also be a stand alone program.

Worms

A software worm is a program designed to enter a computer system – usually a network through security holes. Like a virus, a worm reproduces itself. Unlike a virus, a worm does not need to be attached to an executables program to reproduce. These security holes may be electronic mail system.

Spread

- Through data transfer; either through auxiliary storage devices, or from one computer to the other through networking. It is spread when an infected program is executed or the computer is booted from infected diskette. Through electronic communication devices/times as attached to emails.

Control/Avoidance and Detection

- Avoid using high-risk disks programs e.g. disks containing public domain software or shareware and on disks containing illegal copies of computer programs downloaded form

bulletin boards. You must use a virus detection program to check for viruses before you run any programs from such disks.

- Use of virus detection program/anti-virus programs which examines the files stored on a disk to determine if they are infected with a virus, then disinfects the disk, if necessary.
- Backups – make regular backups of your system.
- Write-protect all boot diskettes. Viruses cannot infect manually protected diskette.

Week 4 Students learning objectives

1. Understand what to look for when making decisions on choice and use of computers: - the consumer guide.
2. Identify the versions of windows Operating system.
3. Be able to start, log in, log off, shut down and restart windows
4. Manipulate the start menu: - customize the start menu.
5. Navigate through windows: - opening folders, minimize, maximize.
6. Use the search tool.
7. Customize the desktop and the task bar.
8. Work with the internet explorer, accessories:
9. Be able to use the help facility for windows.

CONSUMER'S GUIDE TO DESKTOP COMPUTER SYSTEMS

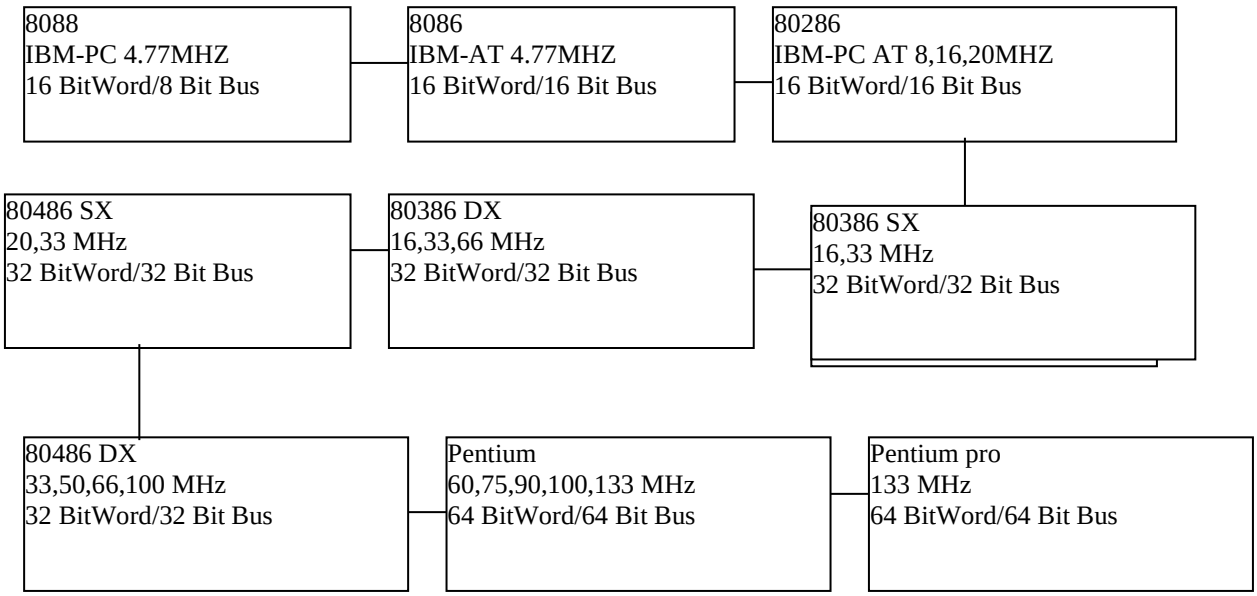
When buying a new computer you must look at the specifications describing the computer's components, capabilities, and special features.
The following specifications will help you.

Comparing Microprocessors

You must determine which microprocessor is best for your computer needs.
The microprocessor is the core component in a computer and its speed and type has to be specified. Most of today's microcomputers are designed around a microprocessor from one of three product families; x 86, 68000 series, or power PC. 68000 series microprocessors are manufactured by Motorola and used by apple in its Macintosh classic, SE, Quadra, and Performa computers.

The power PC microprocessors implements RISC architecture to provide relatively fast performance at low cost. X86 microprocessors work with IBM compatible computers. If you want to use software for windows, select a computer with an x86 microprocessor. If you want to use software designed for Macintosh, select a computer with a 6800 series or power PC microprocessor.

The following chart will help you compare the specifications of the microprocessor.



The Cost and benefits of RAM cache.
A RAM cache is very important for optimum performance of computer with high speed processor because the CPU can process data faster than it can retrieve it from regular RAM area. A Pentium computer should have at least 256 K cache memory chips.

RAM requirements
The amount of RAM a computer needs depends on the operating system and applications software you plan to use. The higher the RAM the better the choice.

The number and type of floppy disk drive
CD – ROM Drive
Lets you use multimedia, game, educational, and reference applications that are available only on CD – ROM disks.
Hard Drive Specifications.
The factors that influence hard drive performance and price include storage capacity, controller type, cache capacity, and bus speed.
The system unit case.
The system unit case holds the main board and provides openings, called bays for mounting disks, CD/DVD ROM/WRITER. Some bays are external and others internal. A system unit with many bays provides greater expansion capability.

Video Adapters and Monitors
Monitor specifications include screen size, maximum resolution and dot pitch. Dot pitch is a measure of image clarity. A video display adapter also called a video card or graphics card, is an expansion card that provides a data pathway from the main board to the monitor. Display resolution depends on the video display adapter that connects the monitor to the computer. Today most computers have a super VGA (SVGA) video adapter.

Sound card

If you want to run games or multimedia software, you should purchase a computer system that includes a sound card.

Selecting a modem

Many computer systems include internal modems that transmit to and receive data from other computers over telephone lines. The speed of transmission is usually expressed as baud rate or as bits per second (BPS). The bald rate is the number of signal that occurs in one second during data transmission. A fax/modem is a modem that includes fax capability.

The value of bundled Software

The price of most computers includes the operating system; you can expect that the latest version of Windows will be installed on the hard-disk by the vendor. Many computer vendors also include application software such as Microsoft Office package.

Week 5 Students learning objectives

1. Understand the toolbar, shortcut menus and keystrokes.
2. Be able to perform quick movement around document and selection of text.
3. Be able to edit documents, delete, enter and alter existing text.
4. Be able to handling documents: - retrieving existing documents, saving files, location of folders.
5. Be able to use different views of the document.

WINDOWS XP/VISTA

What Is an Icon?

An *icon* is a little picture on your screen. When you click or double-click the icon, or select the icon with the keyboard and press ENTER, something happens. Windows uses icons to represent programs, files, and commands. See Figure 1-2.

Figure 1-2

Many programs provide labels for their icons. Icon labels may appear just below the icon, or they may appear in a little box when you rest the mouse pointer on the icon for a moment.

You can choose how the icons on your Windows desktop and those in Explorer windows work when you click them--they run when you double-click them.

Icons on your desktop that include a curved arrow in a little white box in the lower-left corner of the icon are *shortcuts* and represent files or programs on your computer. You can create your own shortcut icons.

Taskbar

The *taskbar* is a row of buttons and icons that usually appears along the bottom of the screen, as in Figure 1-3. You can configure Windows to display the taskbar along the top or side of your screen. You can also tell Windows to hide the taskbar when you aren't using it.

OR

Figure 1-3

The taskbar has several parts:

- The Start button is usually at the left end of the taskbar.
- The task buttons represent each window that is open on the desktop.
- The taskbar can contain one or more toolbars (sets of buttons). (None appear in Figure 1-3.)
- The notification area contains icons for Windows programs that require your attention, along with a clock. This area used to be called the system tray.

Start Menu

When you click the Start button on the taskbar, the Start menu appears. You can also display the Start menu by pressing the WINDOWS key (if your keyboard has one) or by pressing CTRL-ESC.

The Start menu lists commands and additional menus that list most of the programs that you can run on your computer. It looks something like this:

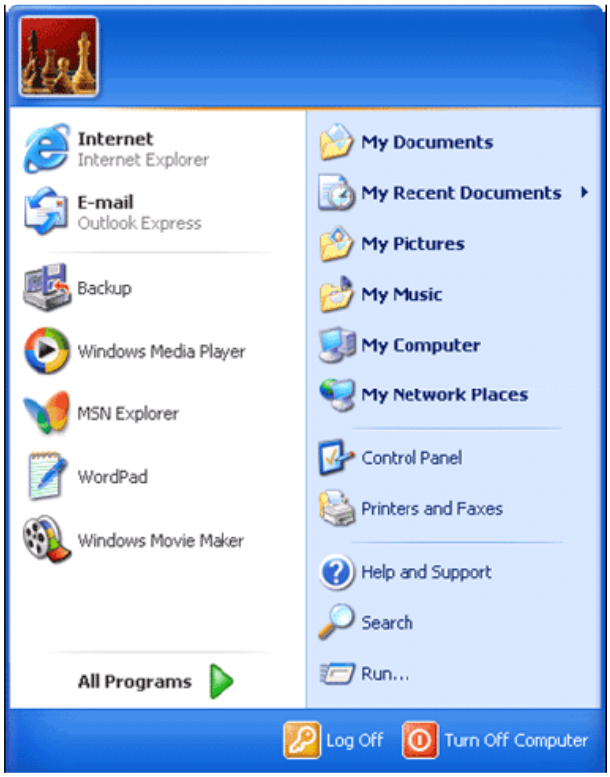


Figure 1-4

Task Buttons

Task buttons are the buttons on the taskbar that represent each program that is running. If a program displays more than one window, more than one task button may appear. Each task button displays the icon for the program and as much of the program name as can fit. Some programs display other information on the task button; for example, Notepad displays the name of the text file that is open.

Click a window's task button to select that window, that is, make that window active. You can also right-click a button to see the system menu, a menu of commands you can give regarding that window, including opening and closing the window.

If the taskbar gets too full to fit task buttons for all the open windows, Windows groups the buttons together, with one button for each application. For example, if you have two Internet Explorer browser windows open, you see one button for the program, with a 2 in the label, like this:

Figure 1-5 Click the task button to see a menu of the windows displayed by that program.

Click the task button to see a menu of the windows displayed by that program.

Notification Area

The notification area appears at the right end of the taskbar and contains the system clock along with a group of tiny icons:

Figure 1-6

When you move the mouse pointer to the clock, after a moment the current date also appears. The icons in the notification area represent programs that need your attention.

Some programs add icons to the notification area. To find out the name of an icon, move the mouse pointer to the icon, without clicking. After a moment, the icon's label appears. Some icons display information rather than a label (for example, the Power Management icon that appears on the system tray of most laptops displays how much charge is left in the laptop's battery).

Mouse Pointer

The mouse pointer indicates which part of the screen will be affected when you click your mouse's buttons. As you move the mouse, trackball, or other pointing device, the mouse pointer moves, too. A separate indicator, the cursor, which usually appears as a blinking vertical line, shows where text you type will appear.

Starting Up Windows

On most systems, Windows starts automatically when you turn on the computer. You see whatever messages your computer displays on startup, followed by the Windows splash screen (logo). Click your user account name: if the account requires a password, type your password and press ENTER.

Shutting Down and Restarting Windows

When you need to turn off the computer, you must shut down Windows first to allow Windows to close all its files and do other housekeeping tasks before terminating. To shut down Windows, choose Start | Turn Off Computer, or click anywhere on the desktop and press ALT-F4, or press CTRL-ESC and choose Shut Down. You see the Turn Off Computer dialog box:

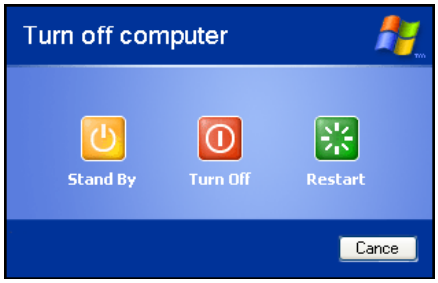


Figure 1-7

Your options are:

- **Stand By** Stores the programs and data that are currently open, and then shuts down Windows so you can turn the computer off. The next time you turn your computer on, you can pick up just where you left off.
- **Turn Off** Shuts down Windows.
- **Restart** Shuts down Windows, and then reloads it (useful if your computer starts acting funny).

What Do The Parts Of Windows Do?

Figure 1-8 shows a program (this example shows WordPad, a simple word processor that comes with Windows) running in a window. Although what's inside the window frame changes from program to program, most windows you see in Windows include the following components:

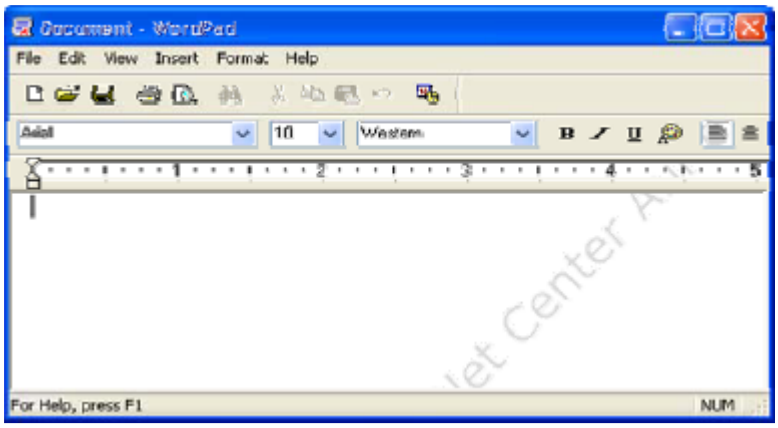


Figure 1-8: The parts of a window

• **System Menu button** Displays a menu of commands you can use to move and resize your window.

• **Title bar** Displays the title of the window and provides a way to move the window around within the screen.

• **Minimize button** Shrinks the window to an icon on the taskbar.

• **Maximize or Restore button** When you click the Maximize button, the window expands to cover the whole screen. Once a window has been maximized, the Maximize button disappears and is replaced by the Restore button. When you click the Restore button (with two overlapping rectangles), the window shrinks to its previous size and the Maximize button reappears.

• **Close button** Closes the window and exits the program.

• **Menu bar** Provides a row of menus you can use to choose commands.

• **Toolbar** Provides a row of buttons you can click to give commands.

• **Status bar** Displays information about the program. Some programs enable you to give commands by clicking parts of the status bar.

• **Scroll bar** Provides a way to "pan" your window up and down, or left and right to show information that doesn't fit in the window. Scroll bars may be horizontal (running along the bottom edge of a window) or vertical (running down the right edge of a window). All scroll bars have arrow buttons at each end and a sliding gray box somewhere in the scroll bar; some programs display scroll bars with additional buttons (for example, to scroll one page of a document at a time).

• **Window borders** Provide a way to drag around the edges of the window to change the size and shape of the window.

System Menu

Figure 1-9

You can also display the System menu by pressing ALT-SPACEBAR or by right-clicking the title bar of the window.

The commands on the System menu do the following:

• **Restore** Resizes the window to its previous size, the same as the Restore button.

• **Move** Enables you to move the window around on your screen by using the cursor (arrow) keys. This command does the same thing as dragging the window's title bar with the mouse. Press ENTER to finish moving the window.

• **Size** Enables you to change the size of the window by using the cursor keys. This command does the same thing as dragging the window borders with the mouse.

• **Minimize** Minimizes the window, shrinking it to a small icon, the same as the Minimize button.

• **Maximize** Maximizes the window to cover the whole screen, the same as the Maximize button.

• **Close** Closes the window, the same as the Close button.

Some applications also add their own commands to the System menu.

Starting Programs from the Desktop

If an icon for the program appears on your Windows desktop, click the icon either once or twice to run the program. If the labels under the icons on your desktop are underlined, click once. If the labels are not underlined, double-click.

Starting Programs from the Start Menu

To launch a program from the Start menu, click the Start button. You see the Start menu, as shown here:

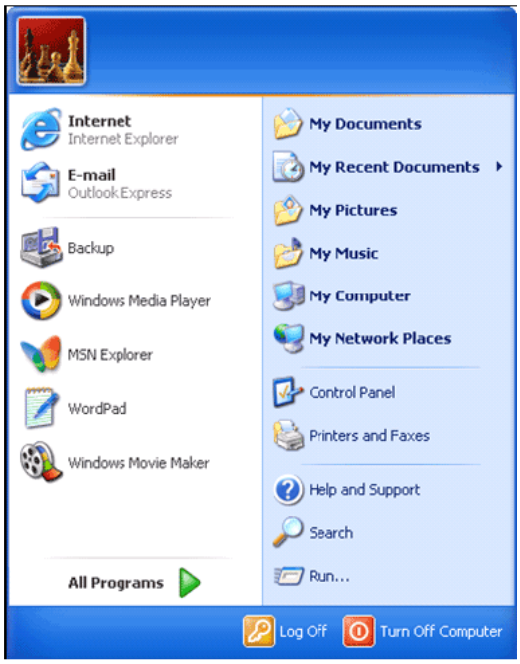


Figure 1-10

At the top of the left side are Internet and E-mail, which run your default Web browser and e-mail program. You can add other programs, too. Below that are icons for programs you've run frequently and recently: Windows chooses these programs according to your usage. At the bottom of the left side is the All Programs button, which displays menus that usually include the rest of the programs that are installed on your computer.

The right side of the Start menu lists the folders that Microsoft suggests you use for your files (My Documents, My Pictures, and My Music) and My Computer (to run Windows Explorer). If your computer is on a network, My Network Places appears. The other choices are usually Control Panel (for computer administration), Connect To (if your computer is on a LAN or the Internet), Help and Support, Search (for finding files and other information), and Run (for running a program whose filename you know).

If you can't find the program you want, and you think it's been installed on your computer, click the All Programs button on the Start menu (that is, choose Start | All Programs).

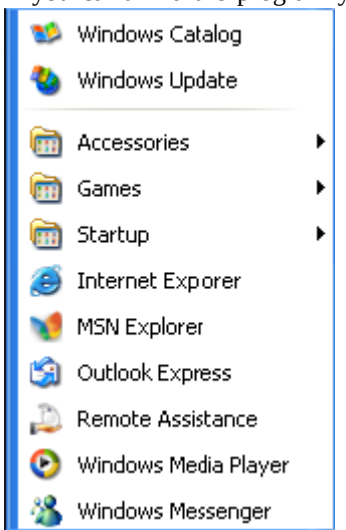


Figure 1-11

When your mouse pointer is on a menu name, a submenu appears (usually to its right). Point to menus until you see the name of the program you want to run, then click the program name. Most programs appear on the Programs menu or on its submenus (because most installation programs add commands for the programs that they install). You might need to try several menus to find the one that contains the

program you want. You can always press ESC to cancel the menu you are looking at (moving your mouse pointer off the menu usually cancels the menu, too). For example, WordPad appears on the Accessories submenu of the Programs menu. To run WordPad, choose Start | All Programs | Accessories | WordPad.

You can rearrange the programs on your Start and Programs menus so the programs you most frequently run appear on the Programs menu or the Start menu rather than on a submenu. You can also create desktop icons for any programs on these menus.

Starting Programs by Clicking Program Filenames

Programs are stored in files, usually with the filename extension .exe (short for "executable") or .com (for "command"). Windows displays the names of program files in Explorer windows. To run the program, double-click the filename of the program you want to run.

For example, if you double-click the filename Mspaint.exe, Windows runs the Microsoft Paint program. You can usually guess the program name from the filename, though some filenames can be cryptic.

Starting Programs by Clicking Document Filenames or File Icons

Windows knows which programs you use to open which types of files. For example, it knows that files with the .doc extension are opened using Microsoft Word. When you install a program, the installation program adds a file association to Windows, so Windows knows what kinds of files it can open.

Choosing Commands from the Menu Bar

The *menu bar* is a row of one-word commands that appears along the top of a window, just below the title bar. To choose a command from the menu bar or to choose a command from any drop-down menu, click it. For example, to choose the File | Open command, click the word "File" on the menu bar and click the word "Open" on the File drop-down menu.

When you choose a command on the menu bar, a *drop-down menu* usually appears. Each drop-down menu is named after the command that displays it. For example, most programs include a File command as the first command on the toolbar. Choosing the File command displays the File drop-down menu, a list of commands that have something to do with files, such as opening, closing, or saving files:

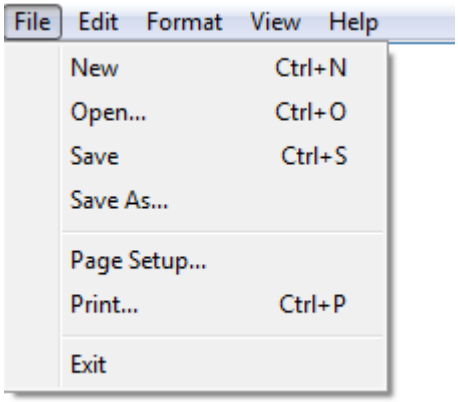


Figure 1-12

If your screen doesn't have room for the entire drop-down menu to appear, you see a downward-pointing triangle at the bottom of the submenu; click the arrow to see the rest of the menu. Many programs use a Windows feature that displays only the most frequently used commands or the commands you've chosen recently. At the bottom of the menu is a double-*V* character (a double downward-pointing arrow) that you can click to see the rest of the available commands.

Clicking Buttons on the Toolbar

Most (but not all) Windows programs display a *toolbar*, a row of small buttons with icons on them, just below the menu bar, for example:

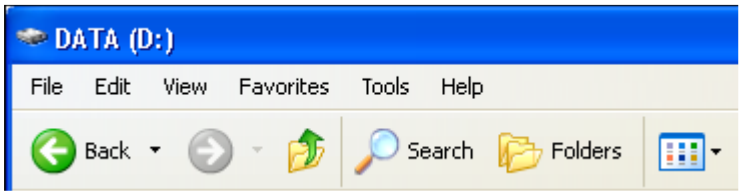


Figure 1-13

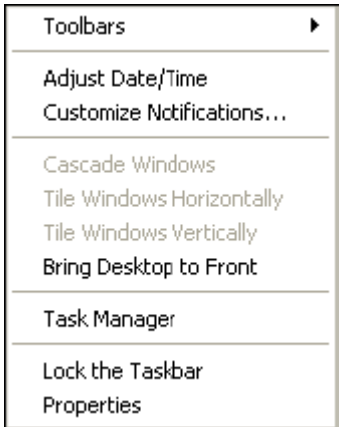
Clicking a toolbar button issues a command, usually a command that you also could have issued from the menu bar.

To find out what a toolbar button does, rest the mouse pointer on the button, but don't click. After a second, a small label appears near the button, naming or explaining the button (this label is sometimes called a *tool tip*). Some programs display toolbar buttons that contain text along with icons, for people who like words with their pictures.

Some programs let you move the toolbar to other locations, including into a separate floating window. Try clicking a blank part of the toolbar and dragging it to another location in the program window. And some programs that come with Windows XP enable you to lock the toolbar, to prevent anyone from changing or moving it. Right-click a blank place in the toolbar to see if a command like "Lock The Toolbars" appears.

Choosing Commands from Shortcut Menus

Windows and most Windows-compatible programs display special menus, called *shortcut menus* (or *context menus*), when you click with the right mouse button. The shortcut menu displays commands appropriate to the object you clicked. For example, if you right-click a blank space on the Windows taskbar, the shortcut menu that appears contains commands you can perform on the taskbar or desktop:



Commands on shortcut menus contain the same symbols (ellipses, triangles, and toolbar buttons) that appear on drop-down menus.

