



National Health Systems Resource Centre



USE OF COMPUTERS

*****Beginners guide*****



Created by HMIS Team, NHSRC

ACKNOWLEDGEMENT

Preface: the development of the HMIS Tool Kit

Since, January 2008, NHSRC has been involved in the development of a HMIS tool kit, including the following components:

1. Three sets of training programs on:
 - a. Use of computers – a beginners' guide.
 - b. Use of Information for Action.
 - c. Use of HMIS – DHIS 2.
2. Data dictionaries for data elements and indicators.
3. Formats for data entry (Sub Center, PHC, CHC, Facility Development and Community Development).
4. Reporting formats for different levels (SC-PHC-PHC-District-State-National), both for upward flow, and also for downward feedback loops.
5. Customization of a Free and Open Source (FOSS) HMIS shell (DHIS 2) that can be adapted by States for their respective HMIS needs.

In addition to the above –a conceptual introduction to HMIS has also been prepared and a basic communication material meant for administrators and planners to construct and use HMIS better and to avoid some of the classical pitfalls of HMIS design is under preparation.

This entire tool kit may be seen as the first version – a start up version that would be enriched and modified by use in the state and districts as well as national levels. We believe that HMIS systems need to be flexible and constantly open to changes and iterative improvements and in that spirit, this is but a first step.

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This tool kit has been prepared as a collaborative team effort, in which the NHSRC HMIS team has collaborated with partners both globally and nationally. All the partners have worked with their own funds and NHSRC has benefited and built its own capacity by working with them. Amongst them:

1. HISP India (Society for Health Information Systems Programmes, India): Their experiences of HMIS implementation in different states over the years, has been very useful in the conduct of the situation analysis, and the formulation of the proposed data elements, indicators and formats. A major contribution in all aspects has been from John Lewis. Specific inputs for the development of the training manuals from Jyotsna (HISP coordinator, Kerala) and Amit, an intern at HISP India from TISS Mumbai, are deeply acknowledged. The experiences of the global research and development network of HISP (Health Information System Programme) ongoing since 1994 and now working in more than 15 countries have been valuable inputs to this exercise., Especially useful has been their training module on “Use of Information for Action” (written by Arthur Heywood and Jon Rohde) which has been adapted and extended to the Indian context . Arthur’s input into the development of the indicator and data dictionaries has also been invaluable.
2. The Department of Informatics, University of Oslo, Norway, and their staff and doctoral students, who have provided inputs into the building of the manuals, and also participated actively in systems development efforts. Special thanks to them for sharing with us free of cost, with the DHIS 2 application, that NHSRC has now the rights to customize for the needs of any state , provided it is on a non commercial basis. Ongoing enhancements on the software are continuously made available to us, thus keeping the application cutting edge. This is a useful tool not only for adaptation for states who may exercise this option, but also for analysis of data on flow.
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Module 1

Overview of ICTs

Overview of ICTs requires you to understand the main concepts of ICTs at a general level, and to know about the different parts of a computer.

Learning Objectives :

After completing this section, you shall be able to

- Understand what hardware is, know about factors that affect computer performance and know about peripheral devices.
- Understand what software is and give examples of common applications software and operating system software.
- Understand how information networks are used within computing, and be aware of the different options to connect to the Internet.
- Understand what Information and Communication Technology (ICT) is & give examples of its practical applications in everyday life.
- Recognize important security issues associated with using computers.
- Recognize important legal issues in relation to copyright and data protection associated with using computers.

Module 1 Overview of ICTs



1.1 Computer Basics

1.1.1 Introduction

Computers play a key role in supporting how individuals work and how they live. Even the smallest organizations have computers to help them operate more efficiently, and many individuals use computers at home for educational, entertainment, and business purposes. In this session, you will learn the basics about computers, the different categories of computers, hardware and software, and about maintaining your computer. You will explore various technology issues that are related to computers such as security, privacy and ethics. A brief example of ICT application in health will be provided.



1.1.2 Categories of Computers

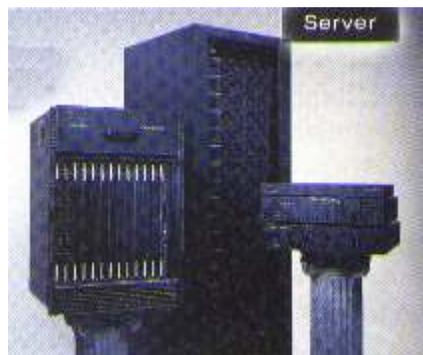
Personal computers

Personal computers are desktop computers designed for an individual's use. They run programs designed to help individuals accomplish their work more productively.



⊕ Servers

Servers are not designed to be used directly. They make programs and data available for people hooked up to a computer network, a collection of computers connected together so that they can exchange data.



⊕ Minicomputers

Minicomputers are multi-user systems that can handle the computing needs of a smaller corporation or organization. Many people use them simultaneously by means of remote terminals or personal computers.



⊕ Mainframes

Mainframes are huge, multi-user systems designed to handle gigantic processing jobs in large corporations or government agencies.



⊕ Supercomputers

Supercomputers are ultra fast computers designed to process huge amounts of scientific data then display the underlying patterns that have been discovered.



1.2 Hardware Components

1.2.1 Input Devices



An input device lets you communicate with a computer. You can use input devices to enter information and issue commands. A keyboard, mouse, scanner, digital camera, touch pads and joystick are examples of input devices.

Some Common Computer Input Devices:

Keyboard

Used to type data into the computer.

Most common input device today.

Has special keys for giving the computer commands.

Commands tell the computer to do something, like save the file.

These special keys are called command or function keys.



Pointing Devices

Pointing devices move some object on the screen and can do some action.

Common pointing devices.

Mouse - most common pointing device



Track ball - basically an upside down mouse
Joystick



Game controller



Scanner

A scanner allows you to scan documents, pictures, or graphics and view them on the computer. You can also use software to edit the items you scan.

Used to put printed pictures and text into a computer.

Converts an image into dots that the computer can understand.

To scan text, optical character recognition (OCR) software is needed.



Digital Camera

- Used to take electronic pictures of an object.
- The pictures taken by a digital camera can be used directly by a computer.



Microphone

- Used to put sound into a computer.
- Need sound recording software.



CD-ROM/DVD-ROM

- Can be used to put both sound and images into a computer.
- Use a laser to read a Compact Disk (CD) or a DVD disk.



Video Capture Card

Usually place inside the computer's case.

Use to put video into a computer .

Need a video source, either a video camera or video recorder .

1.2.2 Output Devices

An output device displays information on a screen, creates printed copies or generates sound. A monitor, printer, and speakers are examples of output devices.

Some Common Output Devices:

⊕ Monitors and Displays

- Shows the processed information on a screen.
 - A monitor uses a Picture Tube like a television with the image displayed on the front of the tube, which is called the screen.



Displays are flat and use plasma, LCD, active-matrix, or some other technology.



- Monitors used to be called Cathode Ray Tubes (CRTs) because of the picture tube, which is a large vacuum tube.
- A monitor or display produces a soft copy. When the device is turned off the information goes away.
- Monitors are slowly being replaced by flat panel displays.

Printers

- Printers produce a hard copy .
- The information is printed on paper and can be used when the device is off.
- It is also called a printout.

Dot-matrix printers (impact printer).



- Uses metal pins to strike an inked ribbon to make dots on a piece of paper.
 - Can see the dots that make up the letters or images.
 - Lowest print quality of all of the printers.
 - Very low in cost per page to use.
 - Rarely used today because of the poor print quality, but still used in business to print multi-part forms.
- Ink jet printers (non-impact printer)



- Use drops of magnetic ink to produce dots on a page to produce text or images.
- The print quality is almost the same as a laser printer.
- Problems with the ink
 - The ink is very expensive
 - The ink is water soluble and will run if the paper gets wet
- Highest cost per page of all the printers
- For producing color documents, it has the highest quality at a reasonable price.

- Laser printers (non-impact printer)



- How the laser printer produces an image.
 - A laser or LEDs make dots on a light sensitive drum.
 - Toner (very tiny particles of plastic) stick to the drum where the dots were made.
 - Paper is pressed against the drum and the toner is placed on the paper.
 - The paper is heated and the toner melts into the paper.
- Produces the highest quality printout.
- For black and white printouts, very low cost per page.
- Printout is permanent.
- Color laser printers are still fairly expensive (Rs.100,000 to Rs. 10,0000).

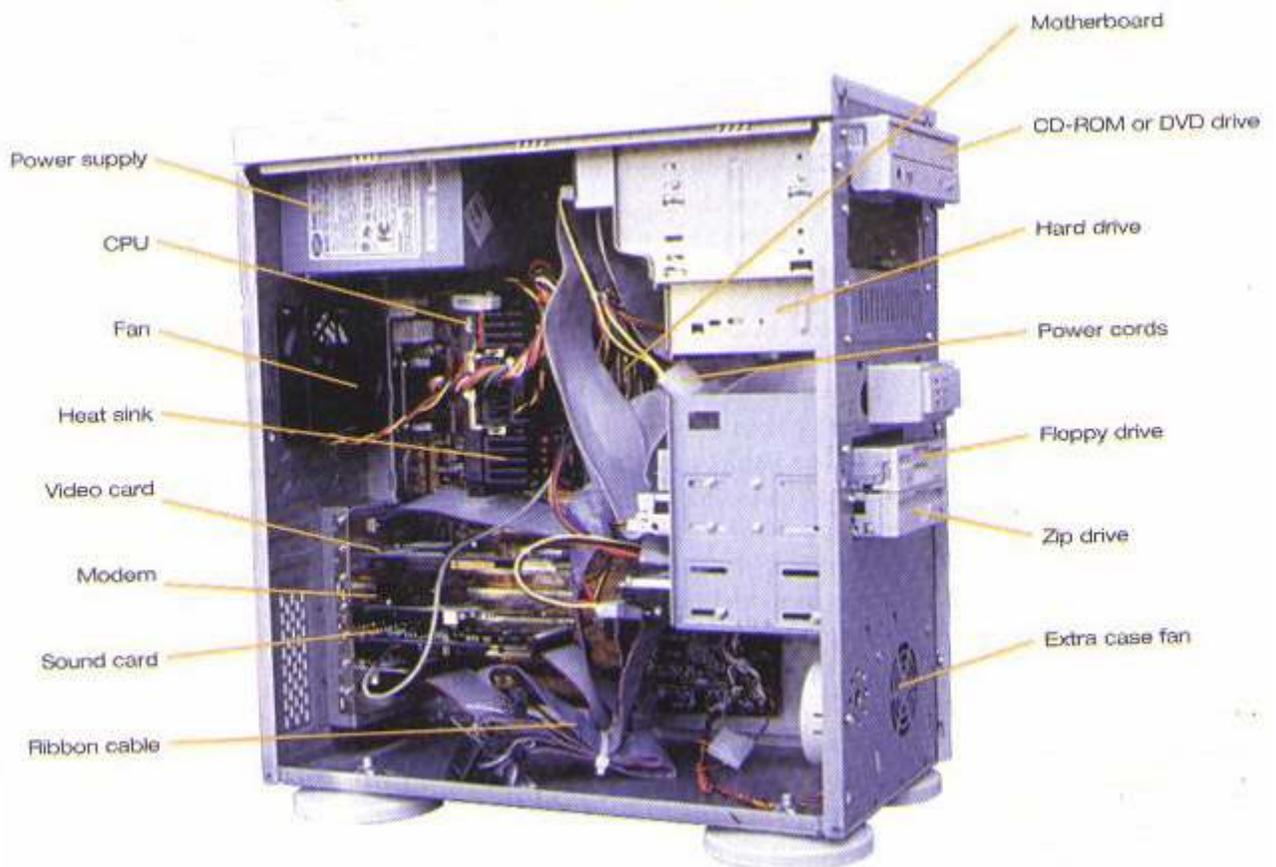
Speakers

Used to output sound



1.2.3 System Unit

⊕ A computer system unit contains many parts.



Motherboard - The motherboard is the main circuit board of a microcomputer. It is also known as the mainboard or system board.

CPU - The CPU is the central electronic chip that determines the processing power of the computer.

Memory - Memory is the part of the computer that temporarily stores applications, documents, and stem operating information.

Bus - A bus is an electronic line that allows 1s and 0s to move from one place to another.

Expansion Slots - Expansion slots appear on the motherboard. They are sockets into which adapters are connected.

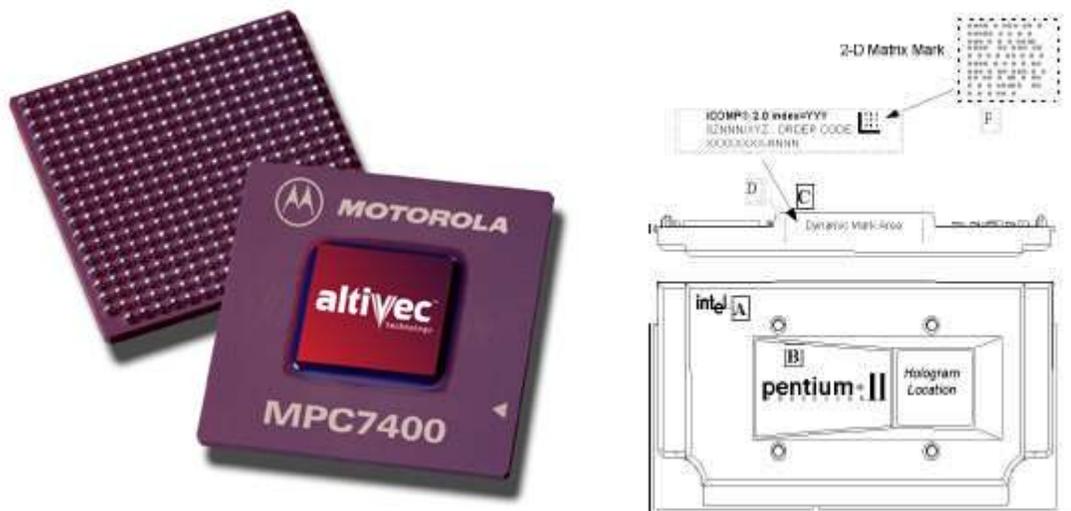
Ports and Connectors - A port is a connector located on the motherboard or on a separate adapter.

Bays - A bay is a space inside the computer case where a hard drive, floppy drive or CD-ROM drive sits

Power Supply - A power supply changes normal household electricity into electricity that a computer can use.

Sound Components - A sound card lets a computer play and record high quality sound.

🔍 Central Processing Unit (CPU)



- Does all of the work for the computer
- Does all of the mathematics, mainly addition.
- Does all the logical comparisons of values.
- Directs the flow of data in a computer.
- Controls the operation of the parts of the computer.
- Today, all CPUs are microprocessors.
- A microprocessor is a complete computer on a silicon chip.
- A microprocessor does all of the functions of a computer.
- stores data and instructions waiting to be used.
- follows changeable instructions.
- does input, processing, and output.

CPUs have three basic parts

The Arithmetic Logic Unit (ALU)

- does all of the mathematics in a computer.
- does all of the logic comparisons of values.

some common logic comparison symbols.

- = equal to
- < less than
- greater than
- <= less than or equal to
- >= greater than or equal to

The Control Unit

- directs the flow of information into the CPU and/or memory or storage.
- controls which instructions the CPU will do next.

Registers

- Used to store data and instructions inside the processor.
- Size of the registers can affect the speed and performance of the processor.

Speed of CPUs

- The speed of CPUs is measured in hertz.
- A hertz is measured based on cycles per second.
- Need to measure time to determine cycles per second.
- All computers have a clock built into them for timing the cycles.
- The clock is usually located in a small metal box on the motherboard.
- Today, many CPUs can complete over six (6) instructions per second.

Speeds of modern CPUs

- Most computers have a CPU that can do more than 400 MHz.
- MHz stands for megahertz.
- A MHz is 1,000,000 cycles per second.
- Computers will soon be at speeds of over a gigahertz, 1,000,000,000 Hertz.

Memory

Primary memory can be used directly by the CPU

Consists of silicon chips, usually either VLS or VLSI technology is used to create the chips.

Two forms of Primary Memory.

- Read Only Memory (ROM).
- Random Access Memory (RAM).

Primary memory is also called primary storage.

Read Only Memory (ROM)



- Stores instructions that are used by the CPU.
- Tells the CPU how to be the kind of computer it is, for example a Windows, Macintosh, or Play Station computers.
- Tells the CPU how to work with the different parts of the computer.
- ROM can also hold programs that are directly accessed by the CPU. One such program is the self-test when the computer is first turned on. The self-test tests to see if all the parts on the main circuit board (mother board) are working correctly.
- The instructions in ROM can not usually be changed.
- The instructions are built into the electronic circuits of the chips.
- These instructions in ROM are called **firmware**.

- To change the instructions in ROM you need to usually change the chips or do some other special process that is normally not available to an average user.
- The instructions in ROM are nonvolatile. They stay in ROM even when the computer is turned off.

Random Access Memory (RAM)



- Store data and instructions that are used by the CPU to perform some tasks.
- These instructions are usually loaded into the RAM from a secondary storage device.
- RAM is also used to store instructions that tell the CPU how to work with its parts. These instructions are usually called drivers.
- The instructions in RAM are constantly changing, depending on the needs of the CPU.
- The instructions in RAM are volatile.
- When the computer is turned off the information in RAM disappears.
- The information in RAM needs to be saved to secondary storage before the computer is turned off.
- Access to information is random access.

1.2.4 Storage Devices



How a computer stores information

1. The computer stores information as a string of zeros (0) and ones (1).
 - The standard string length is eight 0's or 1's in a row.
 - This standard length is called a byte.
 - A byte equals one character.
 - A character is a letter, number, or symbol - it is about any thing that can be typed on a keyboard.
 - There are 256 standard characters used by almost all computers.
2. Information size measurements.
 - Kilobyte (KB).
 - One kilobyte equals about 1024 bytes.
 - 1KB is about 140 words, about a half page of typed double-spaced text (words only).
 - Megabyte (MB).
 - One megabyte equals about 1000 KB.
 - One megabyte equals about 1,000,000 bytes.
 - One megabyte equals about 500 pages of text, or one large book.
 - Gigabyte (GB).
 - One gigabyte equals about 1000 MB.
 - One gigabyte equals about 1,000,000 KB.
 - One gigabyte equals about 1,000,000,000 bytes.
 - One gigabyte equals over 1,000 books of text.

 **Some Common Storage Devices**

Hard Drive

The hard drive is the primary device that a computer uses to store information. The hard drive stores programs, data files, saves files, and organizes files. The hard drive is located inside the computer case. The hard drive, magnetically stores data on stacks of rotating disks called platters.



Floppy Drive

The floppy drive stores and retrieves information on a floppy disk.



CD -ROM Drive

CD-ROM is a device that reads information stored on a compact disc. CD-ROM stands for Compact Disc Read Only Memory. One CD is equal to the space in over 40 floppy disc.

Removable Hard Disk

A zip disk is a removable disk that holds a large amount of information. A zip disk can be used to achieve, protect and transfer large amounts of data.



Zip Drive & Zip Disk

1.2.5 Communications Devices

Specific equipment and programs are needed to connect to the Internet or to communicate with other computers. You can use any type of computer such as IBM compatible or Macintosh to connect to the Internet or communicate with other computers. You need special programs to use the Internet. Most companies that connect you to the Internet provide the programs you need free of charge. You also need a modem to connect to the Internet. A modem translates computer information into a form that can be transmitted over telephone lines. Modems can be used to connect you to the Internet, exchange information, and to send and receive faxes.

1.2.6 Peripheral Devices

A peripheral device is any piece of hardware attached to a computer.

Examples of peripheral devices are printers, scanners, and digital cameras. These have been discussed in this unit.

1.3 Software



1.3.1 General Information

Computer software provides instruction that tell the computer how to operate.

1. Software are also called programs.
2. Programs are usually created using other software called programming languages.

There are two (2) main types of software

1. System Software
 - Used by the computer to accomplish a task.
 - What system software does:
 - controls the internal functions of the computer.
 - controls other devices connected to the CPU.
2. Application Software
 - Used by people to accomplish a specific task.
 - Some common kinds of application software.
 - Word Processor software.
 - Database software.
 - Spreadsheet software.
 - Games.
 - Web Page Browsers.

1.3.2 Kinds of Software

1. Public Domain Software
 - Has no copyright - no one owns the right to control who can make copies of the software.
 - Free to use or make copies of.
 - Can be copied, used in other programs, or changed by anyone.
2. Freeware
 - Has a copyright - someone owns the right to determine who can make copies of the software.
 - Free to use and make copies of.
 - Can only give away exact copies of the software.
 - Can not be changed or used in another program without the copyright holder's permission.
3. Shareware
 - Has a copyright.
 - Allowed to use the software before paying for it.
 - Can be a demo - which limits some major features like the Save command.
 - Can set an amount of time you can use the software.
 - Can trust that you will pay for it if you like the software.
 - Can only give away exact copies of the software.
 - Can not be changed or used in another program without the copyright holder's permission.
4. Commercial Software
 - Has the most restrictive copyright.
 - Have to buy the software before you can use it.
 - Can usually make one copy of the software as a backup copy.
 - A backup copy is used in case something goes wrong with the original software.
 - Can not give away or sell the backup copy.
 - Can not copy, look at the program's code, change, or use the software in another program without the copyright holder's permission.

1.3.3 How Software is Inputted into the Computer

1. Built into the computer's circuits, the ROM chips.
2. Loaded into the computer from a secondary storage device, like a floppy disk or hard disk drive.
3. Typed in from the keyboard.
 - Usually need to use a programming language to create the software.
 - Rarely done by most computer users today.

1.3.4 System Software

System software is a type of program that acts like a conductor in an orchestra. It directs all the activities and sets all the rules for how the hardware and software work together. MS DOS and Microsoft Windows are examples of system software or operating systems software.



Some System Software is built into the computer.

1. ROM chips and BIOS.
2. Helps to setup the computer and start it.

1.3.5 Operating Systems

1. The operating system is usually located on a disk.
 - Can be either on the hard disk drive, a floppy disk, or CD-ROM disk.
 - Must be loaded into RAM before it can be used.
2. Used by the computer's hardware to work with its parts.
 - Tells the computer how to:
 - display information on the screen.
 - use a printer.
 - store information on a secondary storage device.
 - The system software that controls peripherals are called drivers.
3. An operating system works with application software.
 - Does basic tasks, like printing a document or saving a file
 - The operating system starts (launches) the application software so that it can be used.

1.3.6 User Interfaces

1. The user interface is how the computer's operating system presents information to the user and the user gives instructions (commands) to the computer.
2. There are two kinds of User Interfaces
 - Text Interface
 - Presents information to the user in the form of text.
 - Have to type in commands or select commands from a menu displayed as text on the screen.
 - Hard to use or learn, because the user must memorize and type in commands.
 - Examples:
 - MS-Dos (MicroSoft Disk Operating System)
 - ProDos (Professional Disk Operating System)
 - Many of the Text Interfaces had shells placed over them.
 - A shell was more of a Graphic User Interface.
 - Made using the Text Interface easier to use.

- Graphic User Interface (GUI)
 - Presents information to the user in the form of pull-down menus and icons.
 - Pull-down menus the user clicks on to display the menu
 - Icons are small pictures that stand for something, like a file, volume, trash, or program
 - The user gives commands to the computer by selecting items from a menu or by clicking on an icon when using a pointing device.
 - GUIs are easy to learn and use
 - Examples:
 - Windows 98
 - Windows 2000
 - MacOS

1.3.7 Application Software



Application software programs work with the operating system software to help you use your computer to do specific types of work such as word processing to type a letter.

1. Used by people to solve general problems
 - Can be used to do more than one thing - adapted to a wide variety of tasks
 - Some common tasks done by general purpose application software
 - Planning
 - Writing
 - Record keeping
 - Calculating
 - Communicating
 - Drawing
 - Painting

2. Examples of general purpose application software

- Word Processing Software



- Database Software



- Spreadsheet Software



- Desktop Publishing Software



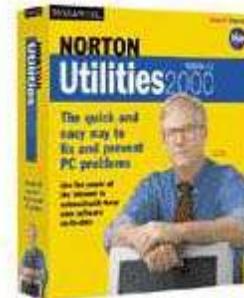
- Paint and Draw Software



1.3.8 Utilities

Utilities allow you to complete certain tasks on your computer. Examples of some of these tasks are file organizations.

- Specific purpose application software are used to help a computer work better or to avoid problems.
- Some utility programs are built into the operating system.
 - Scandisk in the Windows operating system.
 - Disk formatting software.
- Examples of utility programs
 - Anti-virus software.
 - Disk maintenance software.
- File management programs.
- Security software.



1.4 Maintaining Your Computer System



1.4.1 General Do's and Don'ts.

Do's:

- Always shut down your computer properly.
- Do regular Scandisk to check the hard disk surface for damage.
- Defragment the hard drive periodically.
- Delete all files and programs you no longer need from your computer.
- Use a anti-virus program to prevent a virus on you computer.
- Back up data to floppy disks or zip disks to ensure you have a copy.

Don'ts:

- Do not eat around the computer.
- Do not drink around the computer.
- Do not use magnets around a computer.

1.4.2 Taking Care of disks

Do's:

- Delete all files you no longer need from your disk.
- Use a anti virus program to scan for viruses on a disk.
- Do prevent erasing and recording information on a disk by write-protecting it.

Don'ts :

- Do not use magnets around a disk.
- Do not take a disk apart.
- Do not remove the disk while it is in use.
- Do not store in extremely hot or cold locations.
- Do not spill liquids on the disk.

1.4.3 Cleaning Hardware

Follow instructions in the manual or in help files that came with the computer or other hardware devices.

Before cleaning anything, unplug it from the electrical wall socket.

When to clean a computer.

Computers do not need to be cleaned too often if they are kept in a clean environment.

Clean the computer when it looks dirty or when a device (like a mouse) does not work right.

The two things that need the most cleaning are the screen and mouse.

Materials needed for cleaning a computer

Most cleaning materials can be found in a home or any store.

soft lint-free cloths.

soapy water - a drop or two of dishwashing detergent in a gallon of water.

cotton swabs.

water spray bottle to hold the soapy water.

used fabric softener cloth.

You may have to buy the following at a computer or office supply store.

floppy disk drive cleaner kit.

CD-ROM drive cleaner kit.

compressed air.

Cleaning the case and other plastic surfaces

Use a damp lint-free cloth to clean the case.

Spray the water on the cloth. **NEVER SPRAY WATER ON A COMPUTER OR OTHER ELECTRICAL DEVICES!**

Wipe the surfaces with the damp cloth.

For more difficult marks use the eraser. An ink eraser works best.

For cracks and tight places, use a slightly damp cotton swab.

Cleaning a monitor's screen

- Wipe the screen with the damp lint-free cloth.
- Use a dry cloth to dry the screen.
- You may want to use a used fabric softener cloth to help remove static charges on the screen.
- static charges attract dust to the screen.
- a fabric softener cloth has anti-static chemicals on it.
- wipe the screen very lightly with the used fabric softener cloth.
- Do not use a fresh fabric softener cloth. It will leave streaks.

Cleaning the keyboard

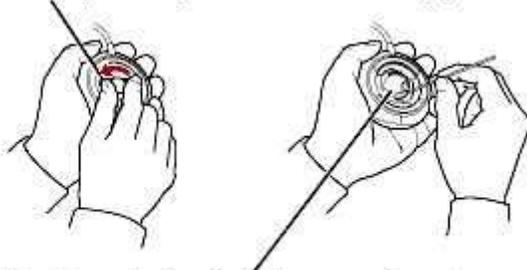
- Use a slightly damp cotton swab to clean in-between the keys.
- Wipe the outside of the keyboard with a damp cloth.
- Use compressed air to remove paper pieces and dust from under the keys.
- Do not take a keyboard apart to clean it! You may not get it back together again.

Cleaning a mouse

- Clean the outside of the mouse with a damp cloth.
- To clean the inside of the mouse.
- Take the mouse apart.
- turn the mouse upside down.
- rotate the retaining ring until it comes free.
- turn the mouse right-side up and catch the ring and ball in your hand.
- Use damp cotton swabs to clean the rollers inside the mouse. Be sure to rotate the rollers to get all of the dirt off of them.
- Wash the ball in warm soapy water. Wipe dry with a lint-free cloth.
- Blow out the inside of the mouse to remove any dust.

Put the mouse back together after it has dried.

Turn the plastic ring counterclockwise to disengage it.



Clean the small rollers inside the mouse with a cotton swab moistened with water.

Inside the computer's case

- The inside of the computer rarely has to be cleaned and it is not recommended that this be done.
- If you must clean inside your computer follow the following precautions.
- Be very careful. You can easily damage the computer or hurt yourself.
- Do not touch the chips or other electrical components.
- Use a vacuum cleaner to remove dust carefully.
- Use compressed air or the blower option on a vacuum cleaner to blow out dust and other particles.
- Floppy disk drives and other drives with removable media
- Follow the instructions on the cleaning kit.
- Do not clean your drives too often, especially the floppy disk drive. The cleaning disk is slightly abrasive and can wear down the drivers read/write heads.

1.5 Security, Privacy, and Ethics



1.5.1 Security

Computers can store both public and private data. You ensure that what is stored on your computer is secure you can use a password to protect the material. User names and passwords can also protect the information stored on a computer. When using the Internet, one should use caution when giving out personal information.

1.5.2 Information Privacy

Intellectual property is a product someone creates based upon his or her thoughts or ideas. Copyright laws exists to protect those who create an idea or product. When using computers, one must respect the property, rights, and privacy of others.

One of the problems related to privacy is the tendency to regard anything displayed on a computer screen as public information. Although most people, including students, would never pick up and read a document lying on someone else's desk, many people do not hesitate to read someone else's computer screen. As word-processing and other tool software becomes more and more common, we must extend the courtesy of privacy from written documents to material displayed on computer screens or stored on disks.

1.5.3 Ethics and the Information Age

Ethics are the standards of honest, morality, and fairness. These standards relate to using computers. One has a responsibility to respect the property, rights, and privacy of others in the way you use computers. Today in the Information Age, one must follow a code of ethics to respect others properties and others personal information.

The legal aspects of computing are complex and multilayered. Teachers can help society by practicing ethical computer use, avoiding software piracy, and providing direct instruction on ethical computing practices.

1.6 Computer Applications in health



Computers are used in a variety of ways in the health field.

1. Management of health data
2. Monitor health outcomes effectively.
3. Tracking of disease burdens.
4. Building awareness about health related issues.



Module 2

Word Processing

Word Processing requires the candidate to demonstrate the ability to use a word processing application to create everyday letters and documents.

Learning Objectives :

After completing this section, you shall be able to

- **Work with documents and save them in different file formats.**
- **Choose built-in options such as the Help function to enhance productivity.**
- **Create and edit small-sized word processing documents that will be ready to share and distribute.**
- **Apply different formats to documents to enhance them before distribution and recognize good practice in choosing the appropriate formatting options.**
- **Insert tables, images and drawn objects into documents.**
- **Prepare documents for mail merge operations.**
- **Adjust document page settings and check and correct spelling before finally printing documents.**

Module 2 Word Processing

2.1 INTRODUCTION

2.1.1 Overview



Microsoft Word is a word processing application designed to help you create professional-looking documents such as newsletters, reports, brochures and letters. In short, Word allows users to produce different types of documents depending upon the situation and need. Formatting features can be enabled and disabled to adjust to the specific requirements of the users. Word is unlimited in what it can offer as you become familiar with its built-in features. To name a few, italicizing text, changing the color of certain images, adjusting alignment of text, activating certain toolbars, and creating objects with the Drawing Tools option are only a few examples of these built-in features.

From this tutorial, you will learn how to use the built-in tools to perform some word processing tasks more effectively and efficiently. Furthermore, you will learn how to create professional-looking documents that you can use in your academic and professional careers.

2.1.2 Basic Terminology



⊕ Before using any type of word-processing software, there are certain terminology that one needs to become familiar with in order to create documents. In Microsoft Word, the following terminology are used to articulate certain features of the software program, its function/navigation methods, and common word-processing terms.

Term	Definition
Arrow Keys	Located on the keyboard, these left/right and up/down arrow keys can be used to move around on the computer screen.
Border	A border is used to outline an object/image on a page or you can insert borders around text/phrases. One can also create borders for entire pages to simulate letter stationery.
Click	Press and release the left mouse button once. Double-click means to click the left mouse button twice quickly.
ClipArt	A gallery or collection of graphic images or pictures that you can add to documents.
Close	A software feature that allows you use to close a document that you are working on without closing the software program.
Color Spectrum	A range of colors from cool to warm. When creating objects (e.g., circles, polygons) one can customize the colors of the objects using the color spectrum table.
Double-click	Press and release the left mouse button twice.
Drag and Drop	Moving objects from one location to another. With your mouse, move the pointer over an object on your screen. Press and hold down the left mouse button and move the mouse to where you want the object to be. Release the button.
Draw Tools	A software feature that allows you to draw objects like lines and shapes using your mouse.
Editing	Changing the appearance of a document in some way such as deleting, moving, or adding characters, changing font styles, inserting bulleted items, and altering the color of text.
File Names	A title given to a document. Names can be up to 255 characters.
Fill	A software feature you use to change the color or shading inside an object, text box, etc.