After you have displayed a shortcut menu, you can choose a command from the menu by clicking the command (with the left mouse button) or pressing the underlined letter in the command. If no letters are underlined in the commands on the menu, pressing a letter usually selects the first command that starts with that letter. To cancel a shortcut menu, click outside the menu or press the ESC key.

Getting Help

The Help And Support Center contains information about Windows XP and some of the programs and accessories that come with it. Other programs that come with Windows, and most third-party applications, have separate help systems. Most programs have two ways of displaying Help screens: Choose Help, Help | Contents, Help | Help, or Help | Topics from the menu bar, or press the *F1* key.

Displaying Help Screens

To see the Help And Support Center window (shown in Figure 1-16), choose Start | Help And Support. The toolbar shows many of the same icons you see in any Explorer window, including Back, Forward, Home, Favorites, and History. You also see Index, Support, and Options commands. The Task pane (left side of the

window) shows a list of topics from which to choose. The rest of the window displays the help information you request from the Task pane.

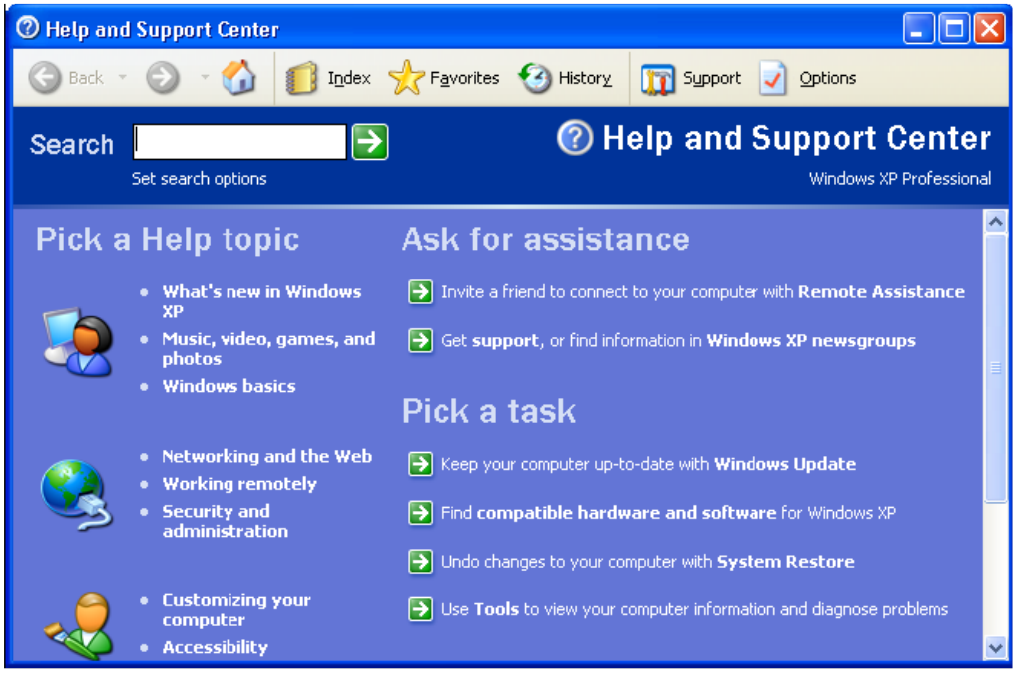


Figure 1-16: The Home page of the Help And Support Center

When the Help And Support Center window first appears, you see lists of help topics and tasks (click Home on the toolbar to return to it). Click a topic to see a detailed list of subtopics in the left pane. When you see a plus box to the left of a topic, click the plus box to see its subtopics. When you see a topic with a question-mark icon to its left, clicking the topic displays an explanation, and steps to follow, in the right pane. If a word or phrase becomes underlined when you move your mouse pointer over it, click it to see information about that topic.

If your computer is connected to the Internet, Windows automatically updates the home page of the Help And Support Center with news and updates, which appear in the lower-right corner of the window.

Cutting, Copying, and Pasting

Cut-and-paste is a feature of Windows that enables you to select information from one file and move or copy it to another file (or to another location in the same file). Cut-and-paste works by storing information temporarily on the Clipboard. The following cut-and-paste techniques enable you to copy or move information within or between almost any Windows application:

- **Cut** Removes selected information from its current location and stores it (temporarily) on the Clipboard.
- **Copy** Copies selected information and makes a (temporary) duplicate of it on the Clipboard.
- **Paste** Copies information from the Clipboard to the location of the cursor in the active application.

To move information, you select it, cut it to the Clipboard, and then paste it in the new location. To copy information, you select it, copy it to the Clipboard, and then paste it in the new location.

You can cut, copy, and paste information by using the following methods (some methods might not work in some applications):

- **Menu** Choose the Edit menu's Cut, Copy, and Paste commands.
- **Keystrokes** Press CTRL-X to cut, CTRL-C to copy, and CTRL-V to paste.
- **Buttons** Many applications have toolbars with Cut, Copy, and Paste buttons, as shown here:

Figure 1-19

- **Mouse** Many applications provide shortcut menus that include the Cut, Copy, and Paste commands. Right-click an object to see a shortcut menu.

The following steps explain how to copy or move text from one location to another:

1. Select the information you want to copy or move.

   • You can select information by highlighting it with the mouse or by holding down the SHIFT key as you use the arrow buttons. The help system of the application you're using will contain more information regarding how to select in that application.

   • Be careful when you have information selected. Depending on the application, you can inadvertently replace the whole selection by typing a character or space or by pressing the DELETE or BACKSPACE keys. Usually, a simple click deselects the information, ending the danger.

   • If you're afraid you deleted something by mistake, press *CTRL-Z* to undo the change in most programs.

2. If you want to copy the information, press CTRL-C, click the Copy button, or choose Edit | Copy. If you want to move the information, press CTRL-X, click the Cut button, or choose Edit | Cut.

3. If you are copying, you don't see any change on the screen when you give the Copy command. If you are cutting, however (which is useful if you want to move information), the selected information disappears from the screen--it is now stored on the Clipboard.

4. Move the cursor to the place you want the information to appear. This may mean changing applications by clicking a button on the taskbar, or even opening a new application. As long as you don't cut or copy anything else or turn off the computer, the information will be available to be pasted to a new location.

5. Paste the text by pressing CTRL-V, by clicking the Paste button, or by choosing Edit | Paste. The information you cut or copy appears at the location of the cursor.

Once you cut or copy information onto the Clipboard, you can make multiple copies of it by pasting it as many times as you want.

Drag-and-Drop

Drag-and-drop is another method of moving or copying information from one file to another, or to another location in the same file. To move information from one location to another, select it with your mouse and drag it to its new location.

Not all programs support drag-and-drop. Some programs copy the information you drag, rather than move it. Some programs enable you to choose whether to move or copy the information (for example, a program may enable you to copy the information by holding down the CTRL key while dragging).

Using Files and Folders

What Is a File?

A *file* is any collection of related information that is given a name and stored so it can be retrieved when needed. A file may contain any kind of information: a program or application (WordPad, for example, is in a file called Wordpad.exe); a document; a part of a document, such as a table or an illustration; a sound or piece of music; a segment of video; or any number of other things.

What Is a Folder?

In Windows the fundamental device for organizing files is the folder. The files on the list are said to be *in* the folder, and each file is allowed to be in only one folder. A folder can be either open or closed. When a folder is closed, all you see is its name and the folder icon, as shown here:

Figure 1-20

Windows comes with several folders that Microsoft suggests you use for your files--My Documents, My Music, and My Pictures. Another icon, My Computer, looks like a folder, and contains all the disks accessible from your computer. These customized folders have unique icons:

Figure 1-21

When a folder is open in Windows Explorer, it has its own window, and the files contained in the folder are displayed in the window.

Folder Tree

If Folder A is inside Folder B, Folder A is a *subfolder* of B. Any folder can contain as many subfolders as you want to put there, but each folder (like each file) is contained in only one folder. And so, a diagram showing which folders are contained in which other folders looks something like a family tree. This diagram is called the *folder tree*. Windows Help calls it the *folder list*.

Figure 1-21 shows the top levels of the folder tree as they appear in the Folders Explorer bar. At the top of the folder tree is the desktop. Immediately under the desktop are My Computer, My Documents, My Network Places, and the Recycle Bin, plus whatever files and folders you might have copied to the desktop.

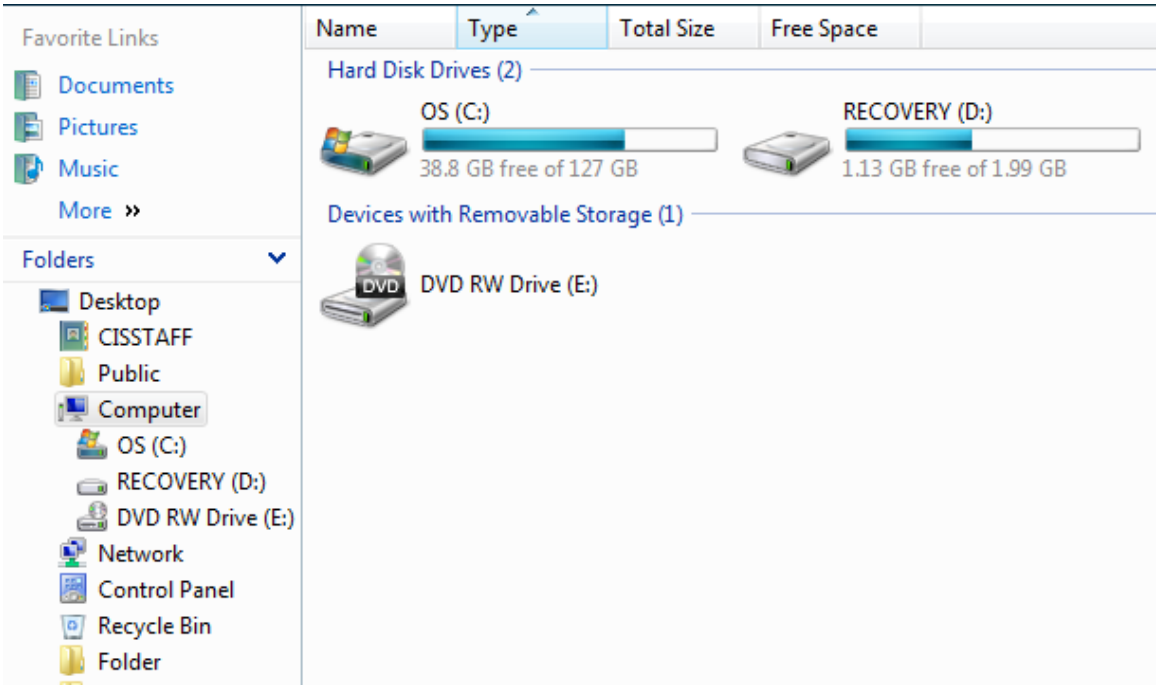


Figure 1-21: The upper levels of the folder tree

Underneath My Computer are icons representing all of your system's storage media: hard drives, floppy drives, CD-ROMs, and so on. (Your system configuration may differ somewhat from that pictured in Figure 1-21.) Also under My Computer is the Control Panel, the window you use for configuring your computer.

Filenames

To store a file and retrieve it later, Windows must give it a *filename*. Often you are asked to invent a name for a file. The names must conform to some rules. You can change a filename using Windows Explorer, as well as in the Open and Save As dialog boxes of many applications.

Legal Filenames

File and folder name can be up to 215 characters long, and can include spaces. Folders, likewise, can have names up to 215 characters long. These names are automatically of type "folder" and have no extension.

In addition to periods and spaces, some characters that were illegal for file and folder names prior to Windows 95 are now legal, including

+ , ; = [ ]

Still, there are some characters you can't use in filenames, including

\ / : * ? "; | and any character you make by using the CTRL key.

Extensions and File Types

Filenames are still followed by a period and an *extension*, which is usually three letters long. The extension denotes the *file type* and, among other things, tells Windows which program to use to open the file and

which icon to use to represent the file. Windows handles most file-type issues invisibly. Files you create with a particular program are typically given a type associated with that program (unless you specify otherwise), and the appropriate extension is added to the name automatically. For example, Web pages usually have the extension .htm or .html, and text files usually have the extension .txt.

We recommend you configure Windows to display extensions for two reasons: to help you know the complete names of your files and to help you determine the types of files you receive from others. To see the extensions:

1. Choose Start | Control Panel. You see the Control Panel window.

2. Select the Appearance And Themes category, and then click the Folder Options icon. The Folder Options dialog box appears. You can also display this dialogue box by choosing Tools | Options from any Explorer window.

3. Click the View tab. The Advanced Settings box contains a long list of options.

4. Click the check box next to Hide File Extensions For Known File Types. If the box is checked, the extensions are hidden; if it's not checked, the extensions are shown.

5. Click OK to make the Folder Options dialog box go away, and close the Control Panel.

When you install a program, the installation program usually tells Windows the file types the program handles.

What Is Windows Explorer?

Windows Explorer is a versatile tool for viewing and manipulating files and folders. It appears whenever you choose Start | My Computer and you can also run it by choosing Start | All Programs | Accessories | Windows Explorer. The program has many features that you can display or hide, and several different views of the features it displays.

Windows Explorer is a twin of Internet Explorer, which is the Windows built-in Web browser. Running either program opens an *Explorer window*. The Explorer window is extremely versatile and has many parts, which you may or may not decide to display. When all parts of the Explorer window are made visible.

The major parts of the Explorer window are:

• **The title bar** Displays the name of the open folder and (optionally) the pathname (the list of the folders that contain the open folder).

• **The menu bar and various toolbars** You issue commands to Windows Explorer by clicking toolbar buttons or making selections off the menus.

• **The working area** Displays icons corresponding to all the files and folders contained in the open folder. The contents of subfolders don't appear in the working area.

• **The status bar** Displays information about the objects you select.

• **The Task pane** Presents easy ways to do tasks that Windows guesses you might want to do with the selected object.

• **The Explorer bar** In Figure 1-22 this is set to display the folder tree.

• **The Address box**, which appears on the Address Bar toolbar of Windows Explorer, displays the name of the open folder. The Address box looks like this:

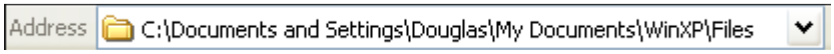


Figure 1-23

Standard Buttons Toolbar, The *Standard Buttons toolbar* is an optional feature of Windows Explorer. Like most features of Windows Explorer, you can configure it to look the way you want. The three leftmost toolbar buttons are navigation buttons: Back, Forward, and Up. In the default configuration, it looks like this:

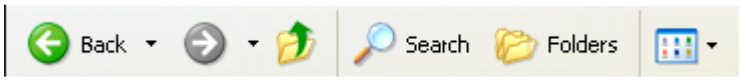


Figure 1-24

Search Helps you find files or folders on your computer system, Web pages on the Internet, or people in a directory. To display it, choose View | Explorer Bar | Search (or press CTRL-E). You can also access the Search Explorer bar by selecting one of the options under Start | Search. You can make the toolbars, Explorer bar, Task pane, or status bar appear or disappear.

What Is the Recycle Bin?

Files and folders deleted from your hard drives don't go away completely, at least not right away, they remain inside the *Recycle Bin*. From there, they can either be restored to the folder they were in, before you deleted them or moved from the Recycle Bin to any other folder via cut-and-paste or drag-and-drop.

The Recycle Bin icon lives on the desktop and looks like a wastebasket. When you open the icon, Windows Explorer shows you the files and folders that were deleted since the Recycle Bin was last emptied.

Figure 1-26

You can put things in the Recycle Bin or take things out that's all.

Working with Windows Explorer

When you Start | My Computer, Windows Explorer opens an Explorer window, as in Figure 1-22. Any folder you open from the desktop creates a new Explorer window. You can also run Windows Explorer by choosing Start | All Programs | Accessories | Windows Explorer.

Viewing the Folder Tree with the Folders Explorer Bar

A folder that contains other folders has a small box next to it, called a *plus box* if it contains a plus sign and a *minus box* if it contains a minus sign. A plus box indicates that the folder has subfolders, but that they are not shown. A minus box next to a folder indicates that its subfolders are listed below and slightly to the right of folder. In Figure 1-25, My Documents contains My Music, My Pictures, and WinXP. The WinXP folder, in turn, contains Files, Fun, Publisher, and Sample Folder. My Computer and My Network Places contain subfolders that are not shown.

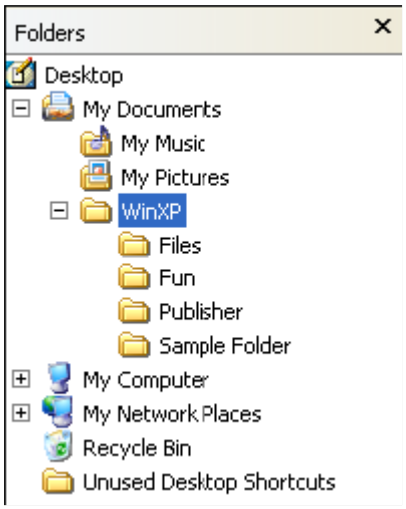


Figure 1-27: The folder-tree map, as shown in the Folders Explorer bar

If the subfolders of a folder are not shown, you can display them (i.e., expand or open the folder) by clicking the plus box next to the folder's name. Clicking the minus box next to a folder's name removes its subfolders from the list (contracts or closes it, in other words). Any portion of the folder tree can be expanded as much or as little as you like.

Creating Files and Folders

New folders and files of certain types can be created on the desktop or in Windows Explorer. On the desktop, right-click any empty area and choose New on the shortcut menu. In Windows Explorer, click the folder in which you want to create the new object and then choose File | New (or right-click any empty spot in the working area and choose New on the shortcut menu).

If the subfolders of a folder are not shown, you can display them (i.e., expand or open the folder) by clicking the plus box next to the folder's name. Clicking the minus box next to a folder's name removes its subfolders from the list (contracts or closes it, in other words). Any portion of the folder tree can be expanded as much or as little as you like.

Figure 1-28

Naming and Renaming Files and Folders

Newly created folders and files are given default names, such as New Folder and New Microsoft Word Document. To rename a file or folder, select its icon and choose the Rename This File (or Rename This Folder) option from the Task pane, or right-click the icon and choose Rename from the shortcut menu. In either case, a box appears around the current name, and the entire name is selected. Type the new name in the box and press ENTER.

If the new name is only a minor change from the old one, edit the old name instead of typing the new one. Click inside the name box at the place where you want to begin typing or deleting.

Changing a File's Extension

Changing a file's extension changes its file type. Don't do this unless you know what you're doing. If you assign the file a type that Windows doesn't recognize, it won't know how to open the file. If you assign the file a type Windows does recognize, whenever you open the file, Windows uses the application associated with that file type. Unless you prepare the file in such a way that is appropriate for that application, the opening fails. (Consider, for example, the Paint program trying to open an audio file--it doesn't work.)

If file extensions are hidden, you can't change them when you rename a file. If they are displayed, you can change them. When you rename a file whose extension is displayed, you must include the extension in your renaming or else the file type is lost. Conversely, if you type in a file extension when the extension is hidden, you wind up with a double extension, like report.doc.doc.

If Windows doesn't recognize a file's extension it will create a generic icon. If you change a file's extension (and, thus, its file type), Windows gives you a warning that the file may become unusable and asks you to confirm your decision. This feature, although annoying, may save you from making a mistake.

Opening Files and Folders

You can open a folder by double-clicking its icon. The folder contents are displayed in an Explorer window.

Double-clicking a file icon opens the file using the default application for that file type. You can open a file in some other compatible application by right-clicking the file icon and selecting an application from the Open With menu, by dragging-and-dropping the icon onto an application's icon, or by using the File | Open command from the application's menu.

Rearranging Files and Folders

The quest for the perfect system of file organization is endless--you frequently need to move or copy files and folders to somewhere other than where they were originally created. You can rearrange your files and folders by using the following:

- Options on the Task pane
- Commands from the menus
- Drag-and-drop techniques

The commands corresponding to the options on the Task pane are also on the menus, the only difference being how the commands are issued, not what they do. This section first examines the Task pane and menu commands, and then the drag-and-drop techniques.

Moving and Copying Files and Folders

When a file or folder is selected in an Explorer window, the Task pane contains the options Move This File (or Folder) and Copy This File (or Folder). When several items have been selected, the options change to Move The Selected Items and Copy The Selected Items. If the Task pane isn't displayed, you can use the Edit | Move To Folder and Edit | Copy To Folder commands instead.

The Move To option is similar to cut-and-paste, and it has the effect of moving objects from a source folder to a target folder. The Copy To procedure resembles copy-and-paste, and it leaves separate copies of the objects in the source folder and the target folder.

Moving And Copying With The Explorer Window

To move (or copy) a file or folder, follow these steps:

1. Open the source folder.

2. Select the objects to be moved (or copied) from the working area of the Explorer window.

3. Click the Move (or Copy) option from the Task pane or select Edit | Move To Folder or Edit | Copy To Folder from the menu. A Move Items (or Copy Items) window opens.

4. Select the target folder in the Move Items (or Copy Items) window. This window and its plus boxes behave just like the Folders Explorer bar.

5. Click the OK button in the Move Items (or Copy Items) window.

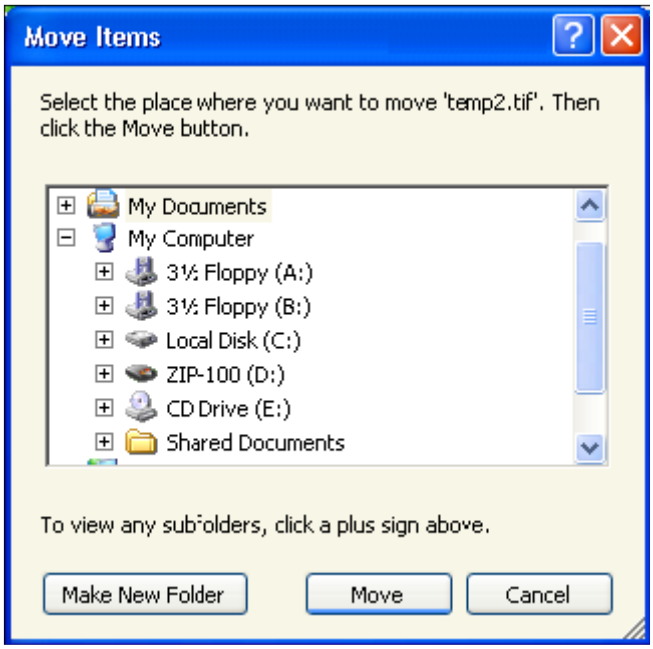


Figure 1-30: The Move Items window

Moving and Copying with the Folders Explorer Bar

When you see the Folders Explorer bar, you can use the icons it displays as target folders for either the cut-and-paste techniques or the drag-and-drop techniques. If you want to move or copy entire folders, you can cut or drag them from the Folders Explorer bar into the working area, into other folders on the Explorer bar, or into other Explorer windows.

If you want to use drag-and-drop, but you neither want to memorize how it works nor trust Windows to guess your intentions, drag with the right mouse button rather than the left mouse button. When you drop in the target folder, select the action you intended from the shortcut menu.

Using the Send To Menu

Send To is a menu found on the File menu of Explorer windows and on the shortcut menu when you right-click a file or folder. The Send To menu enables you to copy files to pre-selected locations quickly and easily. To use Send To for this purpose

1. Open a folder that contains files you want to copy.

2. Select the file(s) and folder(s) to copy.

3. Choose File | Send To from the menu bar, or right-click the item(s) you selected and choose Send To from the shortcut menu.

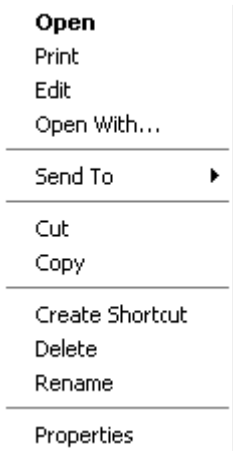


Figure 1-31

4. Choose a destination from the Send To menu. The files are copied to the destination.

Deleting Files and Folders

To delete a file, folder, or collection of files and folders in a single Explorer window:

1. Select the objects to be deleted.

2. Do any of the following four actions: choose File | Delete from the menu bar, right-click the object and select Delete from the shortcut menu, or press the DELETE key on the keyboard. A dialog box appears that asks whether you really want to send the objects to the Recycle Bin (if they are deleted from your computer's hard drive) or delete the objects (if they are on a removable disk).

3. Click Yes in the dialog box.

Reversing Your Last Action Using the Undo Command

Windows Explorer has an Undo command that allows you to recover quickly from simple mistakes like deleting or moving the wrong file. Just press CTRL-Z on the keyboard or select Edit | Undo from the menu.

Retrieving Files and Folders from the Recycle Bin

If you change your mind about deleting a file or folder and it's too late to use the Undo command described in the previous section, you can still retrieve it from the Recycle Bin--if it was deleted from a hard drive and you haven't emptied the Recycle Bin in the meantime.

Opening the Recycle Bin

The easiest place to find the Recycle Bin is on the desktop, where its icon looks like a wastebasket. You can also find the Recycle Bin on the folder tree directly under the desktop, below your computer's disk drive and other devices.

Figure 1-32

Recovering Objects From The Recycle Bin

The simplest way to recover an object from the Recycle Bin is to follow these steps:

1. Open the Recycle Bin.
2. Select the object (or collection of objects) you want to recover.
3. Choose File | Restore from the menu bar.

You can also right-click the item you want to recover and choose Restore from the shortcut menu.

The object returns to the folder it was deleted from. If the object is a folder, all its contents return with it. You can use Restore even if the object was deleted from a folder that no longer exists. You can restore everything in the Recycle Bin to its original location by clicking the Restore All Items option on the Task pane.

Managing Files and Folders

Shortcuts enable you to access the same file or application from many different points in the folder tree, without the disadvantages that come with having several copies of the same file.

You should also know about compressed folders, which save the same files in a smaller amount of disk space, at the cost of some functionality.

Even the best-organized people occasionally forget where they put something, so you need to know how to use the Search Explorer bar.

The attributes of a file or folder appear at the bottom of the General tab of the Properties dialog box.

Searching for Files and Folders

Even with a well-organized file system, you can occasionally forget where you put a file or even what the file's exact name is. By using Search Companion, you can find a file

- By name or part of a name
- By date created, modified, or last accessed
- By file type
- By size
- By a string of text contained in the file
- By some combination of all the previous points

To start Search Companion, click the Search button on the Windows Explorer toolbar, or select View | Explorer Bar | Search from the menu. Either action causes Search Companion to appear in the Explorer Bar.

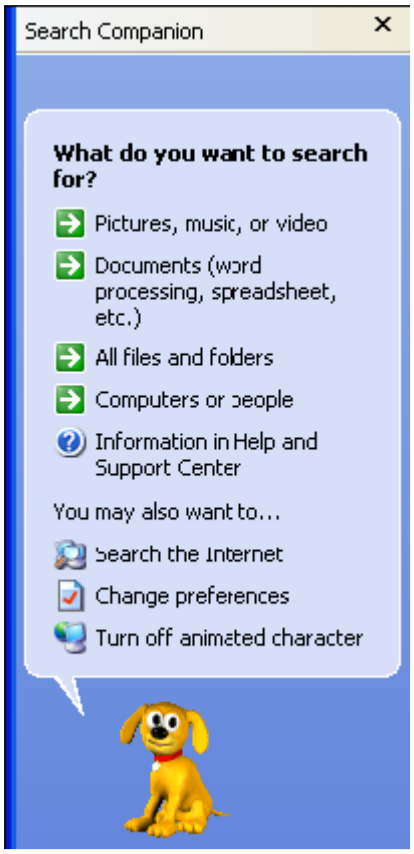


Figure 1-34: Search Companion under standard settings with the dog.

Clicking the All Files And Folders option to search for any file type. This is a more advanced approach if you are not sure of the type of file you need but know what it might contain or part of its name.

Wildcards

The asterisk (*) and question mark (?) characters play a special role in filename searches. Neither is allowed to be part of a filename, so when you include them in a filename search, Windows knows you intend for it to do something special with them. The asterisk and question mark are called *wildcards* because (like wildcards in poker) they can stand for any other character.

The question mark stands for any single character, so you can use it when you either don't know or don't want to specify a character in a filename. If, for example, you can't remember whether a file is named Letter to Tim or Letter to Tom, search for **Letter to T?m**--either Tim or Tom will match T?m.

An asterisk stands for any string of characters. Searching for **Letter to T*m** would not only find Letter to Tim and Letter to Tom, but also Letter to Travel Management Team.

Working with Images

Microsoft Paint is an application for drawing and coloring. It also allows you to crop photos or transform images from one file format to another.

MS DOS

What is DOS?

MS-DOS is a "Disk Operating System". That means it is simply: "a System for Operating the Computer from a Disk".It enables the user to organize data files, load and execute (run) program files, and control the input and output devices attached to the computer. There were other historical brands of DOS besides the most well known "MS-DOS", ie: PC-DOS, DR-DOS/OPENDOS. Generally speaking, they all functioned in the same way, especially at the most simple level.

Booting is a term used to refer to the initial process of loading and executing the operating system on the computer.

How do you communicate with DOS?

The original DOS was an entirely text based system. All it provided for the user was a command prompt: "C:>" or "A:>", where the user would type in commands from the keyboard. The system was entirely case insensitive: so either "ForMAt C:" or "format c:" would erase your hard disk.

The latter example is of course a small warning: with DOS or OS comes power, you can very easily mess up your system if you use powerful commands in the wrong way. The commands you should be careful of are: "Format", "Recover", and "Del". All of these perform useful functions, when used correctly, and all the others are much safe to use.

All modern Operating Systems including Windows continue to use, and have available some form of the command prompt (C:\>). There are times when it is easier or quicker to issue a text-based command then to open and use a graphical-based window, especially when the response to a command is a single word or phrase or only text-based information.

How does DOS organize disks?
DOS works within a file, directory and disk drive structure. This means that all program and data files are named, and grouped together in named directories (folders) on disks. 'Directories' are just lists of files.
How are files named?
While newer versions of DOS support longer filenames, the standard DOS filename format or rather the naming scheme remains: 1-8 letter name, period, 3 letter extension eg:

MYPROG.BAS
MYPIC.JPG
LETTER.DOC

The extension to a file's name is there to allow files of a similar type to be grouped together. I.e. all word processor files might have the extension .DOC, while all picture files might have the extension .JPG While these extensions can be specified by the user, many programs have used them to differentiate between formats, and so they have gradually become standardized. For example you would expect a ".TXT" file to be a file containing unformatted text, or a ".BMP" file to be in a bit mapped graphics file format. You sometimes will see a “.BAK” file which stands for backup file. When you create programs in QBASIC you need to add the extension BAS

To completely specify a file on your computer you must specify its drive , its directory path, and its filename. However a file does not always have to be specified in this complete form: If it is in the current directory, then you can just enter its filename.

How are directories named?

Every disk drive has a root directory which can have subdirectories which are named in the same format as filenames, (though generally without any extension). The subdirectories can have subdirectories and so on. Eg: a floppy disk might contain the following directory structure:

PICTURES [a directory]
    HOLIDAY [a subdirectory]
        ITALY [a subdirectory of a subdirectory]
        FRANCE [a subdirectory of a subdirectory]
FAMILY [a directory]
    PETS [a subdirectory]

A directory path name includes the disk drive and all subdirectories needed to specify a directory on a disk. The disk drive is specified by a single letter. Eg: The floppy disk drive is A and the hard disk drive is C.

The drive letter, is followed by a colon, the directory path names are separated by backward slashes (\), (*Not* forward slashes like Internet addresses). Eg. In the above example "A:\PICTURES\HOLIDAY\FRANCE" would be more than likely to contain pictures of a few baguettes and onions.

How is DOS used?

When you type anything at the DOS prompt, and press enter, you are telling DOS to run a program.

It will first look to see if there is an internal command program which has that name, and if it does not find one, then it will look to see if there is a file on disk with that name.

If it finds an external file with the extension .COM (command), or .EXE (executable), then the program is loaded and run. At this point DOS looses control of the computer until the program has ended. However parts of it are still used by the programs as they are running, eg to load and save files etc.

Some very useful internal DOS commands:
A: - Change current directory path to the floppy disk drive

C: - Change current directory path to the hard disk drive
DIR - Display current directory (show all files and sub-directories).
MD - Make a new directory, eg: MD C:\EMAIL
CD - Change current directory, eg. CD C:\EMAIL
COPY - Copy file(s) from one place to another.
Del - Delete/erase a file
EDIT- opens a word editor that allows text input.

Any other text on the input line after the file name, is passed to the program. This means that in the command "Copy help.txt help.bak", the text, "help.txt and help.bak" is passed to the copy program which will in this case use it to specify source and destination files for a copy.

DOS usage examples:

DIR [enter]

Displays the current directory listing.

DIR *.txt [enter]

Displays any files in the current directory with .TXT as their extension

DIR A:\PICTURES[enter]

Displays a directory listing for the path, A:\PICTURES

A: [enter]
MD PICTURES [enter]
CD PICTURES [enter]
DIR

Change to the floppy disk drive A:, make a directory called PICTURES, change the current directory to PICTURES, and then list (display) all the contents (files and subdirectories) in the directory PICTURES.

COPY letter.txt letter.bak [enter]

Copy the file "letter.txt" to a file called "letter.bak". (Creates "letter.bak" if it does not exist, and overwrites it if it does).

COPY A:\pictures*.pic C:\ [enter]

Copy any file with an extension PIC from the A: floppy drive, in the PICTURES directory to the root directory of the hard disk.

NB:
To get more commands and their meaning type HELP and press enter at the prompt.

Exercise:

1) What does the MS stand for in MS-DOS?

2) What does Booting have to do with DOS?

3) What is the C:\> ?

4) How would you make a Directory in DOS?

5) If you are at the C:/> show the commands you would type to make and get into a directory called "CATS".

MICROSOFT WORD

Week 6 Students learning objectives

1. Perform printing: - using portrait and landscape.
2. Be able to close a document and quit word.
3. Be able to able to create tables, add borders, merge cells, split cells.
4. Be able to use the cut, copy and paste facility in exchanging data between documents.
5. Be able to format text, paragraph, tabs, page breaks, setting margins, paper size.
6. Perform insertion of headers and footers, automatic page, numbering.
7. Use the check spelling facility.
8. Use styles and templates when creating and saving documents.

Introduction

A word processor is a software or program used for producing documents such as letters, memos and reports.

Features of a good word processor

Word processors vary considerably, but all word processors support the following basic features:

- Allow adding, inserting and deleting of text anywhere in the document.
- Allows copy, cut and paste : Allows you to remove (cut) a section of text from one place in a document and insert (paste) it somewhere else. copy : Allows you to duplicate a section of text.
- Allows multiple formatting of text e.g. bold, italics, font style, bullets and numbering.
- Allows you to define various page sizes and margins, and the word processor will automatically readjust the text so that it fits.
- Allows you to direct the word processor to search for a particular word or phrase. You can also direct the word processor to replace one group of characters with another everywhere that the first group appears.
- Provide graphical features such as pictures, graphs, and arts.
- The word processor automatically moves to the next line when you have filled one line with text, and it will readjust text if you change the margins – feature called word wrapping.
- Allows you to send a document to a printer to get hardcopy.
- Allows access to different documents simultaneously.

Exploring Ms Word

Most of the tools and commands you need are easy to find on the Standard and Formatting toolbars and on the Ms Word menus. The following illustration is of the Ms Word window with a blank document in Print Layout view.

Horizontal ruler—use to view and set paragraph indents, tab stops, page margins, and column widths.

Menu toolbar

Standard toolbar

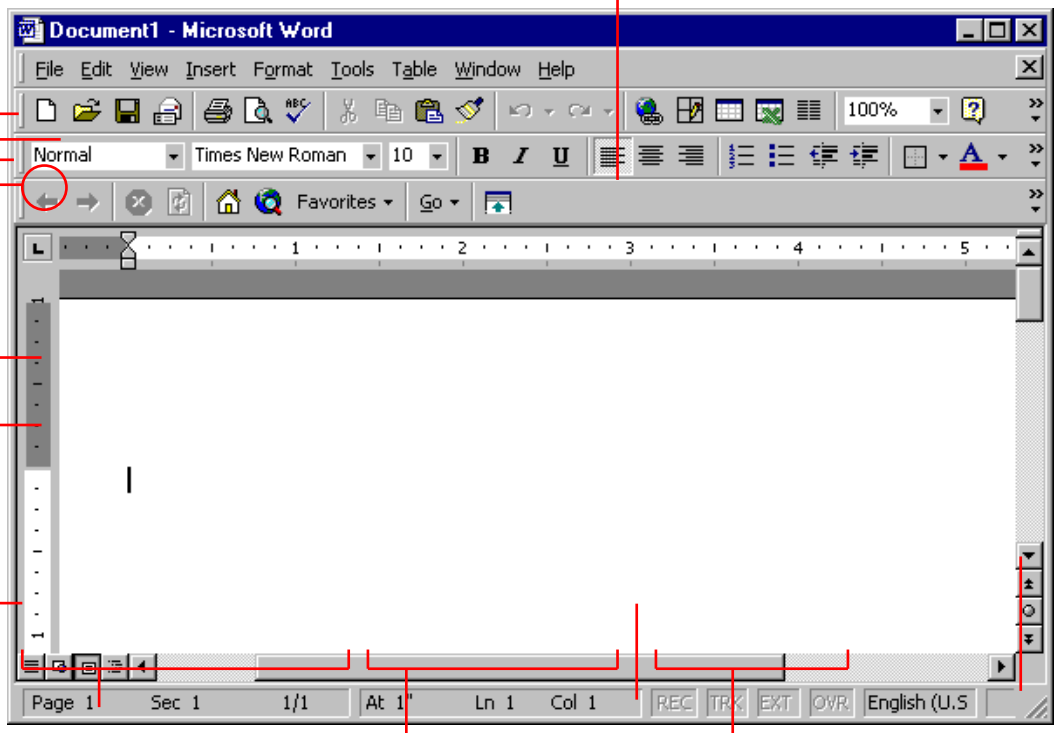
Formatting toolbar

Web toolbar

Tab stop—a position you set for placing and aligning text on a page. Click here to change the kind of tab stop.

Vertical ruler—use to view and set top and bottom margins of pages and the height of rows in tables. Drag the markers to adjust settings. Only available in Print Layout view.

View buttons—click to switch between Normal, Web Layout, Print Layout, and Outline views.



Status bar—Page number of displayed page, section of page, and page number/total number of pages

Scroll bar—drag the box or click the arrows to navigate through the current document.

Select Browse Object—click to open the Select Browse Object menu where you can browse for footnotes or graphics. Use the Previous and Next arrows to browse through the items.

Status bar—Distance from the top of the page to your insertion point; Line of text where the insertion point is located; Distance, in number of characters, from the left margin to the insertion point. No measurements are displayed if the insertion point is not in the window.

Status bar—Double-click REC to turn the macro recorder on or off; Double-click TRK to turn the track changes feature on or off; Double-click EXT to turn the extend selection mode on or off; Double-click OVR to turn the overtype mode on or off. The current language is displayed.

The Standard Toolbar:

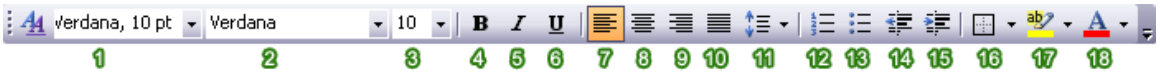
Word allows all toolbars to be customized, so you may not find all options listed here. There are several buttons that may or may not appear immediately in your version of Word. Use the following graphic as a guide to the Standard Toolbar.

1. **New Blank Document:**
   To begin a new document, click on the New Blank Document icon, shaped like a blank sheet of paper.
2. **Open:**
   Clicking on this icon opens up a previously saved document on your computer.
3. **Save:**
   Clicking on the Save icon saves the document you are currently working on. If you are saving a document for the first time, you can click on this button. However, if you want to save a new file from a preexisting document, then you must go to the menu bar and select "File" >> "Save As" and give the file a new name. When working on any document, you should be sure to save frequently, so that you don't lose any work.
4. **Permission:**
   Microsoft has enabled Information Rights Management (IRM) within the new version of Word, which can help protect sensitive documents from being copied or forwarded. Click this for more information and options.
5. **Print:**
   Clicking on the Print icon automatically prints the document currently active in Word. If you wish to explore more print options, then go to the menu bar and select "File" >> "Print."
6. **Print Preview:**
   To get an idea of the appearance of your document in print before you actually print it out, you can click on this icon to view your document from a zoom-out distance.
7. **Spelling and Grammar:**
   Clicking begins a review of your document in search of spelling and grammatical errors that may need to be corrected.
8. **Copy:**
   Copy the current selection to the clipboard, which can then be pasted elsewhere in the document, or into a completely separate program/document.
9. **Paste:**
   Clicking on the Paste button inserts the text that has been most recently added to the Clipboard (the text would have been added there by Cutting or Copying). With Paste, you can either insert the copied text into a document or replace selected text.
10. **Undo Typing:**
    The Undo Typing button goes back and removes the last addition or change made to your document.
11. **Insert Hyperlink:**
    You may find that you want to make links to a particular web site, web page, or some other kind of online file in your Word document. Using the Insert Hyperlink button, you can turn selected text into hyperlinks. When the icon is clicked, a window will appear that will allow you to insert the URL (web address) of the web page you want to link to. You can type in the URL yourself or insert a preexisting bookmark. Once the link is inserted, the link in your Word document can be clicked and the web page will open up in a web browser.
12. **Insert Table:**
    When this icon is clicked, a small window will appear in the form of a grid of squares. Use this

window as a guide to indicate how many rows and columns you would like your table to contain. Once selected, a table will automatically appear in Word. Clicking the Tables and Borders button will allow you to modify the table. To modify an aspect of the table, select, or place the cursor in, the area and apply changes such as borders and colors.

The Formatting Toolbar:

Word allows all toolbars to be customized, so you may not find all options listed here. There are several buttons that may or may not appear immediately in your version of Word. Use the following graphic as a guide to the Formatting Toolbar.

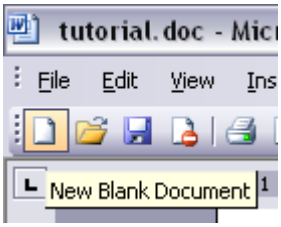


1. **Style:**
   Styles in Word are used to quickly format portions of text. For example, you could use the "Normal" or "Default Paragraph Font" for the body text in a document. There are also three preset styles made for headings.
2. **Font:**
   Font is a simple but important factor in Word documents. The choice of font (the style of the text itself) can influence the way others view documents, either on the screen or in print. For example, Arial font looks better on screen, while Times New Roman is clearer in print. To apply a font to text, select desired text with your cursor, and choose a font from the font drop down menu.
3. **Font Size:**
   You may encounter times in which you need to display some text larger or smaller than other text. Selecting desired text with the cursor and choosing a font size from the drop down menu changes the size of text.
4. **Bold:**
   Places the text in **bold**.
5. **Italic:**
   Places the text in *italics*.
6. **Underline:**
   Underlines the text.
7. **Align Left:**
   Aligns the selection to the left of the screen/paper.
8. **Center:**
   Aligns the selection to the center of the screen/paper.
9. **Align Right:**
   Aligns the selection to the right of the screen/paper.
10. **Justify:**
    Aligns the selection to both the left and right of the screen/paper.
11. **Line Spacing:**
    Adjust the line spacing (single-spaced, double-spaced, etc.)
12. **Numbering:**
    Create a numbered list.
13. **Bullets:**
    Create an unordered, bulleted list.
14. **Decrease Indent:**
    Decreases the indentation of the current selection (to the left).
15. **Increase Indent:**
    Increases the indentation of the current selection (to the right).

16. **Outside Border:**
    Places a border around the current selection; click the drop-down for a wide selection of bordering options.
17. **Highlight:**
    Highlight the current selection; default color is yellow.
18. **Font Color:**
    Change the font color; the default/automatic color is black.

Making a New Blank Document:

When Word is opened, a new blank document should automatically open. If not, then you can begin a new blank document in a variety of ways.
First, find the "New Blank Document" icon, which looks like a blank sheet of paper, located underneath the menu bar in Word in what is called the "standard toolbar." Click on the icon to bring up a new blank document.

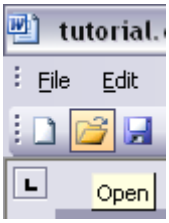


Also, you can go to the menu bar and select File >> New… (shortcut: Ctrl+N).
To begin typing, just click the cursor anywhere within the new blank document.

Opening a Document:

To open to view, edit, or print a document, you must first open up that file in Word.

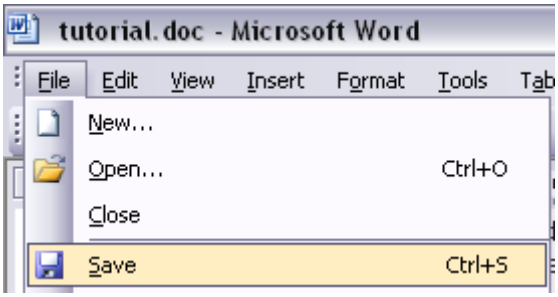
You can open a file by clicking on the "Open" folder icon (with a picture of a folder) located in the standard toolbar. Or, you can use the menu bar and navigate to File >> Open… (shortcut: Ctrl+O).



Saving a Document:

When you are working with any sort of media in any software, you should be sure to save your work often. In Word, there are numerous options for saving documents in a variety of file types.

To save a new, unsaved document, you can click on the Save icon, shaped like a disk located on the standard toolbar. Or, you can go to the menu bar and select File >> Save… (shortcut: Ctrl+S).