Font/Typeface	A software feature you use to change the style of the text in a document. Font refers to the design and size of characters in a document.
Formatting	Changing the way the information is displayed in a table, chart
Group/Ungroup	A software feature that allows you to group several objects into one or ungroup objects to edit individually.
Icon	A small picture that represents an object such as a program.
Insertion Point	Blinking vertical line that appears on the screen that shows where text will be inserted.
Landscape	Prints across long edge (11" x 8.5").
Line Spacing	A software feature you use to adjust the blank spaces between lines.
Margin	A software feature you use to adjust the blank space surrounding a document on all sides.
Maximize	Enlarges a window to fill the entire screen. This allows you view more of its contents.
Minimize	Removes document window from the screen. This moves the item to the task bar. You may redisplay the window at any time.
Moving	A software feature you use to change the position of text/objects, or move text/objects between different documents.
Open	A software feature you use to open a previously saved document such as a letter.
Recycle Bin	Stores all the deleted files that can be recovered later.
Resizing	A software feature you use to change the size of an object like a drawing, picture, or text box.
Restore	Returns a window to its previous size. This lets you view information hidden behind the window.
Reverse Text	White text on a black background.
Save	Save data to a disk with its own file name.
Save As	Save a document under a different name or to save a new document.
Scroll	Allows you to look up and down a long document to view or edit parts.
Scroll Bar	Lets you browse through information in a window. This is useful when a window is not large enough to display all the information a document contains.
Search/Find	A feature that allows you to find all occurrences of a word, phrase, numbers, etc. in a document. The Replace option allows you to substitute a word/phrase with another.
Selecting	Highlighting text in order to change it in some way.

2.1.3 Toolbars



There are several important toolbars in Word. Toolbars give users easy access to certain features such as formatting, drawing, and saving files without going to the Menu Bar. Common toolbars are the Menu Bar, Standard Toolbar, and Format Toolbar.



Word also has other toolbars that appear when certain features or options are activated (e.g., Header and Footer, Picture, Tables and Borders). These pop-up toolbars can be exited by clicking on the Close button (indicated by the X).



Changing the layout of toolbars on the screen is simple. You can easily enable and disable certain toolbars to accommodate your word-processing needs. If you find yourself using a particular feature often such as drawing shapes, activating that toolbar will save you time in the end.

To enable or disable certain toolbars from appearing, click on View and then on *Toolbars*. Click on the toolbar option you want activated. Check marks next to the toolbar options indicate that they are enabled and will appear each time you use Word. To disable active toolbars, click on the option until the check mark disappears.

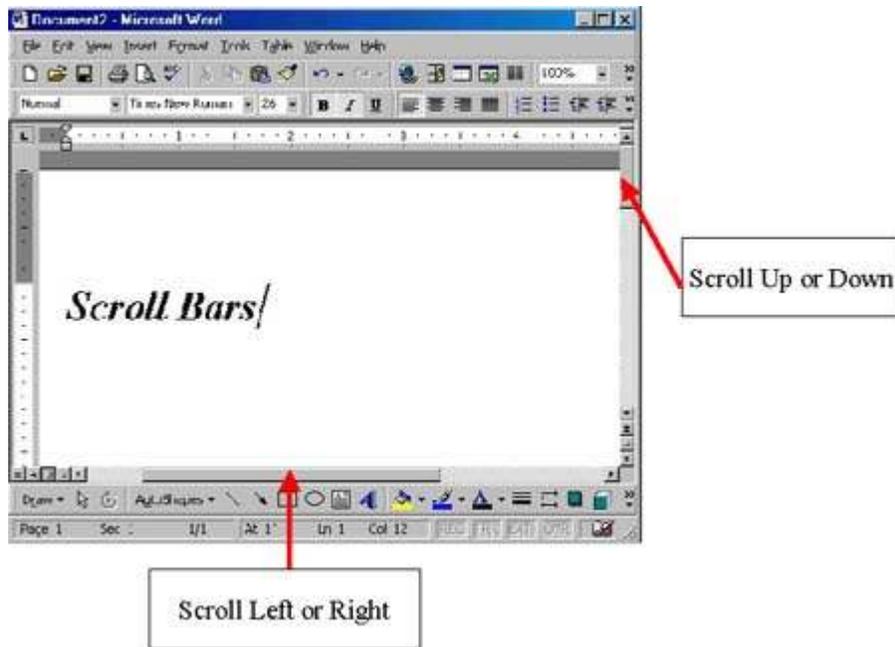
2.1.4 Scrolling



Scrolling allows you to view the document screen by screen. Using Scroll Bar buttons is much faster than using the arrow keys to move within the document.

To scroll up and down, left click on the vertical *Scroll Bar* button located on the right side of the screen. With the mouse button held down, move the Scroll Bar button up or down to view the document.

To scroll left and right, left click on the horizontal *Scroll Bar* button located on the right side of the screen. With the mouse button held down, move the Scroll Bar button left or right to view the document.



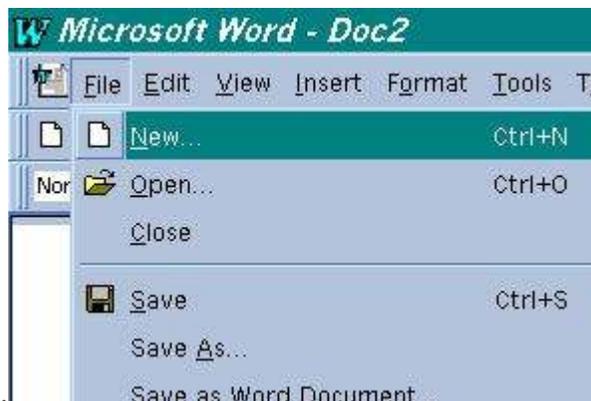
2.2 Managing Word Documents

2.2.1 Creating New Documents



⊕ There are three ways in which one can create a new document.

- One way to open a new document is to position the pointer over the New icon  on the standard toolbar.
- Another way to open a new document is to select File and *New* from the menu bar.

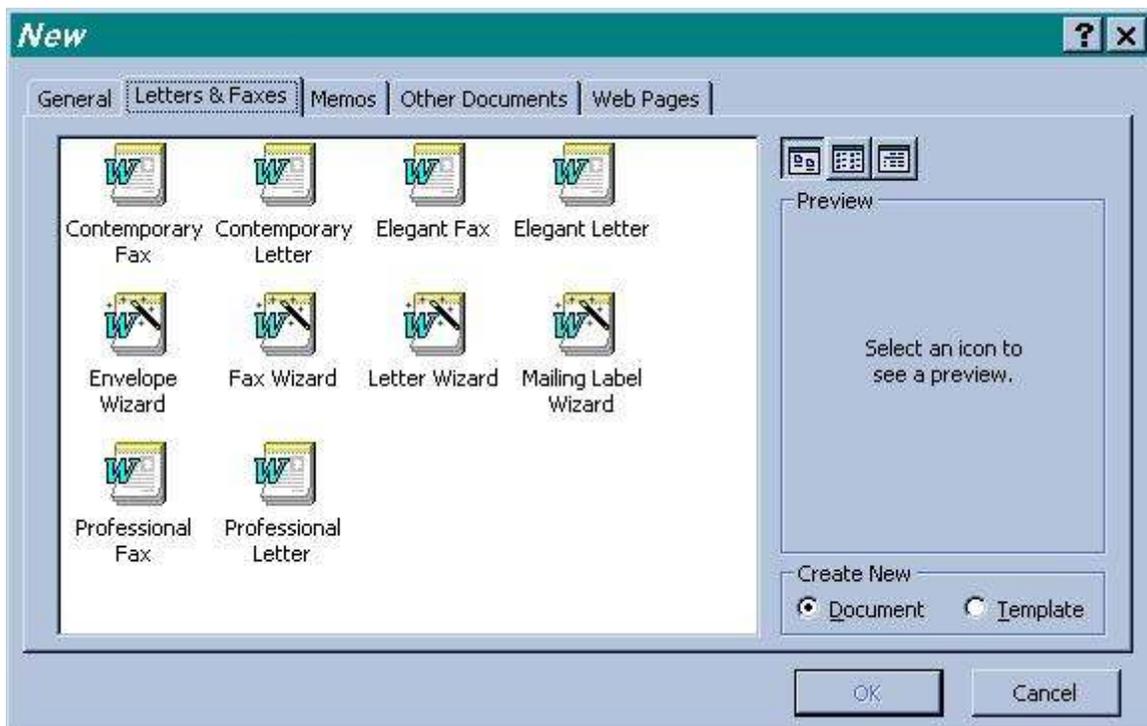


- Or you can press the Ctrl + N keys on the keyboard to open a new document.

2.2.2 Using Templates and Wizards

Templates are popular document styles that have been pre-designed for certain word-processing needs. These templates include letters, memos, FAX cover sheets, reports, Web pages, and other document styles. Wizards, on the other hand, are tools to help you polish document templates. They do not help you with everything such as giving you a written business letter. However, Wizards do help you go through the process of creating documents step-by-step.

To use a template, go to File and select *New*. A New window will appear with several tabs such as General, Letters and Faxes, Memos, Other Documents, Web Pages, etc. Select a tab and click on a template you want. If you want to use a Wizard, click on an icon that mentions Wizard (e.g., Memo Wizard, Web Page Wizard) and follow the directions given to you.

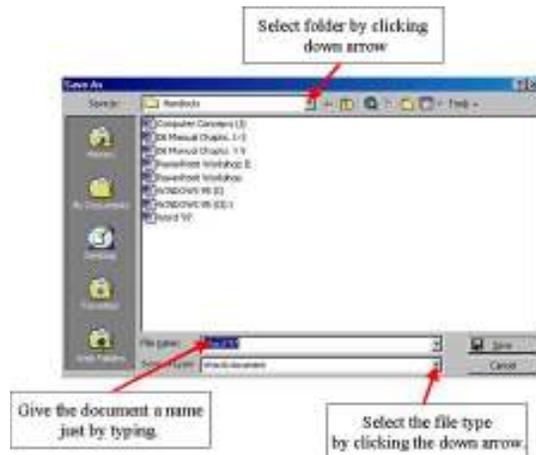


2.2.3 Saving Documents



Once a document has been created, you need to save the document for future editing.

To save a new document, click on File and then on *Save As*. A Save As window will appear with several options. To give the document a title, click in the File name: dialog box and start typing. You may also need to choose a file format depending upon what you will do with the document. Go to the Save as type: dialog box and click on a file format to save the document in (e.g., Rich Text Format, WordPerfect, HTML, MS-DOS Text).



To save a previously-saved document, click on File and then on *Save*. A Save window will not appear as in the Save As option. Instead, Word will automatically save the document under its current file name and file type.

Another way to save a previously saved document is by clicking on the Save button located on the Toolbar next to the Open Folder button.

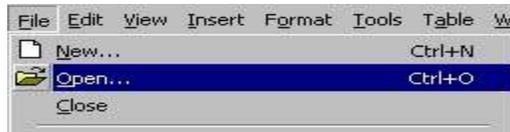


2.2.4 Opening Saved Documents

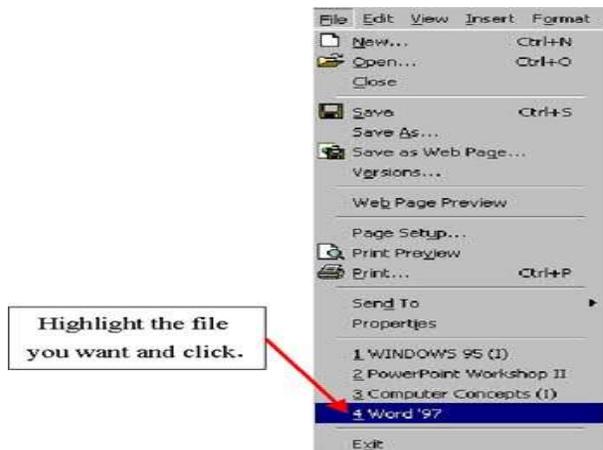


There are several ways to open a saved document in Word.

One way is to go to File and click on *Open*. An Open window will appear and it is just a matter of locating the saved file, clicking on the file name, and selecting Open. You can also double-click on the file name to open the document.



Another way of opening a recently saved document is clicking on File option and choosing one of the file names listed in the bottom half of the drop-down menu (usually indicated by a number or folder name).



Finally, you can go to the Toolbar and click on the Open Folder button located next to the New button.

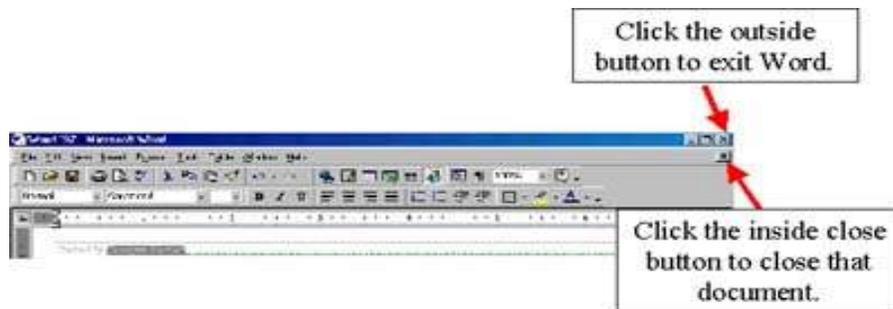


There are some things to be aware of when searching for files in the Open window. If you have files that cannot be seen in the Open window, Word may be limiting the file types to be shown. Thus, you may need to change the file type in the *Files of type:* dialog box.

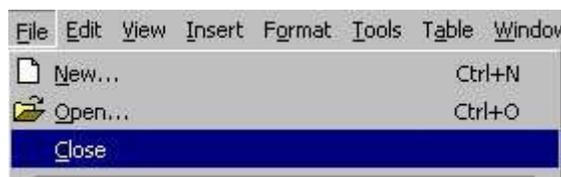
2.2.5 Closing a Document

Once you have saved a document, you can then close the active document without closing the Word program. There are two ways to exit an active document.

First, you can click on the **Close button**. A window will appear asking if you want to save the document before closing (this window will only appear if you have done some editing after saving the document).



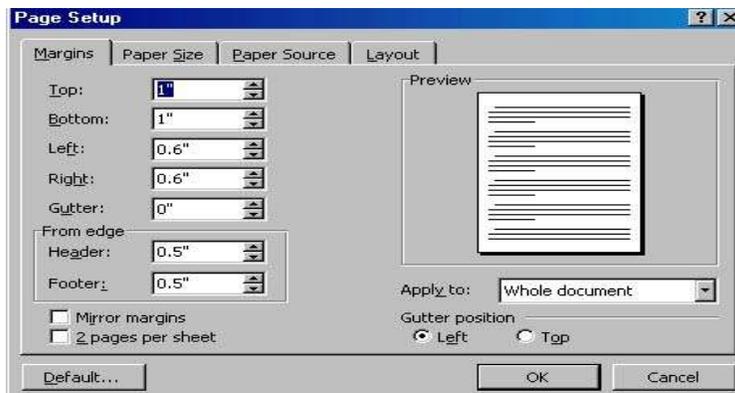
Another way to exit the document is by going to File and clicking on **Close**. If the document has not been saved before closing, a window will appear asking you whether to save the document.



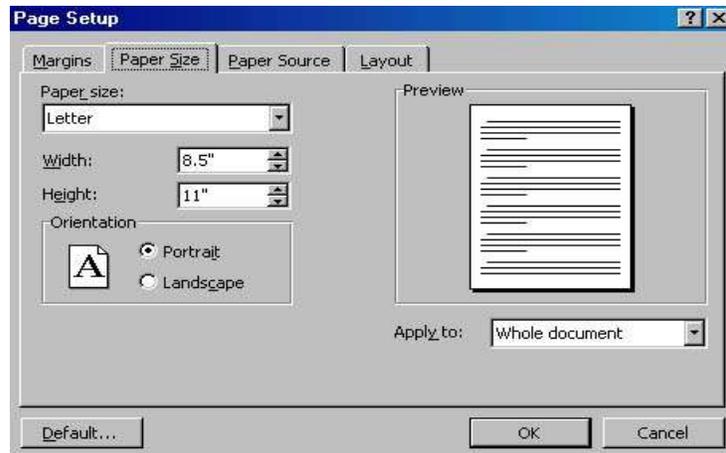
2.2.6 Page Setup

Page setup has four areas that can be adjusted to meet specific needs. These areas include margins, paper size, paper source, and layout. Each area is described below.

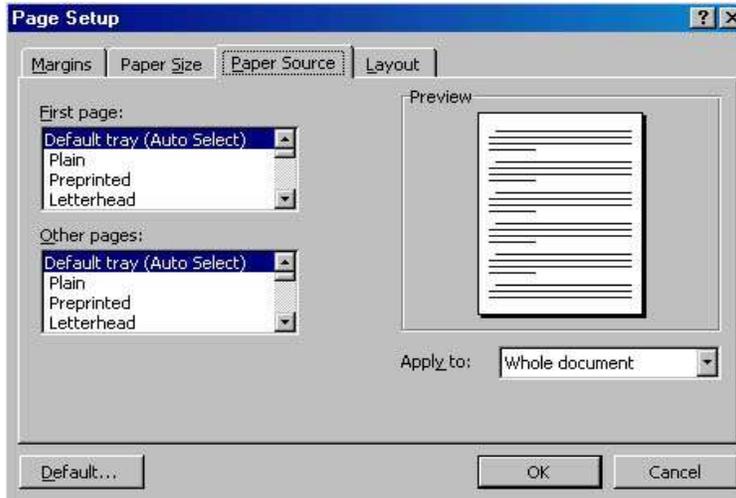
Word begins your document with a default set of margins. **To change the default margins**, you will need to go to *Page Setup* under File. The Margins tab gives you the opportunity to change the Top, Bottom, Left, and Right margins. You can also define where you want the header and footer to go on the page. Furthermore, you can choose whether to apply the new margin settings to the entire document or just to a section of a document.



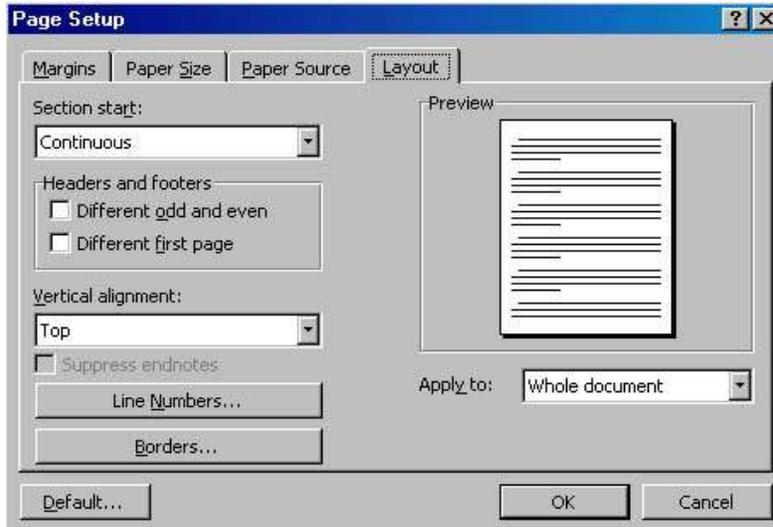
Paper Size allows you to adjust the setting of a document to fit a variety of paper sizes for printing. You can also customize the paper size to suit your needs. Orientation such as Landscape (long edge) and Portrait (short edge) can be changed here.



Paper Source allows you to view and select the printer tray options.



Finally, the **Layout** tab allows you to define where new Sections start and whether to add or delete line numbering currently selected in the Apply to: box. Click on the Line Numbers button to perform this task.



2.2.7 Previewing a Document



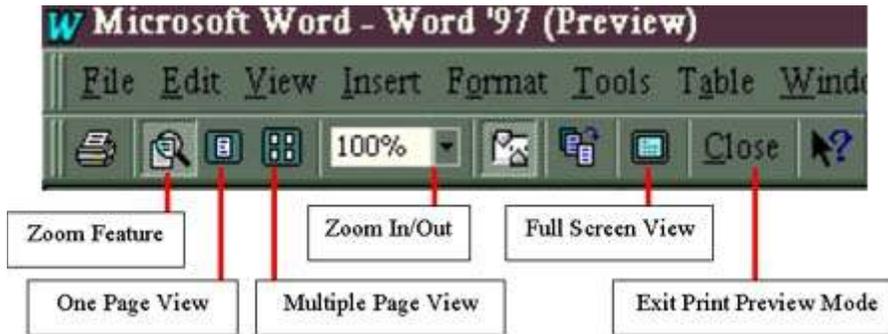
The *Print Preview* mode is used for viewing documents before printing. Print Preview displays pages of the document so that you can get a better idea of how it will look after the document is printed.

To preview your document, go to File and click on *Print Preview*. A window will open displaying your document page by page. You can alter the display by zooming in or out using the magnifying glass.

Viewing multiple pages can also be performed by clicking on the Multiple Page Button on the toolbar and highlighting the number of pages you want shown (you will need to hold the mouse button down to highlight).

To make a page active, just click on the page and a highlight bar will surround the edges.

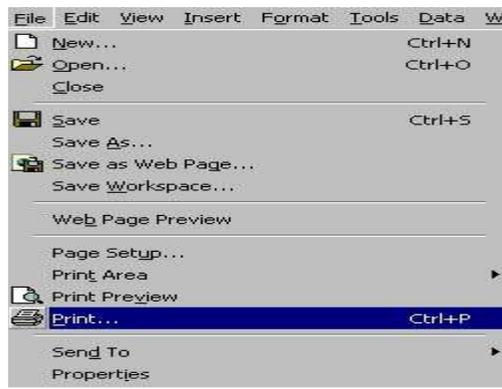
To exit the Print Preview mode, click on the Close button or on one of the Document View Mode Keys on the Status Bar.



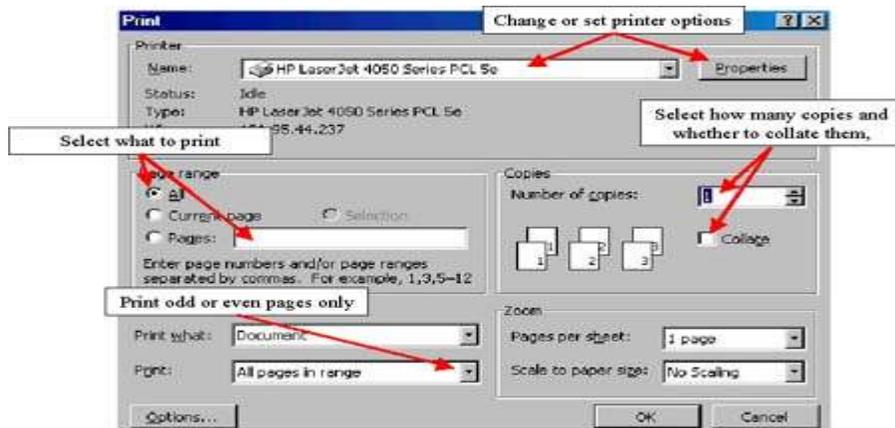
2.2.8 Printing a Document

Printing the document is simple. If you are ready to print a final copy of the document, follow the directions below:

- Click on File and select Print.



- A Print Properties dialog box will appear with several options. Select the one(s) you need and click the OK button.



Another method to use is by clicking the **Print** button located on the Standard toolbar.



2.3 Viewing documents

2.3.1 View Keys

There are different ways to view a document. To view a document you can use buttons along the toolbar, the menu bar options, or keyboard shortcuts. Each viewing option has its own advantages depending upon the purpose of your document. In **Normal View**, you will not see the page's edges and the page breaks are indicated by a dotted line. The computer will perform faster in this viewing mode, and thus, useful when working with larger files. However, certain features will not be displayed such as graphics. In **Page Layout**, the page break simulates the edges of a piece of paper and displays your document as what-you-see-is-what-you-get, graphics and all. Thus, Page Layout will not perform as fast as Normal View.

To change the viewing feature of your document, use any of the options below:

Feature	Button	Menu	Keyboard
Page Layout View		View, Page Layout	Alt + Ctrl + P
Normal View		View, Normal	Alt + Ctrl + N
Outline View		View, Outline	Alt + Ctrl + O
Print Preview		Alt +Ctrl + I	Alt +Ctrl + I

2.3.2 Viewing Multiple Files

When you have several documents opened, there is a better way than using the *minimize* and *maximize* buttons. Pressing and holding down the CTRL button and pressing F6 will allow you to toggle between the opened files. Another way of navigating between opened files is through the Window option located on the Menu Bar. Click on Window and a drop-down menu will appear. A list of documents will appear at the bottom with a check mark next to the active document. To change the active document, just click on a different document.

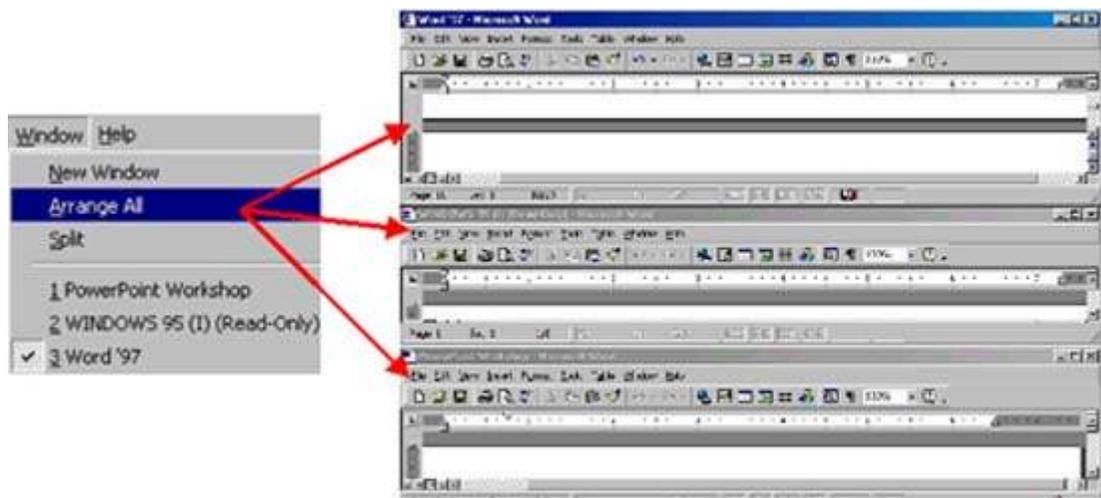


2.3.3 Arrange All Option



When two or more documents are opened simultaneously, the **Arrange All** option provides easier navigation than toggling between the opened documents.

To keep multiple documents open in the text window, go to Window in the menu bar and click on *Arrange All*. You should be able to see all of the opened documents contained in their separate windowpanes. To make one document active, just click anywhere within the document's window and the title bar will become highlighted. You are then ready to edit the text. Close each document individually once you are done.

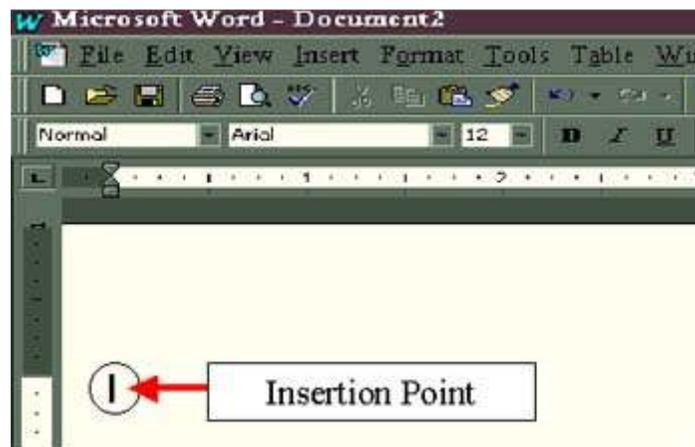


To change the size of the windowpanes, move your mouse over to the edges of the selected document until you see a resize pointer (up and down arrow cursor). With your mouse button held down, move the resize pointer to the desired location. This method will allow you to size the opened documents to suit your needs.

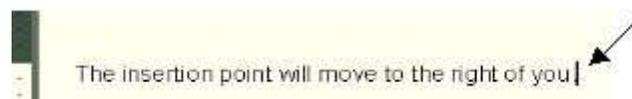
2.4 Working with Text

2.4.1 Typing Text

When you first start Word, you will see a blank document with the insertion point and end of document line at the top. To begin, just start typing.



The insertion point will move to the right as you type. If you make a mistake, press BACKSPACE to delete the characters. The insertion point moves as you type.



When you want to begin a **new paragraph** or insert a blank line, press ENTER. Pressing ENTER will insert a hidden paragraph marker and moves the insertion point to the beginning of the next line.

As the page fills up with text, Word automatically inserts a break and creates a new page. If you want to force a **page break**, use the CTRL+ENTER key combination.

2.4.2 Selecting Text



 Text must be highlighted before any formatting can be done. You can pretty much highlight anything from a single letter to a graphic file. Most of the time, highlighting can be performed by holding and dragging the mouse over the desired text. However, there are several other ways to highlight information.

- **Standard.** Place cursor at the beginning of the information. Hold the mouse button down and drag the mouse to the end of the information. Then release the button.
- **Single Word.** Point at the word you want and double-click. The word will become highlighted in black.
- **Single Line.** Click next to the line in the left margin. Hold the mouse button down and move the mouse either up or down to highlight additional lines.
- **Paragraph.** Double-click next to the paragraph in the left margin. To highlight several paragraphs, double-click in the left margin, and on the second click, hold the mouse button down. Move mouse up or down to highlight additional paragraphs.
- **Document.** Hold down the CTRL key and click anywhere in the left margin.

After you highlight something, you must cut it or copy it immediately. If you do anything else in between, all your highlighted text reverts to normal. Also, be careful when you highlight a piece of text. If you touch any other key before cutting or copying, the highlighted portion will be replaced by what you pressed. In this case, hold down the ALT key and press BACKSPACE to retrieve the replaced text.

2.4.3 Moving, Copying and Pasting Text

Once you highlight something, you are ready to move, copy, or paste the information.

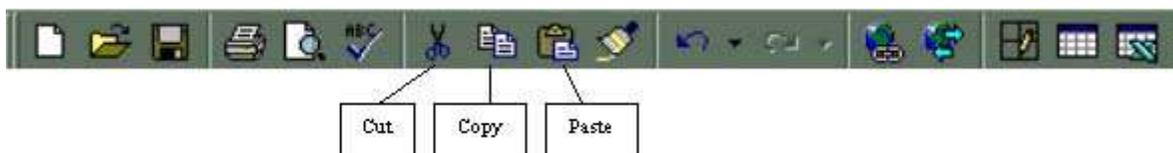
To delete text, just press either the DELETE or BACKSPACE key. The information is completely erased from the window. If you accidentally delete the wrong information, hold down the CTRL key and press the letter Z.

Moving is a little different from deleting. Although the information is erased from the document, the information is temporarily stored on the Clipboard to be pasted elsewhere. To move the highlighted text, hold down the CTRL key and press the letter X to cut. Another way is to click on EDIT and then on Cut. The highlighted text disappears and goes to the Clipboard. The next step is to go to the place within the document (or between documents) where you want the text to be moved. Click in that area to ensure that the insertion point can be seen, and use the CTRL+V combination keys. This will paste the information into its new place.

Copying copies the highlighted information to be placed elsewhere in the document (or between documents). Once the selected text is highlighted, hold the CTRL key and press C. Another way is to go to EDIT in the Menu Bar and select Copy.

Pasting information is the last step. It takes whatever information is on the Clipboard and copies it someplace else. Go to the place in which you want the information to be pasted and click. Make sure the insertion point can be seen. Hold down the CTRL key and press V and there you have it. You can also choose the Paste command from the EDIT option on the Menu Bar. Because the Paste command only inserts a "copy" of the information, the information is still there waiting to be copied again. You can keep pasting the same information into other windows as long as you do not perform a new Cut or Copy command.

Cutting, copying, and pasting information can also be performed by going to the Toolbar and clicking on the appropriate buttons. This may be easier than memorizing all of the key combinations.

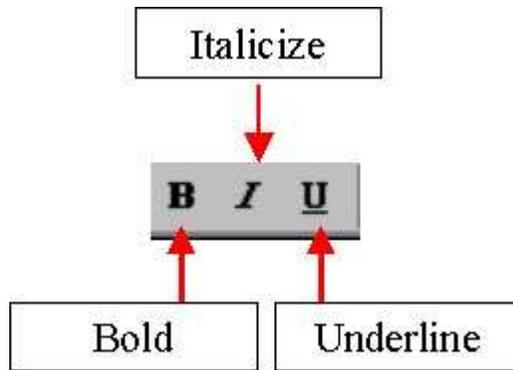


2.4.4 Changing Font Style

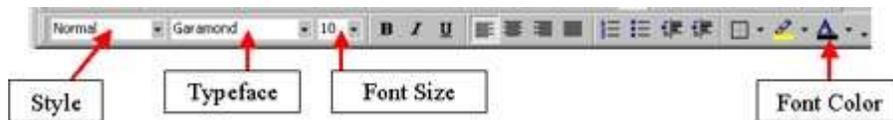


⊕ Fonts are type styles that vary in appearance depending upon the style you choose. Once the font has been selected, there are several things you can do to manipulate its appearance.