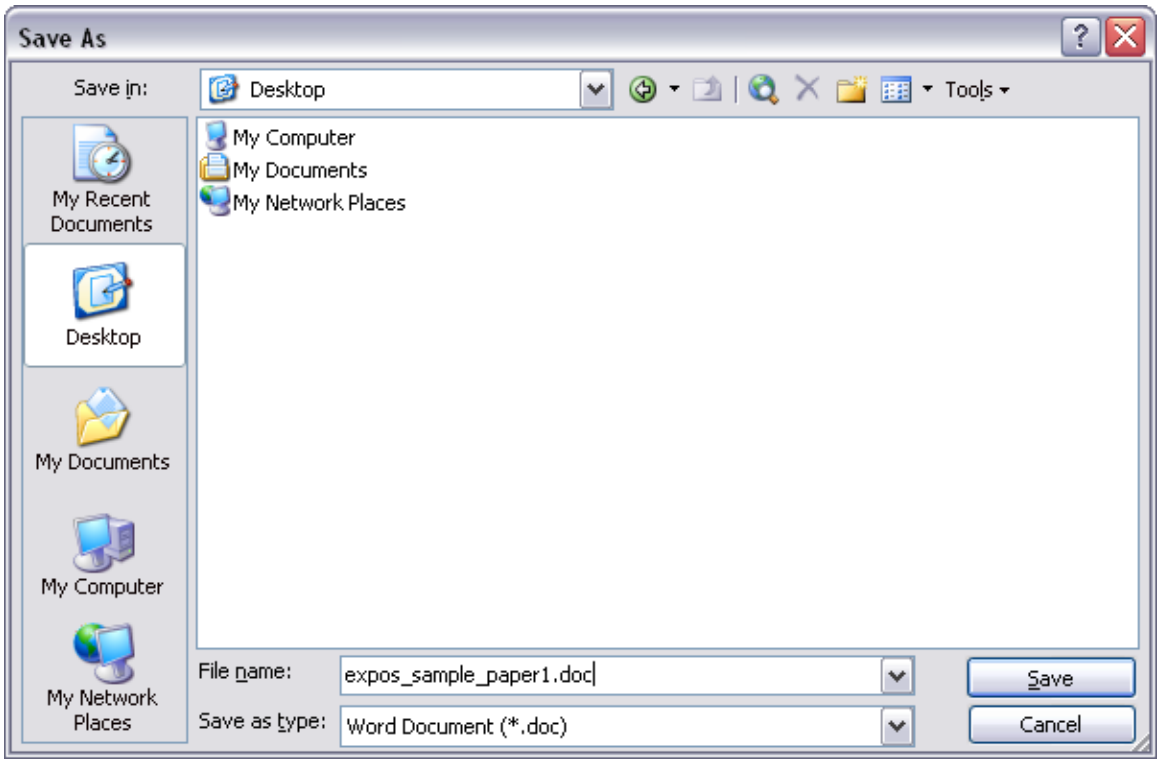
A dialogue box should appear, offering you a number of options. To save the document in the desired location on your computer, locate and select the folder on your computer. Give your document a name in the file name text box. While you can give your document long names, make sure you save it with a name you can remember.

Please note that it's good practice not to use spaces or special characters in file names. For example, a long file name may look like this:

Exercise_one_paper1.doc

To save a completely new document using previously existing (and opened) text, you use the Save As option.

Open the document that you wish to save as an entirely new file, go to the menu bar, and click on File >> Save as. In the file name text box, give your document a new name. Using this option allows you to save multiple versions (with different file names) of a document based on one original file.



Scrolling through a document

- On the right of the screen you have a **vertical scroll bar**; at the bottom of the screen you have a **horizontal scroll bar**. At either end of the scroll bars are arrows pointing in opposite directions. Clicking on these arrows will scroll a document up or down, left or right, depending on which arrow you select.
- You also can scroll by positioning the mouse arrow on the scroll box itself, holding down the left mouse button, and dragging the box in the scroll bar.
- You can also scroll and position the cursor very precisely by using the arrow keypad on the keyboard. When you have finished experimenting make sure the whole Seagull quote shows on the screen.

Selecting (highlighting) a block of text

Highlighted text is text that stands out from the rest of the document either because the background turns black and the text white (black and white monitors) or because the background turns the color you (or someone else) set for the highlighting color on your *Windows* computer.
When you highlight text, you can do things to it (delete it, move it, copy it, change the margins set for it, and so on) without affecting the rest of your document.

You can highlight a single character...

- Locate the *I–beam* pointer on the screen and use the mouse to move it so it is immediately before the "H" in **"**Hodge" in the address at the top of the letter
- Hold down the left mouse button and carefully drag across just the "**H**" at the beginning of the word so that it becomes highlighted.

You can highlight a single word...

- Position the I–beam anywhere over the word to be selected and Double click the left mouse button (or drag across the word using the mouse)

  The single word should be highlighted on the screen.
- Click anywhere in the text to remove the highlight

You can highlight a line of text...

- Position the cursor in the margin to the left of the line you want to highlight (the cursor changes from an I-beam to an arrow pointing in at the line at the edge of the text) and click on the left mouse button.

You can highlight several selected lines...

- Once again, move the cursor into the margin immediately in front of the first word of the first paragraph (the cursor becomes an arrow pointing in at the line)
- Hold down the left mouse button and drag up or down to select (highlight) a couple of lines, then let go of the left mouse button, and click anywhere in the text to remove the highlight

You can quickly highlight an entire paragraph...

- Move the I–beam anywhere in the first paragraph, click quickly 3 (three) times on the left mouse button and notice the effect this has of highlighting the entire paragraph; click anywhere in the text to remove the highlighting

You can highlight an extended area (or block) of text...

- Place the I–beam either at the start or end of the text you want to select and click the left mouse button to put the insertion point cursor there .
- Scroll, if necessary, to the end of the section you want to highlight, then hold down the **Shift key** and click at the end of the block of text.

Notice that the whole section is highlighted.

- Click anywhere in the text to remove the highlighting.

You can quickly highlight an entire document...

You can drag the mouse to highlight several paragraphs or even an entire document of several pages. However, dragging through a 50-page document would quickly become tedious. So *Word* provides a short cut to select an entire document.

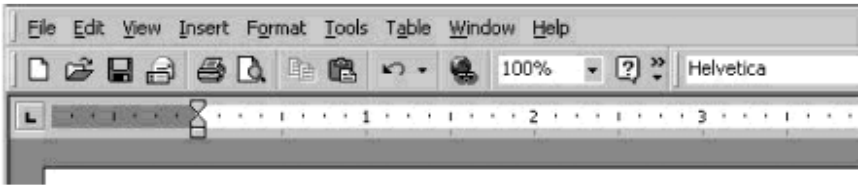
- From the Edit menu at the top of the screen choose Select All.

To remove the highlighting, just click anywhere in the document as usual.

Adjusting the location of the *Word* toolbars for ease of use

Depending on how your version of *Word* is set up on your computer, you may have the two default *Word* toolbars (the Standard and Formatting toolbars) on the same row at the top of your document window (just above the ruler at the top of the page).
The Standard toolbar has tool icons for opening a new document, saving a document, printing a document, and so forth.
The Formatting toolbar has tools for changing fonts and text size and style and so forth. You can drag them apart so each of these toolbars
is on a row of its own. This will allow room for *Word* to show more of the tools in each toolbar, which will save you having to go look for them when you need them.
Here are the steps to do this.

- Slide your mouse along the Standard toolbar to the small bar (the Formatting toolbar handle) to the immediate left of the font selection tool



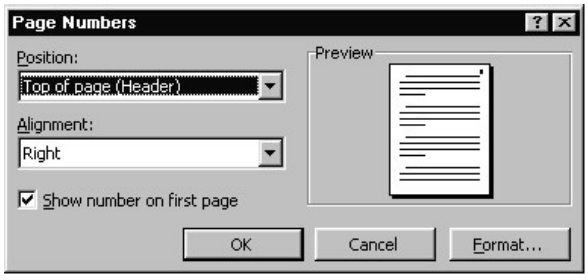
- Your mouse cursor will become a crosshair with four arrowheads when it is resting on top of the toolbar handle
- Grab the handle with the mouse (using the left button) and drag the whole toolbar down just a little.

You will see *Word* make room for the separate toolbar on a new row or line.
Once you have the Formatting toolbar on a row by itself, you can drag it over to the left and line it up with the Standard toolbar, which is right above it now
If you wanted to, you could slide the whole toolbar elsewhere on the screen and drop it wherever was convenient to you.

Inserting Page Numbers

It would be useful to start by inserting page numbers for easier reference as you work. You can insert page numbers in either the header or the footer of your document. *Word* takes care of keeping the numbers sequenced if your pagination changes or if you want to start page numbering at some number other than 1.

- From the Insert menu select Page Numbers...
- This will bring up the Page Numbers dialog box
- In the dialog box, from the Position pop up menu select Top of page (Header), and in the Alignment pop up menu select Right

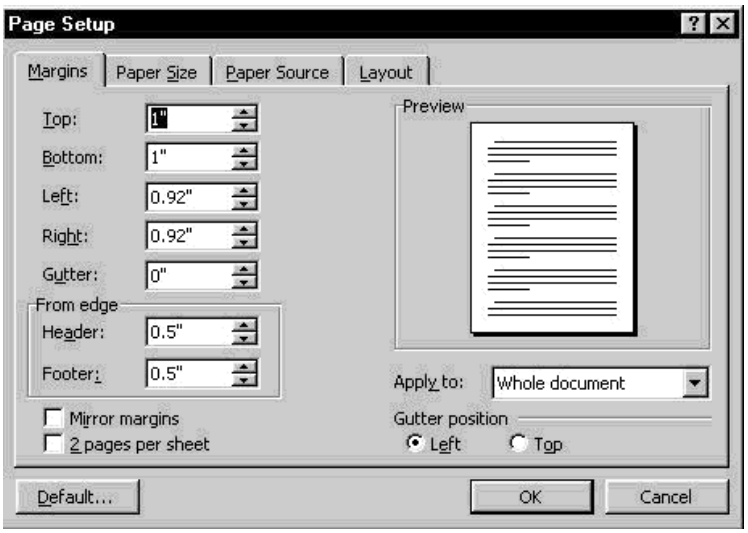


Often you don't want to show the number on the first page of a document.

- Click to **remove** the **check mark** in the box next to **Show number on first page**, then click on **OK**
- If you wanted to start a document at some page number other than 1 you would click on the **Format...** button (lower right in the dialog box), type the number you want for the **Start at** page and click on **OK**.

Setting the Margins

The easiest way to change any of the four margins on a page is in the Page Setup dialog box. In the File menu select Page Setup...



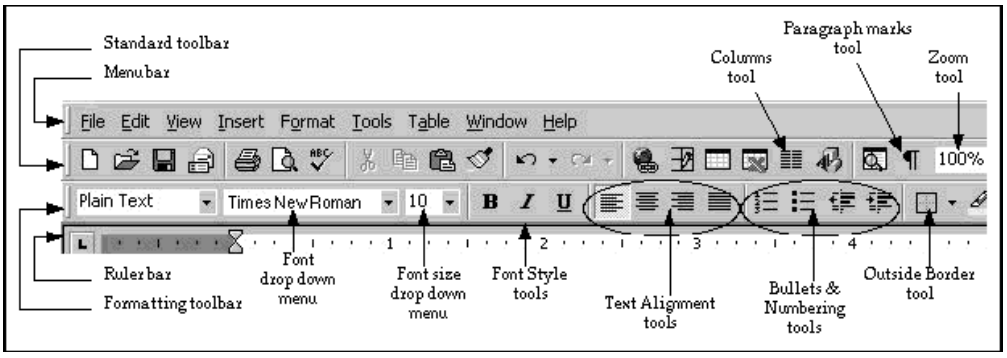
You can use the Page Setup dialog box to change any of the margins on your printed page.

Aligning Text

Alignment involves aligning your text either to the left margin, the right margin, or on both margins of the page (this latter format is often called –justified" text). Alignment also includes the option to center text.

Aligned on both margins

When you align text on both margins, both sides of your text run flush with the right and left margins.
On the Formatting toolbar are several icons



Choosing Fonts
Fonts come in all shapes and sizes, and you probably have at least half a dozen available on your Windows computer. Times New Roman font comes standard with all Windows computers, so the text displayed on your screen is almost certainly in this font.

Changing the Font size of text

The size of fonts is measured in points.
The smallest font size is a point size of 4; the largest possible font size is 255. On your computer system, however, you may find you have a narrower range of font sizes. It would be interesting to use a larger point size for the Title lines.

- Go to the beginning of the your document.
- Highlight the first Title line on the first page.
- Under the *Size* menu, select your desired size.

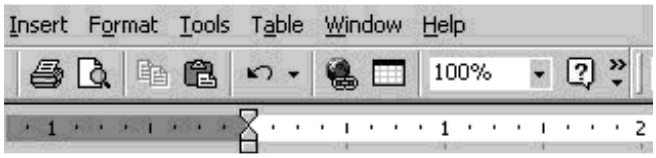
Inserting Page Breaks
It is often the practice to keep an Abstract of a document (e.g. a research paper) on a page by itself.

- Position the insertion point cursor at the start of the title line for the section.
- In the **Insert** menu select **Break...**
  Page Break is selected by default in the Break dialog box.
- Click on the **OK** button to insert the **Page Break**
- In the **View** menu select **Print Layout** to best see the effect of the Page break

Notice that *Word* moves the text to a new page following the Abstract. Thus the Abstract will now print on page 1 by itself, following the title lines.

Indenting Text

Adjusting (moving) the Indent Markers
Indenting refers to the situation where one line or several lines of a paragraph are set in from the rest of the paragraph. This is accomplished in Word using the Indent Markers on the ruler at the top of the screen



There are three indent markers (the First Line Indent marker on top, the Hanging Indent marker in the middle, and the Left Indent marker below-- the small box on which the other margin markers sit). When you drag on the small box (the Left Indent marker) all the markers move together.

Hanging Indents

The indent markers can also be set independently to achieve two types of indents.
First, there is the traditional indentation commonly used for the first line of paragraphs- where you set the margin for the first line in a few spaces from the rest of the paragraph
Second, there is the indentation for lists such as bibliographies or itemized data-- where you set the margin for the first line back a few spaces from the rest of the paragraph. Word refers to these indents as "hanging indents," because the lines that follow look as if they are hanging off the first line.

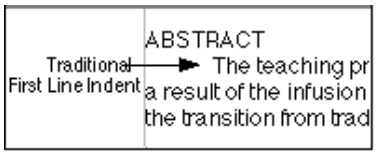


Fig. 2.8a First Line Indent

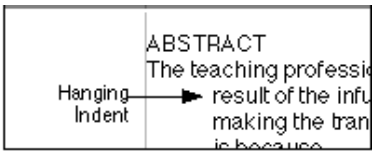


Fig. 2.8b Hanging Indent

Indenting the first line of paragraphs

- Click at the beginning of the first line of the first paragraph of the **Abstract page** (on the next line after the Abstract header) on page 1, hold down the **Shift key** and click again **at the end** of the Abstract (to highlight all the Abstract text)
- Now position the tip of the mouse arrow on the **First Line Indent marker** (the upper marker) on the ruler at the top of the screen
- Hold down the mouse button and drag this **First Line Indent marker** across half an inch (to the **1/2"** hash mark)
- When you let go of the mouse button notice how *Word* indents only the first line of the paragraphs, and adjusts the rest of the paragraphs in the Abstract to accommodate the first line indentation. This makes it easier to tell where one paragraph begins and another ends.

Spacing Paragraphs

Sometimes it's easier to read a list of items if they are slightly separated one from another by what is called white space (the parts of a page where there is no text).

- Now from the **Format** menu select **Paragraph...**, and in the dialog box that pops up on the screen change the **Before:** spacing to **6 pt**, then click on **OK**
- While you still have the table highlighted, change the point size of the text to a point size of **9**, then use the mouse to drag the **Right margin marker** on the right side of the ruler just **2** hash marks to the **left** (a 1/4" only)
- Click anywhere in the text to remove the highlighting, then check the effect of the changes you have just made

Using Tabs

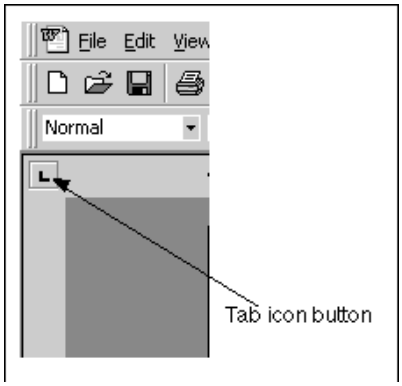
Inserting Tab stops

Tabs are very useful for aligning text in columns, as illustrated below:

John Freshman	18	50.00
Mary Senior	21	45.50
Gerard Sophomore	20	100.00

- Double click on the **File** menu to show all the available options in the menu, then select **New...**, and click on **OK** to open a new blank document (or just click on the **New** icon in the **Standard** toolbar)

Notice the Tab icon button in the Ruler bar towards the top left corner of the screen



The Tab icon is set by default for **left alignment**. So if you click anywhere on the small hash marks along the ruler while this tab icon is selected, a left tab stop will be set at the spot. Then if you use the Tab key on the keyboard to tab across to that tab, you will be left aligned on it.

- If you click once on the Tab icon button in the top left corner of the screen, you'll see the icon change to the icon for **centering** text on the Tab stop (it looks like an upside down '**T**').
- Click again on the Tab icon button and you'll see the icon for **right alignment** on the Tab stop (this tab stop looks like a backwards '**L**').
- The fourth Tab icon is for aligning numbers on a decimal point.

Removing Tab stops

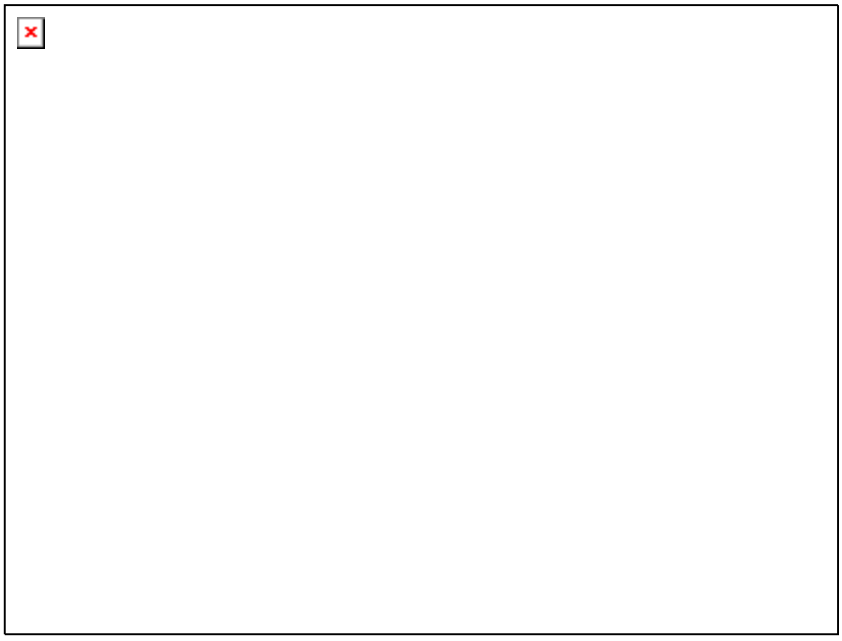
To remove a Tab stop, just use the mouse to drag the Tab stop down off the ruler.
When you release the mouse button the Tab stop will be gone.

Paragraph Styles (Bullets and Numbering)

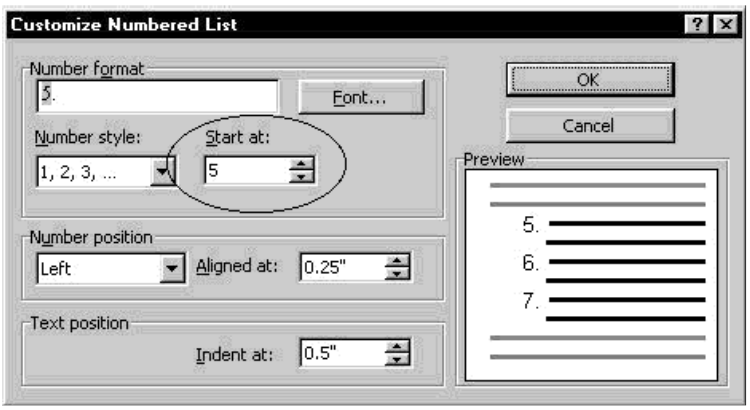
- Now click on the Numbering button in the Formatting tool bar .

Word numbers each item in the table and uses a hanging indent so that the numbers are easy to see. You can use any of several other numbering and bullet styles. You can also start the numbering from a number other than 1. Here's how you do this.

- From the Format menu select Bullets and Numbering...



- In the dialog box click on the Number tab at the top of the box, then click on the button to **Customize...** a Numbered List
- This will bring up a new dialog box so you can make changes to the list settings. If you wanted a different style of numbering, or if you wanted bullets instead of numbers, or an outline style, you'd select Bullets and Numbering... from the Format menu, and click on whatever style you wanted. In the dialog box, you can select either the Numbered tab, the Bulleted tab, or the Outline tab to choose from a variety of different styles for your layout of listed items.



Setting the Spacing between Lines

Papers may be printed with variable spacing between lines. The following steps show you how to do this in *Word*.

- From the **Edit** menu choose **Select All** (or press **Ctrl-A**)
- From the **Format** menu select **Paragraph...** to bring up the **Paragraph** dialog box
- From the **Format** menu select **Paragraph...** to bring up the **Paragraph** dialog box
- In the box for **line spacing** select **Double**

Notice how the small window at the bottom of the dialog box shows the effect of your change, so you can verify it looks OK before committing to it for your paper.

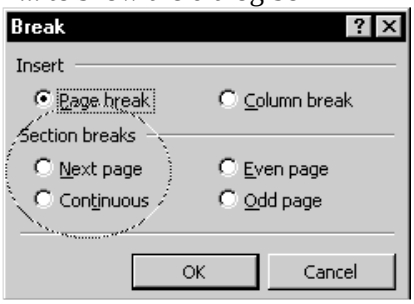
Double spacing is required for many word processing documents and now you know how to do this using *Word*.

Now press **Ctrl-S** to save your work to date

Creating Sections and Columns of Text

Columns are often useful for class newsletters. Reducing the width of lines of text can make for easier reading.

- Position the insertion point cursor at the top of page 3
- From the Insert menu select Break... to show the dialog box



The default in *Word* for a Break is to start a new page, which we don't want here.
We want 2 (two) columns for a new section of the paper, and we don't want to start a new page. So you have to make a couple of adjustments.

- First, in the **Break** dialog box, click on the **Continuous** button to tell *Word* to stay on the same page for the new section, then click on **OK**
- Next, from the Standard tool bar select the **Columns** icon.

Drag the mouse to select **2 columns** from the pop up menu in the tool bar Scroll down to take a look at the difference this makes

Adding Footnotes and Endnotes

Typically, footnotes and endnotes are used in printed documents to explain, comment on, or provide references for text in a document. You can include both footnotes and endnotes in the same document. It allows you to create appropriate notes and citations.
If you're viewing the document on the screen, you can view notes by resting the pointer on the note reference mark in the document. The note text appears above the mark. To display the note text in a note pane at the bottom of the screen, double-click the note reference mark. When you print the document, footnotes appear where you specified: either at the end of each page or directly below the text. In the printed document, endnotes also appear where you specified: either at the end of the document or at the end of each section.

To insert a footnote or an endnote

In this exercise, provide a reference for some information in your worksheet or test.

1. In Print Layout view, click where you want to insert the note reference mark.
2. On the Insert menu, click Footnote.
3. Click Footnote or Endnote.
4. Under Numbering, select the option you want. For help on an option, click the question mark ? and then click the option.
5. Click OK. Ms Word inserts the note number and places the insertion point next to the note number.
6. Type the note text.
7. Scroll to your place in the document and continue typing.

Checking Spelling and Grammar

With Ms Word, you can specify the set of grammar and writing style rules used in the grammar checker. Just select Options on the Tools menu, and then select Spelling and Grammar. Any of the built-in grammar and writing styles can be customized by choosing whether to apply specific rules that apply to a built-in style, such as Casual Communication or Technical Writing. You can also create your own custom grammar and writing styles. Ms Word provides several ways to check spelling and grammar:

- Automatically correct spelling and grammar. To fix spelling and grammatical errors without having to confirm each correction, use the AutoCorrect feature. For example, if you type *definately* and then type a space or other punctuation, AutoCorrect replaces it with "definitely." AutoCorrect can make corrections that are generated by the spelling checker's main dictionary or by a list of built-in AutoCorrect entries. You can easily add your own AutoCorrect entries or remove unwanted ones.
- Automatically check spelling and grammar as you type. To check for spelling and grammatical errors "behind the scenes," use automatic spelling and grammar checking. As you type, the spelling and grammar checkers check the text and then mark possible errors with wavy underlines. To correct an error, right-click on the underlined words to display a shortcut menu and select the correction you want.

- Check spelling and grammar all at once. You can check for spelling and grammatical errors and then confirm each correction. This method is useful if you want to postpone proofing a document until after you finish revising or editing it.
- Check the spelling and grammar of text in another language. To check text in another language, you need to install the spelling and grammar tools for that language and make sure the language is enabled for editing. Thereafter, Ms Word automatically detects the language and uses the correct spelling and grammar tools. Ms Word recognizes the language of complete sentences with appropriate punctuation, but not single words or phrases.

Find and Replace

You can also use the Find and Replace commands to search for and correct words in a document. For example, if you have created an assignment to use during January 1998 and now want to use the same assignment in March of 1999, you can have Ms Word find all instances of "January" and "1998" and replace them with "March" and "1999."

Ms Word also finds and replaces all grammatically inflected forms of a word. For example, if you want to replace the word "saw" with the word "hammer" throughout a document, Ms Word intelligently changes not only "saw" to "hammer," but also "sawing" to "hammering" and "sawed" to "hammered." Ms Word can also intelligently replace the right word forms—in this example, Ms Word would not replace the verb "seen" with "hammer" although it is a word form of "saw" because "seen" is unrelated to "hammer." In addition, Ms Word provides alternative word forms, giving you choices for possible replacements in case the default choice is not ideal. You can select the replacement from a list rather than typing it.

Adding Graphics to a Document

There are two basic types of graphics that you can use to enhance your Ms Word documents: drawing objects and pictures.

Drawing objects include AutoShapes, curves, lines, and WordArt. Use the Drawing toolbar to change and enhance these objects with colors, patterns, borders, and other effects.

Pictures include bitmaps, scanned pictures and photographs, and clip art. You can change and enhance pictures by using the options on the Picture toolbar. If you have access to a scanner or digital camera, you can insert your own pictures into your Ms Word document.

To insert a picture into a document

1. Click where you want to insert the picture.
2. On the Insert menu, point to Picture, and then click From File.
3. Locate the picture you want to insert.
4. Double-click the picture to insert it.

To scan and insert a picture into a document

1. Set up the picture in the scanning device or camera.
2. On the Insert menu, point to Picture, and then click From Scanner or Camera.
3. If you have more than one device attached to your computer, under Device select the device you want to use.
4. Do one of the following:
   - Click Web Quality to use a lower resolution or if you intend for your document to be viewed on screen.
   - Click Print Quality to use a higher resolution or if you intend for your document to be printed.
5. Do one of the following:
   - Click Insert if you're using a scanner and you want to use predefined settings to scan your picture.
   - Click Custom Insert if you're using a scanner and you want to change image settings, or if you're using a camera. Then follow the instructions that come with the device you're using.

6. When the image appears in the document, make any changes you want. You can use the tools on the Picture toolbar to crop the picture, adjust its brightness, contrast, and color, and make other adjustments.

The Insert button might be unavailable with some scanners because the scanner software doesn't support an automatic scan. Use the Custom Insert button instead.

Formatting with Tables

You can quickly create a simple table by using the **Insert Table** command or you can use the Draw Table tool to quickly create a more complex table—for example, one that contains cells of different heights or a varying number of columns per row. Using Draw Table is similar to drawing a rectangle on graph paper—first, draw a line from one corner of the table to the corner diagonally opposite in order to define the boundary of the entire table, and then draw the column and row lines inside.

You can also use tables to perform some of the tasks you might use a spreadsheet for. For example, you can sort table entries in alphabetical, numeric, or date order. You can also total a row or column of numbers in a table, as well as perform other calculations, such as averaging. For more information about these advanced functions of tables, ask the Office Assistant.

To insert and format a table

For this worksheet or test, insert a table to format the space for student answers.

1. Place your pointer in the text where you want to insert the table.
2. From the Table menu, point to Insert and then click Table. The Insert Table dialog box appears.
3. Select a number of columns and rows and AutoFit features. For example, you might only want 2 columns, one for test or worksheet questions, and one for answers. If you have 10 questions, you might want at least 10 rows.
4. Enter a question into each row. You can enter text, pictures, or even other tables into the cells in this table. Use the arrow keys to move around in the table.
5. You can resize the rows and columns of the table. To adjust the size of the table, move the pointer over the vertical line that separates the columns in your table and double-click to automatically fit the text. Do the same to the vertical line on the right side of the column. Or, you can resize the columns by selecting Cell Height and Width from the Table menu and then selecting Autofit.
6. To add a border to the table, click anywhere in the table and on the Format menu, click Borders and Shading.
7. Click the Borders tab.
8. Specify which borders you want to show or click *None* to hide the borders.
9. Click OK.

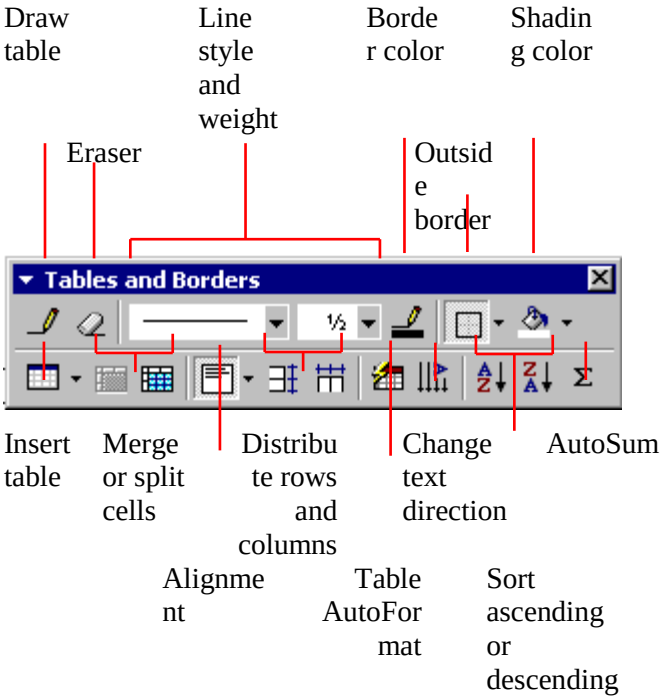
You can also change the size or position of the table with the following:

- In-table row resizer lets you adjust any row's height directly in the table by dragging the row border up or down. You can also adjust column widths with the column resizer. If you hold down ALT while you drag, the vertical ruler shows you the exact row height.
- Table move handle Click to move the table to another position on the page.
- Table resize handle Click and drag to change the size of the entire table while maintaining the same row and column proportions.

To draw a table

You can also use Draw Table to create *nested tables*, tables inside other tables. Nested tables are particularly useful when you use a table to lay out a page and then want to use another table to present information. For example, you could use a table to lay out a math test, and a nested table to present information for a particular story problem.

1. Click Tables and Borders on the Standard toolbar. The Tables and Borders toolbar appears.



2. When you move the pointer over the document, you should note that it has the shape of a pencil. If it does not, click Draw Table .
3. Click and drag diagonally down and to the right to create a rectangle.
4. With the pencil, draw a line that divides the rectangle in two.
5. Use the pencil to divide one of the halves into two columns.
6. Now that you can see the flexibility of the Draw Table feature, use it to create and divide more boxes.
7. Click the Eraser tool.

Go back to the table and erase one of the lines you created by clicking and dragging along the line. Press ESC to cancel the eraser tool.

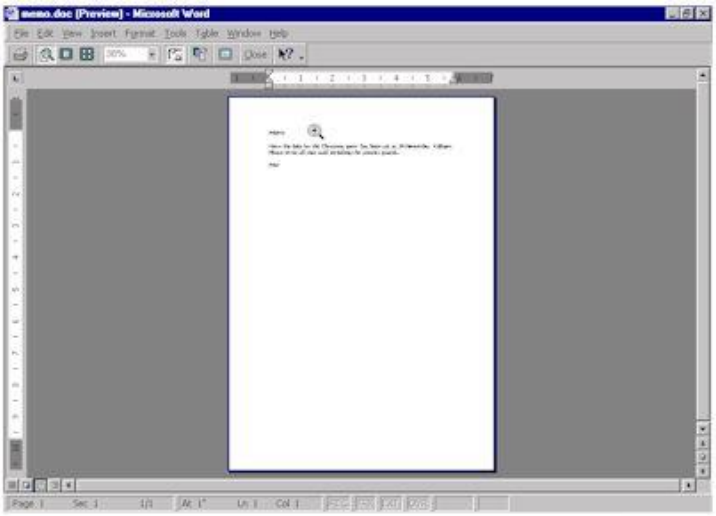
Printing

Print preview

The print preview option allows you to view your document as it would appear printed. This allows you to check the layout and to make any necessary editing and formatting changes before you print.

- The Print Preview button may not be on the toolbar if you have not previously used it. If it is not, click on the additional button on the tool bar, then select the Print Preview button from those listed.

Your screen will appear as shown below.

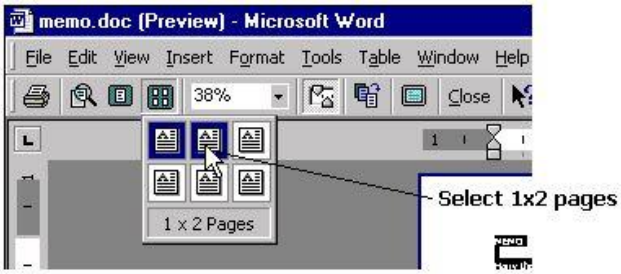


Showing multiple pages

The screen currently displays only one of the two pages of your document. To change the display to two pages follow the steps below.

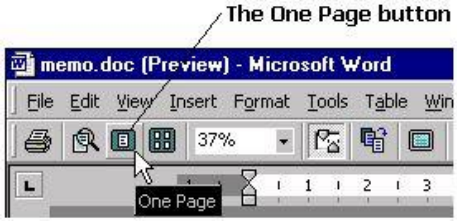
- Hold the mouse key down on the multiple pages button on the toolbar to display a list of the available options.

- Drag the mouse over the options panel to select two pages side by side.



- Release the mouse button. Both pages of the document will now be displayed.

- Click on the one page button to return to the previous view.



Using the magnifying glass

It is difficult to see what is printed on the page because of the size of the picture. To magnify part of the page use the magnifying glass.

If the magnifying glass is already selected, the magnifying glass button on the tool bar will appear depressed, or pushed down.

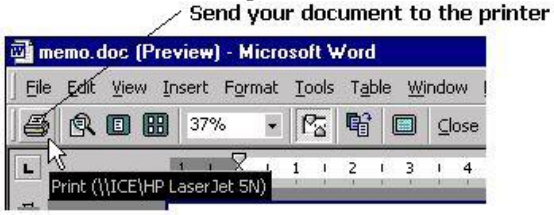
- Check that the magnifying glass on the tool bar is selected. If it is not selected click on it.

This makes the magnifying glass active. The mouse pointer will change shape to a magnifying glass when positioned over the document.

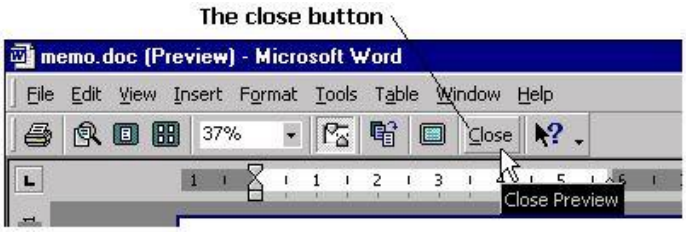
- Click anywhere inside the document to enlarge that portion of it. You can use the scroll bars at the edge of the window to move around the document.
- Click on the document to return the display to full page.

Printing

When you are happy with your document, click the print button on the toolbar.



- Click on the close button to return to normal view.



If you wish to be able to you to choose which pages of a multi-page document to print, or to print more than one copy of your document, you should use the print option from the file menu.

- Choose Print from the File menu. The default settings are appropriate at this stage.
- Click on the OK button to print the document or Cancel if you prefer. Collect your printout from the printer.

Exercises

S.K. MUTAI,
P.o Box 73 329,
Nairobi. 00200
CENTER THE ABOVE LETTERHEAD, AND MAKE THE FIRST LINE BOLD

Mr. R. Onyango.
123 Happy Lane
Seattle, WA 98210

Dear Sir.
I just wanted to let you know that I received your request for information about our Laptops.

I think our company makes the specifications we attached. Many of the users for the lapops are in the field and hence we need them.
Our specifications include:
(1) Branded laptops (**Hewlett Packered**)
(2) RAM sizes 2 GB.
(3) at least 160 GB hard disk
(4) Core 2 Duo porcessors
INDENT PARAGRAPHS (1-4) ABOVE BY 1/4 INCH
Here's what some of our customers say about our HP laptops:

J M Kariuki "HP laptops are more durable than others and every time they fall down accidentally, they are able to recover damages". Please keep making them just as they are…the best!"

L. A Obama, "Your Laptops are the greatest. I love the built in webcam and the multiple DVD drives which make multimedia easy."
DO A **HANGING INDENT** ON THE ABOVE QUOTES, SO THAT NAMES HANG AT LEFT. Also, MAKE THE ACTUAL QUOTES ITALICS

Here is a listing of our current models and pricing.

Model	Length	Hard disk sixe	Price
Ninja	14”	120	$15.95
GI Jake	15”	160	$17.50
Boomer	16”	80	$19.25
Rad	18”	120	$32.49

CREATE A TABLE FOR THE ABOVE DATA AND FORMAT CELLS SUCH THAT THE BORDORES HAVE DOUBLE LINES.

Thanks for your interest,

CREATE THE PAGE BOADER OF TYPE SHADOW WITH A BLUE COLOR. CREATE A HEADER HAVING A LETTERHEAD DESIGN OF YOUR CHOICE
*THEN, GET RID OF ALL THE **RED** INSTRUCTIONS INCLUDING THIS ONE*

S.K. MUTAI.

Second Exercise

Create a 1-page Flier announcing an Open day for a CIS DEPARTMENT, named CIS OPEN DAY.

The date/time (27TH JUNE 2009, VENUE – KEMU MAIN CAMPUS), activities, goodies, etc…**use your Imagination**.

The flier must have a page border , 3 text colors, 3 different text sizes, and at least 1 graphic on it.

Microsoft Excel

Week 7 Students learning objectives

1. Understand Ms excel Toolbar, how to Customize and Shortcut Menus.
2. Understand how to do quick Movement around Spreadsheets and Quick Selection.
3. Perform editing an existing Worksheet.
4. Perform addition of Basic Formulas.
5. Be able to work with multiple Worksheets: - Naming Worksheets within a Workbook.
6. Perform auto-filling in a Series of Data.
7. Perform zooming In and Out of Areas, Viewing Multiple Worksheets on one Screen,
8. Be able to manipulate the Worksheet, Inserting, Deleting, Columns, Rows and Cells.
9. Perform sorting of Cell Data into specific Orders.

What is a Spreadsheet Program?

A spreadsheet program uses worksheets and workbooks. Spreadsheets allow you to organize information in rows and tables (which create cells), with the added automatic mathematics. Spreadsheets have been used for many years in business to keep track of expenses and other calculations. Excel numerical data in a spreadsheet can be converted easily into a chart for graphical presentation of the data.

Terminologies

Worksheet – Excel's term for an electronic spreadsheet

Cell address – cells are "containers" that are capable of holding data. They are arranged in a series of lettered and numbered columns and rows. The cell address is also displayed in the Name box at the left end of the formula bar.

Workbook – multiple related worksheets.

Active cell – a cell with a dark border (called cell selector) around it. It's the cell that you have selected to enter or edit data.

Column heading – the lettered boxes across the top of the Excel's workspace. Clicking one selects an entire column of cells, which you can format or move as a whole.

Row heading – the numbered boxes down the side of the Excel's workspace. Clicking one selects an entire row of cells, which you can format or move as a whole.

Sheet tabs – click on these to move from one worksheet in a workbook to another.

Name box – the box at the far-left end of the Formula bar that holds the address of the cell or cell range currently selected in Excel.

Fill handle - the small black square in the corner of the selection. When you point to the fill handle, the pointer changes to a black cross. To copy contents to adjacent cells or to fill in a series such as dates, drag the fill handle. To display a shortcut menu that contains fill options, hold down the right mouse button as you drag the fill handle.

Characteristics of a good spreadsheet software

1. Allows presentation of bulky tabular data

2. Contains formulae and other functions that make complex mathematical operations easy to handle
3. Contains database tools that allow links to other applications for information processing.
4. Allows the user to represent information graphically.
5. Allows good organization of information within a given file (workbook).

Launching Your Excel Application

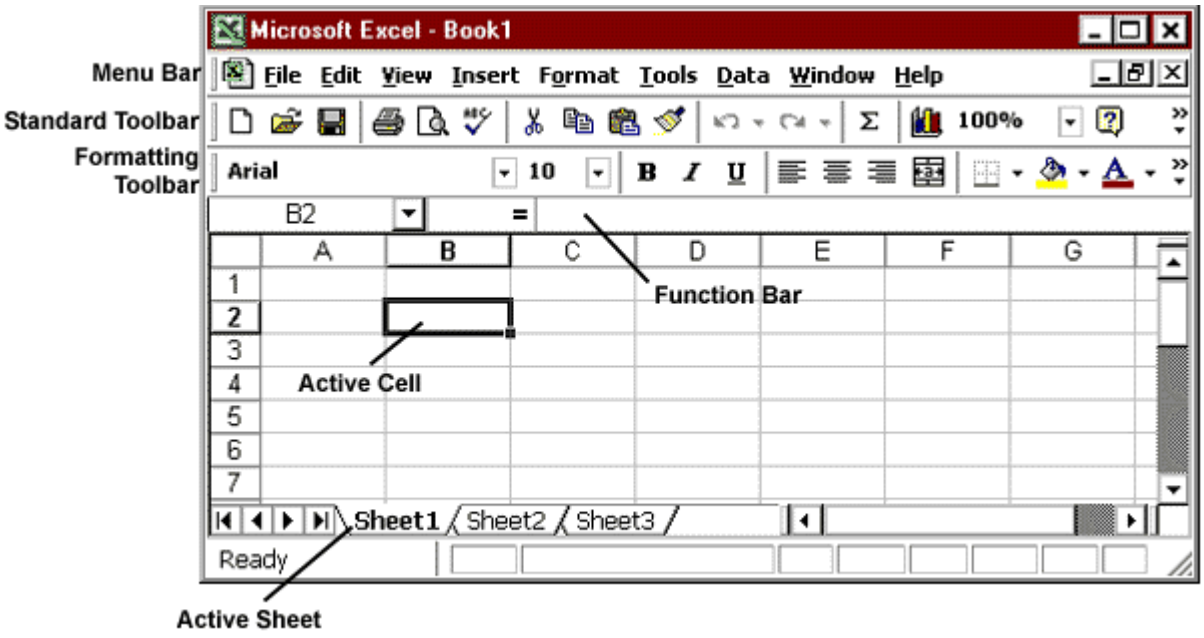
1. Click the Start icon button on the Taskbar at the bottom left corner of your screen.
2. Point to Programs.
3. Click Office from the submenu, and then select Microsoft Excel.

Understanding the Excel Environment

The Workbook Window

The Excel workbook window is shown in Figure 1 (below). Descriptions follow.

FIGURE 1. The Excel Workbook Window



Menu Bar. The Menu Bar at the top of the screen gives you access to different commands that are used for such tasks as opening and closing files, printing documents, formatting data, and other operations.

Toolbars. On the sample window in Figure 1 (above), immediately below the Menu Bar is a row of icon buttons called the toolbars. There are two toolbars that provides quick access to a number of the most commonly used Excel features. The first bar is the **Standard Toolbar***;* the second is the **Formatting Toolbar**. By positioning the mouse pointer on a toolbar icon (without clicking), a yellow box will appear next to the icon with a brief description of that icon's use.

Notes: The example in Figure 1 shows the Standard and Formatting toolbars on separate rows for ease of viewing; however, on your screen you may see these toolbars on a single row. Whenever only a partial toolbar is displayed, you can click the double arrows at the end of the toolbar to see additional icon buttons.

You can control how the Standard and Formatting toolbars are displayed using the Tools menu, as follows:

1. On the Menu Bar click **Tools**.
2. Choose (click) **Customize** from the drop-down menu.
3. Click the **Options** tab to bring it to the front.

4. Check or uncheck the box next to "Standard and Formatting Toolbar share one row":
    - An X in the checkbox means the toolbars will share a single row.
    - A blank checkbox means the toolbars will be displayed on separate rows.
5. Click the **Close** button to return to your workbook window.

The **Standard Toolbar** is illustrated in Figure 2 (below). The buttons, from left to right are: New Worksheet, Open Worksheet, Save, Print, Print Preview, Spell Check, Cut, Copy, Paste, Format Paint, Undo, Redo, Insert Hyperlink, Web Toolbar, AutoSum, Function Wizard, Sort Ascending, Sort Descending, Chart Wizard, Mapping, Drawing, Zoom, and Help. Each of these features can also be initiated from one of the pull-down menus.

FIGURE 2. Standard Toolbar

The **Formatting Toolbar** is illustrated in Figure 3 (below). The buttons are, from left to right: Font Type, Font Size, Bold, Italics, Underline, Margins (left, center, right, merge & center,) Currency Style, Percent Style, Comma Style, Increase Decimal, Decrease Decimal, Decrease Indent, Increase Indent, Borders, Fill Color, and Font Color. Each of these features can also be initiated from one of the pull-down menus.

FIGURE 3. Formatting Toolbar

Toolbars are very useful. They give direct access to commands without having to go through the menu items. Excel offers many toolbars. To see a listing of all the available toolbars, click "View" on the Menu Bar and select "Toolbars." A submenu appears displaying the toolbars. To select a toolbar simply click on it in the submenu. A check mark will appear in front of your selection and will now make that selection viewable from your worksheet.

Formula (or Function) Bar. The Formula Bar displays the contents of the active cell or the active block. It includes text, numbers, formulas, and functions.
Active Cell. The active cell is the currently selected cell. A thick border block, called the **Cell Pointer**, surrounds the active cell. Data is entered in the active cell.
Active Sheet. Often a file consists of more than one worksheet. Each sheet contains a tab you click to move from one sheet to another. You can rename sheets to make it easier to remember what each one contains. You may do so by double-clicking the sheet name, e.g., Sheet1, typing a new name, and tapping the ENTER key.
Worksheet Window. The worksheet window displays the Excel worksheet. It is comprised of rows and columns. The columns are labeled with the letters of the alphabet, i.e., A, B, C, etc. The rows are numbered down the left side. Rows and columns intersect to form cells. Each cell can be referenced via its column name followed by its row number. For example, the intersection of row 2 and column B is cell B2 (as shown in Figure 1, above).

Navigating in a Workbook

At the bottom of the workbook window (where the sheet tabs are located) are a number of controls you can use to move from worksheet to worksheet within a workbook. Use the four tab scrolling buttons in the lower left corner only when you have more worksheets in a workbook than can be displayed at once. You can drag the tab split box to change the number of the sheet tabs displayed. To reset the tab display, simply double-click the tab split box.
You can also navigate a worksheet using the arrows to the right of your keypad — up, down, left, or right. You can always use point and click with your mouse.

Selecting a Range (or Block) of Cells

1. Click the first cell you want to include in the range

2. While holding the mouse button down, drag the mouse to include all cells you want to include in the range.
3. Release the mouse button. The range selected will appear highlighted except for the first cell of the range.