First, you can **Bold**, *Italicize*, and Underline text. To **Bold** text, select the word or words you want with the mouse. On the Format Toolbar, click the Bold button and your text will be in bold. To **Italicize**, go to the Format Toolbar and click on the Italicize button. Finally, if you want to **Underline** text, select the passage and click the Underline button on the Format Toolbar. If you do not like what you have done, click on EDIT and choose Undo (or use the Undo button on the Toolbar).

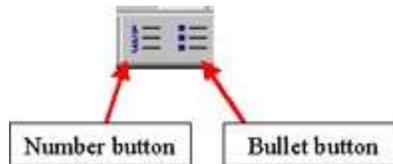


You can also change the font typeface and font size using the Format toolbar.



2.4.5 Creating Bulleted and Numbered Lists

Adding lists is simple. There are two types of lists to choose from: numbered and bulleted. If you have already typed in your text, highlight the selected words, sentences, or paragraphs and click on one of the list style buttons on the Format Toolbar. For **numbered** lists, click on the Number button. For **bulleted** lists, click on the button.

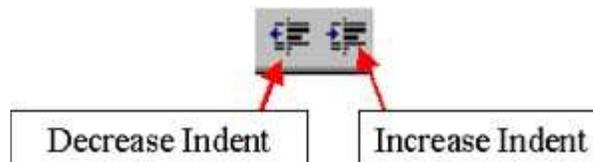


If you are typing text for the first time, click on one of the style buttons and press enter after you are finished typing each word, sentence, paragraph, etc. Word automatically inserts the bullet or number for you (AutoFormat must be enabled for this to work).

Word also renumbers sequences automatically. For instance, if you decide to insert a sentence between #2 and #3, press return after sentence #2 and a blank #3 appears waiting to be filled in (note that the old #3 is now a #4).

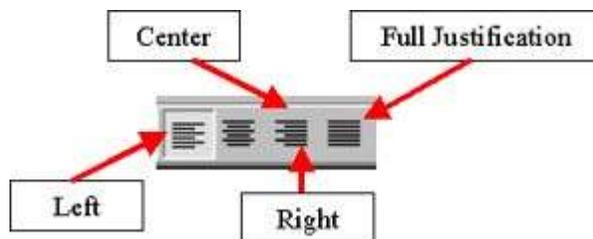
2.4.6 Indenting Text

If you want to indent text, place the insertion point at the appropriate place and click on one either Increase Indent or Decrease Indent (to undo Indent) buttons located on the Format Toolbar.



2.4.7 Alignment of Text

If you want to adjust the alignment of the text, place the insertion point at the beginning of the desired text (or highlight the text). Then, click on one of the *Alignment buttons* located on the Format Toolbar. You can choose left, right, center, or full justification.

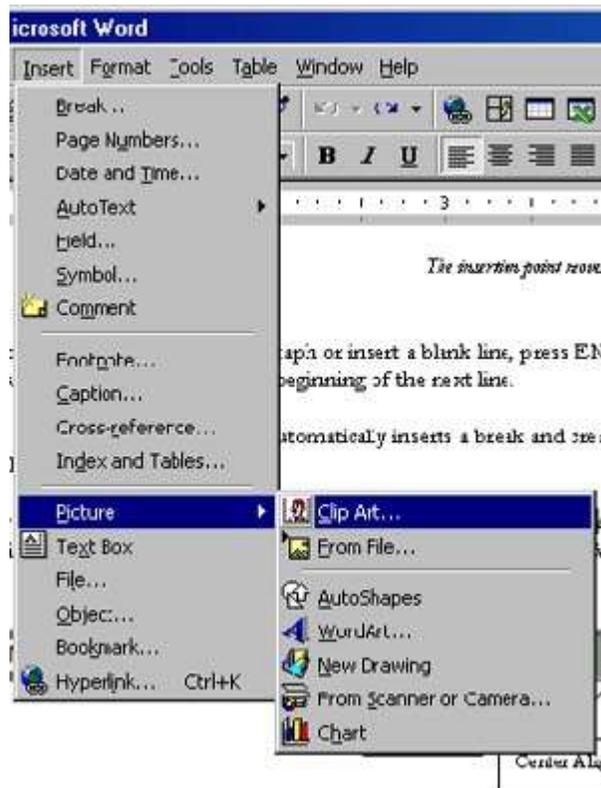


2.5 Working with Graphics

2.5.1 Adding ClipArt

Word provides ready to use pictures, called clipart, that you can add to your documents. **To add clipart, follow the steps below.**

- Position the insertion point where you would like the graphic to go.
- Choose Insert from the menu bar.
- Choose the *Picture* option from the drop down menu.
- Choose *ClipArt* from the Picture menu.



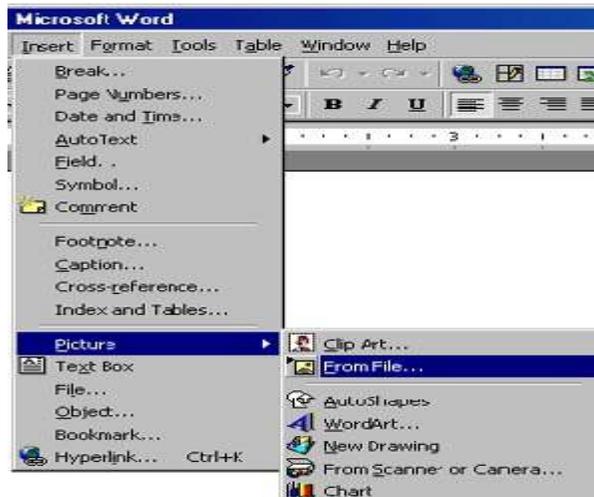
- Choose the graphic you want from the ClipArt Gallery by clicking on it. A popup window will appear with four buttons. Choose the first button to insert your ClipArt onto the document.



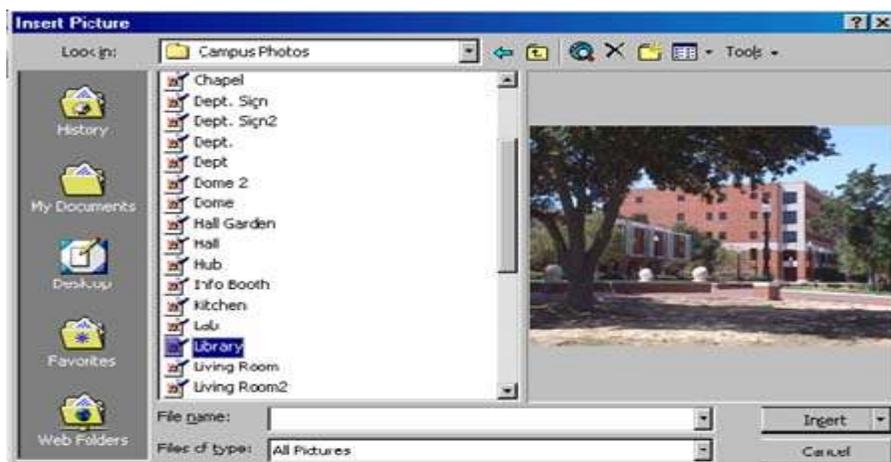
2.5.2 Adding Personal Images

If there are digitized images that you have on the computer, you can also add these to your documents. **To add personal images**, follow the steps below.

- Position the insertion point where you would like the image to go.
- Choose Insert from the menu bar.
- Choose the *Picture* option from the drop down menu.
- Choose *From File* from the Picture menu.



- Locate the drive and folder for your image and click on the *Insert* button.



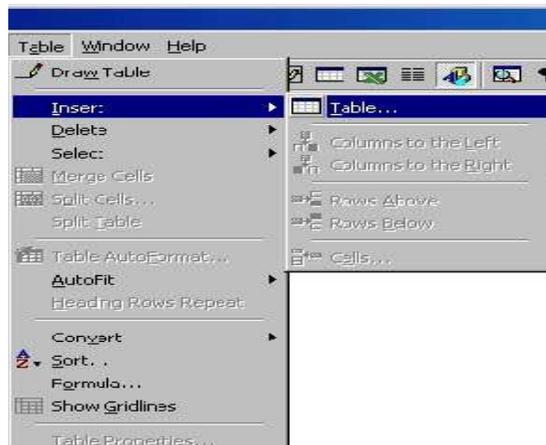
2.6 Creating Tables

2.6.1 Using the Menu Option

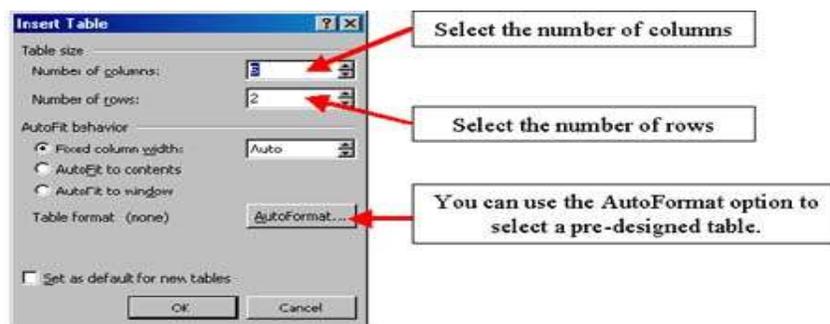
There are two major ways in which one can create tables in Word. One way is by using the menu option and the other is using the toolbar. Both of these methods will be covered in the following pages.

To create a table using the Menu, follow the steps below:

- Place the insertion point where you want the table to appear.
- Click on Table in the menu bar and select *Insert Table*.



- The Insert Table dialog box appears with several options.



- In the Insert Table dialog box, type the number of columns and rows that you want for your table.

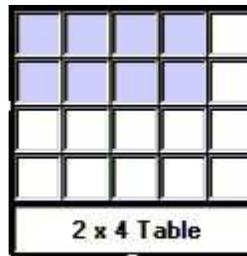
- To create the table, click the OK button. An empty table appears on your screen and you are ready to begin adding information to the table.

2.6.2 Using the Toolbar Option



 To create a table using the Toolbar option, follow the steps below:

- Place the insertion point where you want the table to appear.
- On the Standard toolbar, click and hold the *Insert Table* button. A drop-down menu appears.



- To indicate the size of your table, select the appropriate dimensions. NOTE: Drag right to select columns; drag down to select rows.
- When the correct size is selected, release the mouse button. An empty table appears on your screen and you are ready to begin adding information to the table.

2.6.3 Adding Information to the Table



 To enter information into your table, just type. When you want to move to another cell in a table, you will need to use one of the following methods:

- press the [Tab] key.
- press an [arrow] key.
- use the mouse to click in the appropriate cell .

2.6.4 Moving Around and Selecting within a Table



 These helpful shortcuts will help you move around within the table.

Move to Cells	Method
previous cell	use the left arrow until you are in the cell you want
next row	press the down arrow
previous row	press the up arrow
Select Cells	Method
next cell	use the Tab key
previous cell	Shift + Tab
entire row	drag I-beam across the rows or place the pointer to the left of the row and click
entire column	Alt+click or place the pointer at the top of the column, when the down arrow appears click the mouse

2.6.5 Formatting Tables



 There are several things you can do to alter the appearance of the table. These are adding rows and columns and deleting rows and columns.

To add a row at the end of a table, place your insertion point in the last cell (last row, last column) and press the Tab key.

To add a row within the table, place your insertion point in a cell below where you want to add a row and from the Table menu, select *Insert*. Select either *Rows Above* or *Rows Below* option.

To add a column within the table, place your insertion point to the right of where you want to insert a column. From the Table menu, select *Insert*. Select either *Columns to the Right* or *Columns to the Left* option.

To delete a row, place your insertion point in the row to be deleted. From the Table menu, select *Delete*. Select the *Rows* option.

2.7 Special Features

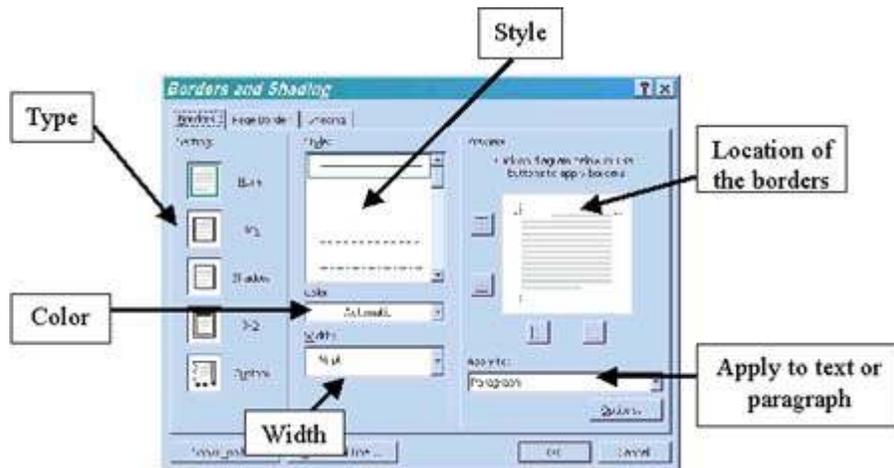
2.7.1 Borders and Shading



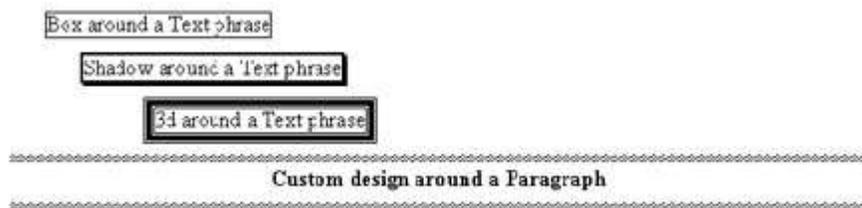
Adding borders and shadows to text help accentuate information on your document that you want the reader to take notice.

To add borders to text, follow the steps below:

- Select the text, phrase or word by highlighting it.
- Once highlighted, click on Format in the menu bar and then on *Borders and Shading*.
- A window will appear. Here, you have several options such as type of borders to use, thickness, location, and color. You can also choose to apply it to the text you selected only or to the paragraph.

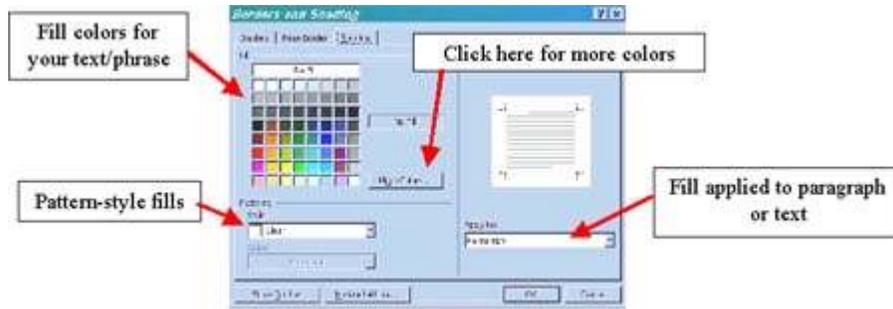


- There are **two types** of borders that you can create for textual information. Borders using the *text option* surrounds only the word(s) selected. Borders using the *paragraph option* extends across the entire length of the page. See the examples below for an illustration.



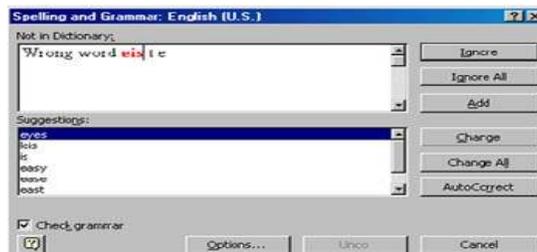
To create a border for the page, you would click on the Page Border tab and select the options there in the window to suit your needs.

To add shading to text, you can adjust the color of a particular border text or phrase (even if your text/phrase do not have solid borders). Click on the Shading tab and select the options you want.



2.7.2 Spelling and Grammar Tool

Word offers some handy tools under its Tools menu. *Spelling and Grammar* is one of them. A window appears after you click on this option showing the word or sentence in question on the top, and a list of possible suggestions at the bottom. If the suggestion is something you like, click Change. If not, click Ignore.



If you do not want Word to check for grammar, click the Check grammar box to disable the function.



2.7.3 Language Tool

The Language option has your *Thesaurus*. If you are in a bind for words, then this feature can help you find the right words to use.

To use the Thesaurus, click on a word in your document and select the Language function option under Tools in the menu bar. A window will appear with alternative words (if Word has any to offer). Locate the word you want to use, highlight it, and then click *Replace*.



2.7.4 Word Count

Word Count is a feature that gives you statistical data concerning your document such as the number of pages, words, characters (with and without spaces), paragraphs, and lines. This tool is handy when you need to keep the document's length to a certain number of words.

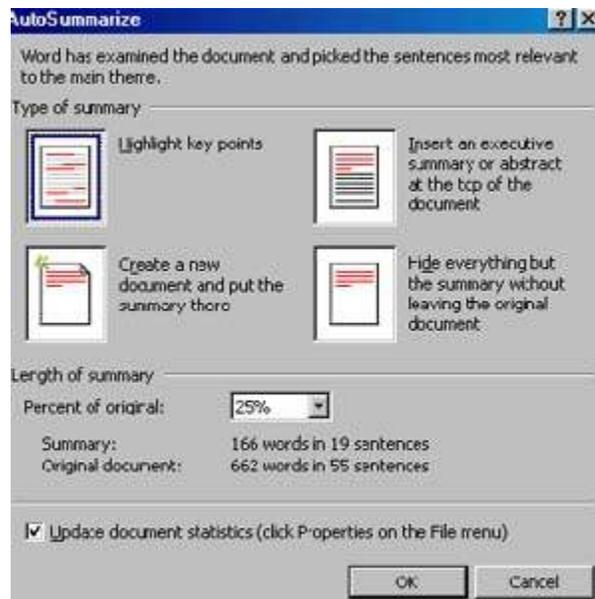
To start Word Count, click on Tools and then on Word Count. The function will start automatically and a window will appear with the total numbers.



2.7.5 AutoSummarize

AutoSummarize is a nifty little feature that summarizes your document by examining the content and selecting sentences that best relate to the main theme. Just click on Tools in the menu bar and then on *AutoSummarize*.

A window will appear with several options. There are four types of summaries you can choose from. These are 1) highlighting key points, 2) creating a new document with the new summary, 3) inserting an executive summary at the top of the document, and 4) hiding everything but the summary without leaving the original document. Just click on an icon that represents the option you want.

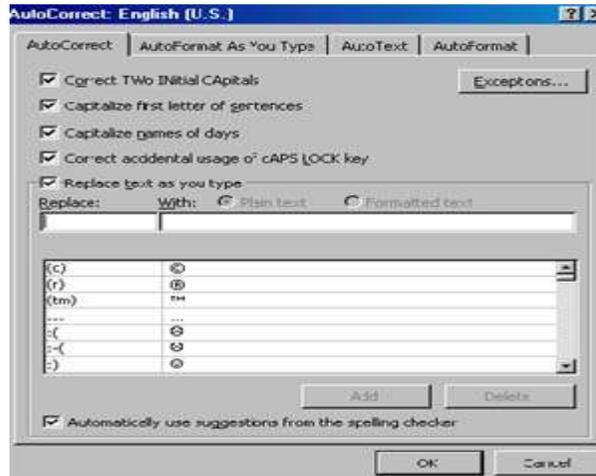


Designating the summary's length is another option. You can determine the Percent of original you want condensed. Once you choose a size in Percent of original, Word will tell you how many words and sentences from the original document will be summarized. These will vary depending upon the degree of summarization you choose.

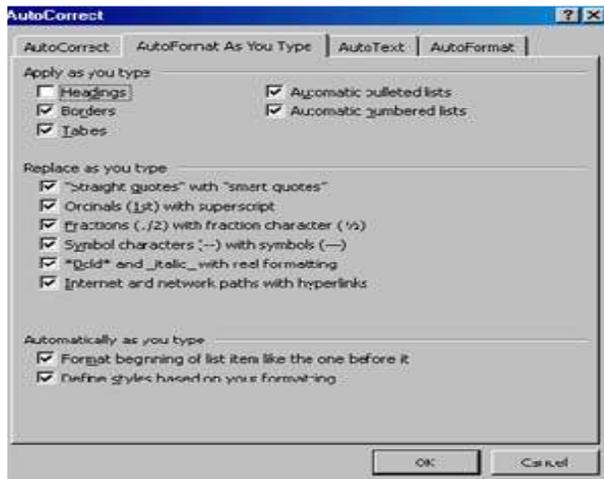
2.7.6 AutoCorrect

 AutoCorrect is a function that enables Word to perform some automatic editing features while you type. Follow the steps below to perform this function.

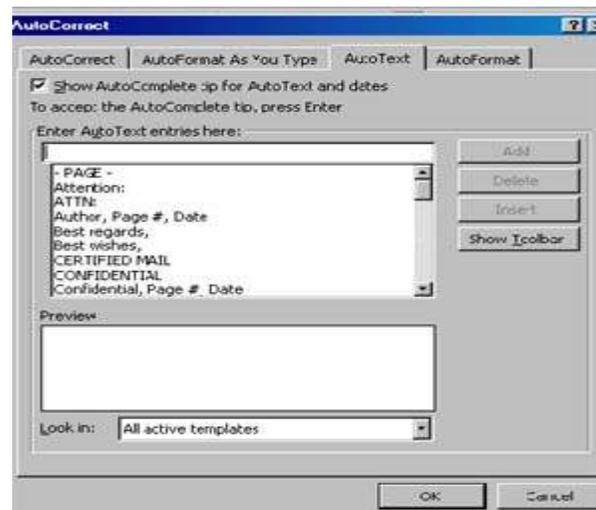
- Click on Tools and select *AutoCorrect*.
- An AutoCorrect window appears with four tabs.
- Click on the *AutoCorrect* tab to bring it forward. In this option, you can tell Word which mistakes or errors you want corrected automatically. There is also a section that lists common typos and misspellings that Word will automatically replace once found.



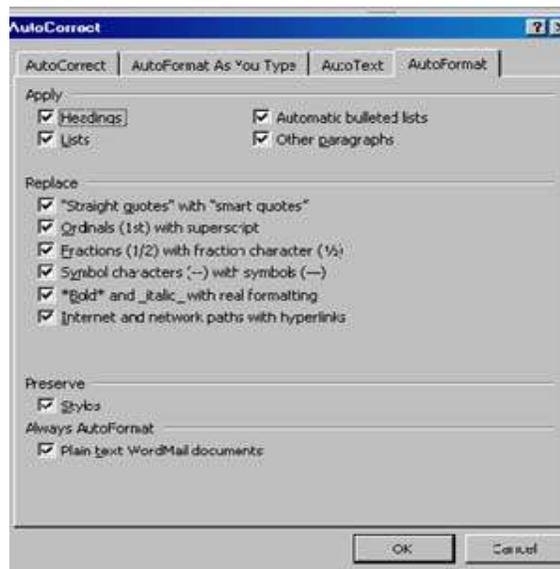
- The *AutoFormat As You Type* allows you to tell Word what automatic formatting features you want to take place as you type. Autoformatting such as Automatic Bulleted and Numbered lists, Ordinals with superscript (1st), and Fractions with fraction character ($\frac{1}{2}$) can all be enabled by clicking in the boxes next to the options.



- *AutoText* gives you suggestions of possible words as you type. It only takes a few letters before Word recognizes a possible match and offers you a suggestion. A box will appear with the word(s) in it. If what you began typing is the word(s) you want, just press Enter. Word will then complete the word(s) you started typing.

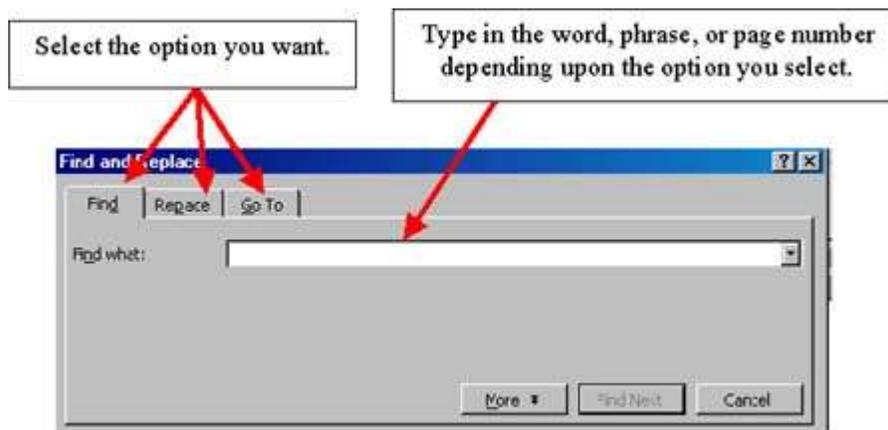


- Finally, you can designate how Word will *AutoFormat* your document. A list of options are given to you. Click the boxes to enable the *AutoFormat* features. Once you are done editing the document, click *Format* located on the menu bar and then on *AutoFormat*. A window will appear asking you a few questions such as to *AutoFormat* now or *AutoFormat* and review each change. You can also select the document type (e.g., general document, letter, e-mail) to help Word *AutoFormat* more effectively.



2.7.7 Find, Replace and Go To Options

Find, Replace and Go To are useful tools for editing documents. If there is a certain word or phrase that you want to search throughout the document, the **Find** feature will help you locate each occurrence. **Replace** is a feature that allows you substitute words in the document for another. Finally, **Go To** allows you to skip to certain pages or other formatting features such as text lines, paragraphs, headers, graphics, etc.



To utilize these two tools, click on Edit in the menu bar and select either *Find*, *Replace*, or *Go To*, depending upon what you want to do in the document. These features are much faster than reading an entire document to locate a word or using the scroll bar to skip several pages.

Module 3

Presentation

Presentation requires the candidate to know how to create presentation.

Learning Objectives :

After completing this section, you shall be able to

- Work with presentations and save them in different file formats.
- Choose built-in options such as the Help function within the application to enhance productivity.
- Create a slide show
- Animate text and images in the presentation
- Add Clipart and WordArt Tool

Module3 Electronic Presentation

3.1 Introduction

3.1.1 Overview

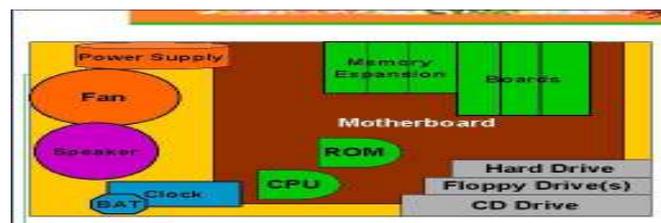


PowerPoint is a presentation graphics package that allows educators to produce a professional-looking presentation that can be used in the classroom. PowerPoint has many of the features found in other software programs such as word processing, drawing, graphing, and charting. These tools are user-friendly and do not require a great amount of time to learn, especially when one is already familiar with other Microsoft Office products.

The following descriptions give a quick overview of what PowerPoint can provide:

- A PowerPoint presentation is made up of a series of slides that can later be used to create overhead transparencies or 35mm slides.
- In addition to printing out slides, speaker's notes, audience handouts, and outlines can also be printed to help the presenter and audience stay on track.
- Once the presentation has been created, it can easily be uploaded to a server for Web browsing.
- Importing other files such as Word and Excel into the PowerPoint slides can be accomplished.
- PowerPoint allows the integration of multimedia such as using digital video and sound to enhance the presentation.

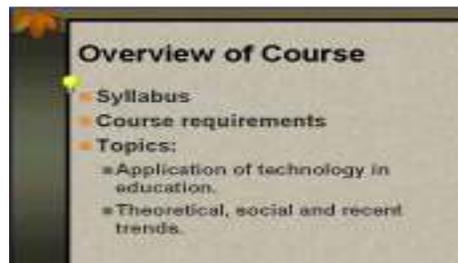
With all of these features available in PowerPoint, the software can assist educators to deliver course content to their students with imaginative and interactive presentations like the examples below.



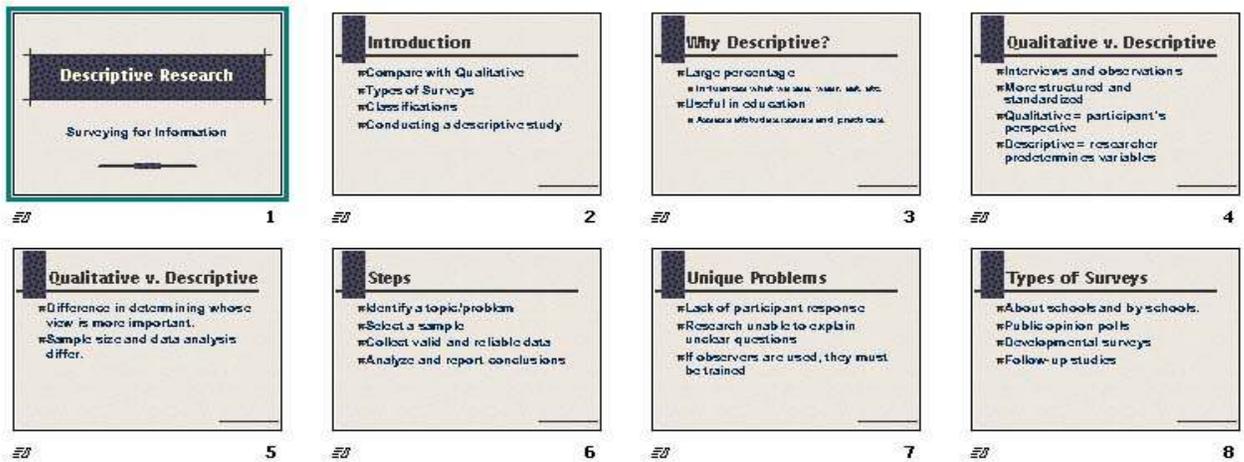
3.1.2 Basic Terminology



Before one can start creating a PowerPoint presentation, a few basic terms must be defined. Like most graphics presentation software, PowerPoint divides a presentation into several **slides**. Each slide is a screen that typically contains bulleted points that are related to a single main idea. Bulleted points are not complete sentences, but key words that articulate the components of the main idea. These key words or bulleted items are later expanded upon by the presenter. The graphic below demonstrates a slide with bulleted points and sub-points.



The slides together make up the presentation or **slide show**. A presentation can have as little as one slide (generally used to make an announcement) to seventy slides depending upon the topic. Once the presentation has been created, PowerPoint uses the slide show function to display the slides in full-screen, animated form. The graphic below shows a presentation in the **slide sorter view** (a viewing feature that allows you to see miniatures of all the slides within a presentation).



Because PowerPoint is interactive, **animation** can be incorporated into the presentation. Text can be animated as it enters the slide, as well as graphic images. Certain design templates in PowerPoint also have animation embedded in them (e.g., High Voltage, Pulse, and Cactus).

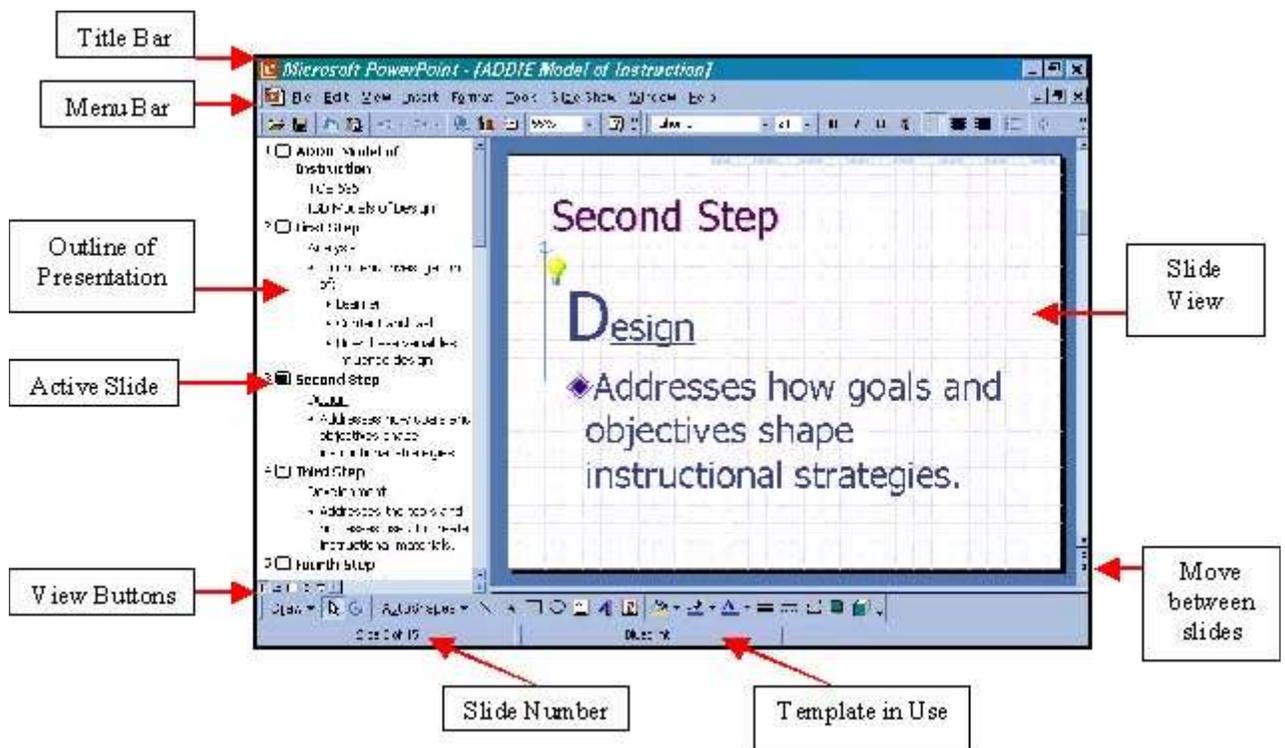
To indicate a change of topic, slide **transitions** are often used. These are special effects applied between slides. So, as one slide leaves the presentation, the other enters with a transitional effect (e.g., wipe, blinds horizontal, fade).