Entering Data and Using Formulas

Entering a Label (Text) or a Value (Number)

1. Click the cell where you want to enter a label or a value.
2. Type a label (text) or a value (number). A label can include uppercase and lowercase letters, spaces, punctuation, and numbers. When typing values, do so without commas and dollar signs. You can format them later using the **Format** menu.
3. Tap ENTER.

A simple spreadsheet would look like this: -

	A	B	C	D
1		**Grade 1**	**Grade 2**	**Grade 3**
2	**Student 1**	98	100	80
3	**Student 2**	78	90	85
4	**Student 3**	90	100	100
5	**Student 4**	86	88	90
6	**Student 5**	0	0	0

Creating a Formula

When using a formula in your spreadsheet, (a cell containing a formula that references other cells), the sum will automatically change as other cell values referenced in the formula change. This feature is very valuable when editing or adding information to your worksheet. You do not have to remember to update other cells that rely on that cells information.

A formula always begins with an equal sign (=) followed by some combination of numbers, text, cell references, and operators. If a formula is entered incorrectly, an **ERROR IN FORMULA** message will appear.

This is what a basic spreadsheet may look like, keeping track of the grades for five students. As you'll notice, numbers automatically align to the right, while text automatically aligns to the left. Room has been allowed at the top and the left for column and row headings, which have been placed in bold.

Simple Formulas:

	A	B	C	D
1		**Grade 1**	**Grade 2**	**Grade 3**
2	**Student 1**	98	100	80
3	**Student 2**	78	90	85
4	**Student 3**	90	100	100
5	**Student 4**	86	88	90
6	**Student 5**	0	0	0

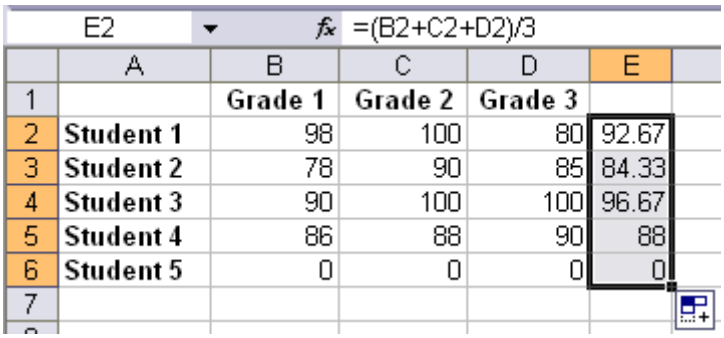
"92.67" was not entered as the contents for cell "E2." The "formula bar" has the following entered into it:

=(B2+C2+D2)/3

By following the normal order of operations, the contents of the three cells in parenthesis (B2, C2, and D2) are all added to each other, and then divided by 3. This gives an average of the three grades, which is then shown in the cell "E2" (where the formula was entered).

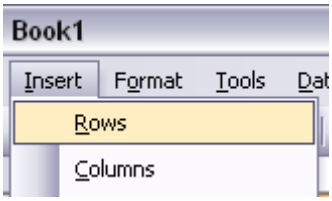
If you wanted to do the same for students 2 through 5, you would enter in similar formulas for each cell from "E3" to "E6" replacing the column and row numbers where appropriate.

An easy method to replicate formulas is to select the cell which contains the original formula ("E2" in this case), click the bottom right corner of the selection box, and drag down several rows (to "E6" in this example). The formula will be copied down in each cell, and will change itself to reflect each new row.

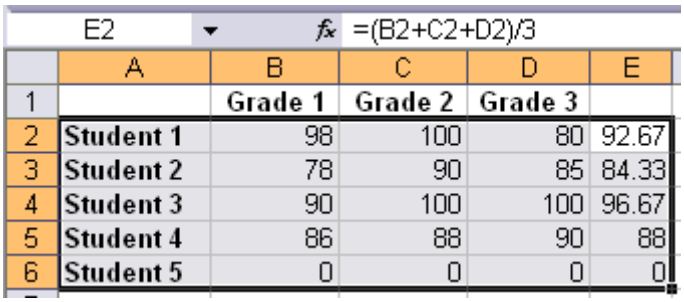


	A	B	C	D	E
1		Grade 1	Grade 2	Grade 3	
2	Student 1	98	100	80	92.67
3	Student 2	78	90	85	84.33
4	Student 3	90	100	100	96.67
5	Student 4	86	88	90	88
6	Student 5	0	0	0	0
7					

Insert Rows & Columns:
You may find that you need to insert a new, blank row where there isn't a blank row any more. To insert a new blank row, place your cursor directly below where you would like a new row. Select Insert >> Rows. To insert a new column, place the cursor in a cell directly to the right of where you would like the column. Select Insert >> Columns.

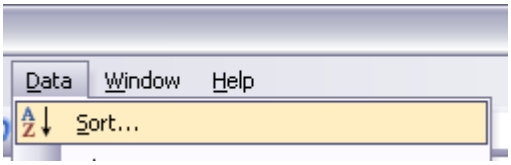


Sorting:
One of Excel's powerful features is its ability to sort, while still retaining the relationships among information. For example, let's take our student grade example from above. What if we wanted to sort the grades in descending order? First, let's select the information we want to sort.



	A	B	C	D	E
1		Grade 1	Grade 2	Grade 3	
2	Student 1	98	100	80	92.67
3	Student 2	78	90	85	84.33
4	Student 3	90	100	100	96.67
5	Student 4	86	88	90	88
6	Student 5	0	0	0	0

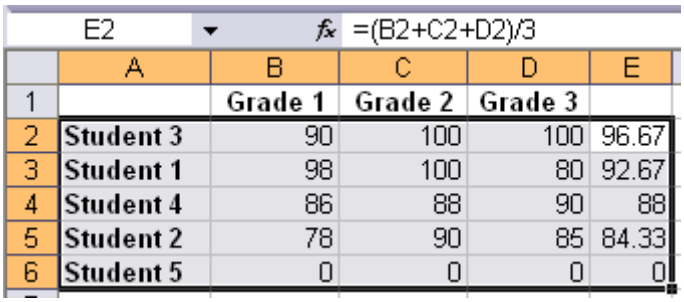
Now let's select the "Sort" option from the "Data" menu.



A new window will appear asking how you would like to sort the information. Let's sort it by the average grade, which is in Column E; be sure to set by "Descending" order. If there were other criteria you wished

to sort by as secondary measures, you could do so; let's select "Then by" as "Grade 3" just for the practice of doing so ("Descending" order, as well).

Excel will sort your information with the specifications you entered. The results should look something like this:



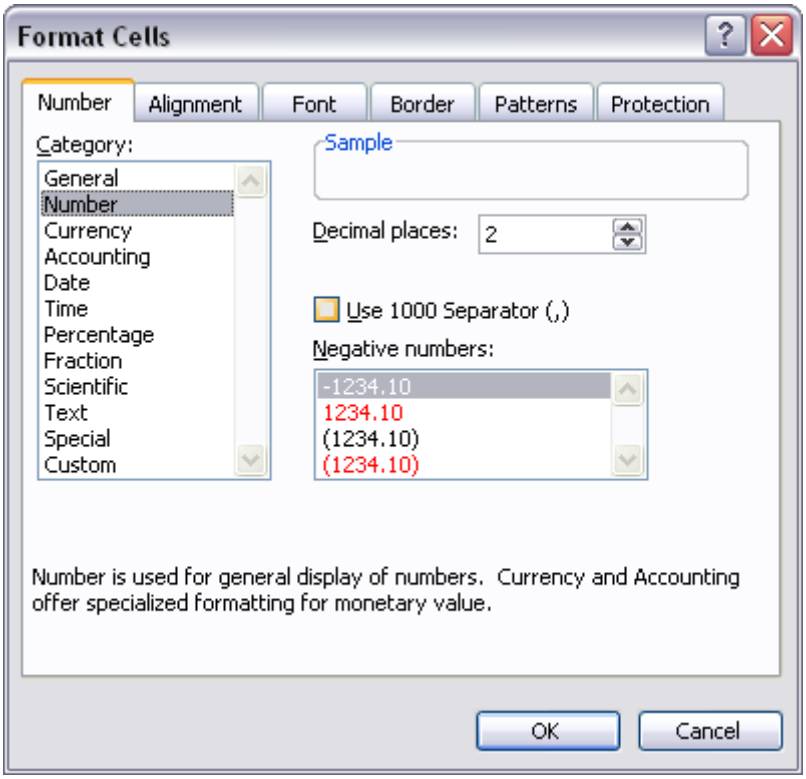
	A	B	C	D	E
1		Grade 1	Grade 2	Grade 3	
2	Student 3	90	100	100	96.67
3	Student 1	98	100	80	92.67
4	Student 4	86	88	90	88
5	Student 2	78	90	85	84.33
6	Student 5	0	0	0	0

Cell Formatting:

You may notice that, by default, Excel will leave as many decimal points as possible within the cell's width restraints; as you increase the cell's width, the number of decimal points increases.

	A	B	C	D	E
1		Grade 1	Grade 2	Grade 3	
2	Student 3	90	100	100	96.6666667
3	Student 1	98	100	80	92.6666667
4	Student 4	86	88	90	88
5	Student 2	78	90	85	84.3333333
6	Student 5	0	0	0	0

Select "Cells" from the "Format" menu. A new window will appear with a wide variety of ways in which to customize your spreadsheets.



For example, if we wanted to set the percentages fixed to only two decimal points, you can make this selection under the "Number" category within the "Number" tab. You can also set the formatting for things such as the date, time, currency, etc.

The "Font" tab will also allow you to change the default font used on the spreadsheet. The other tabs provide even more ways to customize your spreadsheet and its appearance; experiment with the settings to see what works best for you.

Week 8 Students learning objectives

1. Perform manipulation of the Workbook: - Naming & Moving Worksheets.
2. Perform printing of a Workbook or Selected Sheets.
3. Understand the Structure of Formulas with Built-in Functions.
4. Use the Function Wizard.
5. Perform borders and Shading, AutoFormat and Printing with Page Breaks
6. Manipulate margins, Define the Print Area and Scaling.
7. Be able to insert headers and footers, automatic page numbering.
8. Be able to add charts, titles, textboxes and directional arrows.

Calculation Operators

Operators specify the type of calculation that you want to perform on the elements of a formula. Microsoft Excel includes four different types of calculation operators: arithmetic, comparison, text, and reference.

Arithmetic operators To perform basic mathematical operations such as addition, subtraction, or multiplication; combine numbers; and produce numeric results, use the following arithmetic operators.

Arithmetic operator	Meaning (Example)
+ (plus sign)	Addition (3+3)
– (minus sign)	Subtraction (3–1) Negation (–1)
* (asterisk)	Multiplication (3*3)
/ (forward slash)	Division (3/3)
% (percent sign)	Percent (20%)
^ (caret)	Exponentiation (3^2)

Comparison operators You can compare two values with the following operators. When two values are compared by using these operators, the result is a logical value either TRUE or FALSE.

Comparison operator	Meaning (Example)
= (equal sign)	Equal to (A1=B1)
> (greater than sign)	Greater than (A1>B1)
< (less than sign)	Less than (A1<B1)
>= (greater than or equal to sign)	Greater than or equal to (A1>=B1)
<= (less than or equal to sign)	Less than or equal to (A1<=B1)
<> (not equal to sign)	Not equal to (A1<>B1)

Text concatenation operator Use the ampersand (&) to join, or concatenate, one or more text strings to produce a single piece of text.

Text operator	Meaning (Example)
& (ampersand)	Connects, or concatenates, two values to produce one continuous text value ("North"&"wind")

Reference operators Combine ranges of cells for calculations with the following operators.

Reference operator	**Meaning (Example)**
: (colon)	Range operator, which produces one reference to all the cells between two references, including the two references (B5:B15)
, (comma)	Union operator, which combines multiple references into one reference (SUM(B5:B15,D5:D15))
(space)	Intersection operator, which produces on reference to cells common to the two references (B7:D7 C6:C8)

The order in which Excel performs operations in formulas

Formulas calculate values in a specific order. A formula in Excel always begins with an equal sign (=). The equal sign tells Excel that the succeeding characters constitute a formula. Excel calculates the formula from left to right, according to a specific order for each operator in the formula.

Use of parentheses

To change the order of evaluation, enclose in parentheses the part of the formula to be calculated first. For example, the following formula produces 11 because Excel calculates multiplication before addition. The formula multiplies 2 by 3 and then adds 5 to the result.

=5+2*3

In contrast, if you use parentheses to change the syntax, Excel adds 5 and 2 together and then multiplies the result by 3 to produce 21.

=(5+2)*3

In the example below, the parentheses around the first part of the formula force Excel to calculate B4+25 first and then divide the result by the sum of the values in cells D5, E5, and F5.

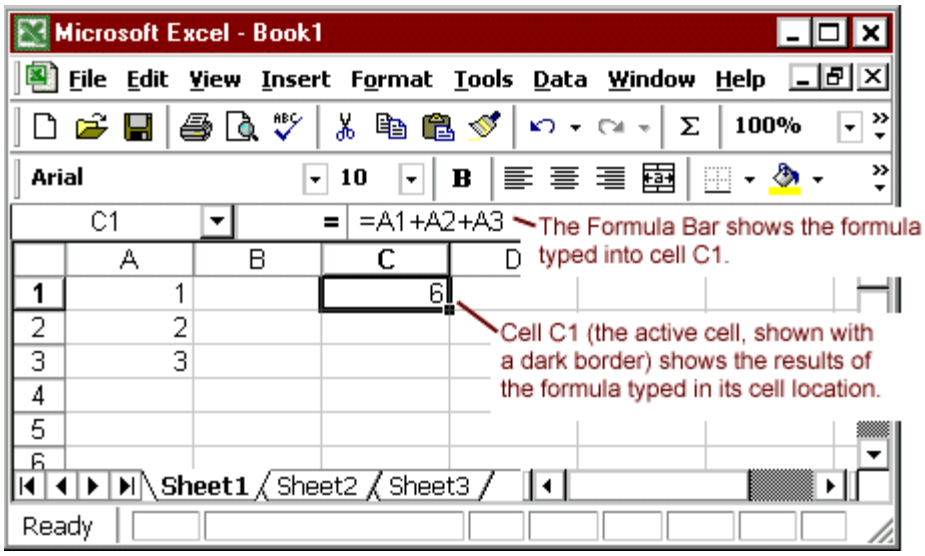
=(B4+25)/SUM(D5:F5)

How to Enter a Formula

(see Figure 4, below, for an example)

1. Click a cell where you want to enter a formula.
2. Type = (equal sign) to begin the formula.
3. Type the first argument. Remember, an argument can be a number or a cell reference. You can type in the number or if referencing a cell, you can single click on the cell location to have the cell reference automatically included in your formula.
4. Next, type an arithmetic operator (see Table 2, above).
5. Next, enter the next argument.
6. Steps 4 and 5 can be repeated as many times as needed to add to the formula.
7. Last, tap the ENTER key. The result of the formula appears in the cell while the formula itself appears in the Formula Bar.

FIGURE 4. Formula Example



Worksheet Functions

Functions are predefined formulas that perform calculations by using specific values, called arguments, in a particular order, or structure. Functions can be used to perform simple or complex calculations. For example, instead of typing =A1+A2+A3+A4+A5, you may type =SUM(A1:A5). (The colon indicates the range from A1 to A5.) In this example, SUM is a function that Excel knows about.

It is important to use the correct syntax and format of a function for correct results.

Structure of a function

The structure of a function begins with an equal sign (=), followed by the function name, an opening parenthesis, the arguments for the function separated by commas, and a closing parenthesis.

Function name: For a list of available functions, click a cell and press SHIFT+F3.

Argument: Arguments can be numbers, text, logical values such as TRUE or FALSE, arrays, error values such as #N/A, or cell references. The argument you designate must produce a valid value for that argument. Arguments can also be constants, formulas, or other functions.

Argument tooltip: A tooltip with the syntax and arguments appears as you type the function. For example, type =ROUND(and the tooltip appears. Tooltips only appear for built-in functions.

Entering formulas When you create a formula that contains a function, the **Insert Function** dialog box helps you enter worksheet functions. As you enter a function into the formula, the **Insert Function** dialog box displays the name of the function, each of its arguments, a description of the function and each argument, the current result of the function, and the current result of the entire formula.

Σ Adding a Range Using the AutoSum Function

The AutoSum function is a great tool to use when you want to quickly add contents of a range of cells.

1. Click the cell where you want the total to appear (usually the last cell in the column or row of cells that you want to add. The cell must be blank).
2. Click the **AutoSum** icon button on the Standard Toolbar. AutoSum inserts a formula that uses the SUM function. It displays a moving border that looks like scrolling lines around the selected range of cells. This is called a marquee. Excel puts this around the range of cells it "thinks" you want to add up, and inserts the range reference in the formula.
3. If this is the correct range, press ENTER. If not, type or highlight the correct range and press ENTER.

Formatting Text and Performing Mathematical Calculations

Choosing a Default Font

Microsoft Excel enables you to choose a default font. The default font is the style of typeface that Excel will use unless you specify a different style. For the exercises in this lesson, you want your font to be set to Arial, Regular, and Size 10. To set your font to Arial, Regular, and Size 10:

1. Choose *Format* > *Cells* from the menu.
2. Choose the Font tab.
3. In the Font box, choose Arial.
4. In the Font Style box, choose Regular.
5. In the Size box, choose 10.
6. If there is no check mark in the Normal Font box, click to place a check mark there. Your selections are now the default.
7. Click OK.

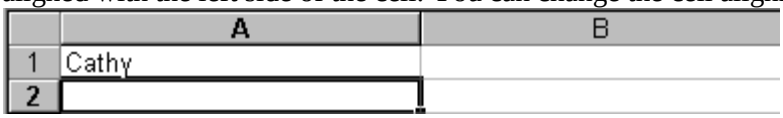
Adjusting the Standard Column Width

When you open Microsoft Excel, the width of each cell is set to a default width. This width is called the standard column width. You need to change the standard column width to complete your exercises. To make the change, follow these steps:

1. Choose *Format* > *Column* > *Standard Width* from the menu. The Standard Width dialog box opens.
2. Type **25** in the Standard Column Width field. Click OK. The width of every cell on the worksheet should now be set to 25.
3. Move to cell A1.
4. Type **Cathy**.
5. Press Enter.

Cell Alignment

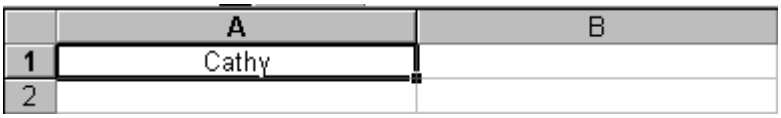
The name "Cathy" is aligned with the left side of the cell. You can change the cell alignment.



Centering by Using the Menu

To center the name Cathy, follow these steps:

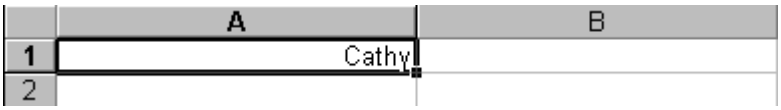
1. Move the cursor to cell A1.
2. Choose *Format* > *Cells* from the menu. The Format Cells dialog box opens.
3. Choose the Alignment tab.
4. Click to open the drop-down box associated with the Horizontal field. After the drop-down box is opened, click on Center.
5. Click OK to close the dialog box. The name "Cathy" is centered.



Right-Aligning by Using the Menu

To right-align the name "Cathy," follow these steps:

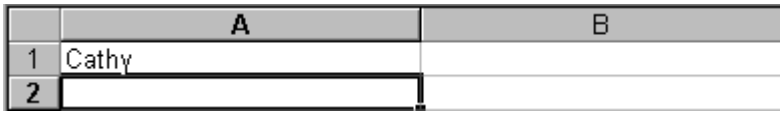
1. Move the cursor to cell A1.
2. Choose *Format* > *Cells* from the menu. The Format Cells dialog box opens.
3. Choose the Alignment tab.
4. Click to open the drop-down box associated with the Horizontal field. After the drop-down box is opened, click on Right (Indent).
5. Click OK to close the dialog box. The name "Cathy" is right-aligned.



Left-Aligning by Using the Menu

To left-align the name "Cathy," follow these steps:

1. Move the cursor to cell A1.
2. Choose *Format* > *Cells* from the menu. The Format Cells dialog box opens.
3. Choose the Alignment tab.
4. Click to open the drop-down box associated with the Horizontal field. After the drop-down box is opened, click on Left (Indent).
5. Click OK to close the dialog box. The name "Cathy" is left-aligned.



Alternate Method: Alignment by Using the Formatting Toolbar

Using the Formatting toolbar, you can quickly perform tasks. You can use the Formatting toolbar to change alignment.

Centering by Using the Toolbar

To center the name "Cathy," follow these steps:

1. Move the cursor to cell A1.
2. Click on the Center icon, which is located on the Formatting toolbar.

The red circle designates the Align Center icon.

Right-Aligning by Using the Toolbar

You can right-align the name "Cathy" by following these steps:

1. Move the cursor to cell A1.
2. Click on the Align Right icon, which is located on the Formatting toolbar.

The red circle designates the Align Right icon.

Left-Aligning by Using the Toolbar

You can left-align the name "Cathy" by following these steps:

1. Move the cursor to cell A1.
2. Click on the Align Left icon, which is located on the Formatting toolbar.

The red circle designates the Align Left icon.

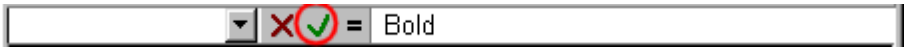
Adding Bold, Underline, and Italic

You can bold, underline, or italicize text in Microsoft Excel. You can also combine these features -- in other words, you can bold, underline, *and* italicize a single piece of text.

In the exercises that follow, you will learn three different methods for bolding, italicizing, or underlining text in Microsoft Excel. You will learn to bold, italicize, and underline by using the menu, the icons, and the shortcut keys.

Adding Bold by Using the Menu

1. Type **Bold** in cell A2.
2. Click on the check mark located on the Formula bar. Clicking on the check mark is similar to pressing Enter.



3. Choose *Format* > *Cells* from the menu. The Format Cells dialog box opens.
4. Choose the Font tab.
5. Click on Bold in the Font Style box.
6. Click OK. The word "Bold" should now be bolded.

Adding Italic by Using the Menu

1. Type **Italic** in cell B2.
2. Click on the check mark located on the Formula bar. Clicking on the check mark is similar to pressing Enter.
3. Choose *Format* > *Cells* from the menu. The Format Cells dialog box opens.
4. Click on Italic in the Font style box.
5. Click OK. The word "Italic" is italicized.

Adding Bold by Using the Icon

1. Type **Bold** in cell A3.
2. Click on the check mark located on the Formula bar.

3. Click on the Bold icon, which is on the Formatting toolbar.
4. Click again on the Bold icon if you wish to remove the bolding.

Adding Italic by Using the Icon

1. Type **Italic** in cell B3.
2. Click on the check mark located on the Formula bar.

3. Click on the Italic icon, which is on the Formatting toolbar.
4. Click again on the Italic icon if you wish to remove the italics.

Adding Underline by Using the Icon

1. Type **Underline** in cell C3.
2. Click on the check mark located on the Formula bar.

3. Click on the Underline icon, which is on the Formatting toolbar.
4. Click again on the Underline icon if you wish to remove the underline.

NB: using the keyboard shortcuts,

- Hold down the Ctrl key while pressing "i" (Ctrl-i) to change font to Italics.
- Hold down the Ctrl key while pressing "u" (Ctrl-u) to underline.
- Hold down the Ctrl key while pressing "b" (Ctrl-b) to make it Bold.

Changing the Font, Font Size, and Font Color

You can change the Font, Font Size, and Font Color of the data you enter.

Changing the Font

1. Type **Times New Roman** in cell A5.
2. Click on the check mark located on the Formula bar.
3. Choose *Format* > *Cells* from the menu. The Format Cells dialog box opens.
4. Choose the Font tab. All of the Fonts listed in the Font box are available to you.
5. Find and click on Times New Roman in the Font box.
6. Click OK. The font changes from Arial to Times New Roman.

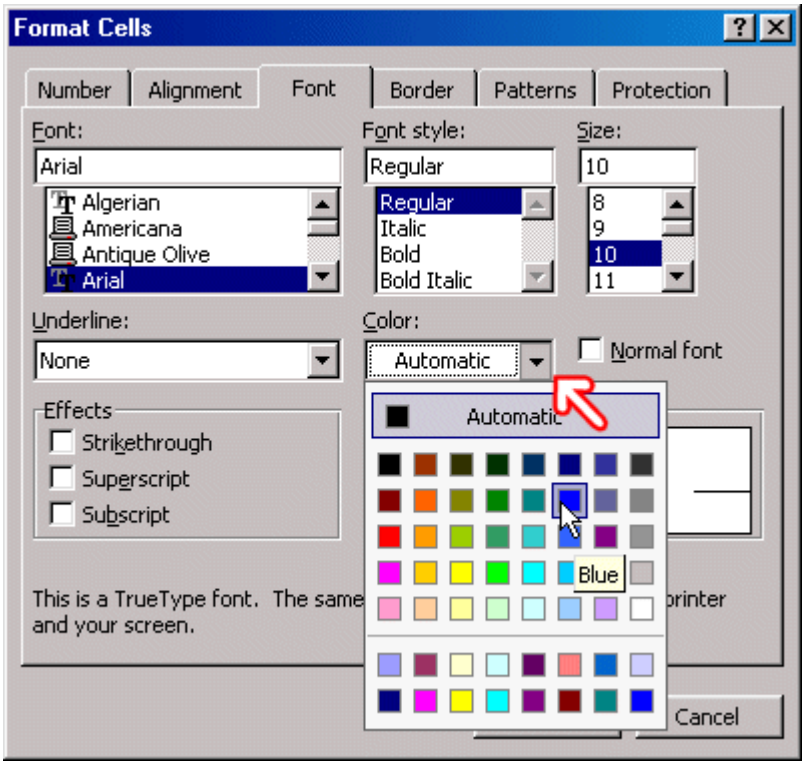
Changing the Font Size

1. Place the cursor in cell A5.
2. Choose *Format* > *Cells* from the menu. The Format Cells dialog box opens.
3. Choose the Font tab.
4. Click on 16 in the Size box.
5. Click OK. The font size changes to 16.

Changing the Font Color

1. Place the cursor in cell A5.

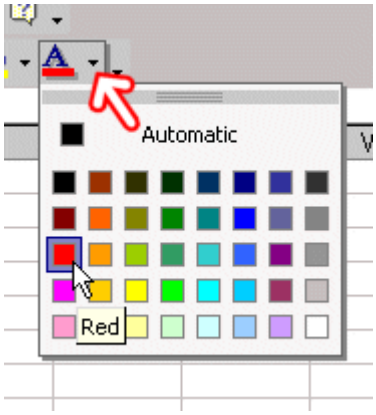
2. Choose *Format* > *Cells* from the menu. The Format Cells dialog box opens.
3. Choose the Font tab.



4. Click to open the drop-down menu associated with the color field.
5. Click on Blue.
6. Click OK. The color changes to blue.

Alternate Method: Changing the Font Color by Using the Icon

1. Place the cursor in cell A5.
2. Click on the down arrow next to the Font Color icon.



3. Click on Red. Your font changes to red.

Working with Long Text

Whenever you type text that is too long to fit into a cell, Microsoft Excel attempts to display all the text. It left-aligns the text regardless of the alignment that has been assigned to it, and it borrows space from the blank cells to the right. However, a long text entry will never write over cells that already contain entries -- instead, the cells that contain entries cuts off the long text. Do the following exercise to see how this works.

1. Move the cursor to cell A6.
2. Type **Now is the time for all good men to go to the aid of their army**.
3. Press Enter. Everything that does not fit into cell A6 spills over into the adjacent cell.
4. Move the cursor to cell B6.
5. Type **TEST**.
6. Press Enter. The entry in cell A6 is cut off.
7. Move the cursor to cell A6.
8. Look at the Formula bar. The text is still in the cell.

Changing a Single Column Width

Earlier you increased the column width of every column on the worksheet. You can also increase individual column widths. If you increase the column width, you will be able to see the long text.

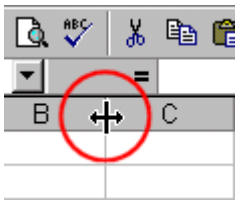
1. Make sure the cursor is anywhere under column A.
2. Choose *Format* > *Column* > *Width* from the menu. The column width dialog box opens.
3. Type **55** in the Column Width field.
4. Click OK.

Column A is set to a width of 55. You should now be able to see all of the text.

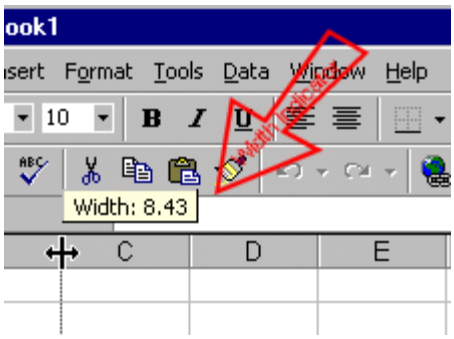
Alternate Method: Changing a Single Column Width by Dragging

You can also change the column width with the cursor.

1. Place the cursor on the line between the B and C column headings. The cursor should look like the one displayed here, with two arrows.



2. Move your mouse to the right while holding down the left mouse button. The width indicator appears on the screen.

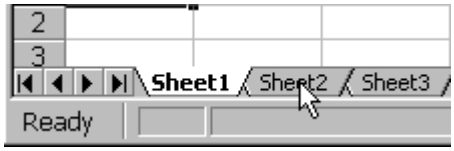


3. Release the left mouse button when the width indicator shows approximately 40.

Moving to a New Worksheet

In Microsoft Excel, each workbook is made up of several worksheets. Before moving to the next topic, move to a new worksheet.

1. Click on Sheet2 in the lower left corner of the screen.



Setting the Enter Key Direction

In Microsoft Excel, you can specify which direction the cursor moves when you press the Enter key. You can have the cursor move up, down, left, right, or not at all. You will now make sure the cursor is set to move down when you press the Enter key.

1. Choose *Tools* > *Options* from the menu. The Options dialog box opens.
2. Choose the Edit tab.
3. Make sure there is a check mark in the "Move Selection after Enter" box.
4. If Down is not selected, click to open the Direction drop-down box. Click on Down.
5. Click OK.

Making Numeric Entries

In Microsoft Excel, you can enter numbers and mathematical formulas into cells. When a number is entered into a cell, you can perform mathematical calculations such as addition, subtraction, multiplication, and division. When entering a mathematical formula, precede the formula with an equal sign. Use the following to indicate the type of calculation you wish to perform:

+ Addition
- Subtraction
* Multiplication
/ Division
^ Exponential

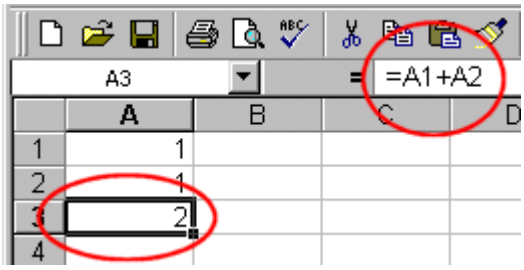
Performing Mathematical Calculations

The following exercises demonstrate how to perform mathematical calculations.

Addition

1. Move your cursor to cell A1.
2. Type **1**.

3. Press Enter.
4. Type **1** in cell A2.
5. Press Enter.
6. Type **=A1+A2** in cell A3.
7. Press Enter. Cell A1 has been added to cell A2, and the result is shown in cell A3.



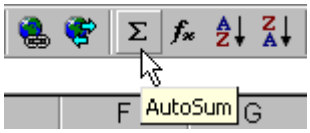
Place the cursor in cell A3 and look at the Formula bar.

NB You can change the signs to – Subtraction, * Multiplication, / Division or ^ Exponential

The AutoSum Icon

The AutoSum icon on the Standard toolbar automatically adds a column of numbers. The following illustrates the SUM function:

1. Go to cell F1.
2. Type **3.** Press Enter.
3. Type **3**. Press Enter.
4. Type **3**. Press Enter.
5. Click on the AutoSum button, which is located on the Standard toolbar.



6. F1 to F3 should now be highlighted.
7. Press Enter. Cells F1 through F3 are added.

Absolute Cell Addressing

An *absolute* cell address refers to the same cell, no matter where you copy the formula. You make a cell address an absolute cell address by placing a dollar sign in front of both the row and column identifiers. You can do this automatically by using the F4 key. To illustrate:

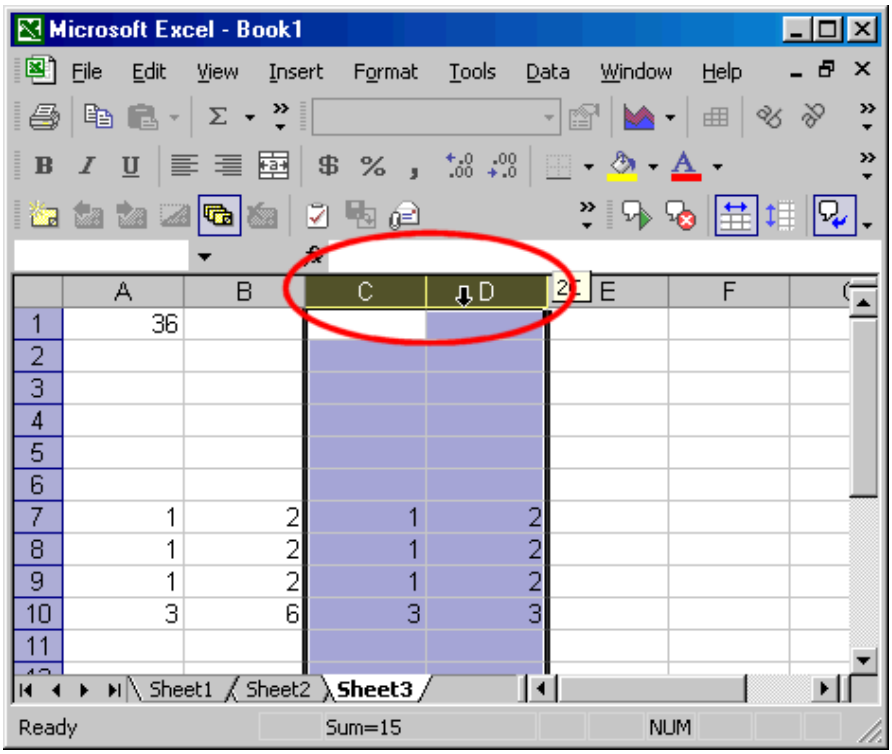
1. Move the cursor to cell C10.
2. Type =.
3. Use the up arrow key to move to cell C7.
4. Press F4. Dollar signs should appear before the C and before the 7.
5. Type +.

6. Use the up arrow key to move to cell C8.
7. Press F4.
8. Type +.
9. Use the up arrow key to move to cell C9.
10. Press F4.
11. Press Enter. The formula is recorded in cell C10.

Deleting Columns

You can delete columns from your spreadsheet. To delete columns C and D:

1. Click on column C and drag to column D.



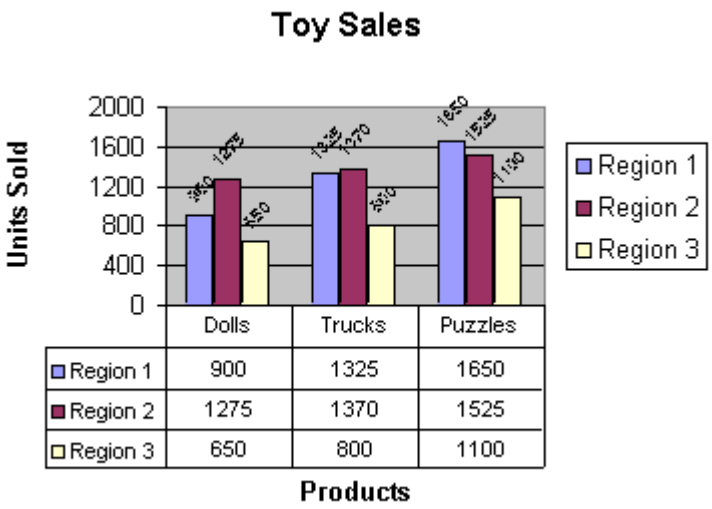
2. Choose *Edit* > *Delete* from the menu. Column D is deleted.
3. Click anywhere on the spreadsheet to remove your selection.

NB: This can also be done to rows.

Creating Charts

Using Microsoft Excel, you can represent numbers in a chart. You can choose from a variety of chart types. And, as you change your data, your chart will automatically update. You can use Microsoft Excel's Chart Wizard to take you through the process step-by-step.

Creating a Column Chart



To create the column chart shown above, start by creating the spreadsheet below exactly as shown.

	A	B	C	D	E
1	Toy Sales				
2					
3	**Products**	**Region 1**	**Region 2**	**Region 3**	
4	Dolls	900	1275	650	
5	Trucks	1325	1370	800	
6	Puzzles	1650	1525	1100	
7					

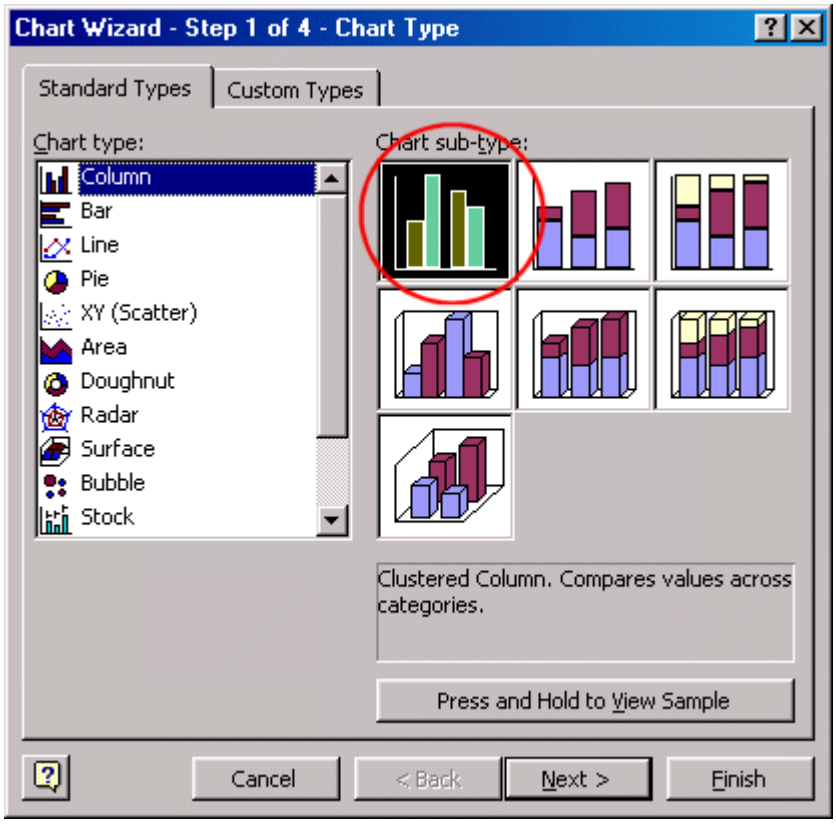
After you have created the spreadsheet, you are ready to create your chart.

Highlight cells A3 to D6. You must highlight all the cells containing the data you want in your chart. You should also include the data labels.

Choose *Insert* > *Chart* from the menu.

Click on Column to select the type of chart you want to create.

In the Chart Sub-type box, choose the Clustered Column icon to select the chart sub-type.



Click on Next.
To place the product names on the x-axis, select the Columns radio button.
Click on Next.
Type Toy Sales in the Chart Title field. Toy Sales will appear as the title of your chart.
Type Products in the Category (X) Axis field. Products will appear as your x-axis title.
Type Units Sold in the Value (Y) Axis field. Units Sold will appear as your y-axis title.
Choose the Data Labels tab.
Select Value in the Labels Contain Frame to display the data labels as values.
Choose the Data Table tab.
Select Show Data Table. The data table will appear below your chart.
Click on Next.
Choose As Object In Sheet1 to make your chart an embedded object and part of the worksheet.
Click on Finish

Your chart will appear on the spreadsheet.

Make Your Worksheets Look good Using AutoFormat

If you need to make a good impression, consider using AutoFormat to make your worksheets look their best. To apply AutoFormat to your worksheet, perform the following steps:

1. Select the range of cells you want to format
2. Choose format, AutoFormat to display the AutoFormat dialog box.
3. Click the Options button to display a list of formatting elements. Insert and delete the check marks next to each element to toggle on or off the various formatting options. You can preview these in the Sample window before applying them to the actual data in your worksheet.
4. When you see a result you like, click OK to accept it.

Supplying Headers and Footers for Your Worksheets

Excel comes with a number of preset headers and footers, which should serve the purpose well. To apply one of these, perform the following steps:

1. Click the worksheet you want to apply the headers or footers.
2. Choose View, Header and Footer from the menu bar.
3. Choose the Header/ Footer tab.
4. In the Header or Footer box, click the drop-down arrow and select the header or footer you want.
5. Click OK to apply the header and/ or footer.

Saving a Worksheet

1. Click the **Save** icon button on the Standard Toolbar (illustrated above).
2. (Optional) If you want to save the worksheet to a different folder, click **File** from the menu bar and click "**Save as**" box, then select the disk drive and folder that you wish to store your file in.
3. Type the new workbook name in the "**File name**:" text box.
4. Click **Save**. The new name appears in the Title Bar. Remember: the title bar is the bar at the very top of your application window.

Printing

Printing the Entire Worksheet

To print an entire spreadsheet, click the **Print** button on the Standard Toolbar.

Printing a Section of a Worksheet

1. Highlight the range you wish to print.
2. Click **File** on the Menu Bar and select **Print** to display the Print dialog box.
3. Click on **Selection** in the lower left of the dialog box. Make sure the circle is filled in.
4. Click **OK**.

Note: You may select other options in the Print window before you print your spreadsheet. For instance, you may print certain pages of your spreadsheet by filling the "From:" and "To:" boxes in the "Print range" area. You may also print several copies of your worksheet by selecting the "Number of copies:" option in the Print dialog box.

Print Preview

You may preview your worksheet before printing. Click the **Print Preview** button on the Standard Toolbar (pictured above). After previewing, you may print at this point by clicking the **Print** button on the Print Preview toolbar.

Exercises:

1. The following worksheet shows the salary calculations for employees in the sales department of a company.

	A	B	C	D	E
1					
2	**SALARY CALCULATIONS**				
3	**EMPLOYEES NAMES**	**MARITAL STATUS**	**BASIC SALARY**	**MONTHLY SALES**	**DEDUCTIONS**
4	Barak M.O.	Married	27000	250000	8000
5	Njuguna S. M.	Single	23000	234000	3000
6	Odhiambo W. O.	Married	28000	170000	4500
7	Macharia R. M.	Married	17000	213000	7000
8	Wanjiku E. M.	Single	22000	234000	5200
9	Kioo J. M.	Single	14000	567000	3200
10	Boit T.	Married	18000	123000	5000
11					

a) Open the workbook and save it as **Third.xls.**
b) Enter the data into the first worksheet of the workbook and rename the worksheet as **salaries.**
c) Calculate the commission for each employee if an employee is entitled to 4% commission on the monthly sales.
d) Calculate the monthly relief, which is 5% of the basic pay for the married employees.
e) Use an appropriate logical test to determine if an employee is entitles to this relief.
f) Calculate the net pay for each employee.
g) On the second worksheet of the workbook, plot a column chart to compare the basic salaries and the net salaries of the employees. Rename this sheet as Chart.

2. Maragwa enterprise is a small business, which would like to project the growth of its company over the next year. The table below shows the budget forecast for the business. It is assumed that the sales figures increase by 1.1 % per month. The overhead costs are to be determined as follows:

a) If the total cost of materials and labour is less than or equal to $18500, overhead is $9000; otherwise overhead is $8500 plus 1% of the combined material and labour costs.
b) Enter the table into a worksheet and compute the sales and the costs for the remaining months.
c) Use the if function to determine the overhead cost.
d) Calculate the totals and gross profit for the remaining months.
e) Construct a bar chart displaying sales, material, labour and overhead costs.
f) Construct a labeled pie chart displaying Gross profit Vs months.

BUDGET FORECAST								
		Jan	**Feb**	**Mar**	**Apr**	**May**	**June**	**Total**
Sales		**$40,000.00**						
Costs.	**Material**	**$5,000.00**	**$14,500.00**	**$10,000.00**	**$12,300.00**	**$8,000.00**	**$14,500.00**	
	Labour.	**$13,000.00**	**$4,500.00**	**$3,200.00**	**$4,000.00**	**$12,300.00**	**$10,000.00**	

	Overhead.							
	Total costs							
Gross								

3. KEMU has over seven hundred employees. Each employee is deducted 10% of the salary earned on food, 5% on transport and 2% on PAYE. Each employee who earns above 10,000 gets a house allowance ofKshs.3000 and those who earn below 10000 gets 2500. ***(Use the IF function to determine this}***

a) Create a worksheet that contains all these data showing monthly earnings of each employee. A minimum of 10 employees is required.
b) If each employee was to get 20% of bonus pay for his/her salary, calculate the bonus pay.
c) Plot a pie chart showing this data i.e. employee's bonus pay. Format the chart to look more presentable and neat.
Chart Title should be included as "KEMU EMPLOYEES".
d) Filter the data to show all the employees earning more that Kshs 15000. Copy the filtered data in separate sheet and rename it as Filtered.
e) Save the workbook as KEMU EMPLOYEES.

4. Create the following worksheet

a) The worksheet should be well formatted, font (type, size 12), Bold the text; have borders and any other formatting to make it more presentable.
b) Calculate a deduction, which includes NSSF that is 5% and NHSF that is 2% of salary.
c) Calculate Net Salary
d) Plot a chart of salary per month. House allowance, Deductions and Net salary.
e) Copy in sheet 2 from sheet 1 the data of salary per month, house allowance, deductions, net salary. Sort it in ascending order and rename the sheet as "Sorted".
f) Rename sheet 1 as "Salary" and save the workbook as EMP Payslip.
g) The basic salary was increased by 8% in the second year calculate the new PAYE, NSSF and Marriage Relief *(use the if function).*
h) All monitory figures are in French francs.
i) Rename the sheet as **Malakazi.**

Name	ID No.	PfNo.	Salary	H.Allowance	Net salary
Julie	2346739	550670	15000	8000	
Mike	2555723	550714	10000	5000	
Joanne	2055117	659100	8000	3000	
Nicholas	2186892	500120	24000	12000	
Edward	2481311	21243	30000	14000	
Jennifer	2064171	374401	4000	1000	
Geoffrey	2040056	448866	18000	9000	

5. Complete the following invoice delivery note and save it as Delivery Note in your Ms Excel folder.

ITEM NO.	TITLE	ORDERED	SUPPLIED	COVER PRICE	DISCOUNT	EXTENDED
1	Shaka	65	65	679.00		
2	Science II	550	550	110.00		

3	P Maths	800	800	160.00		
4	Our World	320	320	350,00		
5	Maths III	430	430	640.00		
6	History	755	755	395.00		
7	History II	200	200	1500.00		
8	P History	490	490	990.00		
9	War IT	540	540	1150,00		
10	Daily Star	79	79	420.00		
11	The People	60	60	750.00		

a) 22% discount will be given if the item bought costs Shs. 650 or more.
b) Other items costing less than Shs. 650 get a 13% discount.
c) Extended means the cost of the item purchases after the discounts have been awarded.
d) Insert three more columns namely; Amount, VAT and Net Amount.
e) Amount is calculated as the cost per a supply.
f) VAT is 16% of the Amount.
g) Net Amount is the figure payable after VAT deductions.
h) Format the Cover Price, Discount, Extended, Amount, VAT, and Net Amount into currency with 2 decimal places.
i) Rename the worksheet as Invoice.