There are many more terms that need to be defined. However, these will be covered in their own sections of this tutorial.

3.1.3 Application Window Layout

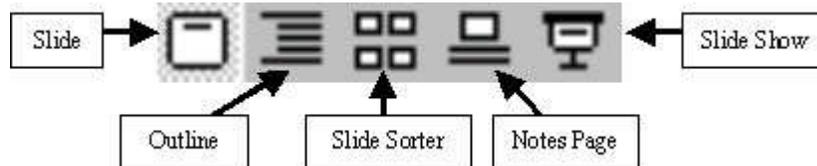


The following graphic illustrates common features of the application window for PowerPoint (Office 2000 version).



3.1.4 View Buttons

Regardless of the PowerPoint version being used, common view buttons will be found toward the bottom of the application window. The graphic below illustrates the types of buttons one may find. For users of Office 2000, the button for Notes Page is missing. However, you can use this feature by going to View in the menu bar.



The following describes each of the buttons and its purpose:

- **Slide View** - Allows users to enter text, add images, edit elements, and add animated effects. This feature is referred to as WYSIWYG (What You See is What You Get). To edit elements of a slide, one has come to this view mode.
- **Outline View** - Shows the title and body text of the slides in an outline format. One can rearrange and edit slides at a glance here. However, elements such as graphics, WordArt, or draw objects will not be displayed in this mode.
- **Slide Sorter View** - Shows miniatures of all the slides. One can quickly rearrange, copy, delete, and apply special effects such as transitions to the slides.
- **Notes Page View** - Displays a slide with a text box for speaker's notes.
- **Slide Show View** - Run and preview the final product.

Toggling between these views could also be accomplished by going to View on the menu bar.

3.2 Creating a Slide Show

3.2.1 Opening and Closing Presentations

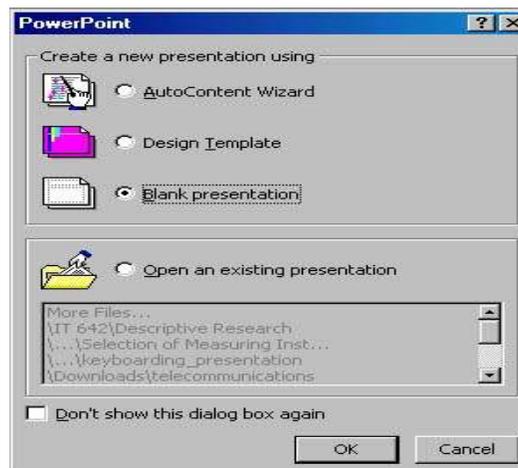


 This section will discuss certain procedures for starting and closing the PowerPoint program.

There are two ways to **open the program**:

- Double-click on the PowerPoint icon located on the desktop
- Click on the Start button and then go to Programs. Locate Microsoft PowerPoint and click on that to start the program.

Once the program initiates, you will see a window like the one below:



Each option has its own purpose. They are defined below:

- **AutoContent Wizard** - A good tool for new users. It gives a step-by-step process by offering content and design suggestions.
- **Design Template** - Opens a New Presentation window that offers pre-designed templates to choose from. Some of these templates have animated sequences in the slides.
- **Blank Presentation** - Allows users the flexibility to customize a presentation or just begin entering content. A New Slide dialog box will appear once this option is selected with several Slide Layout options. Double-click on the desired slide layout. A white, blank slide with two text placeholders should appear.

- **Open an Existing Presentation** - Retrieve a presentation that has been previously saved. Click on the radio button to browse through the list of most recent presentations or click on *More Files* to search the computer.

There are two ways to **close the existing presentation**.

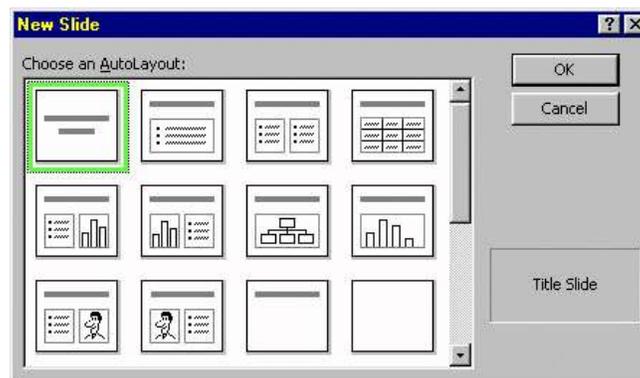
- Go to File in the menu bar and select *Close* (or *Exit* if you want to exit PowerPoint completely).
- Click on the *Close* button for that particular window (be careful not click on the PowerPoint exit button).



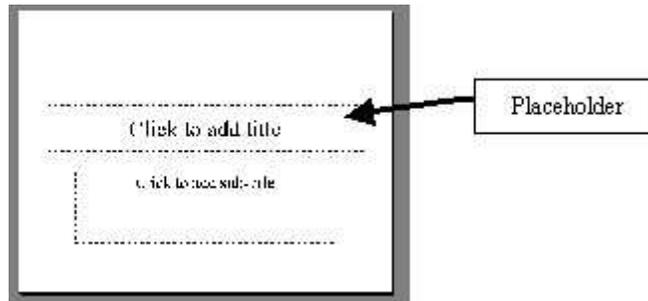
3.2.2 Working with a Blank Presentation



Once you initiated the program and selected the Blank Presentation mode, a dialog box will ask you which Slide Layout to choose. Most likely, one would select the first layout for the title slide.

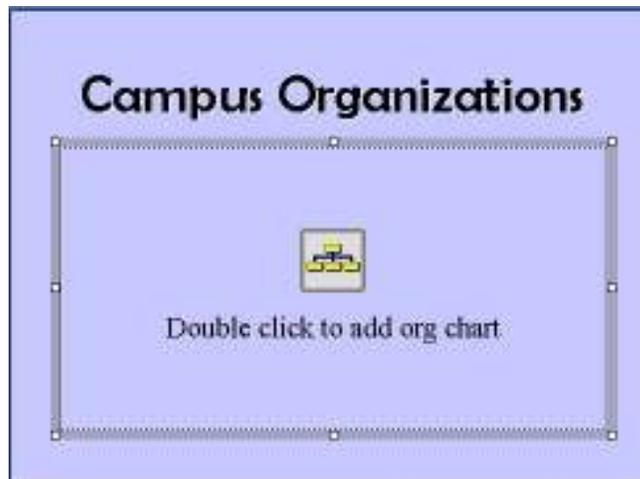


A blank, white slide should now be present with text placeholders for entering text.



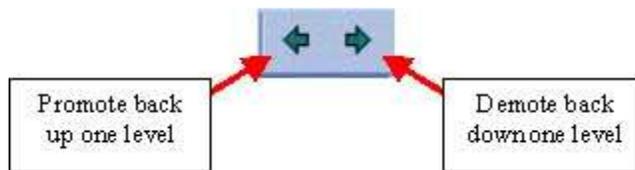
To add text, just click within the placeholder and the area will become highlighted. Once highlighted, type the text. To get out of the placeholders, click on any unoccupied space. To go back to the editing mode to change, add, or delete text, just click on the text and the placeholder should appear.

Placeholders could also serve to hold pictures, charts, and tables. Generally, these placeholders will appear when you have selected that particular Slide Layout. If you did select a layout that has one of these placeholders, just double-click within the placeholder and the program will initiate (e.g., ClipArt Gallery, Insert Chart, Insert Table). Like before, click outside of the picture, chart or table to end the editing mode. If you want to change things later, just click back on the picture, chart, or table.



To add bulleted items, just type in the text you want for the first line and press the ENTER key on the keyboard. A bullet will automatically appear in the second line, ready for the new line of text. Just repeat the process for each bulleted item.

To create sub-points, press the TAB key on the keyboard to change to the Second Level (main points are First Level). The bulleted line will become indented and the text will appear smaller with a different bullet style. If you ever need to change the level of bulleted items (e.g., going from Second to First), use the Promote/Demote buttons located on the toolbar.



3.2.3 Adding New Slides

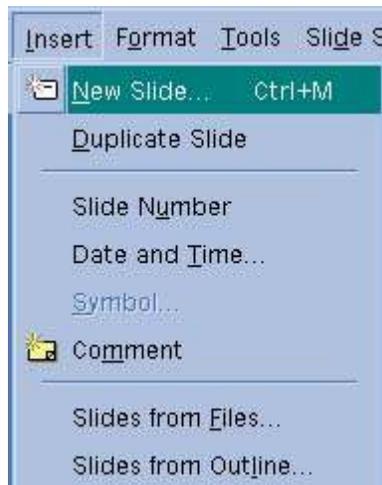


When one is ready to add a new slide to a presentation, there are two ways to accomplish this. The first method is to use the **New Slide button** located on the toolbar. The button will look like a blank, white slide with a star.



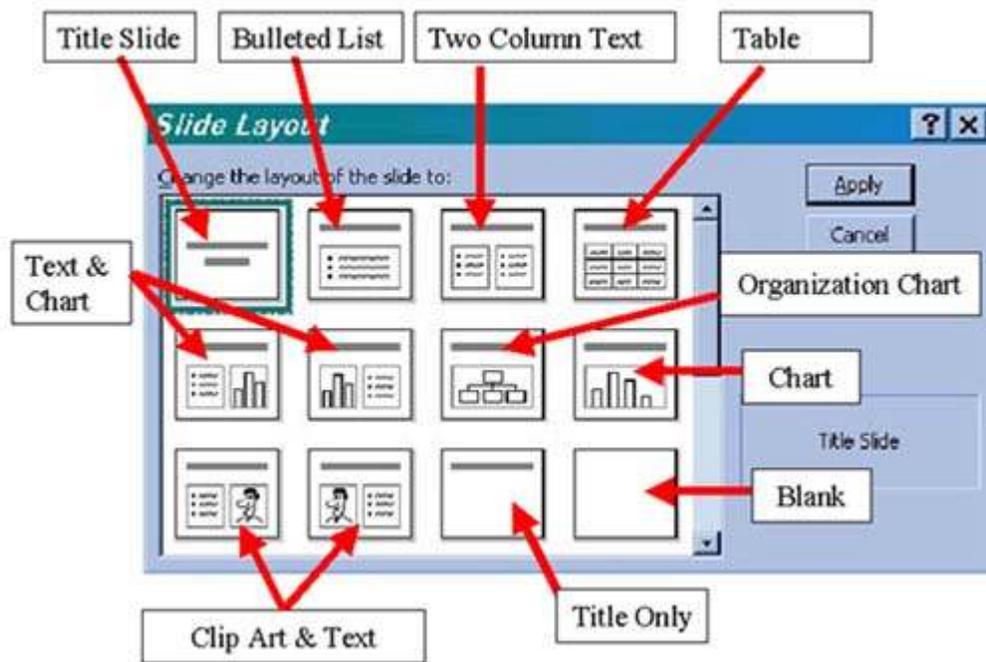
Click on this button and the Slide Layout dialog window will appear with several options to choose from. Select the one you want by double-clicking on the chosen layout and the new slide will appear on the screen.

The other method is through the menu bar. Click on **Insert** in the menu bar and then click on New Slide. Again, the Slide Layout window will appear.



3.2.4 Slide Layout Designs

PowerPoint comes with many different layout designs to choose from. One can customize their own by using text boxes. However, it is much easier to use one of PowerPoint's pre-designed slide layouts. A slide layout design could consist of text placeholders, graphic placeholders, chart placeholders, table placeholders, and media placeholders. Layouts can also contain no placeholders for those who want to create their own design. The graphic below identifies the most common layout forms in PowerPoint (there are many more).



Once a slide layout is selected (say when you insert a new slide), that particular **layout can be changed later**. To change the layout design of an existing slide, click on Format in the menu bar and select *Slide Layout*.

3.2.5 Manipulating Slides



 To add, delete, copy, and hide slides within a presentation, one must go to the Slide Sorter view. There one can perform the following functions:

- **Insert New Slide** - Click on the slide that you want to a new slide after. Go to Insert and select *New Slide*. You can also insert new slides by clicking on the *Insert Button* on the Standard Toolbar.
- **Delete Slide** - Select the slide you want to delete and hit the Delete key.
- **Rearrange Slide** - Click on the desired slide. Hold the mouse button down and drag the mouse before the slide you want to move to. When a grey vertical line can be seen before the desired slide, let the mouse button go.
- **Copy Slides** - You can copy a slide from within the same presentation or between two different presentations. To copy from within, right-click on the desired slide and select Copy. Right-click on the white space before the slide you want to insert the copied slide into. Select Paste.
- **Hide Slides** - Hiding slides is a good feature to use in case you do not want a slide(s) to appear during a particular Slide Show. As opposed to deleting a slide(s) for a presentation and then recreating that slide for another presentation, the Hide Slide button will prevent the selected slide(s) from appearing during a presentation. Just select the slide or slides that you want to hide and click the Hide Slide button. To unhide, select the slide or slides you want and click the Hide Slide button again. The selected slide(s) will now appear during the Slide Show.

3.2.6 Customizing the Background



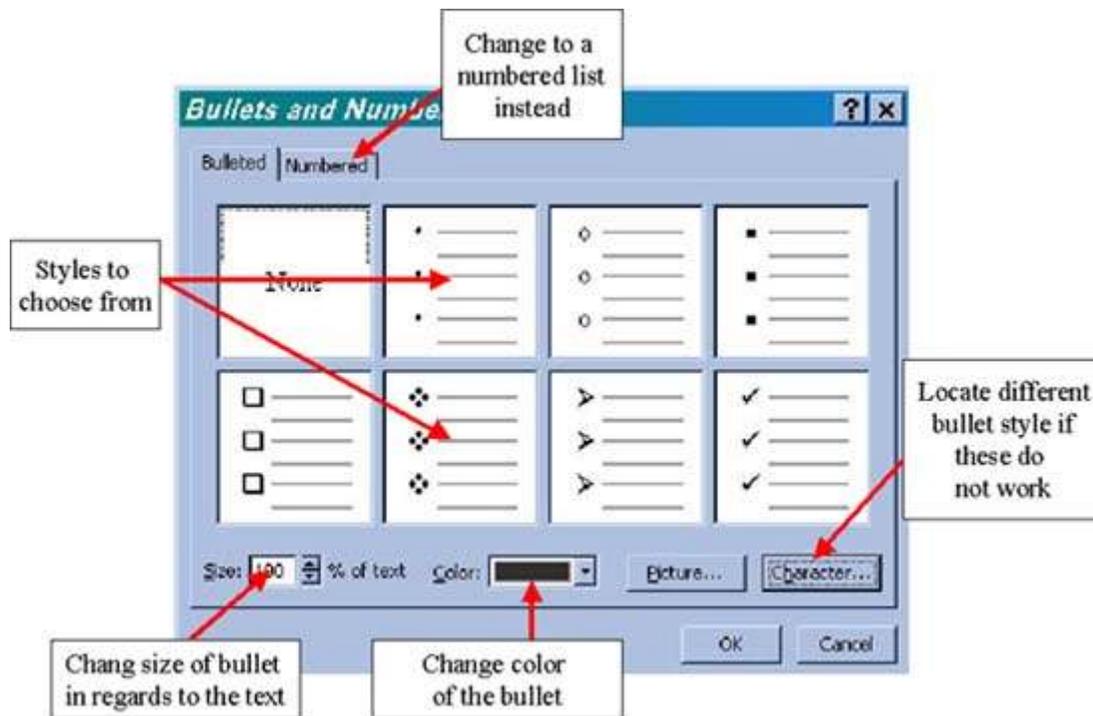
 There are several ways one can change the background appearance of a presentation in terms style, color, and design. The style and color will depend upon the situation or emotional response you want to attain from the audience. This section is divided into four parts: color use, incorporating design templates, customizing the background color/image, and changing the color scheme. Click on the buttons below to see each topic.



3.2.7 Changing Bullets and Font Styles

Bullet and font styles can be altered to suit the presenter's needs. The best way to change bullet and font styles is within Master slides so that all the slides within the presentation will have the same style.

To change **Bullet Style**, select the body text area by clicking within the placeholder. Go to Format and then click on *Bullets and Numbering*. A dialog window will appear like the one below:



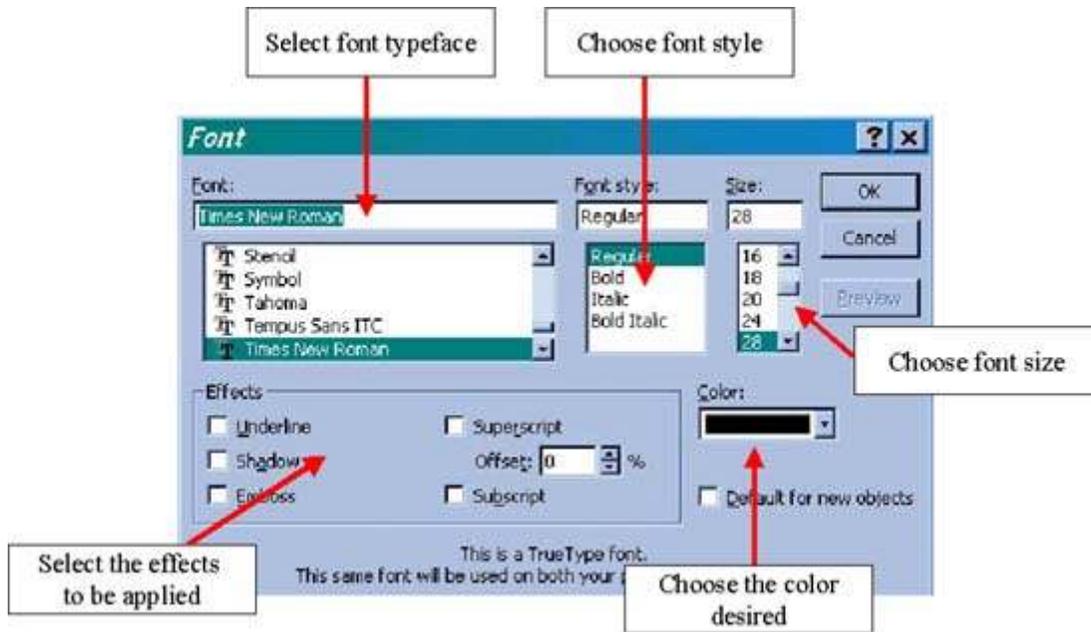
Double-click on the desired style shown in the window or click on the *Character* button to select a different style.

You can also adjust the *Color* and *Size* as well by typing the desired number or clicking on the corresponding drop-down menu arrows.

If you just want a particular bullet style to apply to a line of text, click in the line *right after* the bullet and perform the operations mentioned above.

To change **Font Style**, select the text area by clicking within the placeholder. Go to Format and click on *Font*. A Font dialog box will appear. Things you can manipulate here are the Font, Font Style, Size, Color, and Effects (e.g., underline, shadow, emboss).

Remember that everything you change in the Master Slide will affect the rest of the presentation.



If you just want to **change a particular word or phrase**, then highlight that word or phrase before going to the *Font* window.

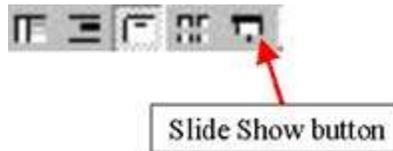
3.2.8 Presenting the Slide Show



 When one is finished creating the presentation, it can be previewed in Slide Show mode. This will help the presenter preview the layout, design, animation, text, and pictures before formally making the presentation. If things do not look right, this is a good time to make the changes.

The Slide Show is also the final form to be delivered to be delivered to an audience. When in Slide Show mode, a presenter can progress to the next slide or backtrack to the previous slide.

To begin the Slide Show, click on the slide show button (toward the lower left of the window) or go to View and click on Slide Show. NOTE: To begin the Slide Show with the title slide, make sure you are on the title slide. The Slide Show begins on whatever slide is chosen.



To end the Slide Show, press the ESC key on the keyboard. This will end the Slide Show and take you back to the PowerPoint program.

There are several things that one can do while in the Slide Show mode. These are listed below with the task in the left column and its command(s) on the right.

Advance to the next slide	ENTER, the SPACEBAR, mouse click, or left arrow key
Return to the previous slide	BACKSPACE or up arrow key
Go to slide	<slide number>+ENTER
Display a black screen and return to the presentation from a black screen	Press the "B" key

3.3 Working with Master Slides

3.3.1 Definition of Master Slides

A PowerPoint Slide Master contains objects that appear on each slide within the presentation. One only has to create an item once on the Master Slide for PowerPoint to automatically include that item on every slide. For instance, if you want the all titles and headings to be Arial font at 44 pt. with a shadow effect, then you will only need to make this change once in the Master. The remaining slides within the presentation will take on this change so that you will not need to go to each slide to change the font style and size.

The Slide Master has placeholders already set up for the text. The format of these objects determines the way your text will look on each slide. Slides can be made to look different from the Slide Master. However, a Slide Master will offer you a consistent starting point.



The Slide Master is very flexible and allows users to customize slides to suit their needs. Things that can be altered in Master slides are:

- Moving objects around such as text placeholders, footers/headers, page numbers, dates, and graphic elements (for background purposes).
- Adding draw objects and images, headings, and other types of text placeholders.

- Changing background colors or design templates
- Altering the format of fonts and bullets.
- Adding custom animation to text.

3.3.2 Types of Master Slides



There are two types of Master Slides in PowerPoint. The Title Master and the Slide Master. Each has its own specific purpose and will help the user customize certain elements to ensure consistency in terms of design, layout, and interactivity.

The **Title Master** is used to customize elements such as animation, font, background, etc. for slides that follow the Title Master. Thus, if a presentation has three different Title slides, all three will follow the Title Master (unless the individual made changes within the slide itself).

The **Slide Master** is used to keep body slides consistent in terms of animation, font style, background, etc. Again, unless the individual edited particular slides, all the slides that follow the Slide Master will have the same appearance and interactivity.

To edit or view the Master slides, go to View in the menu bar. Then, go to Master and select either the Slide Master or Title Master. You may not be able to use the Title Master (it may appear grayed out) until you apply a design template.



3.3.3 Changing the Layout and Design of Masters



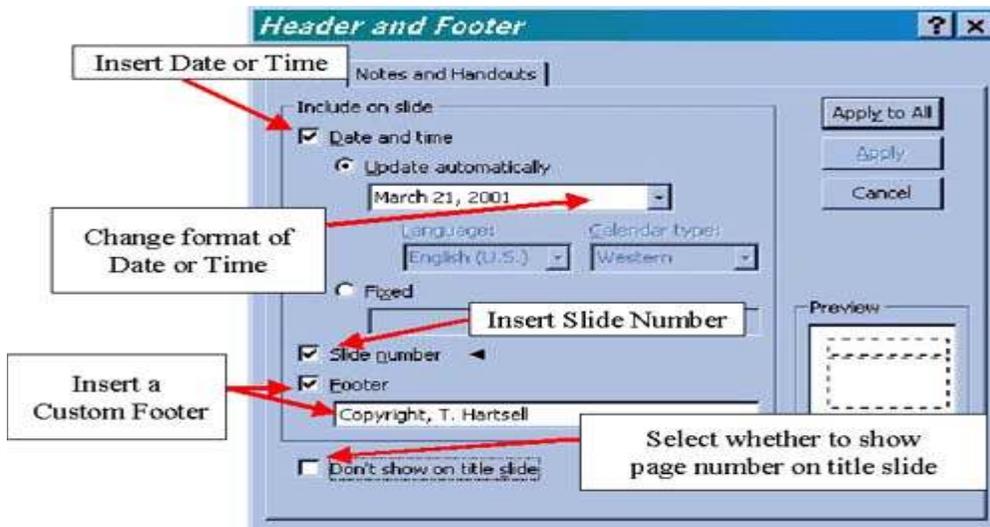
⊕ There are several things that you can change in the Slide Master. Some of these have been spoken about in other sections of this tutorial such as customizing the background, using Design templates, and changing the appearance of bullets. So, this section will be a cursory review of some of these things.

To change master text and title styles, follow the given steps:

- On the View menu, point to Master and then click on *Slide Master (or Title Master)*.
- Click anywhere in the Click to edit Master styles text blocks (the text you want to change).
- On the menu bar, go to Format and then click on Font. Make the appropriate changes.
- Right-click on the Paragraph level line (1st, 2nd, 3rd) and select Bullets and Numbering. Make the desired changes.
- On the View menu, click Normal to return to the presentation or click on the Slide View button toward the bottom of the window.

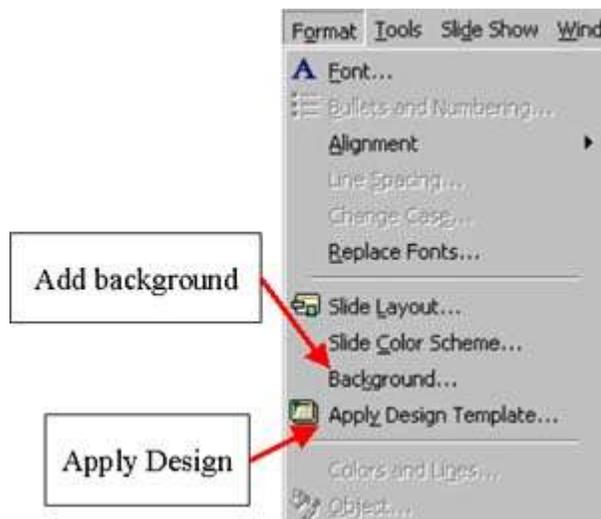
Things like the the date, footer, and number areas can all be changed in the same way. **To add a date, footer and page number**, go to View and then click on Header and Footer. Select the options you want based upon the graphic below.

One can also **change the size and location of the text placeholders**. Resizing can be down by using the resizing handles and moving can be accomplished by clicking and dragging the text placeholder.



Remember that the slide master will change all slides within the presentation. So, make sure that the change is something you want to do.

To change the background or design template, go to Format and choose either Background or Apply Design. If you want individual slides to have a different background or design, the you would need to go to those particular slides (in Slide View) and edit them that way.



To add a reoccurring logo or image, just insert the logo or image onto the Slide Master or Title Master (go to Insert and then Picture). You can resize and move the image around to any location on the slide. Now, that logo or image will appear on all the slides that follow the Master.

3.4 Animations and Transitions

3.4.1 Animating Text and Images



There are several ways to add interactivity in PowerPoint. One of the ways is by animating objects on the slide. Others include incorporating hyperlinks and multimedia. For this section, only animation will be discussed.

Animation can be applied to all types of objects within the slide such as text, pictures, and draw objects. Regardless of the object being animated, they all go through the same steps. Click on the buttons below to go to that topic.



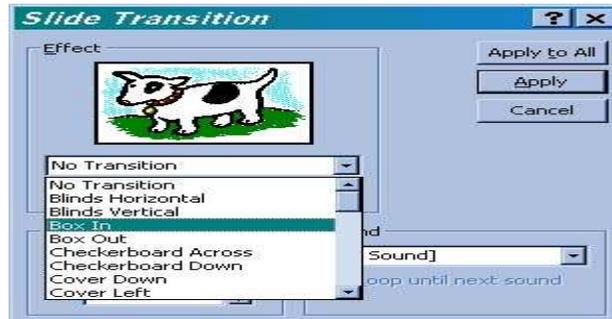
3.4.2 Slide Transitions



Transitions are special effects inserted between slides to indicate a change of topic. They take on a variety of styles and can be effective if used properly. **To apply transitions**, go to Slide Sorter view. You can choose either to apply a transition to specific slides or to all of the slides within a presentation. To apply a transition to all of the slides, click on Edit in the menu bar and then on Select All (if you were applying a transition to specific slides, hold the Shift key as you click on the desired slides). Click on the **Slide Transition button** located on the top left of the window, and a Slide Transition dialog box will appear.



Choose the desired transition by clicking on the down arrow beneath the picture of the dog. A list of styles will appear. As you click on the various styles, a preview of the effect can be seen as the dog transitions to a key and vice versa.



After the style has been selected, choose the **speed of the transition**. Always choose Fast or Medium when selecting a speed because the audience should be paying attention to you and not the "fascinating" effect on the screen.

In the **Advance option**, choose *On mouse click* so that you will have control over the flow. If you want **sound**, select the *Sound* option and choose the desired sound. It is not recommended to incorporate sound just for the reason stated above. You are the center of attention, not the presentation.

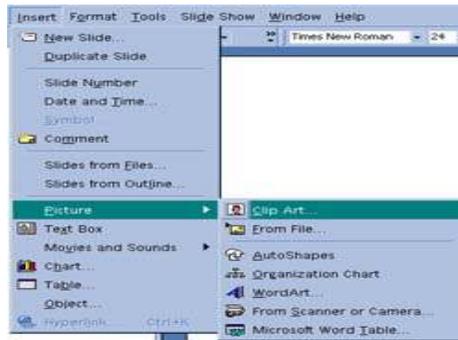
Click the **Apply to All button** and the transition will be applied to the entire presentation. Otherwise, the transition will only apply to the slide(s) highlighted.

3.5 Graphics

3.5.1 Adding ClipArt



 **To add ClipArt or images to the presentation**, click on Insert on the menu bar and then on Picture. If your picture was in a file, choose the *From File* option. If you want to use PowerPoint's catalog of pictures, select *Clip Art* and a dialog box will appear with several options.



Make sure the ClipArt tab is showing. Browse through the categories to find a picture you want. Click on the picture to highlight it. Then click on the Insert button.



Once the picture is embedded onto the slide, you can **move the picture around**. Just click on it and with a four-armed pointer (shown below), drag the image to the desired location. 

To change the image's size, use the sizing handles (indicated by the black, square boxes). Move your mouse over one of the handles and when you see a two-armed pointer (shown below), click and hold the left mouse button down. Drag the mouse until the desired size is met and let the mouse button go. 

3.5.2 Adding WordArt



 WordArt is an application that creates decorative text to add interest to a document. You can be very creative with WordArt as you can (a) rotate text in any direction, (b) add three-dimensional effects, (c) display the text vertically down the page, (d) shade, slant or arch the text, and (e) even change the colors.

WordArt is very easy to use. Basically, you choose a style for the text among a selection and enter your specific text. You can then modify the style through various effects found on the WordArt Toolbar. The following are examples of what you can create with WordArt.

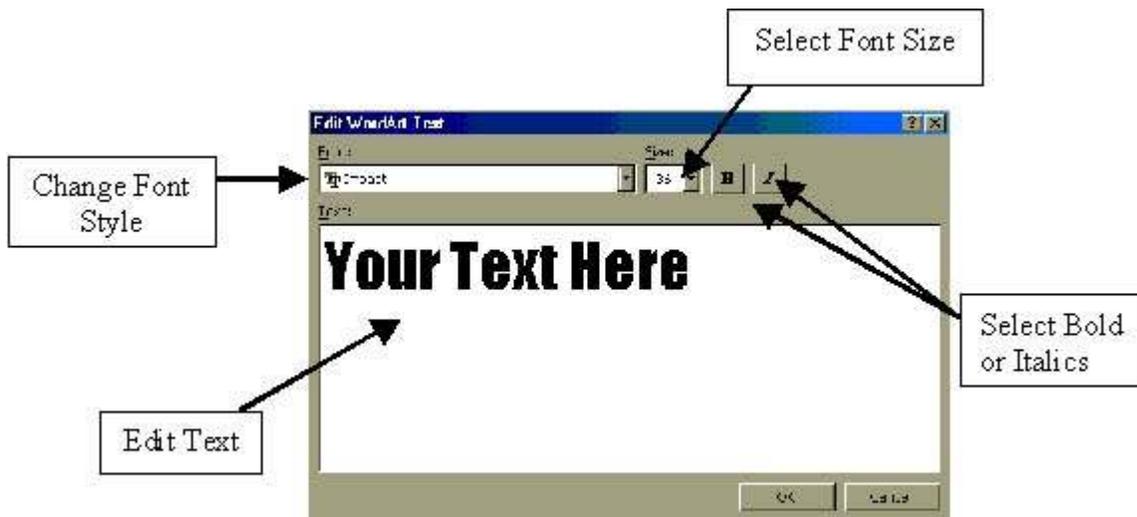
There are two ways in which you can **insert WordArt** into your document. Both methods give you the same WordArt options (e.g., style, text, color).

- **Draw Toolbar** - On the Draw Toolbar, click on the button that has a blue-colored "A." If you do not see the Draw Toolbar, you will have to enable it by clicking on View, go to Toolbars, and then click on *Drawing*.
- **Menu** - On the menu bar, click on Insert then go to Picture and click on *WordArt*.



Once you click on the appropriate button, a window with the WordArt Gallery appears. There are several different styles that you can choose from. To select a particular style from the WordArt Gallery, double-click on the appropriate style.

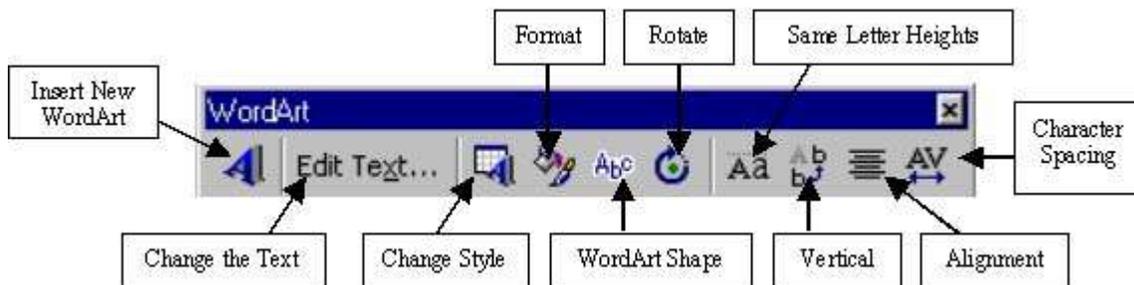
An Edit WordArt Text dialogue window will appear. Here, you can (a) type the text you want, (b) change the font style, (c) change the font size, and (d) select whether you want to bold or italicize the text. Make all the necessary changes and click on the OK button.



Once you inserted the WordArt, you can always change certain features at a later time using the WordArt Toolbar. To bring the WordArt Toolbar up:

- Double-click on the WordArt itself. An Edit WordArt Text window will appear. If you do not want this option, just close the that window and the WordArt Toolbar will remain on the screen (or in some other location).
- Right-click on the WordArt and select Show WordArt Toolbar.
- Click on the WordArt once, then go to View, then to Toolbars and click on WordArt.

The WordArt Toolbar will look like the example below.



The buttons on the WordArt Toolbar performs certain functions as defined by their labels. Basically, if you want to change certain features of the WordArt, just click on the respective button and edit away by selecting options or changing the layout features.

The buttons are defined below:

- **Insert WordArt.** By clicking on this button, you will create a new WordArt.
- **Edit Text.** This option allows you to change the text, font style, font size, and whether to Bold or Italicize the text.
- **Change Style.** This option allows you to change the WordArt style found in the WordArt Gallery. Just click on the new style and the original WordArt will transform to the new style.
- **Format WordArt.** This will open up the Format window so that you can add colors and lines (borders), and to adjust the size and layout.
- **WordArt Shape.** By clicking this button, you can edit the shape of the WordArt such as changing the slopes, curves, arches, etc.
- **Rotate.** This option allows you to change the direction of the text such as horizontal, vertical, slanted, and upside down.
- **Text Wrapping.** You can adjust the layout (e.g., square, tight, through, top/bottom) of the WordArt using this option.
- **WordArt Vertical Text.** This option changes the appearance of the text by making it either vertical (up/down) or horizontal (left/right).
- **Character Spacing.** You can change the spacing between letters such as loose, tight, normal, etc.

3.6 Managing Presentations

3.6.1 Saving Presentations

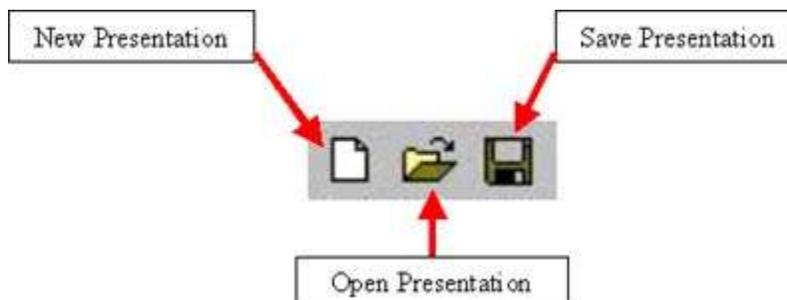
When saving a presentation for the first time or saving an existing presentation with a new name, you will have to perform a **Save As** rather than a Save command. To perform this function, go to File and click on *Save As*. A Save As dialog box will appear like the one below:



To **save your presentation**, follow the steps below:

- Type a title for your presentation in File name:
- Locate a folder that you want to save the presentation to by going to Save in:
- The Save as type: option allows you to save the presentation in various formats depending upon how you want to distribute your presentation.

Once you have saved the presentation, resaving it is quite easy. The best way to **save an existing presentation** is by clicking on the Save button located on the toolbar.



The **Pack and Go** feature is a way of saving presentations to ensure that everything remains the same (e.g., font styles, bullets, graphics, animation, color) when you travel from one computer to another. The Pack and Go Wizard allows you to retain the linked files and True Type Fonts even though you are exporting the presentation to another computer. Also, you can tell the Pack and Go Wizard to include a PowerPoint Viewer so that computers without PowerPoint can still play your presentation. To perform a Pack and Go, go to File and click on *Pack and Go*. Then, follow the directions and answer any questions that the Wizard may prompt you.

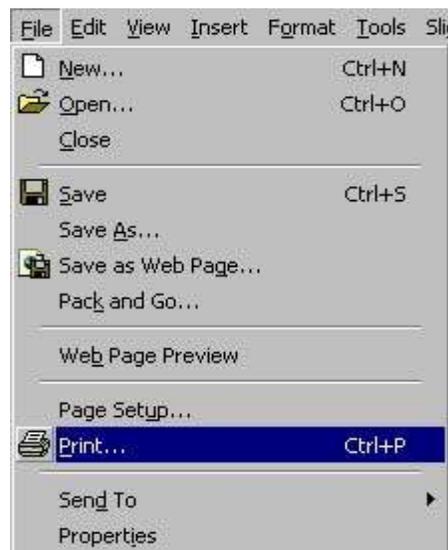
In addition, PowerPoint also has the option to save PowerPoint slides as HTML so that the presentation can be uploaded to the Web. To perform this task, go to File and click on *Save as Web Page*.

3.6.2 Printing Presentations

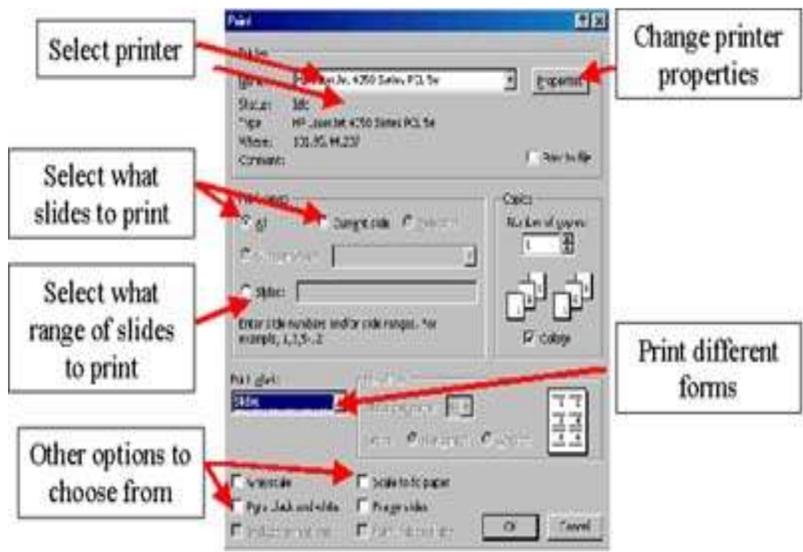


 PowerPoint allows the user to print presentations in various forms. These forms could be used by both the user and the audience and it is advisable to explore the different forms.

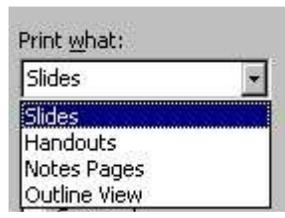
To print a presentation, go to the File in the menu bar and click on *Print*.



In the Print dialog window, several options will be available to you. See the graphic below to learn the various areas of the Print window.



In the area that asks you to *Print What*, there are four forms to choose from. Just click on the down arrow next to the text box under *Print What*. Each form has a unique purpose. The different types of print are given below.



- **Slides** - Prints the entire slide on one page. Used for creating overhead transparencies.
- **Handouts** - Prints 2, 3, 4, 6, or 9 slides on one page. Also, allows you to choose Horizontal (left-right) or Vertical (up-down) layout. Used mainly to distribute a copy of the presentation to the audience.
- **Notes Pages** - Prints a copy of the slide on the upper half of a page and typewritten notes on the lower half of the page. Used mainly by presenters to help them keep on track and cover information that is vital.
- **Outline View** - Prints an outline of the text divided by each slide. Only the text will be shown in this form. Graphics will not be printed. Used mainly by presenters to keep on track.

Module 4

Spreadsheet

Spreadsheet requires the candidate to understand the concept of spreadsheets and to demonstrate an ability to use a spreadsheet to produce accurate work outputs.

Learning Objectives :

After completing this section, you shall be able to

- Work with spreadsheets and save them in different file formats.
- Choose built-in options such as the Help function within the application to enhance productivity.
- Enter data into cells and use good practice in creating lists. Select, sort and copy, move and delete data.
- Edit rows and columns in a worksheet. Copy, move, delete and appropriately rename worksheets.
- Create mathematical and logical formulas using standard spreadsheet functions. Use good practice in formula creation and recognize error values in formulas.
- Format numbers and text content in a spreadsheet.
- Choose, create and format charts to communicate information meaningfully.
- Adjust spreadsheet page settings and check and correct spreadsheet content before finally printing spreadsheets.

Module 4 Spread Sheet



4.1 Introduction

4.1.1 Overview

 A spreadsheet is like an accountant's ledger. As with a ledger, it consists of a grid of rows and columns that enables you to organize data into a manageable form. Excel is a spreadsheet program that allows you to organize data, complete calculations, make decisions, graph data, and develop professional-looking reports.

There are three major parts of Excel or any other spreadsheet program:

Worksheets. Allow you to enter, calculate, manipulate and analyze data.

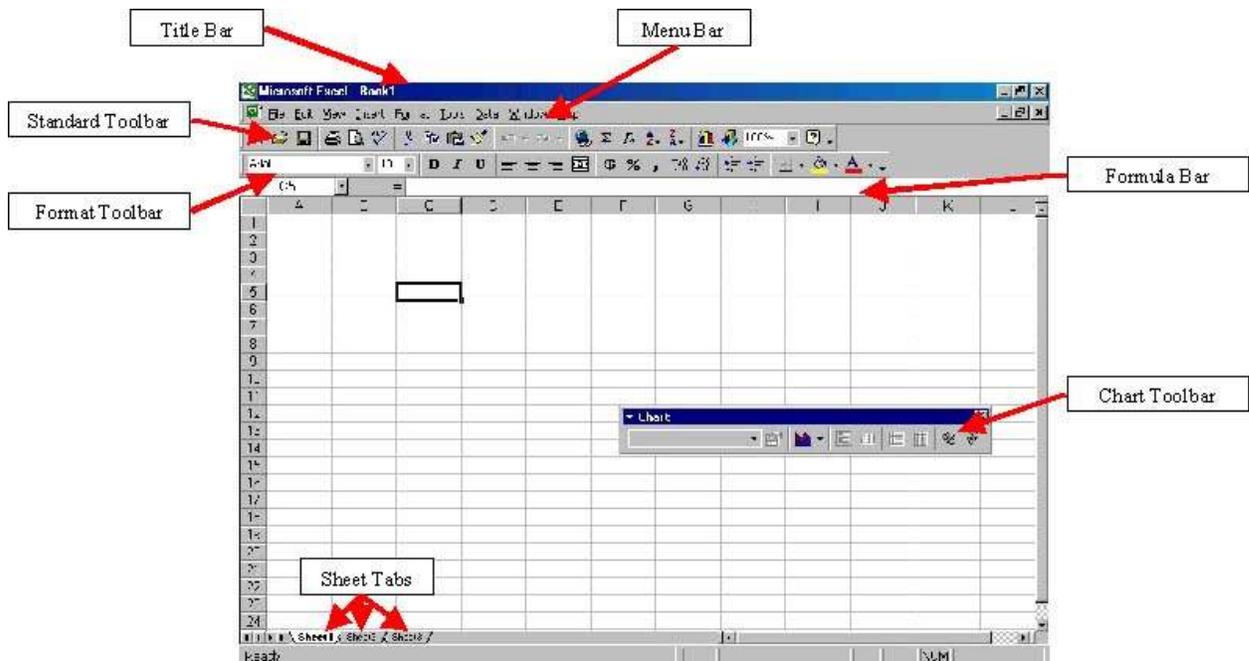
Charts. Pictorially represent data in two-dimensional and three-dimensional charts.

Databases. Help manage data. For instance, once the data is entered, the software program can then sort the data, search for specific data, and select data that meets a criteria.

An advantage to using a spreadsheet program is that data can be recomputed instantly. For instance, if you change a student's score for a particular test, the spreadsheet program will automatically recalculate the total score to reflect the newly entered data. This cannot be done with a paper ledger unless you have an eraser or whiteout available near you.

4.1.2 Screen Layout

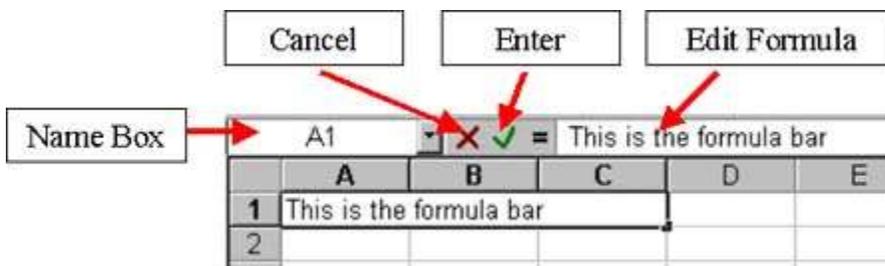
Before one can use the Microsoft Excel program, certain screen features need to be addressed. Although many of the elements are the same as other Microsoft Office products, a few are very unique to spreadsheets (or Excel). The graphic below offers these unique, and common, features found in Excel.



Common features include the Title bar, Menu bar, Standard Toolbar, and Format Toolbar. However, the unique features are the Sheet Tabs, Chart Toolbar, and Formula Bar. These unique features are explained below.

- **Sheet Tabs** - In Microsoft Excel, a workbook is the file in which you work and store your data and can contain many worksheets. Various kinds of related information can be organized in a single file through worksheets. The names of the sheets appear on tabs at the bottom of the workbook window. To toggle between sheets, just click the sheet tabs.

- **Chart Toolbar** - In Microsoft Excel, creating charts and graphs are common. Thus, there is a special toolbar designated toward the
- creating and editing of Excel charts and graphs. Most often, when you work on a chart or graph, the toolbar will appear. If it does not, go to View, then to Toolbars, and select *Chart*.
- **Formula Bar** - As data is entered into the cells, it appears in the formula bar at the top of the screen. It displays the content of the active cell which can be edited later. The formula bar can display text, numbers, formulas, and functions. Certain features of the formula bar is given below.



4.1.3 Row and Column Headings



A spreadsheet is divided into rows and columns that are assigned to a heading. Rows are given numeric values that can range from 1 to 16,000. Columns, on the other hand, are assigned alphabetic headings from column A to Z, then continue from AA to AZ and then from BA to BZ and so on.

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							

Column Headings

Row Headings

4.1.4 Cell Referencing

The cell is the intersection between a row and a column. Each cell is also identified by a cell reference such A1, B1, C1, and so on. The letter identifies the column and the number identifies the row.

So, when someone tells you to look at the data in Cell B5, you first look at Column B and then scan down to Row 5. This will become Cell B5. In the example below, Cell B5 contains Walker's grade on Test 1 (which is a 90).

	A	B	C	D	E
1	Student	Test 1	Test 2	Final	Total Score
2					
3	Yoko	100	90	81	271.0
4	Syram	90	76	87	253.0
5	Walker	90	78	78	246.0
6	Baker	60	60	45	165.0
7	Costillo	80	85	100	265.0
8					
9	Class Average	84	77.8	78.2	
10					

4.2 Working with the data

4.2.1 Selecting a Cell

Before entering data into a cell, you must first **select** it by using one of the various methods:

- Click your mouse within the cell.
- Use the Arrow keys to move around the spreadsheet (up/down, left/right).
- Use the Tab key to move to the next cell within the same row.
- Use the Enter key to move the next cell down within the same column.

4.2.2 Entering and Editing Data



When you see a heavy border around the cell, the cell is active and ready to take in the data.

	A	B	C	D
1	This is an active cell because of the border			
2				

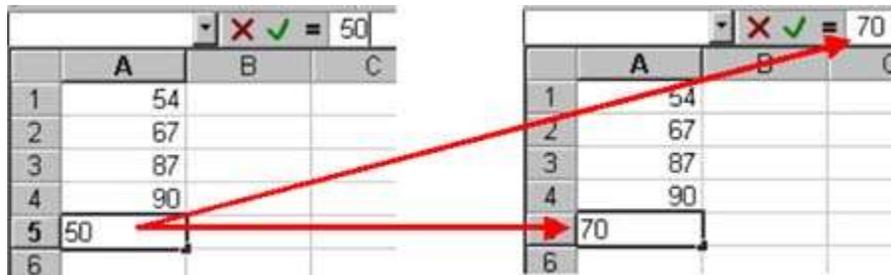
To enter data into cells, just type in your data. Soon as you enter the text, a number, a formula or function, you will see the results in the Formula Bar.

	A	B	C
1			
2			
3			
4			
5	50		
6			

If you want to give your worksheet a title, just click in a cell and type your title. For column headings, click in the appropriate cell and type in your heading. The same applies to rows. Look at the graphic below to see how headings and titles may look like in a spreadsheet.

	A	B	C	D	E	F
1	Science Club Fund Expense Report					
2	Receipts					
3	Sale		100.00			
4	Spaghetti Dinner		1,000.00			
5	Kaffe Tickets		1,500.00			
6	Pizza and Cakes Sale		75.00			
7						
8						
9						
10						
11						
12	Disbursements					
13						
14	T-Shirts		20.50			
15	Pizza and Cakes		200.00			
16	Kaffe Inze		15.80			
17	Kaffe Tickets		45.00			
18	Spaghetti Dinner		750.00			
19	Spaghetti Tickets		100.00			
20	Science Fair Ribbons		104.02			
21	Miscellaneous		25.25			

To edit data within a cell, one can use one of two methods. First, a user could click within the cell and edit data that way. Second, a user could click within the formula bar to edit data. Either way, the data selected will be changed depending upon what you do.



4.2.3 Clearing Cell Contents

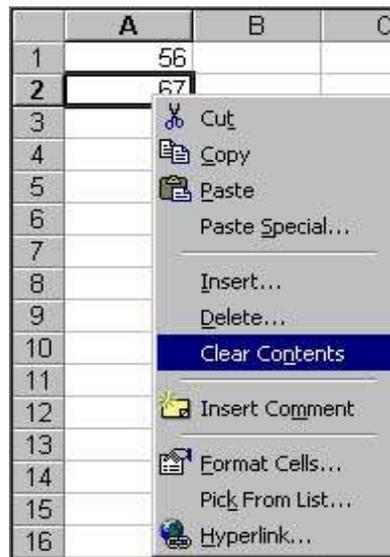


Clearing a cell of its data is quite simple in Excel. There are several methods in which one can delete information within a cell.

- Click in a cell and once it is highlighted, just press the *Delete* key on the keyboard.
- Click in a cell and go to the *Formula bar*. Press the Delete or Backspace keys until the data is cleared.
- Click in a cell and go to Edit on the menu bar and select *Clear*. Choose what information you want to delete.



- Right-click on a cell and select *Clear Contents*.



To clear data from multiple cells, move your mouse over the first cell within the group. A fat plus sign should be seen. Now, click and drag that fat plus sign over the selected cells until they are highlighted (grayed out). Then, use one of the methods mentioned above (easiest way is to press the *Delete* key).

3	Student	Test 1	Test 2	Final	Average
4	Costa, Frank	70	80	90	82.5
5	Ford, Judd	70	85	80	78.8

Select pointer

4.3 Managing Excel Worksheets

4.3.1 Opening and Closing Spreadsheets

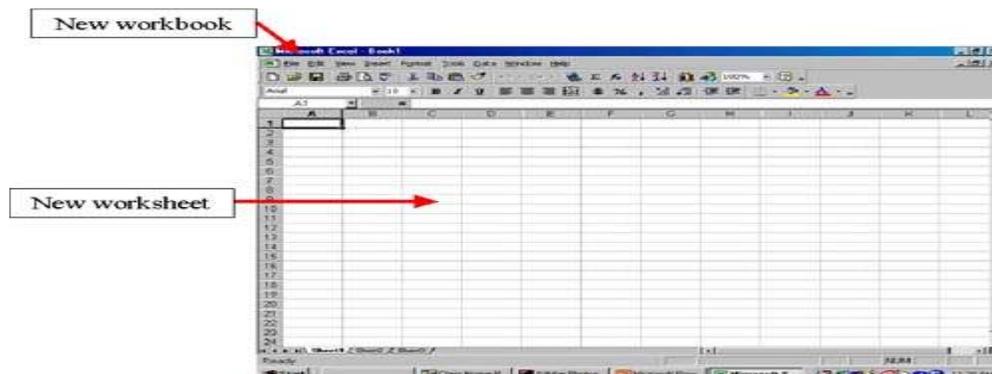


This section will discuss certain procedures for starting and closing the Excel program.

There are two ways to **open the program**:

- Double-click on the Excel icon located on the desktop.
- Click on the Start button and then go to Programs. Locate *Microsoft Excel* and click on that to start the program.

Once the program initiates, you will see a screen like the one below:



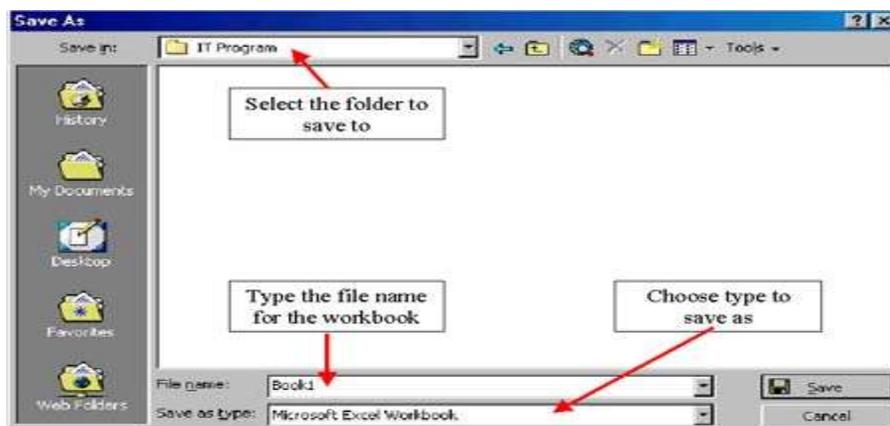
There are two ways to **close the existing workbook**.

- Go to File in the menu bar and select *Close* (or *Exit* if you want to exit Excel completely).
- Click on the *Close* button for that particular window (be careful not click on the Excel exit button).



4.3.2 Saving Worksheets

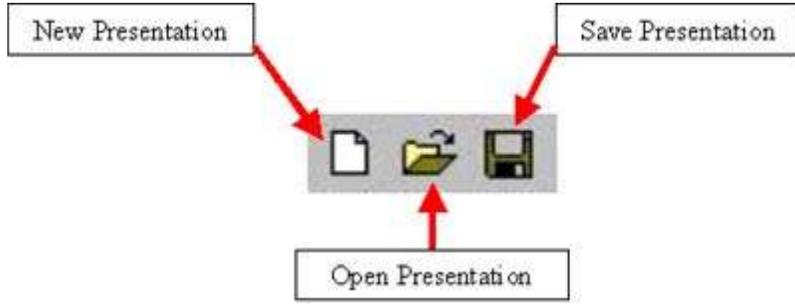
- When saving a workbook for the first time or saving an existing workbook with a new name, you will have to perform a **Save As** rather than a Save command. To perform this function, go to File and click on *Save As*. A Save As dialog box will appear like the one below:



To **save your workbook**, follow the steps below:

- Type a title for your workbook in File name:
- Locate a folder that you want to save the workbook to by going to Save in:
- The Save as type: option allows you to save the workbook in various formats depending upon how you want to distribute it.

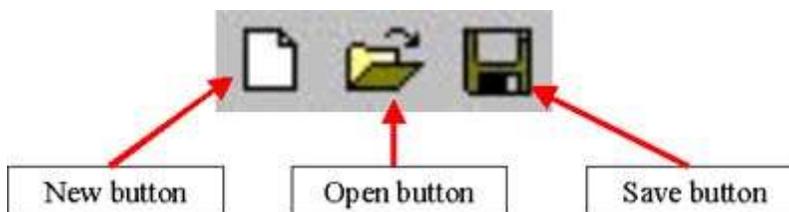
Once you have saved the workbook, resaving it is quite easy. The best way to **save an existing workbook** is by clicking on the Save button located on the toolbar.



4.3.3 Create a New Workbook

After you edit a workbook and close it, you can still create a new workbook without exiting and reopening Excel. There are two ways to create a new workbook while in Excel.

- Click on the *New button* located on the Standard toolbar.



- Go to File and select *New*. A New dialog window will appear with several options. These options are: General (click on workbook to begin a clean workbook), Spreadsheet Solutions (standard template for creating worksheets), Business Planner Templates (templates that offers suggestions for content to include).



4.4 Formulas and Functions

4.4.1 Constants and Formulas



A **constant** is an entry that does not change. It may be a number such as a student's test score or something descriptive like a label. A **formula** is a combination of numeric constants, cell references, arithmetic operators, and/or functions that displays the results of the calculation. Every cell contains either a constant or formula.

A formula always begins with an = sign. Symbols such as +, -, and / indicate addition, subtraction, multiplication and division. Any expression that is in parenthesis are evaluated first, followed by multiplication or division from left to right, then finally addition or subtraction from left to right. An example of a formula would look like this $= (B3+C3+2*D3)/4$.

In the example below, formulas for calculating the total scores of each student and the overall class averages can be seen.

	A	B	C	D	E
1	Student	Test 1	Test 2	Final	Total Score
2					
3	Yoko	100	90	81	=B3+C3+D3
4	Syram	90	76	87	=B4+C4+D4
5	Walker	90	78	78	=B5+C5+D5 ←
6	Baker	60	60	45	=B6+C6+D6
7	Costillo	80	85	100	=B7+C7+D7
8					
9	Class Average	$=(B3+B4+B5+B6+B7)/5$	$=(C3+C4+C5+C6+C7)/5$	$=(D3+D4+D5+D6+D7)/5$	
10		↑	↑	↑	
11					
12					

4.4.2 Functions



A formula may also include a **function**, or predefined computational task, such as the AVERAGE or SUM function. **Functions** are useful when you want to perform calculations without having to type the formula (e.g., =(B3+C3+2D3)/4) in the formula bar.

Basically, **functions** are built-in features that perform specialized calculations on a selected set of data and offer the end-results of that calculation. Really, they replace the more complex mathematical formulas as well as performing logical calculations and text manipulation to retrieve information about the Excel worksheet.

The SUM function is one of the most common functions in spreadsheets. SUM is so common that it has its own button on the Standard Toolbar. However, you can access many others through the Paste Function utility that will be discussed later in the tutorial.

The general structure of functions goes like this:

Start with an equal sign.	=
Followed by the name of the function.	=SUM
A left parenthesis.	=SUM(
Values to be used by the function.	=SUM(B3:D3
A closing right parenthesis.	=SUM(B3:D3)

The worksheet below illustrates the AVERAGE and SUM functions of our classroom database. As you can see, the functions help us from having to input the entire calculation (=B3+C3+D3 and =B3+B4+B5+B6+B7/5) into the formula bar.

	A	B	C	D	E
1	Student	Test 1	Test 2	Final	Total Score
2					
3	Yoko	100	90	81	=SUM(B3:D3)
4	Syram	90	76	87	=SUM(B4:D4) ←
5	Walker	90	78	78	=SUM(B5:D5)
6	Baker	60	60	45	=SUM(B6:D6)
7	Costillo	80	85	100	=SUM(B7:D7)
8					
9	Class Average	=AVERAGE(B3:B8)	=AVERAGE(C3:C8)	=AVERAGE(D3:D8)	
10		↑	↑	↑	
11					
12					

There many more types of functions that can be used. Click on the following buttons to go to that specific function.



4.4.3 Using the Fill Handle to Copy Formulas



The fill handle, located in the lower-right corner of a cell, is a useful tool for duplicating formulas and functions to other cells. This will save time because reentering the formula or function for each cell is not needed. Once the formula or function for a particular cell has been entered, all you have to do is drag the fill handle over the other cells in which you want the same formula or function to occur. Look at the graphics below to get an idea of how this works.

	A	B	C	D	E	F
1		Science Club Fund Expense Report				
2						
3	Receipts		18-Dec	15-Apr	26-Aug	
4						
5	Bake Sale		138.00	145.00	130.00	
6	Spaghetti Supper		1,885.00	1,500.00	1,670.00	
7	Raffle Tickets		1,500.00	1,550.00	1,600.00	
8	Pizza and Coke Sale		452.00	450.00	487.00	
9						
10	Total		3975.00			
11						

	A	B	C	D	E	F
1		Science Club Fund Expense Report				
2						
3	Receipts		18-Dec	15-Apr	26-Aug	
4						
5	Bake Sale		138.00	145.00	130.00	
6	Spaghetti Supper		1,885.00	1,500.00	1,670.00	
7	Raffle Tickets		1,500.00	1,550.00	1,600.00	
8	Pizza and Coke Sale		452.00	450.00	487.00	
9						
10	Total		3975.00			
11						

	A	B	C	D	E	F
1		Science Club Fund Expense Report				
2						
3	Receipts		18-Dec	15-Apr	26-Aug	
4						
5	Bake Sale		130.00	145.00	130.00	
6	Spaghetti Supper		1,885.00	1,670.00	1,670.00	
7	Raffle Tickets		1,500.00	1,550.00	1,500.00	
8	Pizza and Coke Sale		452.00	450.00	450.00	
9						
10	Total		3975.00	3645.00	3387.00	
11						

4.4.4 AutoSum Button



The SUM function is one of the most common functions to use in spreadsheets. Functions are useful when you want to perform calculations without having to type in the formula (e.g., $=\text{SUM}(B3:D3)/4$) in the formula bar.

To use the SUM function, you must first select the cell in which the SUM will be stored. Then you can use the AutoSum button on the Standard Toolbar to enter the SUM function.

Sum function in formula bar

	A	B	C	D	E
1	Student	Test 1	Test 2	Final	Total Score
3	Yoko	100	90	81	=SUM(B3:D3)
4	Syram	90	76	87	
5	Walker	90	78	78	
6	Baker		60	45	
7	Castillo		85	100	
8					
9	Class Average	84	78	78	

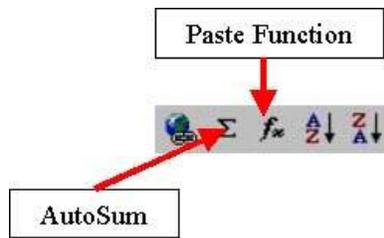
Proposed range to sum surrounded by marquee

Sum function displays in active cell

4.4.5 Using the Paste Function Tool

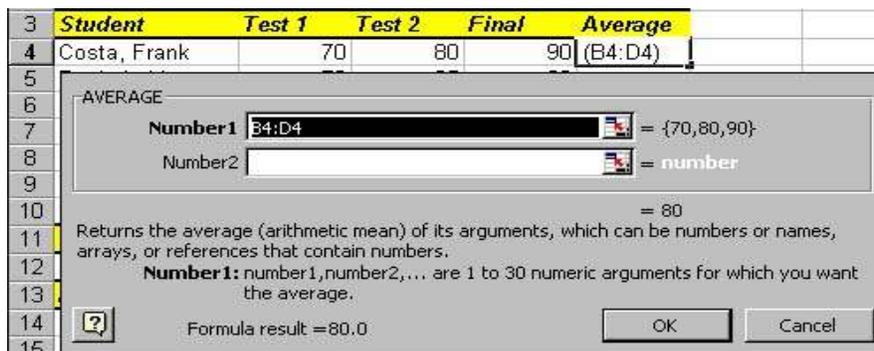


One can always enter the calculation by hand or use Excel to insert the formula into the cell. AutoSum is one such instance, but Excel has many more. These can be found in the Paste Function Tool located on the toolbar. This feature helps you go through the process of creating formulas containing functions.

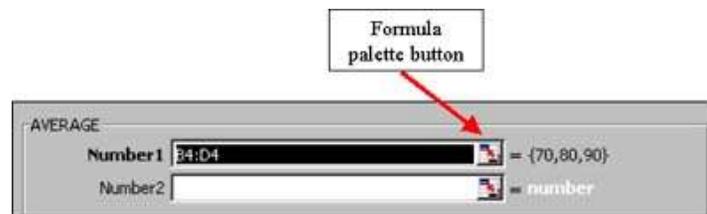


To use the Paste Tool Function, follow the steps below:

- Make sure you are in the correct cell.
- Select the Paste Tool Function.
- The function dialog window is divided into two sections. The left side contains the category of functions within Excel. The right side is where the actual function is located. Choose the category (e.g., Statistical) and then the actual function to be performed. You will then be taken to a second dialog window where you will be asked to enter the block of cells to apply the function to. Type or highlight the block of cells you want.