6. The following table shows the students' performance in three subjects. Enter the information in a worksheet and use the formulas and functions to calculate:

a) The total marks of each student
b) If a student's average is greater than 80, the student gets a bonus of 3 marks.
c) Each of these units is 3 credit hours. Calculate the GPA of each student. Assume that it's the first semester. If a student's GPA is less that 3.0 output 'Wake up!' else output 'Bravo'.
d) Also calculate the standard deviation for the complOO marks.

	STUDENT	COMP100	MATH100	COMP101
1	Wambugu	67	45	89
2	Chao	78	65	56
3	Otieno	67	46	84
4	Karanja	97	45	52
5	Prisca	65	68	62
6	Robert	76	23	65
7	David	56	85	76
8	Sandra	57	28	23
9	John	85	88	76

MS POWERPOINT

Week 9 Students learning objectives

1. Understand PowerPoint toolbars, Customizing and Shortcut Menus.
2. Be able to Plan and Design within a Time Limit.
3. Design and draw Organizational Charts.
4. Format presentations:- Bold, Italics, underline etc.
5. Add Color, WordArt.
6. Perform grouping and Ungrouping Objects and Using Symbols.
7. Understand the use of Master Slides: - Creating, Editing and Applying.
8. Add Graphics/Objects Speakers Notes Creating with each Slide

Introduction

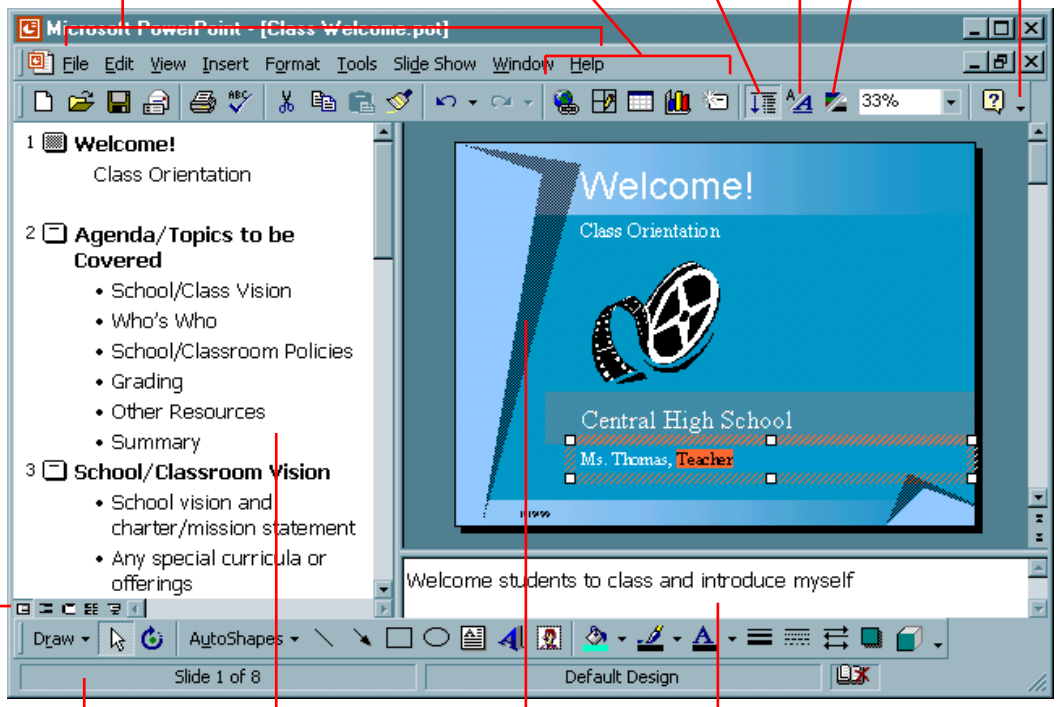
With PowerPoint, you can make learning more dynamic by creating presentations of classroom materials and projects. You can use graphics, text, movies, sounds, and the Internet to share information on any topic. Once you learn to use PowerPoint you can:

- Create presentations with the AutoContent Wizard.
- Add and delete slide from presentations.
- Customize a slide layout.
- Add notes.
- Use the Web to view presentations.

PowerPoint User Interface

Menus and Toolbars

Microsoft PowerPoint has a menu bar and several toolbars in addition to a Task Pane and a Status bar. By default the items shown in the Figure below will be displayed.



Open the **View** Menu

1. Click on **Task Pane** to turn it on (if off) or off (if on).
2. Click on **Toolbars** to view a list of toolbars.
3. You can turn then on or off by clicking the name of toolbar.

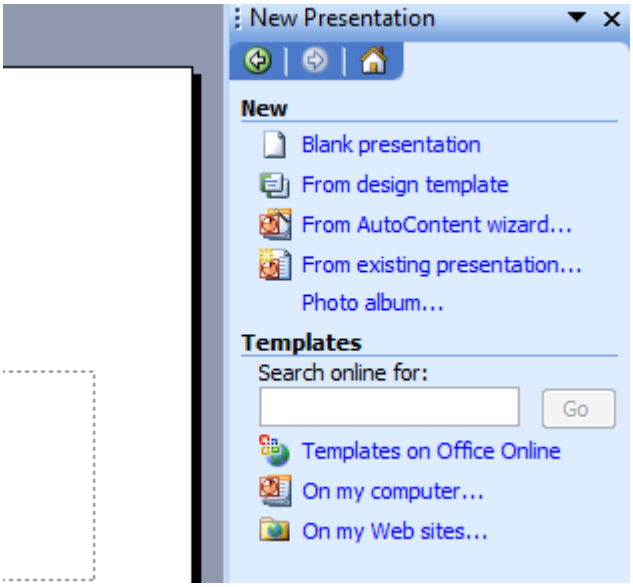
By default the **Standard** and the **Formatting** toolbars are turned on.

Using the AutoContent Wizard

The AutoContent Wizard helps you create a presentation by leading you through some basic questions. You respond to questions asked by the Wizard, and the Wizard uses your answers to automatically lay out and format the presentation. PowerPoint then selects the best style and built-in outline to suit the presentation.

To create a presentation using the AutoContent Wizard

1. Open PowerPoint.
2. Select the AutoContent Wizard option and then click OK.
3. Read about the AutoContent Wizard and then click Next.
4. Select Generic and then click Next.
5. Select the On-screen Presentation option and then click Next.
6. Click in the Presentation title box and then type Class Overview as a title for the presentation.
7. Click in the Footer box, type the class title and then click Next.
   This includes the class title at the bottom of each slide.
8. Click Finish to exit the AutoContent Wizard. The first slide appears in Normal view.
9. On the File menu, click Save.
10. Select a folder, name the presentation and then click OK.



Choose the from auto content wizard option

Viewing presentations

There are three ways to view your presentations in PowerPoint. The views are accessed from the View menu, or from the buttons in the lower-left corner of the PowerPoint screen.

i) **Normal view** is the view to use when you are designing a presentation slide by slide. In Normal view, you see the Outline in the left pane, the slide in the upper-right pane, and the notes in the lower-right pane. The Normal view makes it easy to organize a presentation in outline format and add notes to each slide.

j) **Slide Sorter view** shows the entire set of slides on the screen, so that you can check the order and consistency of the slides.

k) **Slide Show view** puts the presentation together as a slide show, so you can view the finished presentation, complete with sound and animation.

PowerPoint provides master slide styles or default slide formats to make it easy to create a professional-looking presentation.
The formats include bullets, two columns, tables, charts, clip art, and blank slides.

Creating slides

To add text to a slide

b) Open the presentation you created. The first slide already contains the title and your name. Also, note that the footer text that you chose is on the slide.

c) In the Outline pane, select the text "State the purpose of the discussion" and then type *Classroom procedures, attendance, and grades*.

d) Select the text "Identify yourself" and then type *Instructor and student introductions*.
e) Continue by replacing text in each of the slides. You can edit slides at any time by clicking the text you want to change. Then you can delete, add, or change text.

Adding notes

The Notes pane is used to add speaking notes to a presentation. After you have completed a presentation, you can print the presentation with notes so that you can keep track of what is coming up next in the presentation.

To add notes to a slide

Use the scroll bar in the Slide pane to move to the first slide in the presentation.
Click in the Notes pane.
Type *Explain that the presentation will give all class participants an overview of what to expect for the coming semester*.
Continue to add notes to each slide by selecting the slide with the scroll bar, clicking in the Notes pane, and then typing the notes.
Save your work.

Customizing a presentation

PowerPoint offers you many choices of colors, backgrounds, styles, fonts, formats, bullets, headers, and footers. Using PowerPoint, you can easily create styles for different types of lessons, handouts, and lectures. When you use the slide master features, you can customize a series of presentations or handouts for an entire course or a single presentation.

In addition to the presentation styles that are part of PowerPoint 2000, you can use styles that you created yourself easily and quickly. You may want to incorporate pictures, clip art, or other graphics.

Because the purpose of a presentation determines its look, it is important to know how to customize PowerPoint presentations.

To change the design

On the Format menu, slide design, click Apply Design Template.
a) Click any of the designs to see a preview of the design.
b) Double-click on any of your choice. Each of the slides now has the chosen design.
c) Save your presentation.

Customizing the background

Customizing the background allows you to change the color behind every slide. As a rule, it is best to use a color that matches the lighting in the room in which you are presenting. Dark blue is excellent for showing a presentation in a darkened room, while a lighter background is better for a lighted room.

To change the background color for each slide

On the Format menu, click Background.
In the Background dialog box, click the down arrow. You will see several color squares and More Colors and Fill Effects.
Click Fill Effects to browse through the available effects.
Click Cancel.
In the Background dialog box, click the down arrow again.
Click More Colors to see the variety of colors available.
Click the Custom tab to select any color in the color spectrum.
Click Cancel.
Click Apply to all to make any changes apply to the entire presentation.

Selecting colors and fonts

Changing the color scheme is more dramatic than changing the background color. Completing the color selection is the next step in customizing a presentation. There are two ways to change colors: use a preset color scheme or customize your own color scheme. You can make changes to almost all parts of a presentation including the notes and handouts.

To change the color scheme for all slides

On the Format menu, click Slide Color Scheme.
Click the first color scheme in the second row.
Click Apply to All to make the change to the entire presentation. This darker color scheme is especially effective for use in a darkened room.

To customize the color scheme

On the Format menu, click Slide Color Scheme.
Click the Custom tab. The Background color scheme box is selected.
Click Change Color. The current color is selected on the hexagon.
Click a different blue spot at the top of the hexagon, and then click OK. You can see a comparison between the old color and the new color in the bottom-right corner of the window.
Change the rest of the options under Scheme colors as desired.
Click Apply to All to make the color changes to the entire document.

To replace fonts in your presentation

On the Format menu, click Replace Fonts. To see this option, you may have to click the chevron.
In the box, click Arial Black.
Click Replace.
Click the Replace menu and click Tahoma.
In the box, click any font of your choice.
Click Replace.
Repeat steps 4-6 until you have selected the most effective fonts for your presentation.
Click Close when you have finished.
Save your work.

Creating headers and footers in a presentation

To add footer information

On the View menu, click Header and Footer.

On the Slide tab, under Include on slide, select Date and time and Update automatically if you want the date to reflect the last date the slides were modified. You can also do one of the following:

d) You can also select a date format from the date list

- Or -

e) Select Fixed and type the date you will be giving the presentation, so that it reflects when the presentation is given instead of when it was updated.

Select Slide number to print a number on each slide.

Select Footer; the text *English 7-8* is already in the footer. To change this, select the text and then type the preferred text in the text box.

Adding Graphics

Adding graphical elements can help you create eye-catching slides for a presentation. PowerPoint gives you the option of adding AutoShapes, WordArt, flowchart symbols, and ClipArt. You can also import text, graphics, and charts from other Office programs.

Using AutoShapes to add standard objects

PowerPoint has many standard objects that can be added to presentations, including objects with and without text.

With some AutoShapes you can add text and with others you can create a flowchart. Flowcharts are handy for such topics as how a bill becomes a law or how photosynthesis occurs. The AutoShapes toolbar stays on the screen until you close it by clicking the X in the upper-right corner of the toolbar.

To add an AutoShape to a presentation

On the Insert menu, click Picture and then click AutoShapes.

Click Stars and Banners and then click the 5-Point Star.

Click in the upper-right corner of the slide and then drag the object down diagonally about one inch.

To delete an AutoShape, right-click the AutoShape you want to delete and then click Cut.

To add an AutoShape with text to a presentation

On the AutoShapes toolbar, click Callouts.

Click the Rounded Rectangular Callout.

Click in the slide and drag the object down diagonally about one inch.

Type the text of your choice.

Select the text you have just typed.

Right-click the Callout box, click Font, change the font size to 24, and then click OK.

d) Click and drag the upper-right corner of the Callout box until all the text fits within it.

e) Close the AutoShapes toolbar.

Using WordArt to add creative text

You can add banners, seals, and logos that contain dynamic WordArt effects.

To use WordArt

On the Insert menu, click Picture and then click WordArt.

Double-click the WordArt in the first column, third row.

Type the text you want in the WordArt.

In the Font box, click a font.

In the Size box, click 72.

Click OK. The WordArt appears on the slide.

Drag the WordArt to the location on the slide that you prefer.

Close the WordArt toolbar by clicking the X in the upper-right corner of the toolbar.

To add flowchart symbols

Select the slide to which you want to add flowchart symbols.
On the View menu, click Toolbars and then click Drawing.
On the Drawing toolbar, click AutoShapes, click Flowchart, and then click a shape.
Click in the slide and then drag the shape down diagonally about one inch.
Type the text you want in the shape and then make any changes to the text like you did with the AutoShape.
Add additional flowchart symbols by following steps 3-5.

Tables

Tables are indispensable for many types of presentations. A table such as Table 5.1 can be created in MS Word then copied and pasted into PowerPoint. However, you can create a table directly in PowerPoint through the Insert /Table menu.

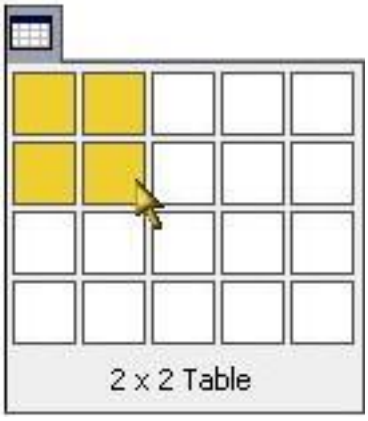
1. Select **Insert**
2. Click **Table**

A dialog box identical to Figure 5.7 opens to allow you to set the number of columns and rows. When you click OK, the table is inserted into PowerPoint. You can also use the standard toolbar **Table button (**  **)**. When you click on this button, it opens out to reveal a grid. To indicate the number of rows and columns, you drag the mouse pointer as shown in Figure 5.8.

Processor	Pentium 5	Pentium 4	Pentium 3	Pentium 2	Pentium 1
Max. Speed	5.x GHz	3.x GHz	1.x GHz	400 MHz	300 MHz

Tables can be edited to add columns and rows. Their background and boundary colours can be changed. They can also be moved, enlarged or shrank.

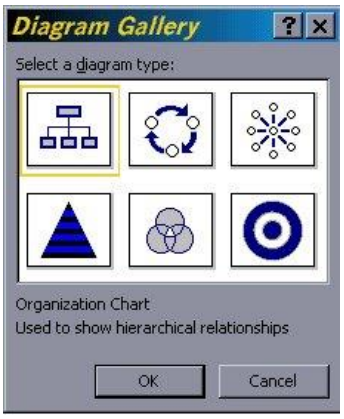
Insert table using menu



Insert table using toolbar

Diagrams

As indicated earlier, the easiest way to insert diagrams (including organisation charts) is through the Drawing toolbar. Clicking the **Diagram and Organisation Chart** button shown in Figure 5.6 will open the dialog shown in Figure 5.9 allowing you to select the type of diagram you want including: Organisation Chart, Circle, Radial, Pyramid, Venn, and Target diagrams. Each time you insert a diagram, a new floating tool appears allowing you to change various properties of the diagram.



Insert diagram

Statistical Chart

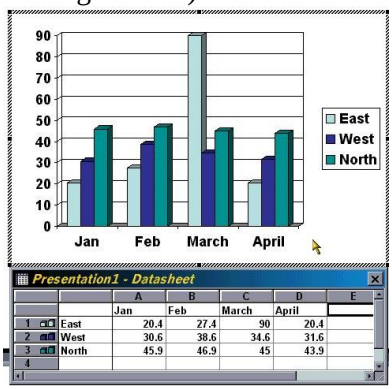
There are a number of ways of inserting a chart. Perhaps the easiest would be to create the chart on Microsoft Word (or OpenOffice Calc) then copy it and paste it into PowerPoint.

You can insert a chart through the Insert menu using tow methods:

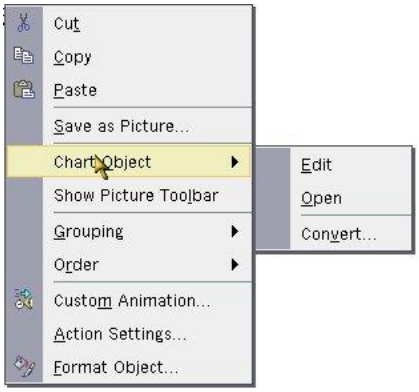
1. Select the **Insert** menu
2. Click the **Chart** button

A chart and a portion of a spreadsheet will be displayed as shown in Figure 5.10 . You can change the figures and headings to suit your data. Clicking in an empty area of the slide will insert the chart.

A chart, once inserted, can be edited by right-clicking on the chart and selecting **Chart Object → Edit** from the popup menu that appears (see Figure 5.11).



Insert chart



Edit chart menu

To insert music or sound on a slide

1. Display the slide you want to add music or sound to.
2. On the Insert menu, point to Movies and Sounds.
3. Do one of the following:
   f) To insert a sound from the Clip Gallery, click Sound from Gallery and then locate and insert the sound you want.
   g) To insert a sound from another location, click Sound from File, locate the folder that contains the sound, and then double-click the sound you want.

   A sound icon appears on the slide.
4. A message is displayed. If you want the sound to play automatically when you go to the slide, click Yes. If you want the sound to play only when you click the sound icon during a slide show, click No.
5. To preview the sound in Normal view, double-click the sound icon.

Simple Animation. To enliven your slideshow, you can add some simple animation effects to the text using the Task Pane Slide Design – Animation Schemes menu. Each animation scheme is applied to all slides by default but, as you saw with the design themes and colour schemes, you can apply the scheme to only the selected slides.

To preview the slide show

On the Slide Show menu, click View Show.

After the first slide appears, click anywhere on the screen to move through the presentation.
At the last slide, click anywhere to end the slide show.

Keyboard Shortcuts

Many operations can be carried out faster by using keyboard keys instead of menus or toolbars. As an example, to print through the menu requires you open the **File** menu then click **Print**. The same effect can be achieved by pressing **CTRL** and the **P** keys simultaneously (or tap **P** while holding own the **CTRL** key). The following are some other useful keyboard shortcuts:

ALT+F4	Quit PowerPoint
ALT+F11	Launch Visual Basic editor
CTRL+C	**Copy** the selected text or object
CTRL+V	**Paste** text or an object
CTRL+X	**Cut** the selected text or object
CTRL+U	Make letters **underline**
CTRL+I	Make letters **italic**
CTRL+B	Make letters **bold**
CTRL+D	Make a duplicate copy of the selected slide
CTRL+F	Find text
CTRL+H	Replace text
CTRL+M	Insert a new slide
CTRL+N	Create a new presentation
CTRL+O	Open a presentation
CTRL+P	Print a presentation
CTRL+S	Save a presentation
CTRL+W	Close a presentation
CTRL+Y	Redo or repeat an action
CTRL+Z	Undo the last action
ESC	Cancel a menu or dialog box action
F1	Help
F5	Run a presentation
F7	Check spelling

While Running a Slide Show

number+ENTER	Go to slide *number*
B or PERIOD	Display a black screen, or return to the slide show from a black screen
W or COMMA	Display a white screen, or return to the slide show from a white screen
S or PLUS SIGN	Stop or restart an automatic slide show
ESC, CTRL+BREAK, or HYPHEN	End a slide show

PowerPoint has advanced features, use the help facility on the menu to learn more.

To print notes

1. On the View menu, point to Master, and then click Notes Master.
2. Add the items you want on the notes master—art, text, headers or footers, date, time, or page number. Items you add appear only on the notes; no changes are made to the slide master.
3. On the File menu, click Print.

4. In the Print what box, click Notes Pages.
5. Click OK.

To print handouts

1. On the View menu, point to Master and then click Handout Master.
2. On the View menu, point to Toolbars and then click Handout Master. To preview the layout you want, click the layout buttons on the Handout Master toolbar.
3. Add the items you want on the handout master— art, text, headers or footers, date, time, or page number. Items you add appear only on the handouts; no changes are made to the slide master.
4. On the File menu, click Print.
5. In the Print what box, click Handouts.
6. In the Slides per page box, click the number of slides you want on the handouts.
7. If you select four, six, or nine slides per page, click Horizontal or Vertical to specify the order in which you want the slides to appear on the page.
8. You can also change the orientation of the paper when you print handouts. Click Page Setup on the File menu and then click Landscape or Portrait under Notes, handouts & outline.
9. Click OK.

Exercise

PowerPoint is a presentation graphics program that can be used to prepare on-screen slides, 35 mm slides, overhead transparency slides, speaker notes and handouts.

Visit the website http://www.ngocouncil.or.ke/Downloads/Vision2030.pdf and design a PowerPoint presentation that will help students to become more proficient in one of the pillars for the Kenya Vision 2030.

- Try not to create a presentation just for the sake of the assignment. In other words, think about how PowerPoint can enhance students' experience with the content in ways that are not possible with other media. (For example, PowerPoint makes it easier to organize information, highlight key points using color, shape, and animation, etc.)
- As you work on the presentation, try to make sure that the resources you include (hyperlinks to web sites, photos and images, sounds and music, or videos) are culturally authentic whenever possible. They should also contribute to helping students to grasp the meaning you are trying to convey. (In other words, don't just include animations, graphics, music, or sound effects just for fun—use them as tools!)
- There is minimum number of slides should be 8.
- You must include at least one image or photo, one hyperlink, and one audio or video clip in your presentation (Please note that videos consume a lot of memory).
- You may include special animations, backgrounds, effects, or transitions.

TIPS

- Use contrasting colors (light backgrounds call for darker fonts, while dark backgrounds call for lighter colored fonts).
- Use at least 24-point font in presentations that will be viewed by a whole class.
- Do not use more than 2 different fonts on a slide.
- Do not put too many words on a slide. If you need to include more details, it is better to use additional slides.
- Try to be consistent with the style of designs and color schemes.
- Images make it more interesting!