- If you click on the *formula palette button*, the current formula window will be temporarily set aside and you will be taken back to the worksheet where you can use your mouse to select the block for the function.



- Once you have selected or entered the block of cells to use for the function, click the OK button or press the Enter key.

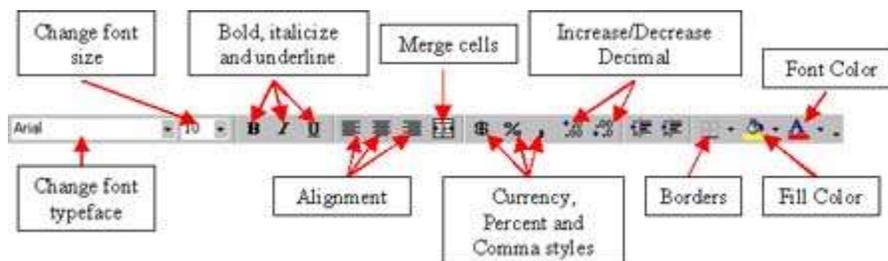
4.5 Formatting Data

4.5.1 Formatting Toolbar



There are many things that one can do to improve the appearance and presentation of spreadsheets. Changing the format of numeric data, adding shading and borders, and merging cells are just a few of the editing methods one can use to improve the appearance of spreadsheets.

The **formatting toolbar** contains many features that can be used to edit the appearance of spreadsheets. These are explained below:



- **Font Typeface** - Change the typeface of the font in a selected cell(s). To change font typeface for multiple cells, select the cells and then change the typeface.
- **Font Size** - Change the size of the font in a selected cell(s). To change font size for multiple cells, select the cells and then change the typeface. To change font size for multiple cells, select the cells and then change the size.
- **Font Style** - Change the font to bold, italicize, or underline. To change font typeface for multiple cells, select the cells and then change the typeface.
- **Alignment** - Change the alignment of certain cells to either left, right or centered aligned. Select the cell(s) and click one of the buttons.
- **Merge Cells** - Merge several cells into one cell. Select the cells desired and then click on the *Merge Cell* button.

- **Number Format** - Change the appearance of data into currency (\$), percent (%), or comma (.00) style. Select the desired cells and click on one of the buttons.
- **Decimal Places** - Increase or decrease the number of decimal places. Select the cell or cells and click on one of the buttons.
- **Borders** - Add borders to a selected cell(s). Click on a cell or highlight several cells and click the border button. If you want variation in the borders' appearance, click the down arrow to bring a dropdown menu and click on your preferred style.
- **Fill Color** - Add a fill color to a cell(s). Select the cell or cells and click on the *Fill Color* button. If you want another color, click on the down arrow next to the button to open another menu of colors.
- **Font Color** - Change color of the font in an existing cell(s). Select the cell(s) and click on the *Font Color* button. If the color is not what you wanted, click on the down arrow.

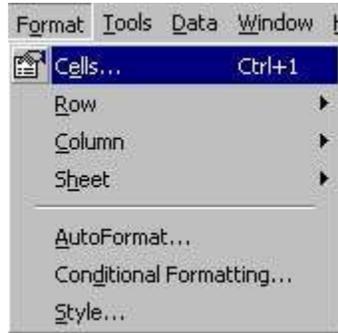
4.5.2 Changing Numeric Data



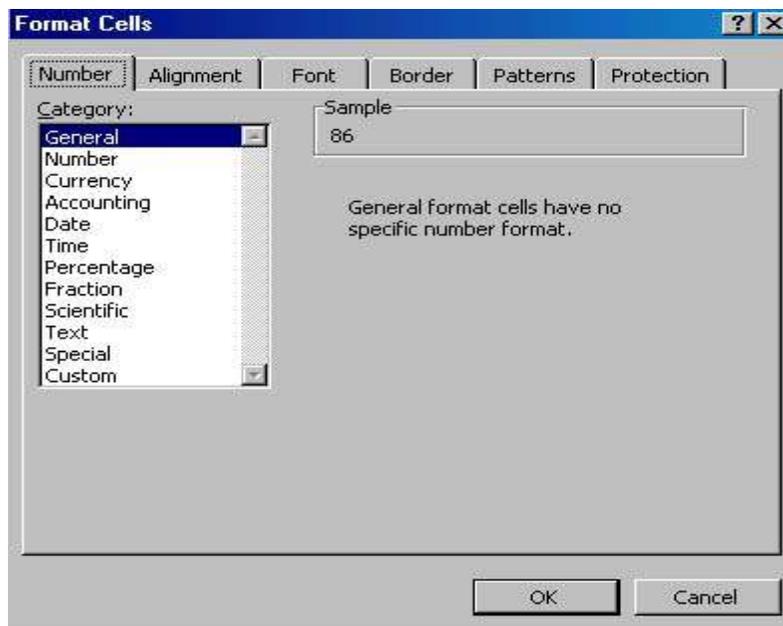
 Numeric (and textual) data can vary in form. One can change numeric data into a decimal, percentage, fraction, or currency form. There are others and one has much flexibility in the way numeric data is formatted.

Using the Format Toolbar is one method for changing the format of numeric data. However, there is another method that allows users to have more control in the way data appears.

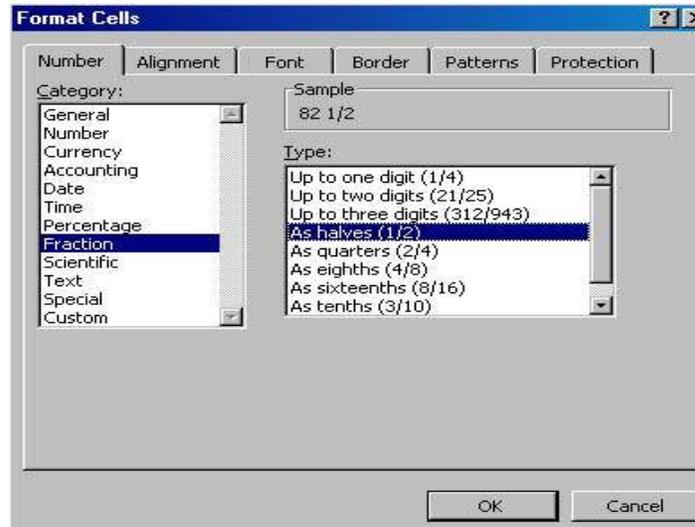
To change the format of numeric data, go to Format in the toolbar and click on Cells.



A new dialog window will appear with several tabs. Make sure that the *Number* tab is showing (if it is not, click on it).



In the **Category** section (left side of the window), there will be several types of data formatting **Types** listed such as Number, Currency, Date, etc. Select the desired format by clicking on it and a new list of formatting options will appear to the right. See the example below for the Fraction category and the kind of control you can have in terms of formatting the data.



Experiment the ways in which you can change the structure and appearance of numeric (and textual) data in Excel spreadsheets by clicking on all of the *categories* and changing the *type*.

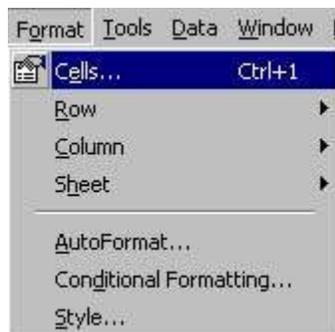
4.5.3 Alignment of Data



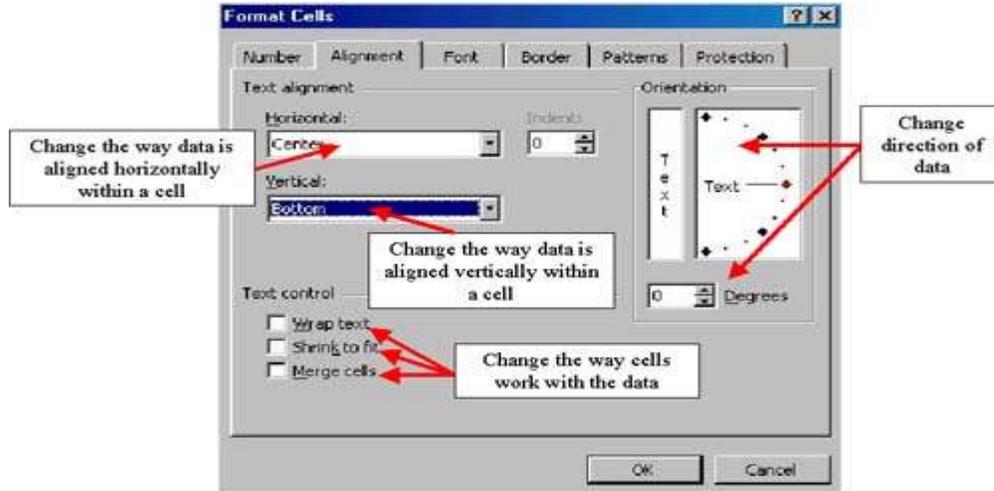
Data can be aligned in various ways. Not only can the data be aligned left, right or centered, but also aligned within the cells and in orientation (e.g., 45 degree slant).

Using the Format Toolbar is one method for changing the alignment of data. However, there is another method that allows users to have more control in the way data appears.

To change the alignment of data, go to Format in the toolbar and click on Cells.



A new dialog window will appear with several tabs. Make sure that the *Alignment* tab is showing (if it is not, click on it). Things that you can do in terms of changing data alignment is explained in the graphic below.

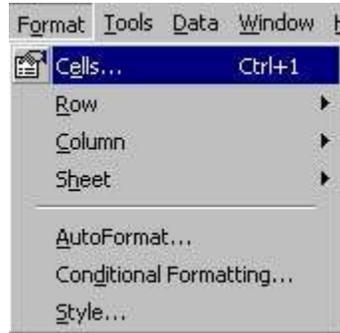


4.5.4 Placing Borders around Cells

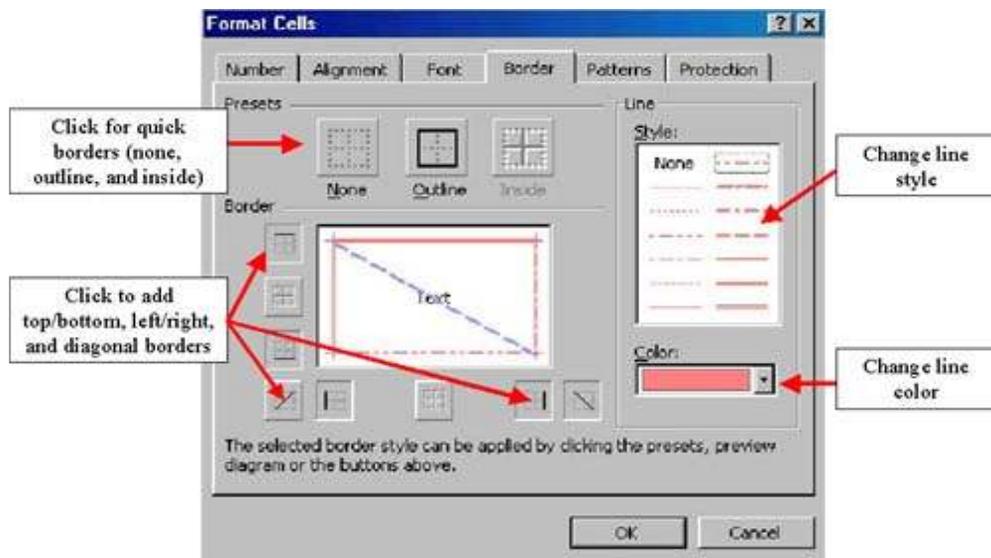
Cells in spreadsheets can have borders around them to help make the data appear more organized. In addition, the use of borders can also help accentuate certain data that you want readers to notice first.

Using the Format Toolbar is one method for adding borders around cells. However, there is another method that allows users to have more control in the way data appears.

To add borders around cells containing data, go to Format in the toolbar and click on Cells.



A new dialog window will appear with several tabs. Make sure that the *Border* tab is showing (if it is not, click on it).



4.5.5 Changing Column and Row Width

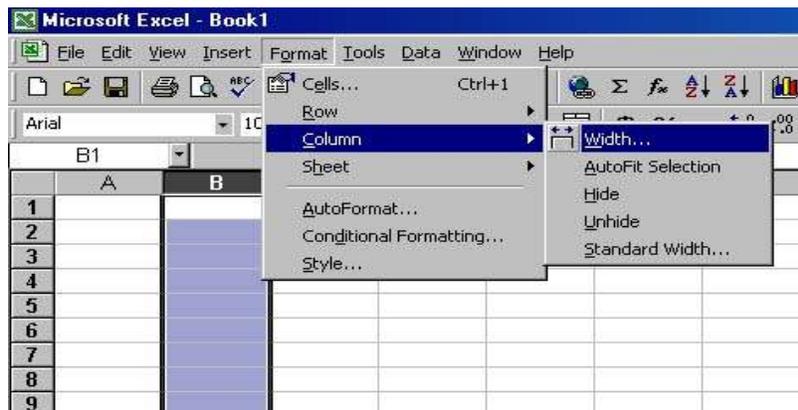


There are two ways in which the columns and rows can be resized. One way is by manually changing the column or row with the mouse and the other is by using the toolbar.

To change the width using the mouse, move your mouse over the column (letters) or row (numbers) headings. As soon as you see the mouse pointer change into a two-sided arrow like the picture below, you are ready to change the width. Just click and drag the mouse until you reach the desired the width.



To change the width using the toolbar, first click on the row or column to be changed. Then, go to Format in the toolbar and move the mouse until you see the *Column* or *Row* option.



When you move the mouse over Column or Row, a popup window will appear with several options. Click **Width** and a Column or Row Width dialog window will appear. Here, just change the number to adjust the size of the column(s) or row(s). Greater the number, greater the width.

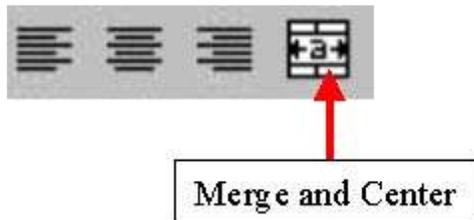


4.5.6 Merge Cells

Sometimes merging multiple cells into one is necessary (especially for titles and labels) in worksheets. Merging multiple cells is not that difficult and there are two ways that this can be accomplished.

To merge cells using the format toolbar, follow the given steps:

- Select the cells to be merged by clicking on the first cell and dragging the mouse across to the other cells.
- After letting the mouse button loose, go to the format toolbar and click on the *Merge and Center* button.

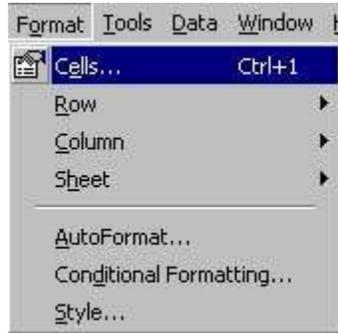


- Once this button is clicked, the multiple cells that were selected turns into one elongated cell with center alignment. You are now ready to type in the data.

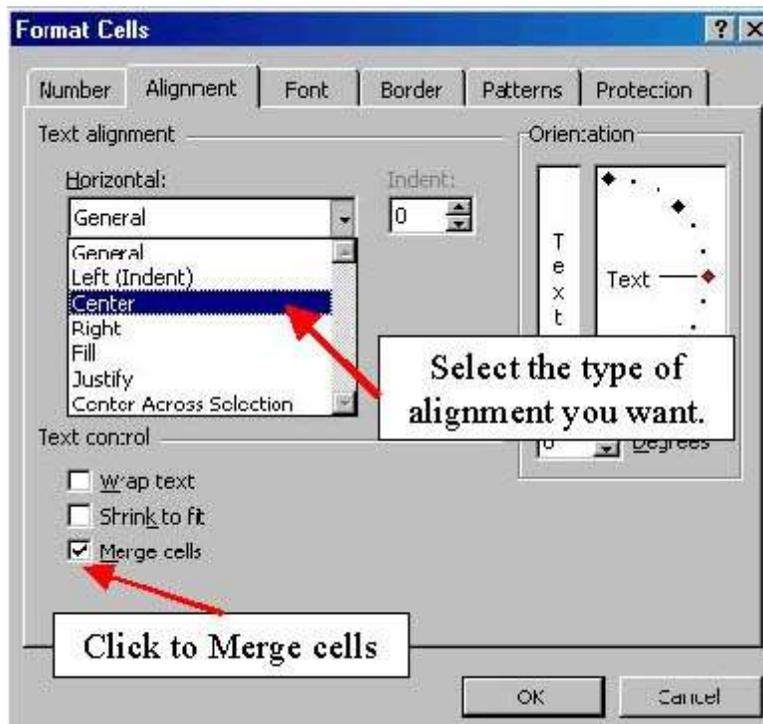
	A	B	C	D
1	Type Your Title Here			
2				

To merge cells using the toolbar option, follow the given steps:

- Select the cells to be merged by clicking on the first cell and dragging the mouse across to the other cells.
- After letting the mouse button loose, go to Format on the toolbar. Click on the *Cells* option.



- A Format Cells window will appear with several tabs. Choose the *Alignment* tab by clicking on it and click on the square near the Merge Cells options toward the bottom. In the *Horizontal* alignment section, select the format you want (e.g., Left, Right, Center, Fill, Center Across Selection).



- After making the selection, click the OK button and type your data into the new cell.

4.6 Page Setup

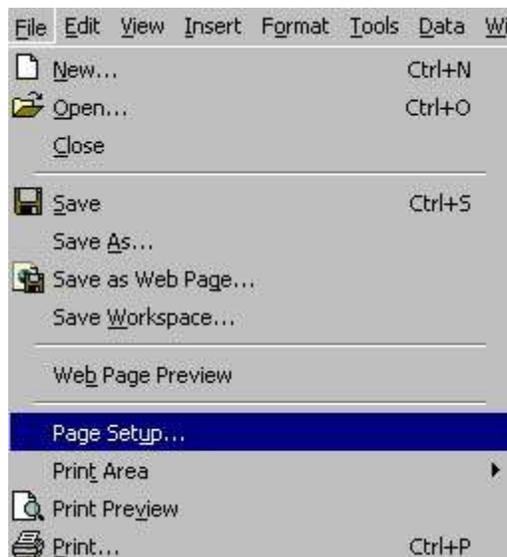
4.6.1 Changing Margins



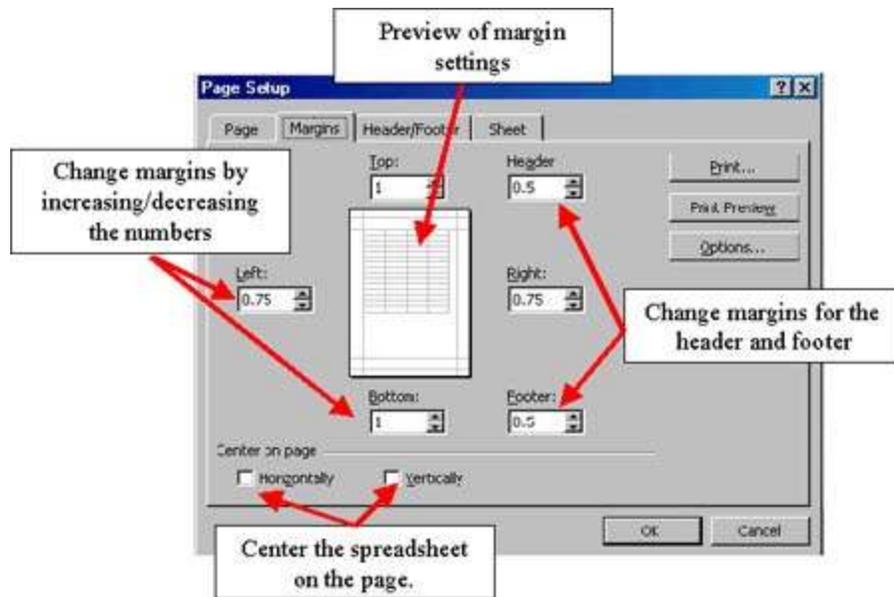
Margins in a worksheet can be changed at any time. However, it is recommended to change the margin settings before you begin the worksheet. Once you begin creating the spreadsheet, changing the margins can off-set everything. Therefore, some time must be spent toward making the readjustments.

To change the margins, follow the given steps:

- Go to File and click on *Page Setup*.



- A Page Setup window will appear. Make sure the *Margins* tab is selected. If not, click on that tab.
- Here, you can change several things. Please look at the graphic below to see what can be changed.

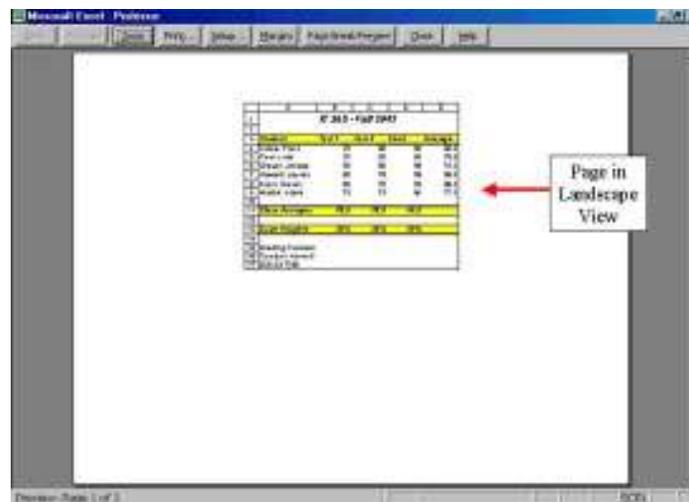
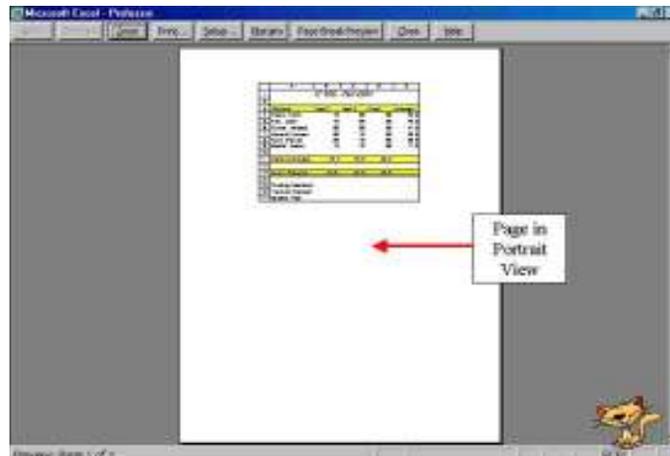


- Once the margins are adjusted, click on the OK button to apply those changes.

4.6.2 Changing Page Orientation

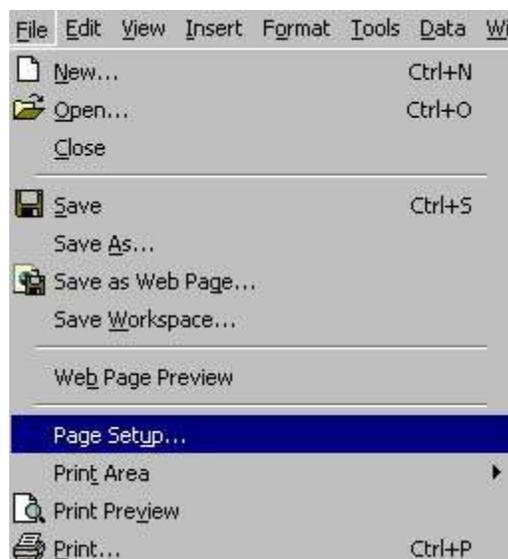


🔍 Spreadsheets can have different page layout orientations. Basically, there are only two (1) portrait and (2) landscape. Portrait layout will print spreadsheets in a vertical format (8.5 x 11 page). Landscape will print spreadsheets in a horizontal format (11 x 8.5 page). Selecting between the two layouts will depend upon the user's needs. However, printing spreadsheets in landscape view will be better for spreadsheets that are wide, as compared to long.

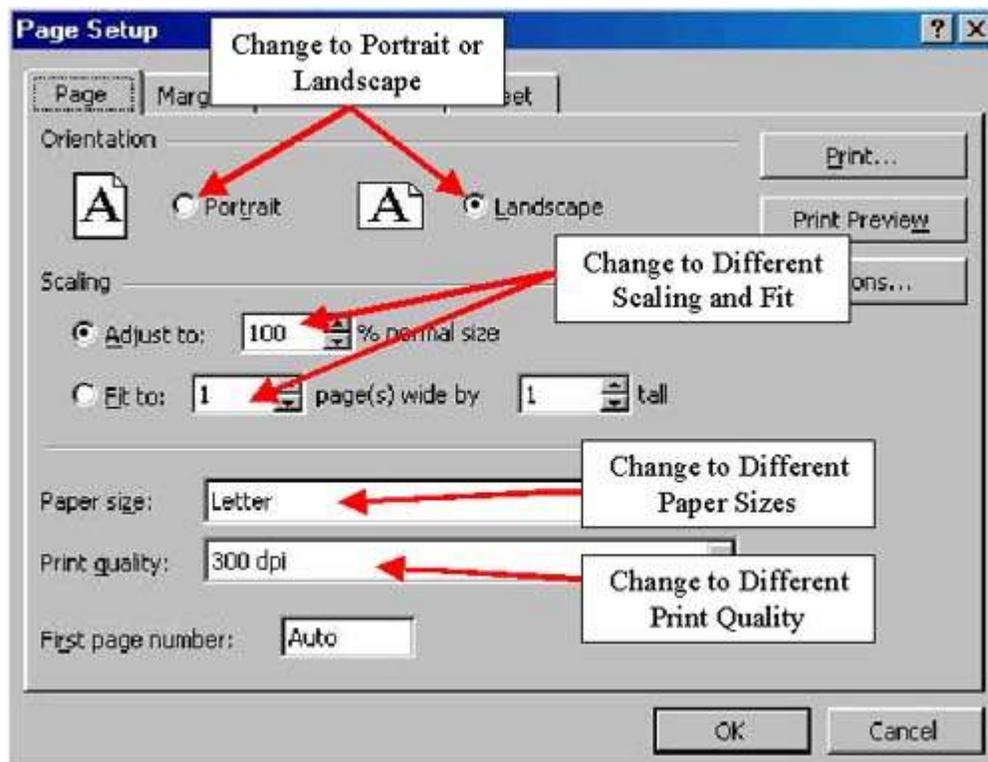


To change the page orientation of spreadsheets, follow the given steps:

- Go to File and click on *Page Setup*.



- A Page Setup window will appear. Make sure the *Page* tab is selected. If not, click on that tab.
- Here, you can change the layout. Please look at the graphic below to see what can be changed.

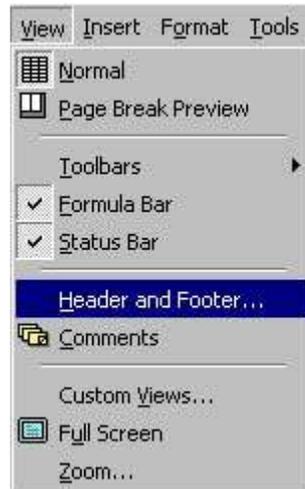


4.6.3 Adding Footers and Headers

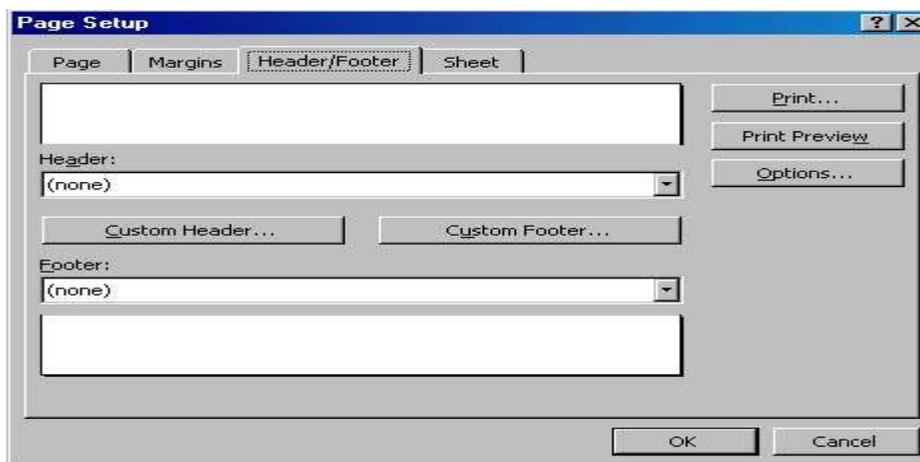
In addition to adding titles to the spreadsheets themselves, one can also insert headers and footers to identify time/date, the spreadsheet's creator, a running head, page number, etc. Inserting headers and footers are quite easy to do. In addition, one has a lot of flexibility in terms of what to include in the header or footer.

To add a footer or header, follow the steps given below:

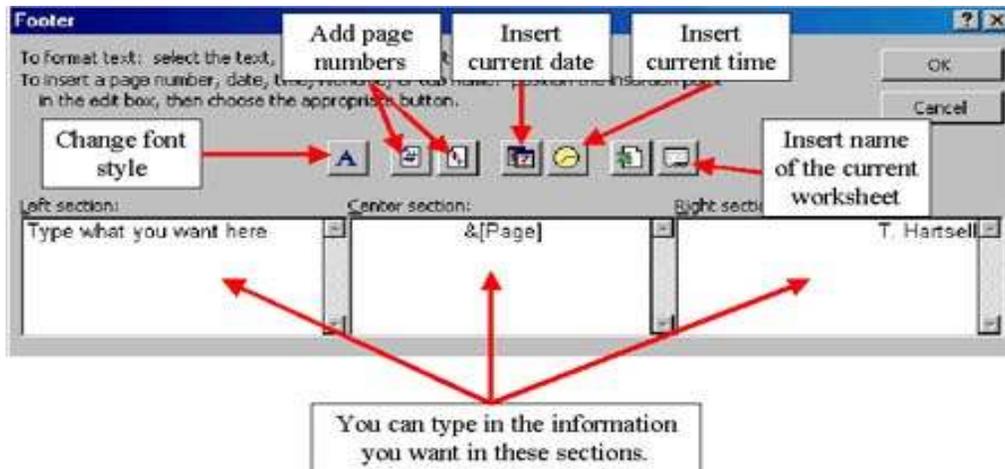
- Click on View in the menu bar and click on Header and Footer.



- Make sure the Header/Footer tab is showing (if not, click on that tab).



- Click on the Custom Footer (or Custom Header) button and a Footer (or Header) properties window will appear with three areas in which you can insert information. Look at the graphic below of what you can add or do to customize the footer (or header).



- Once the changes have been made, click the OK button.
- You can preview the footer or header by clicking the Print Preview button or accept the changes made by clicking the OK button.
- The footer or header will not be seen in the spreadsheet view. However, the footer or header will print out in the final version.

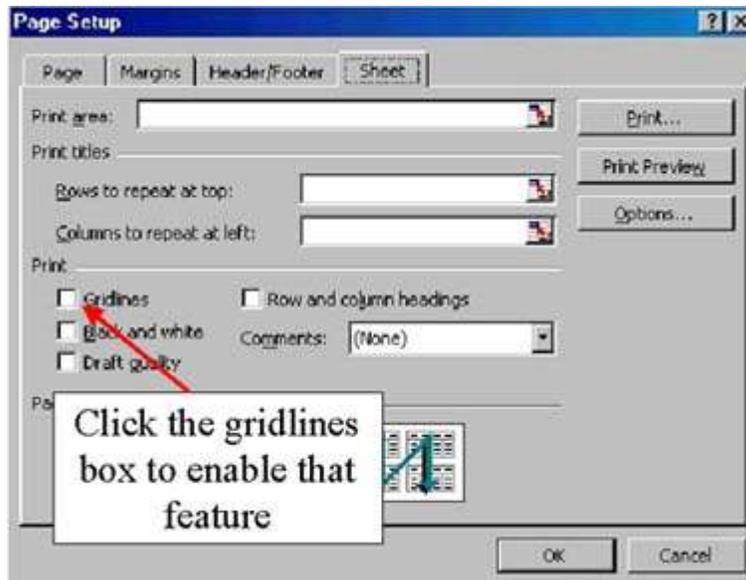
4.6.4 Turning Gridlines & Column/Row Headings Off



There will be times that displaying the gridlines and column/row headings is necessary. One may want to show how the spreadsheet is laid out in the printed version and having the gridlines and headings enabled will help in this matter. In addition, one may want to make reference to certain cells in a printed spreadsheet and having the column/row headings enabled will allow others to locate those cells.

To enable the gridlines, follow the directions below:

- Click on File in the menu bar and select *Page Setup*.
- Make sure that the *Sheet* tab is showing (if not, click on that tab).
- Click on the square box next to the *Gridlines* option to enable that feature.

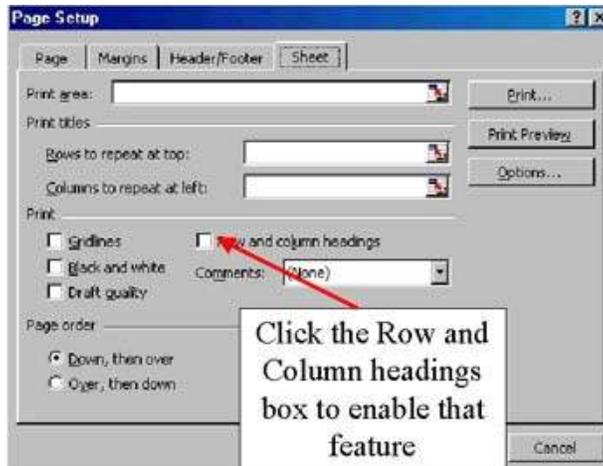


- Click the OK button to accept the changes.
- Your spreadsheet will now print with the gridlines like the graphic below.

IT 365 - Fall 2001				
Student	Test 1	Test 2	Final	Average
Costa, Frank	70	80	90	82.5
Ford, Judd	70	85	80	78.8
Grauer, Jessica	90	80	98	91.5
Howard, Lauren	80	78	98	88.5
Krein, Darren	85	70	95	86.3
Moldof, Adam	75	75	80	77.5
Class Averages	78.3	78.0	90.2	
Exam Weights	25%	25%	50%	
Grading Assistant Taralynn Hartsell 555-33-7788				

To add the column/row headings to the printed spreadsheet, perform the following:

- Click on File in the menu bar and select *Page Setup*.
- Make sure that the *Sheet* tab is showing (if not, click on that tab).
- Click on the square box next to the *Column and Row Headings* option to enable that feature.



- Click the OK button to accept the changes.
- Your spreadsheet will now print with the gridlines like the graphic below.

	A	B	C	D	E
1	IT 365 - Fall 2001				
2					
3	Student	Test 1	Test 2	Final	Average
4	Costa, Frank	70	80	90	82.5
5	Ford, Judd	70	85	80	78.8
6	Grauer, Jessica	90	80	98	91.5
7	Howard, Lauren	80	78	98	88.5
8	Krein, Darren	85	70	95	86.3
9	Moldof, Adam	75	75	80	77.5
10					
11	Class Averages	78.3	78.0	90.2	
12					
13	Exam Weights	25%	25%	50%	
14					
15	Grading Assistant				
16	Taralynn Hartsell				
17	555-33-7788				

4.7 Charts

4.7.1 Creating a Chart



 The best way to display data in spreadsheets is by creating charts. Numbers can usually be represented quicker to a larger audience in a picture format. Excel has a chart program built into its main program. The Chart Wizard steps a user through the process of creating charts and is the simplest method to use.

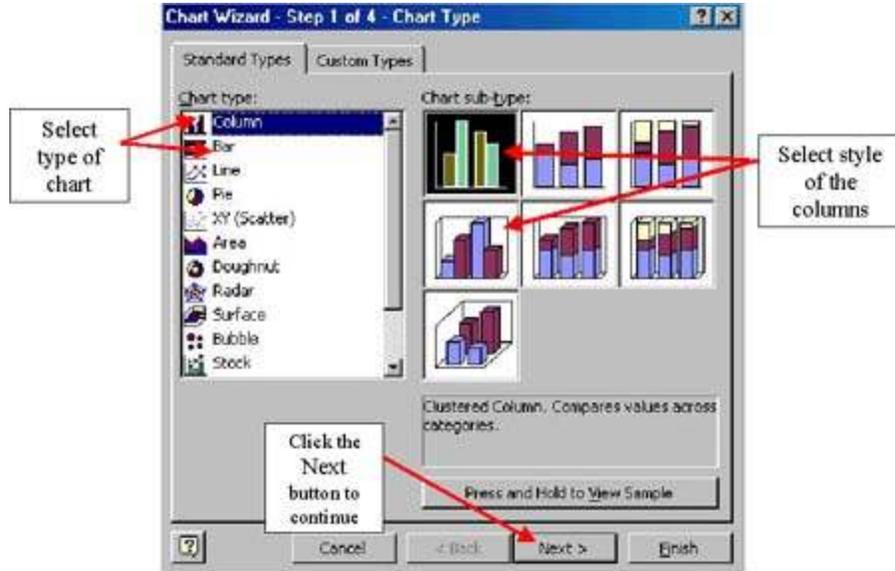
There are many types of charts. The two most widely used are the bar chart (or column) and pie chart. However, in this tutorial, only the bar chart will be explained.

To create a bar chart using the Chart Wizard, follow the given steps:

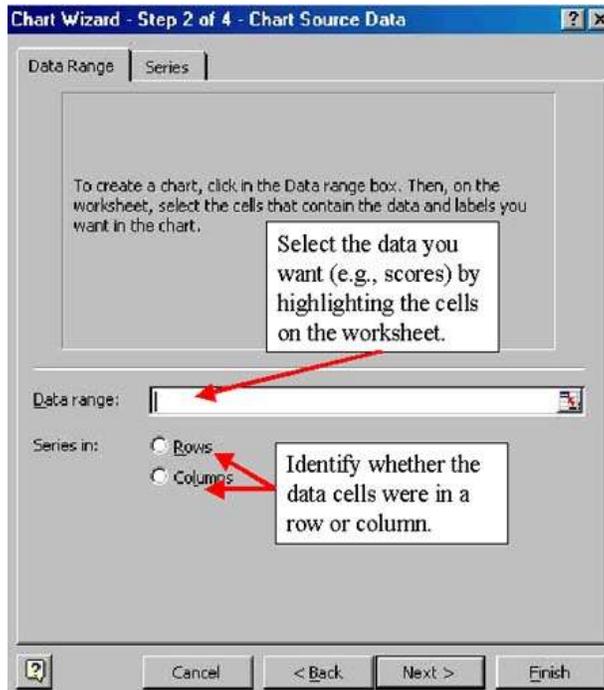
- Click on the Chart Wizard button located on the toolbar.



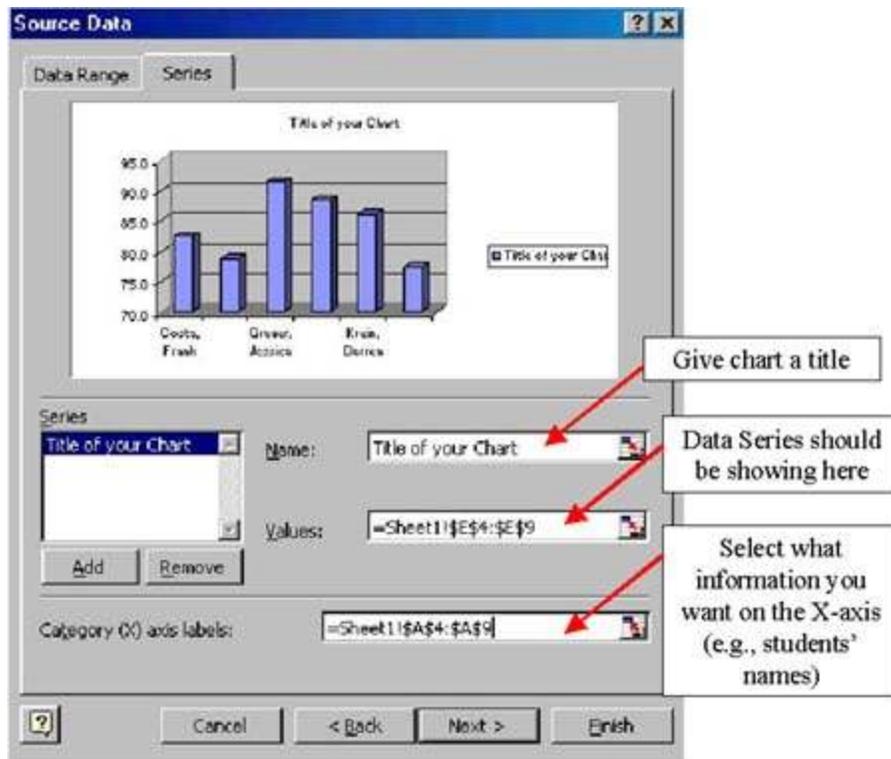
- A Chart Wizard dialogue window will appear. Here, you can select the type of chart you want (e.g., column, bar, pie, line) and what style (e.g., 3D effect, stacked). Once selected, click the Next button.



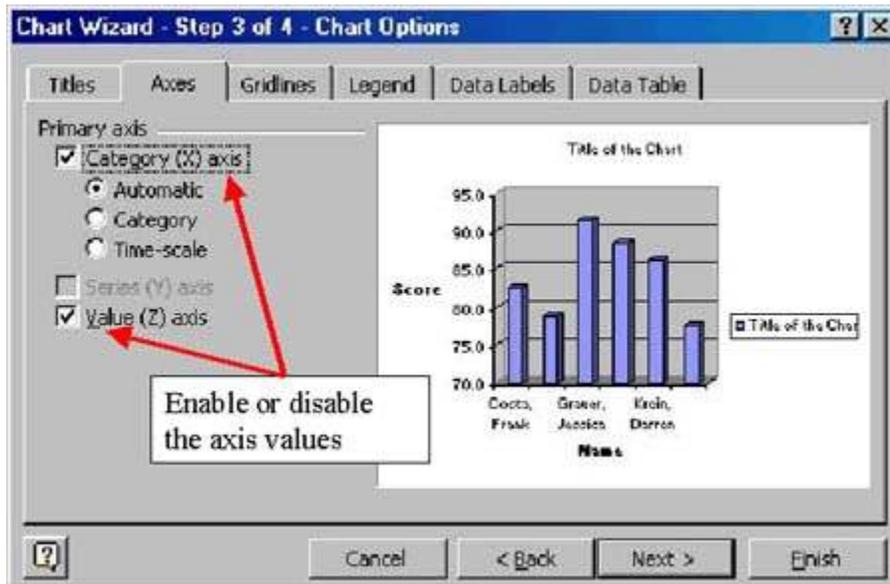
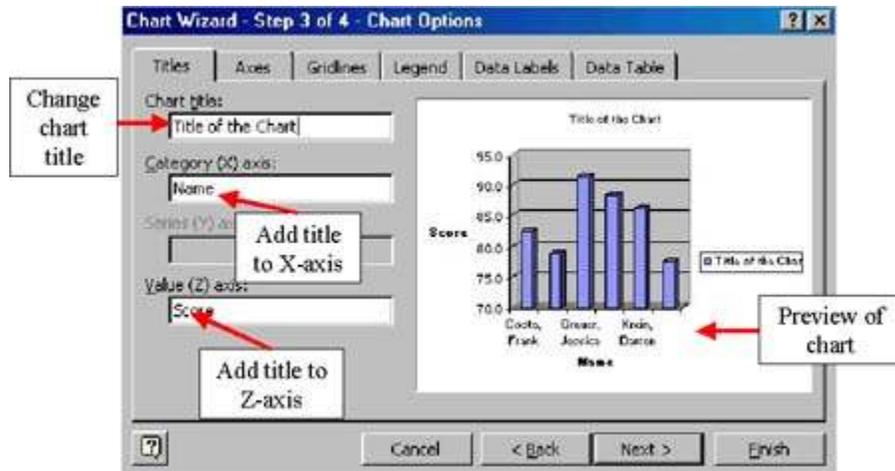
- You will come to a window that will ask what Data Range you want in the chart (Z-axis). Select the data by dragging your mouse over the series of cells (e.g., student's final test scores). Then, select whether that series of cells were in a row or column. Try clicking on both and see which style you prefer.



- Click on the Series tab. Here, you will want to give the chart a title and select which cells to include in the X-axis.



- Click the Next button and you will come to a new window. These are all options that you can add to your chart to make it look more attractive or functional. The following series of graphics will demonstrate what can be done here.



Enable or disable gridlines in the chart

Chart Options

Titles Axes Gridlines Legend Data Labels Data Table

Category (X) axis

- Major gridlines
- Minor gridlines

Series (Y) axis

- Major gridlines
- Minor gridlines

Value (Z) axis

- Major gridlines
- Minor gridlines

2-D walls and gridlines

Enable or disable the 2D walls in the chart

Cancel < Back Next > Finish

Enable or disable the Legend

Chart Wizard - Step 3 of 4 - Chart Options

Titles Axes Gridlines Legend Data Labels Data Table

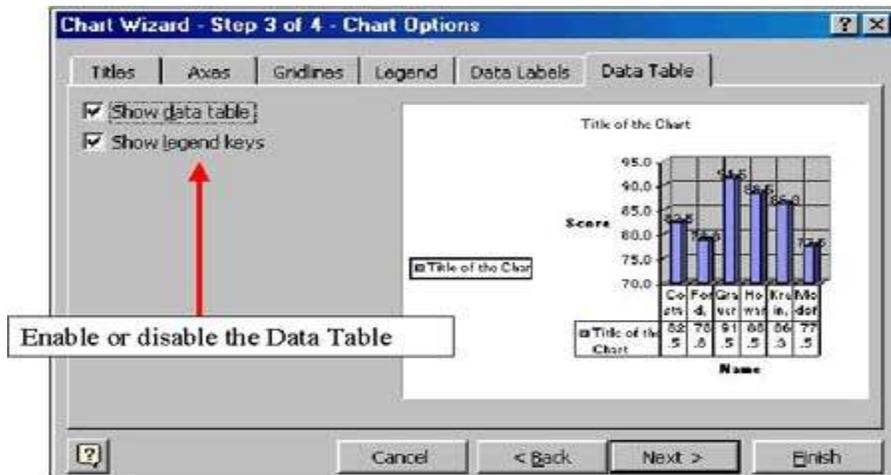
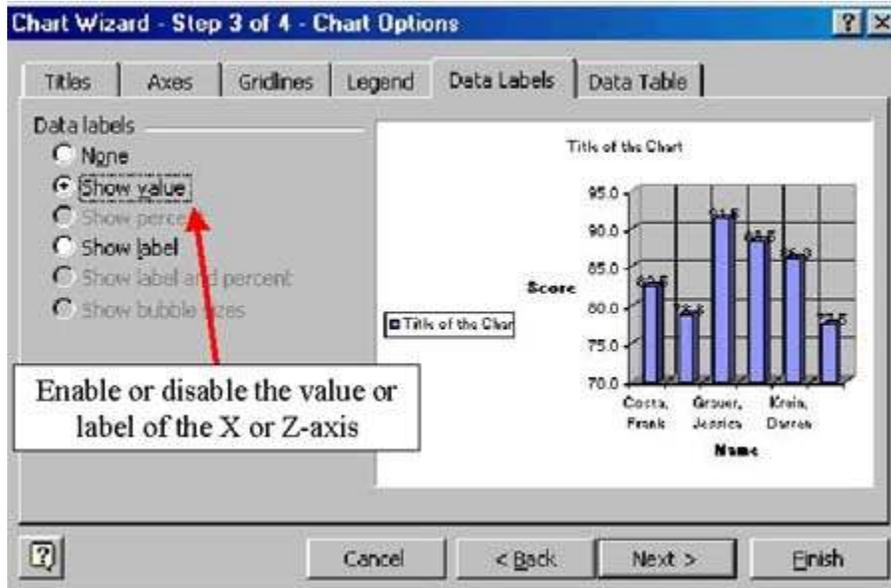
Show legend

Placement

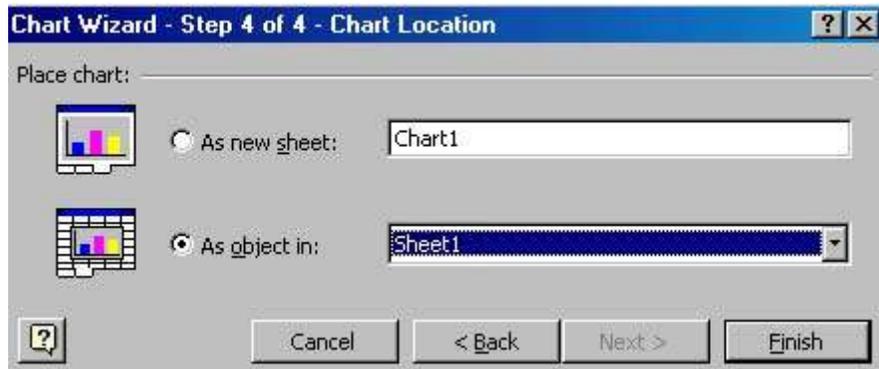
- Bottom
- Corner
- Top
- Right
- Left

Decide on the location of the Legend

Cancel < Back Next > Finish



- Click the Next button and you will see a new window. Select the *As New Sheet* if you want the chart to be inserted into a worksheet of its own. Select the *As Object In* if you want the chart to appear on the same worksheet along with the data.



- Click the Finish button and your chart will be inserted into a new worksheet or on the same worksheet with the data.



4.7.2 Moving the Chart



Moving the chart around in a spreadsheet is simple. There are basically two different ways:

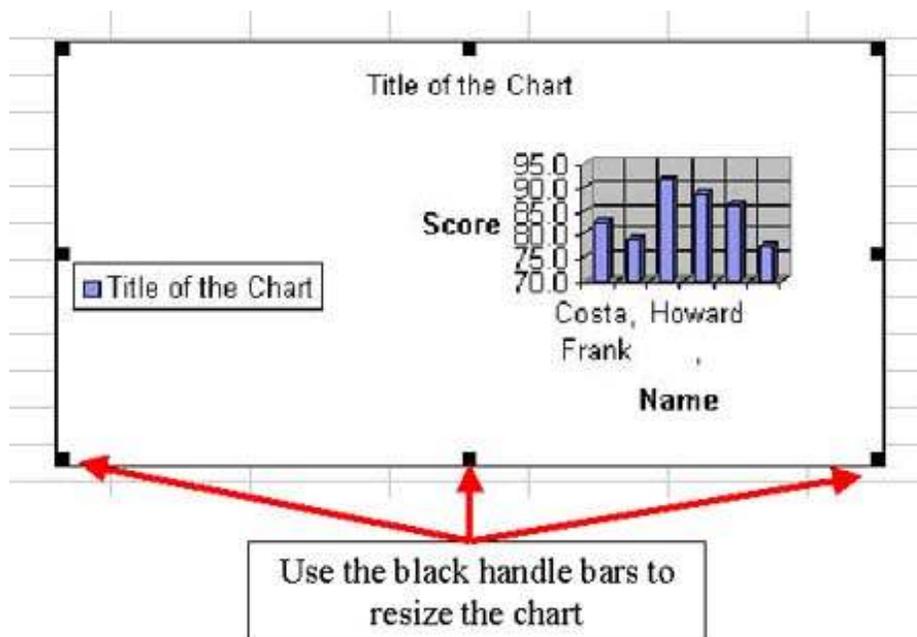
- Click on the Chart and drag it to an appropriate place.
- Click on the Chart, use the Move option (CTRL+V), and then click on another cell and use the Paste option (CTRL+V).

4.7.3 Changing the Size of the Chart



⊕ Sizing the chart can be handled in one simple way.

- Click on the chart. Move your mouse button over one of the black, square boxes and drag the chart to an acceptable size.



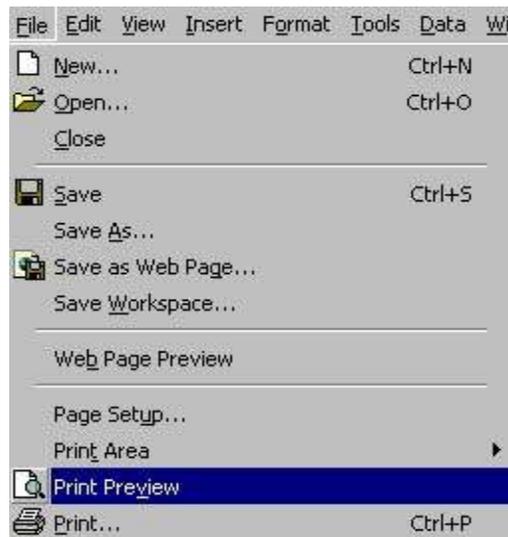
4.8 Previewing and Printing

4.8.1 Previewing the Worksheet

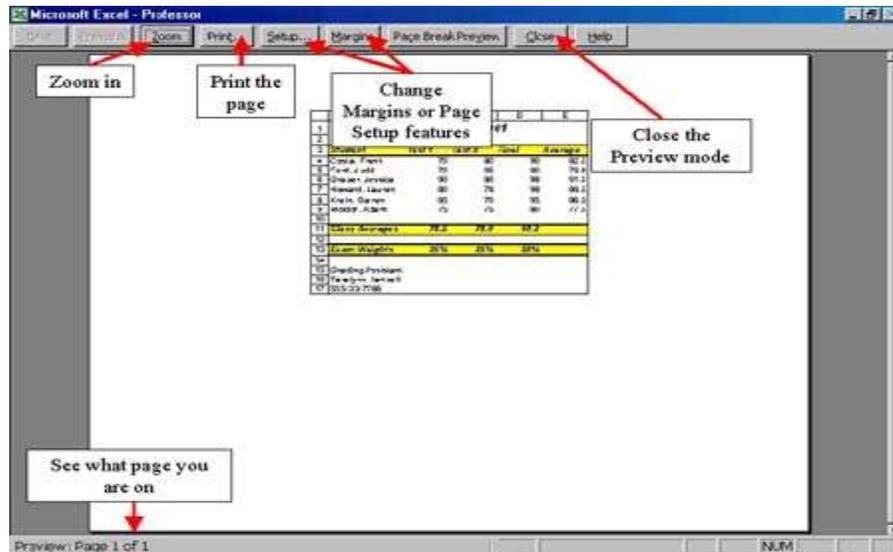


 Previewing a worksheet before final printing is recommended. That way, one can see how the worksheet will look like once it is printed. Layout features and special header/footers can all be seen in the preview mode.

To preview the worksheet, click on File in the menu bar and select *Preview*.



In the Preview mode, a window will appear with an image of the spreadsheet. There are several things you can do here. Look at the graphic below to see what these are in the Preview mode.

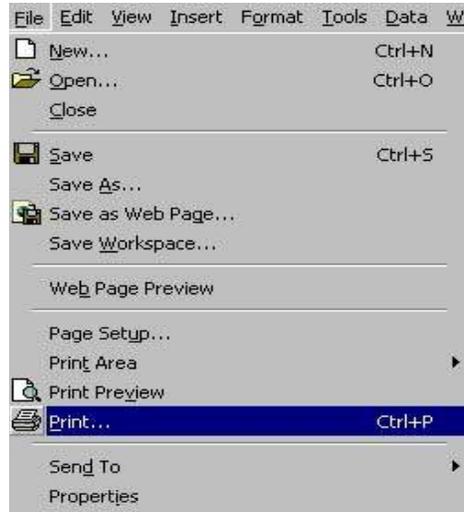


4.8.2 Printing the Worksheet

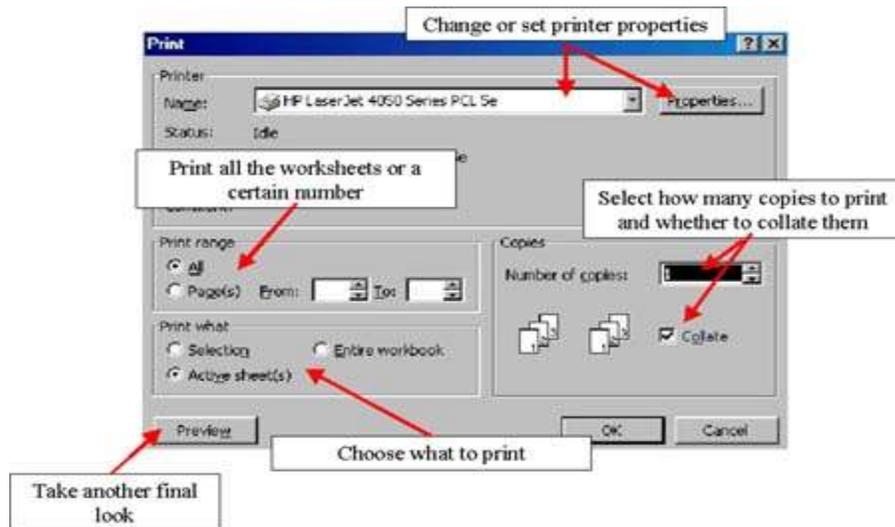


Printing the worksheet is simple. If you are ready to print a final copy of the spreadsheet, follow the directions below:

- Click on File and select Print.



- A Print Properties dialog box will appear with several options. Select the one(s) you need and click the OK button.



Module 5

Databases

Databases requires the candidate to understand the concept of a database and demonstrate competence in using a database.

Learning Objectives :

After completing this section, you shall be able to

- Understand what a database is and how it is organized and operated.
- Create a simple database and view the database content in various modes.
- Create a table, define and modify fields and their properties; enter and edit data in a table.
- Sort and filter a table or form; create, modify and run queries to retrieve specific information from a database.
- Understand what a form is and create a form to enter, modify and delete records and data in records.
- Create routine reports and prepare outputs ready for distribution.

Module 5 Data Base

5.1 Introduction

5.1.1 Overview



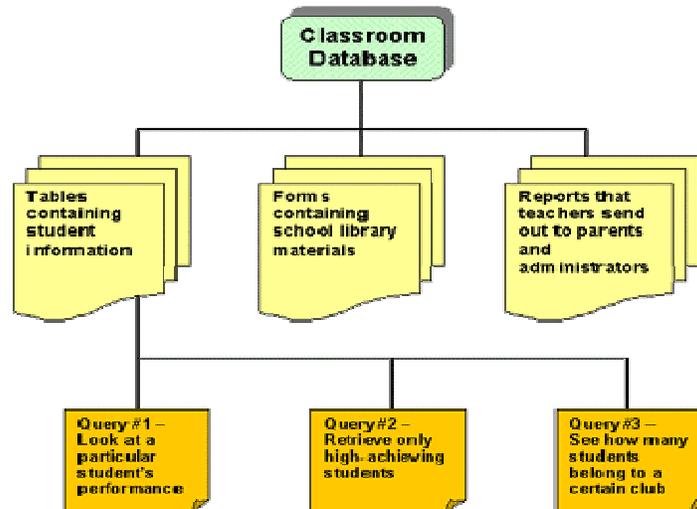
 A database is a program that allows easy access, retrieval, and use of data. A *database management system*, like Access, allows you to use a computer to:

- create a database
- add, change, and delete data in the database
- sort the data in the database
- retrieve data in the database
- create forms and reports using the data in the database

A database is a collection of data which is organized in a manner that can be easily retrieved. They consist of fields, records, and files, much like a phone book. A field is a single piece of information (your last name is one field); a record is one complete set of fields (your entry in the phone book is a record); and a file is a collection of records (the entire phone book). When you look at the phone book for someone's phone number, you search for the phone book database.

Databases, like Access, are used to store large quantities of information. The information can be viewed, sorted, manipulated, retrieved, and printed in various ways. The database give you the flexibility to obtain this data in multiple formats.

A database management system consists of a collection of tables, forms, reports, and queries. In a sense then, the database is a *hierarchical* structure under which all the files (tables, forms, reports, etc.) fall under. Look at the illustration below for an example of the hierarchical structure.



Terms and Definitions

Field

The smallest piece of data in a table.

Cell

Where one row and one column intersect on a table.

Record

A collection of all fields relating to one person, place, or thing occupying a single row of a table.

Table

A collection of records with one record occupying a single row with one or many fields per row. A database can consist of multiple tables.

Query

Ask specific questions about the data in the database.

Forms

A method of entering, displaying, and searching data in other than the spreadsheet-like environment of tables and queries.

Reports

Summarizes and formats data in the "look" that you want for either table or query data.

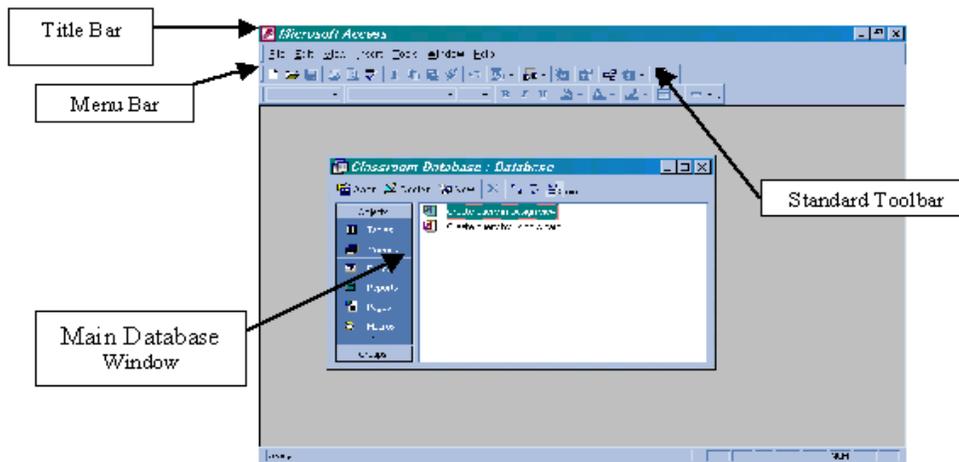
Object

Components that make up a database (i.e., tables, forms, queries, and reports).

5.1.2 Interface



There are several bars in Microsoft Access that can help the user navigate through the software program. The **title bar** is located on the top of the window. This will help the user understand which program they are in. The **menu bar** is underneath. Common functions can be found here with easy access. The **standard toolbar** is where specific functions (and common ones) pertaining to Access can be located. Finally, the **main database window** contains all of the associated files that belong to the database (Classroom Database in the example below). The relational files can be accessed by clicking on the appropriate button (e.g., Tables, Queries, Forms).



 **Database Window** The window that appears when you open an Access database. In an access database, you can click **Table, Queries, Forms, Reports, Pages, Macros, and Modules** in the Database

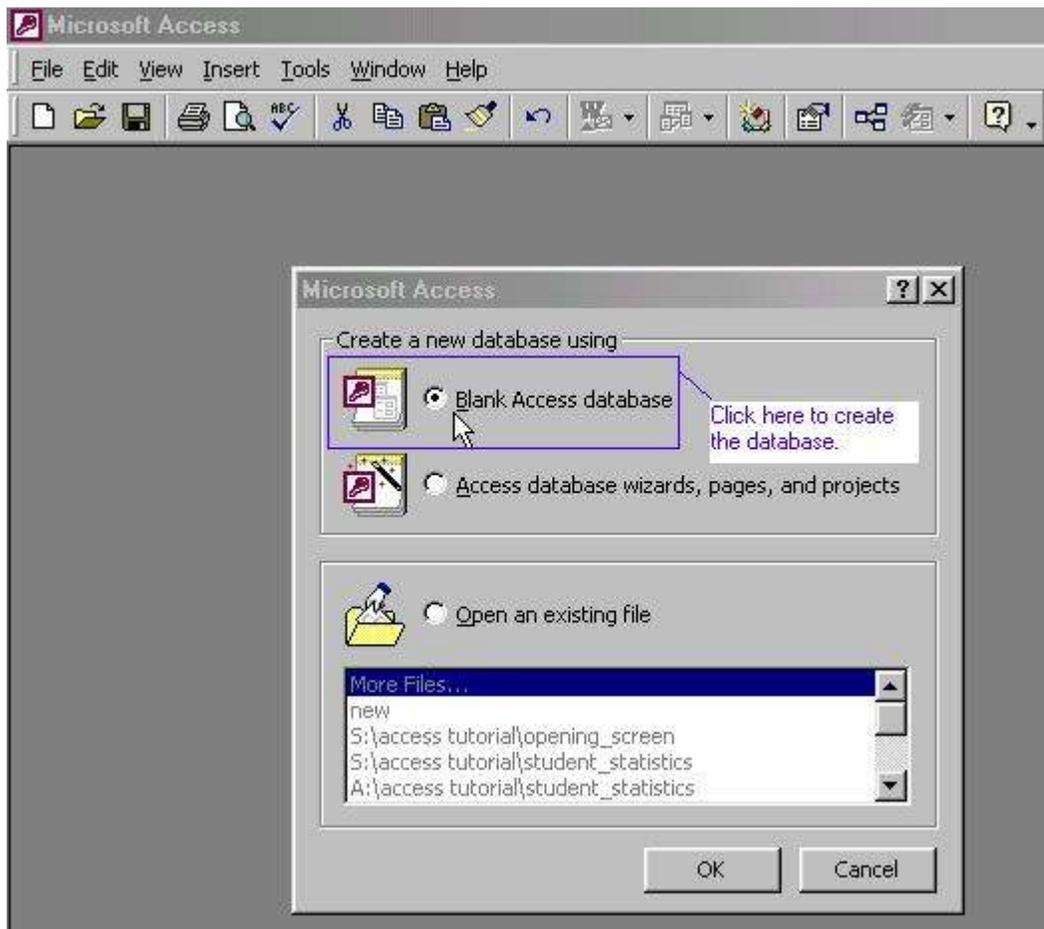


To display the Database window, click Database window on the toolbar. You can also press F11 to switch to the Database window from any other window.

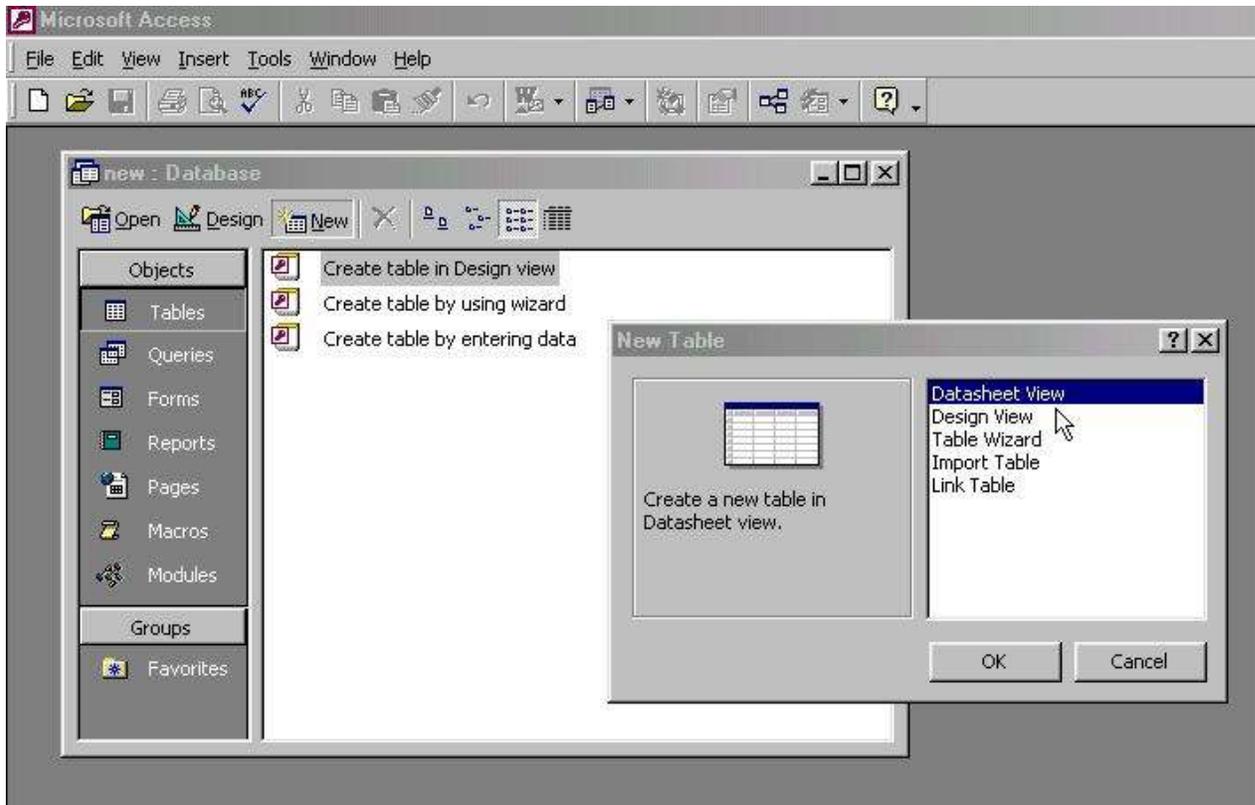
5.1.3 Getting Started

⊕ To open Microsoft Access:

- Click on the start button in the lower left corner of your screen. In the Microsoft Office suite, click Microsoft Access (the one with the key as an icon).
- Select blank access database and click OK.



- Access will immediately ask you to name the database. Name it and click Create.
- Highlight the option to the right that says "Create a table in design view".
- Click new on the menu bar. A box should pop up.
- Click on design view and then OK.



- Your new empty table should pop up.

⊕ To close Microsoft Access:

- After you have followed the directions in the "Creating Data" section of this tutorial, save your information.
- Click on File from the menu bar.
- Click Close to close down the current table

5.2 Creating a Database File

5.2.1 Creating a Table Design

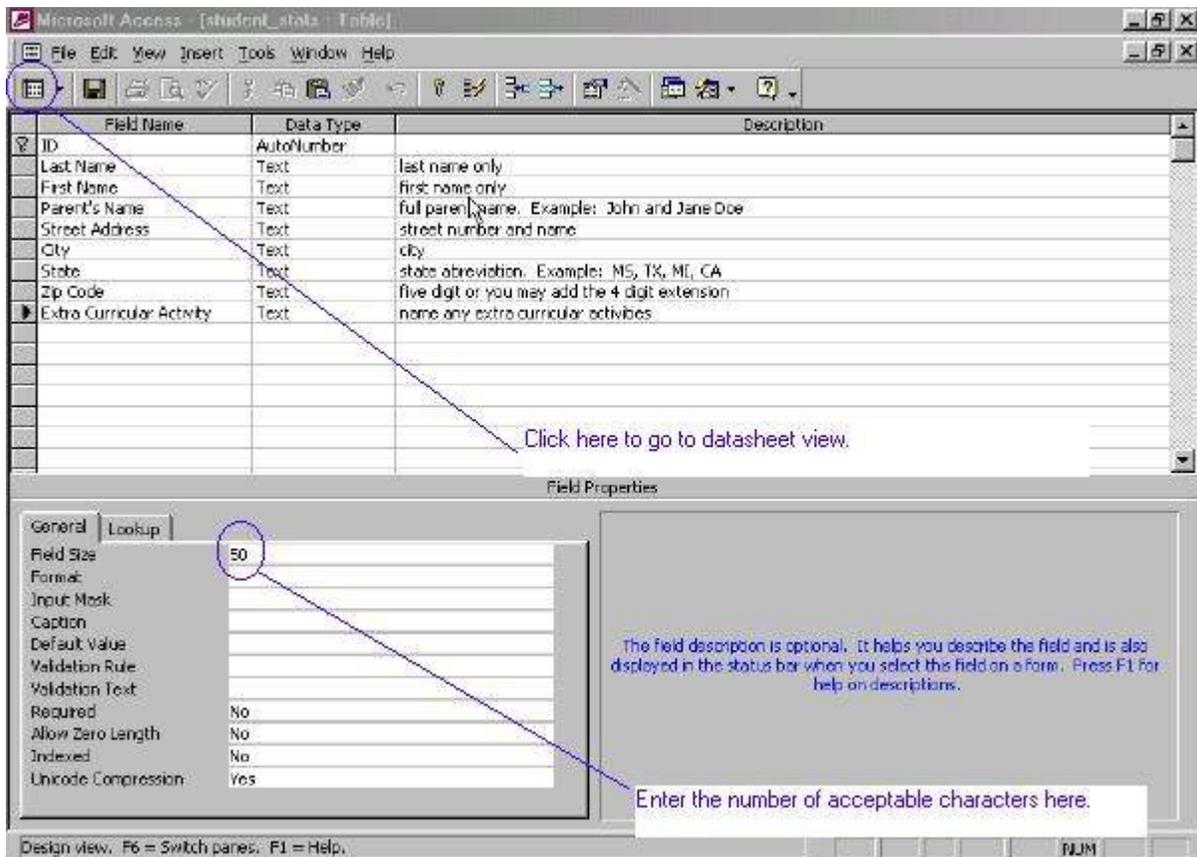


Table Design View

A table can be created and customized in Table Design View where the Field Names, Data Types, Descriptions, and Field Properties are defined. After selecting the Table tab and New in the Database Objective window, you will be presented with a New Table dialog box where you selected Design view.

1. Field name - type the name of your field into your table. The name should give information about what the field contains. For example, if the field contains the street address of several people, then the field name should be "Street Address". If it will contain telephone numbers, then the field name should be "Telephone Numbers" or "Tel". Just be sure that the name is clear.
2. After you enter the field name, tab to the data type. There should be a little grey and black drop down arrow next to this area. Click on it and select the type of information that will be entered here (text, numbers, date, etc). You will probably use "text" for the type of information for most of your fields (even for zip codes and telephone numbers). The "number" type of information is mostly for numbers that will be used in calculations. Find the dialog box at the bottom of the screen. In the space that says "field size", type in the limit to the number of characters that may be entered in this area. For example, if the data type is "date" then you don't want the user to enter 50 characters. Look at this date: 10/30/1944 that is ten characters long. Specify that you only want the user to be able to enter ten characters. This helps the user know when he has entered too much and cuts down on errors.
3. Tab to the description area. The description area helps you and the user know what to type. The computer knows what to expect because it has that information in "data type". Now the user needs to know what to type. If the data type is "date" then type "date" under the description. You may also want to specify whether the year is four digits or the last two digits. Suppose the information to be entered is "state". In the description, you need to specify whether you want the state abbreviation or the full name.
4. Keep repeating these steps until you have typed and described all the field names that you desire.

EXAMPLE OF A TABLE IN DESIGN VIEW



After you have set up your fields, go to datasheet view. Click on the view icon in the upper left corner of the screen. the icon will look like a form (or a sheet of paper) with lines across it. Access will ask you if you want to set up a key number. It is not necessary to do this, but you may want to say yes so that you can relate this table to other tables in the future.

5.2.2 Entering Data: Datasheet View



Entering Data: Datasheet View

Now It is time for you or someone else to enter the actual information. Suppose the fields you defined were: first name, last name, parent's name, street address, city, state, zip code, and extra curricular activity. Your data sheet will only have one line for you to enter information. Tab from field to field to enter information. When you have entered information on that line, press the tab button to get another line.

EXAMPLE OF TABLE IN DATA SHEET VIEW

ID	Last Name	First Name	Parent's Name	Street Address	City	State	Zip	Extra Curricular Activity
1	Williams	Wilimena	Willie and Wiler	787 Willow Lane	Williamsburg	VA	12345	band
2	Blacksmith	Smitty	Sam and Salen	234 Smiling Driv	Smallsville	VA	12345	football
3	Cleveland	Clyde	Claudius and C	890 Colossal Co	Clarkston	VA	12345	soccer, tennis
4	Snake	Samantha	Sly and Christie	343 Slithering W	Sluethton	VA	12345	basketball, swim team
5	Davenport	Dave	Demetrius and I	3542 Diamond F	Camington	VA	12345	gymnastics, track and field
6	Davenport	Darius	Demetrius and I	3542 Diamond F	Camington	VA	12345	track and field, swimming
7	Jones	Sheila	Sandy Jones	214 Shady Pin	Smallsville	VA	12345	cheerleader
8	Kinner	Laura	Raymond and L	563 Nice Street	Clarkston	VA	12345	none
9	Peterson	Peter	Pete and Felick	803 Harcourt Hs	Williamsburg	VA	12345	band, swimming
10	Brokaw	Peter	Sam and Prince	123 National Co	Sluethton	VA	12345	none
11	Jennings	Edward	David and Nicol	385 Pilgrim Heig	Clarkston	VA	12345	journalism club
12	Sawyer	Nelda	Ned and Burnic	34 Loomis Layn	Sluethton	VA	12345	football
13	Parker	Lance	Fred and Betty	732 Parker Heig	Clarkston	VA	12345	basketball
14	Ewing	Eunice	William and Wh	45 Phillips Adju	Camington	VA	12345	none

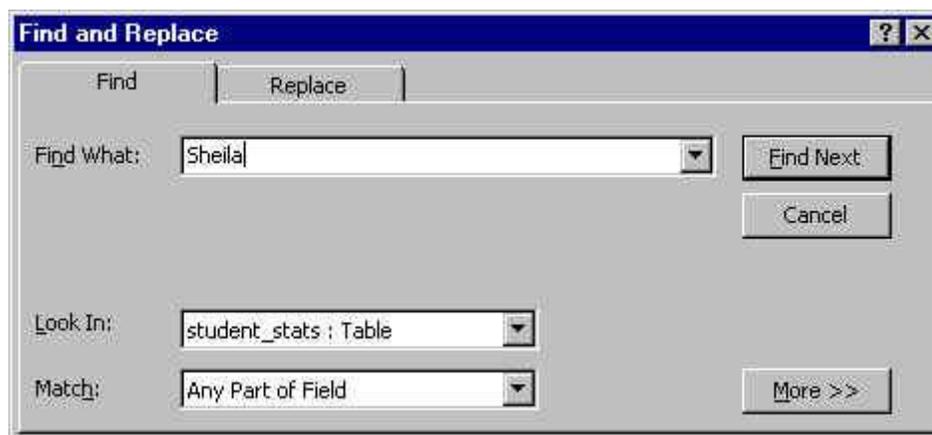
Editing Data

Editing data works in much the same manner as it does in a word processor. If you need to change anything, just go to that view (datasheet or design), click on the field and edit the information.

5.2.3 Finding or Replacing Data

There are many ways in Microsoft Access to find or replace just the data you need, whether you're looking for a particular value, one record, or a group of records.

- You can find a record by scrolling in a datasheet or form, or by typing its record number in the record number box.
- With the Find dialog box, you can locate specific records or find certain values within fields. You can navigate through records as Access finds each occurrence of the item you're looking for. If you want to replace certain values that you find, use the Replace dialog box instead.



5.3 Form

5.3.1 Creating a Form by Using Auto Form

AutoForm creates a form that displays all fields and records in the underlying table or query. If the record source you select has related tables or queries, the form will also include all the fields and records from those record sources.

1. In the Database window, click Forms under Objects.
2. Click the New button on the Database window toolbar.

3. In the New Form dialog box, click one of the following wizards:
 - **AutoForm: Columnar** -- Each field appears on a separate line with a label to its left.
 - **AutoForm: Tabular** --The fields in each record appear on one line, with the labels displayed once at the top of the form.
 - **AutoForm: Datasheet** -- The fields in each record appear in row-and-column format, with one record in each row and one field in each column. The field names appear at the top of each column.
4. Click the table or query that contains the data you want to base your form on.
5. ClickOK.



Microsoft Access applies the last auto format you used to the form. If you haven't created a form with a wizard before or haven't used the AutoFormat command on the Format menu, it uses the Standard auto format.

5.4 Managing Data

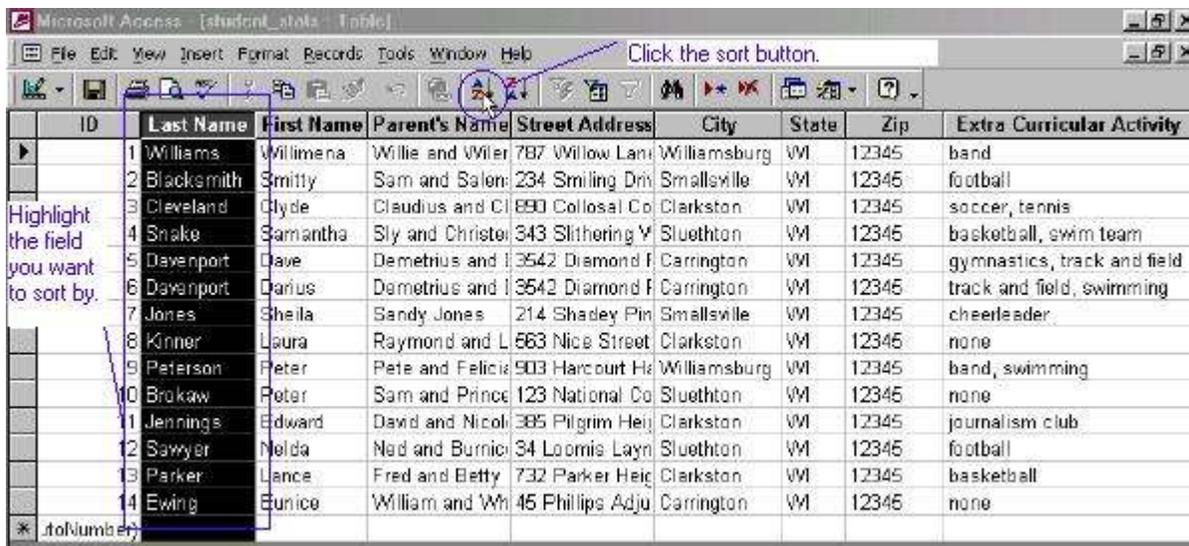
5.4.1 Sorting



Sorting Data

To sort data, simply select the field and click on the ascending or descending button on the tool bar.

EXAMPLE OF DATABASE BEFORE SORT



ID	Last Name	First Name	Parent's Name	Street Address	City	State	Zip	Extra Curricular Activity
1	Williams	Wilimena	Willie and Wiler	787 Willow Lane	Williamsburg	WI	12345	band
2	Blacksmith	Smitty	Sam and Salen	234 Smiling Drive	Smallsville	WI	12345	football
3	Cleveland	Clyde	Claudius and Cl	890 Colossal Co	Clarkston	WI	12345	soccer, tennis
4	Snake	Samantha	Sly and Christo	343 Slithering V	Sluethton	WI	12345	basketball, swim team
5	Dayenport	Dave	Demetrius and I	3542 Diamond F	Carrington	WI	12345	gymnastics, track and field
6	Davenport	Darius	Demetrius and I	3542 Diamond F	Carrington	WI	12345	track and field, swimming
7	Jones	Sheila	Sandy Jones	214 Shadey Pin	Smallsville	WI	12345	cheerleader
8	Kinner	Laura	Raymond and L	663 Nice Street	Clarkston	WI	12345	none
9	Peterson	Peter	Pete and Felicia	903 Harcourt Ha	Williamsburg	WI	12345	band, swimming
10	Brokaw	Peter	Sam and Prince	123 National Co	Sluethton	WI	12345	none
11	Jennings	Edward	David and Nicol	385 Pilgrim Hei	Clarkston	WI	12345	journalism club
12	Sawyer	Nelda	Ned and Burnic	54 Loomis Layn	Sluethton	WI	12345	football
13	Parker	Lance	Fred and Betty	732 Parker Hei	Clarkston	WI	12345	basketball
14	Ewing	Eunice	William and Wh	45 Phillips Adju	Carrington	WI	12345	none

EXAMPLE OF DATABASE AFTER SORT

ID	Last Name	First Name	Parent's Name	Street Address	City	State	Zip	Extra Curricular Activity
2	Blacksmith	Smitty	Sam and Salen	234 Smiling Dm	Smallsville	WI	12345	football
10	Brokaw	Peter	Sam and Prince	123 National Co	Bluethton	WI	12345	none
3	Cleveland	Clyde	Claudius and Cl	890 Colossal Co	Clarkston	WI	12345	soccer, tennis
6	Davenport	Darius	Demetrius and	3542 Diamond F	Carrington	WI	12345	track and field, swimming
5	Davenport	Dave	Demetrius and	3542 Diamond F	Carrington	WI	12345	gymnastics, track and field
14	Ewing	Eunice	William and Wh	45 Phillips Adju	Carrington	WI	12345	none
11	Jennings	Edward	David and Nicol	385 Pilgrim Hei	Clarkston	WI	12345	journalism club
7	Jones	Sheila	Sandy Jones	214 Shadey Pin	Smallsville	WI	12345	cheerleader
8	Kinner	Laura	Raymond and L	663 Nice Street	Clarkston	WI	12345	none
13	Parker	Lance	Fred and Betty	732 Parker Heig	Clarkston	WI	12345	basketball
9	Peterson	Peter	Pete and Felick	803 Harcourt He	Williamsburg	WI	12345	band, swimming
12	Sawyer	Nelda	Ned and Burnic	34 Loomis Layn	Bluethton	WI	12345	football
4	Snake	Samantha	Sly and Christe	343 Slithering Y	Bluethton	WI	12345	basketball, swim team
1	Williams	Wilimena	Willie and Wiler	787 Willow Lan	Williamsburg	WI	12345	band

5.4.2 Filtering a Table



You can easily filter records by selecting values in a form or datasheet. Here are the steps:

1. In a field on a form, sub form, datasheet, or sub datasheet, find one instance of the value you want records to contain in order to be included in the filter's results.
2. Select the value, and then click Filter By Selection on the toolbar. How you select the value determines what records the filter returns.
3. Repeat step 2 until you have the set of records you want.

To remove a filter and show the records that were displayed previously in the table, query, or form, click Remove Filter on the toolbar in Datasheet view or Form view.

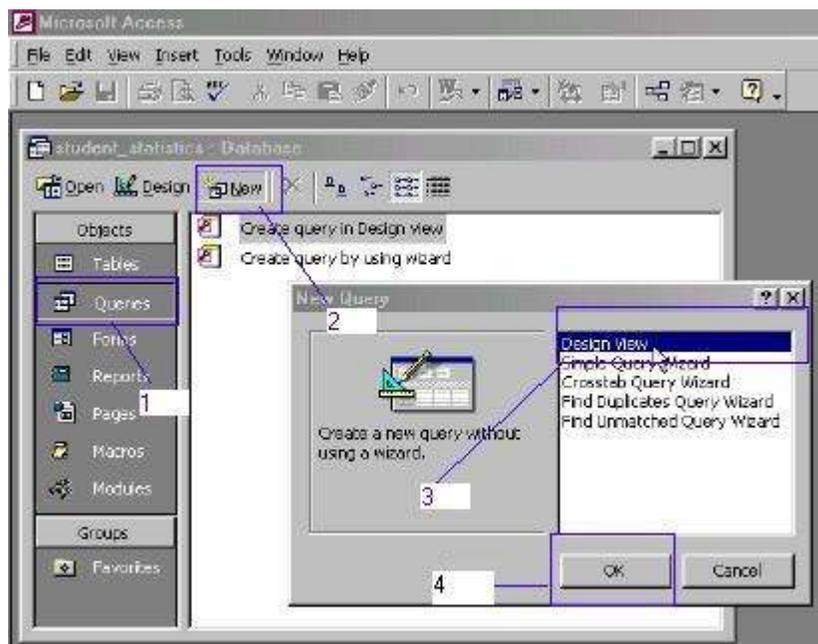
Removing a filter doesn't delete it. You can reapply the filter by clicking Apply Filter on the toolbar. When you remove a filter from a datasheet, Microsoft Access also removes any filters you applied to any subdatasheet within it.

5.4.3 Query

Queries

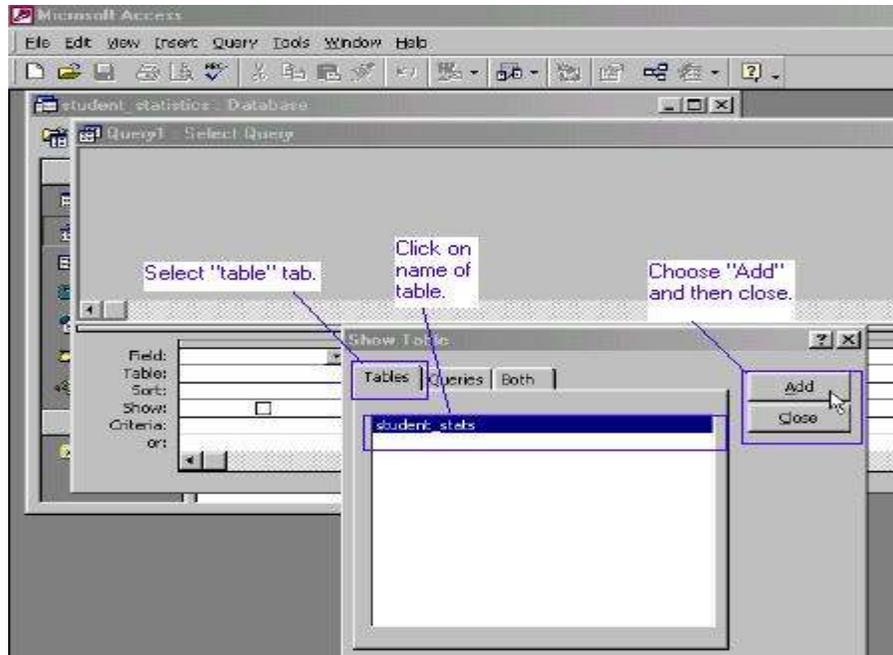
A query's purpose is to allow you to filter out specific records for display. Suppose you have created a database of all the students in a school. You want to display only the students who participate in basketball and football. That information is under the field name "Sports". You can generate a query form that will only show the names of the students who play that specific sport. You may choose any field for display. If you only want the students' first name, last name, home room, and sport, you can display only those fields without displaying fields like address, parent's name, etc. This is how you do it:

- When you have finished entering, editing, and sorting your data, save the table and close it down by clicking **File** on the menu bar. Then click **Close**.
- You should see a dialog box with a column on the left that has the words: Objects, table, query, form, reports, pages, macros, modules, groups, and favorites. Click on **query** and then **new**.
- A box should pop up. Click on **design view** and **OK**.



- The next screen will have two boxes. The box in front should say "Show table". You will have three tabs to choose from (tables, queries, both). Since you have only created one table so far, that is all you can choose right now. Be sure the

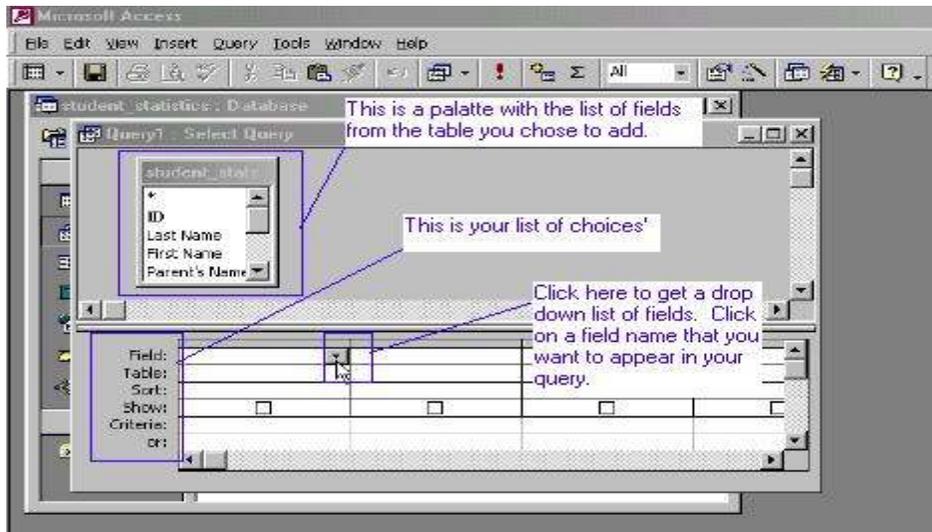
table tab is selected. Click on the name of your table and choose **add**. For this example, let us suppose the name of the table is "student stats". Click on **close** to get to the second box on this same screen.



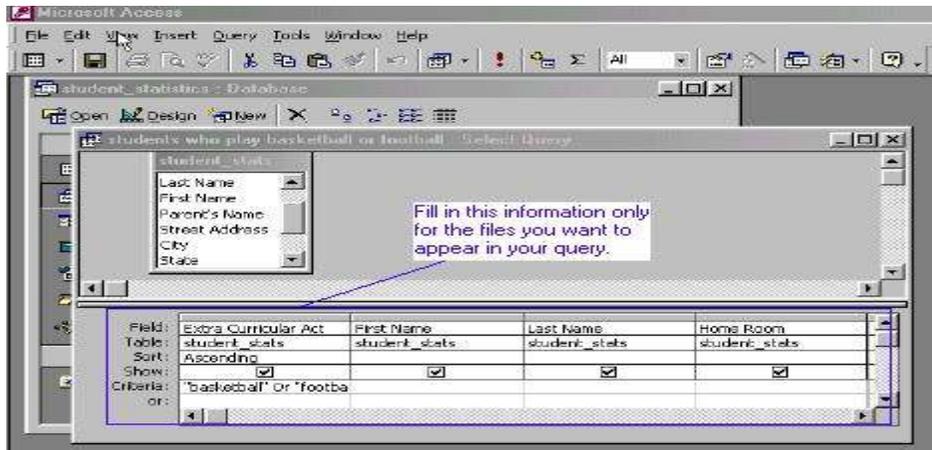
- Now a palette list of all the fields from your table should be in the *top half* of that box.

There are several fields at the *bottom half* for you to enter information. To the left of the fields at the bottom, there is a list that says: field, table, sort, show, and criteria. Click in the area beside the word "field".

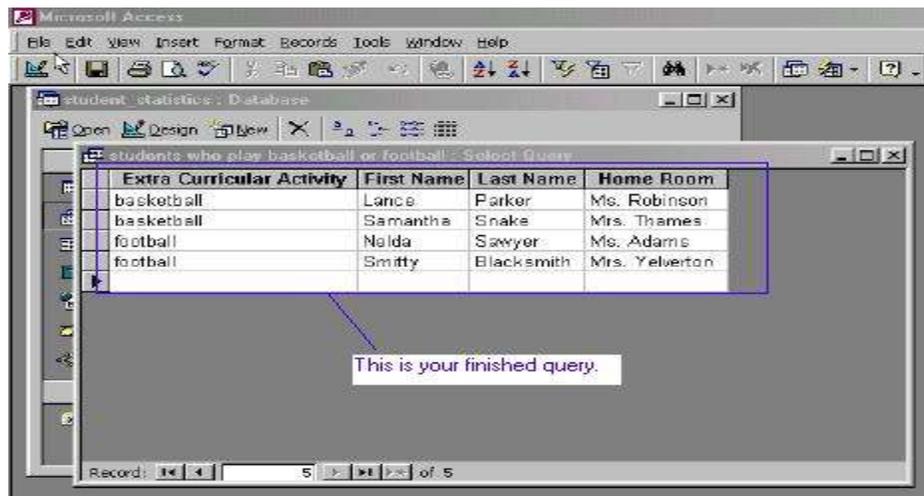
- A grey and black drop down arrow should appear. Click on that arrow and choose the field that you want to appear in your query. In this case, let us say the field we want to show is "extra curricular activities".



- Click in the area beside the word "table". Choose the name of the table you want to pull from. (this is just in case you had more than one table)
- Click in the area beside the word "sort". Decide how you want your information to appear. (ascending or descending) You may chose not to sort at all. That is fine.
- Click in the area beside the word "criteria". We do not want to see the students that play tennis, golf, hockey, etc. We only want three specific sports. You have to specify which athletes you want to see or the query will show all the athletes from every sport.
- In the criteria section you will type basketball or football exactly as it appears in your database. In the next column to the right, do this process again, except choose the field "student name".
- Do the process again to choose "home room". Since you are not looking only for students with a certain name or homeroom, you do not need to specify a criteria for these fields. (unless you really want only those students named John Smith from Mrs. Taylor's home room that play basketball or football) That kind of query will yield very little if anything at all.



- Remember we said that we only want some of the information from the table to show up on your query so you may choose which ever fields you want to appear.
- When you are finished selecting fields, click on the **view** from the menu bar and then choose **data sheet**. You should be able to see your query now with the filtered information.

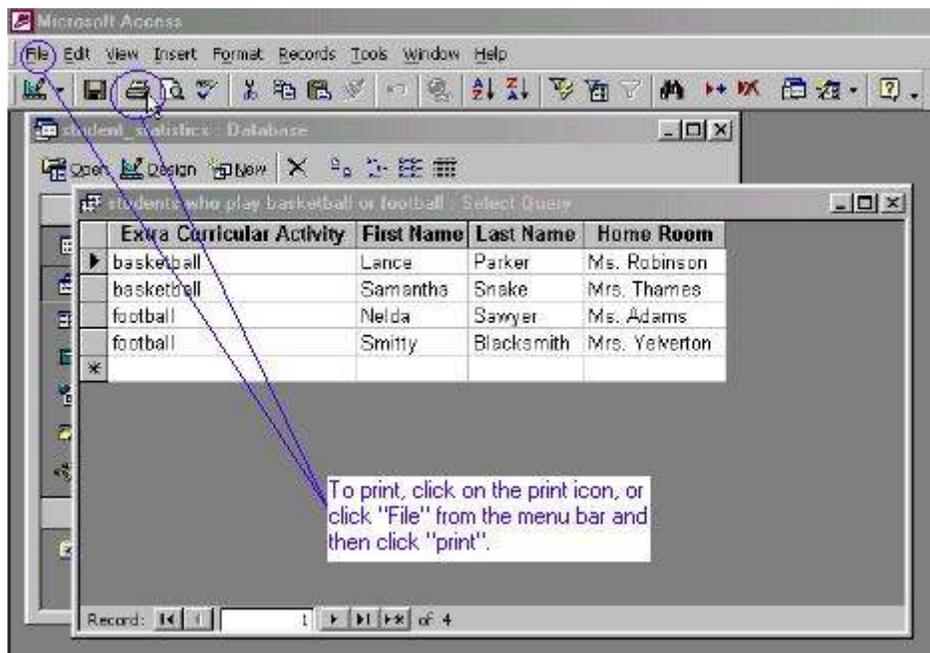


- You can print your query by clicking on **file** in your menu bar. Click **print**. You may want to print your query in landscape. In that case go to **file, page setup**, and choose **landscape** and then **print**.

5.4.4 Printing

Printing

To print a table, query or mail merge, just click on **file** and then **print**. For tables and queries, you may want to print it in landscape view so that more of the field information can fit across the page. In that case, just click on **file**, **page set up**, **landscape**, and **print**.



5.5 Report

5.5.1 Creating a Report Using AutoReport

AutoReport creates a report that displays all fields and records in the underlying table or query.

1. In the Database window, click Reports under Objects.
2. Click the New button on the Database window toolbar.
3. In the New Report dialog box, click one of the following wizards:
 - **AutoReport: Columnar.** Each field appears on a separate line with a label to its left.
 - **AutoReport: Tabular.** The fields in each record appear on one line, and the labels print once at the top of each page.
4. Click the table or query that contains the data you want to base your report on.
5. Click OK.



Microsoft Access applies the last autoformat you used to the report. If you haven't created a report with a wizard before or haven't used the AutoFormat command on the Format menu, it uses the Standard autoformat.

You can also create a single-column report based on the open table or query or on the table or query selected in the Database window. Click AutoReport on the Insert menu, or click the arrow next to the New Object button on the toolbar, and then click AutoReport. Reports created with this method don't have a report header and footer or a page header and footer.

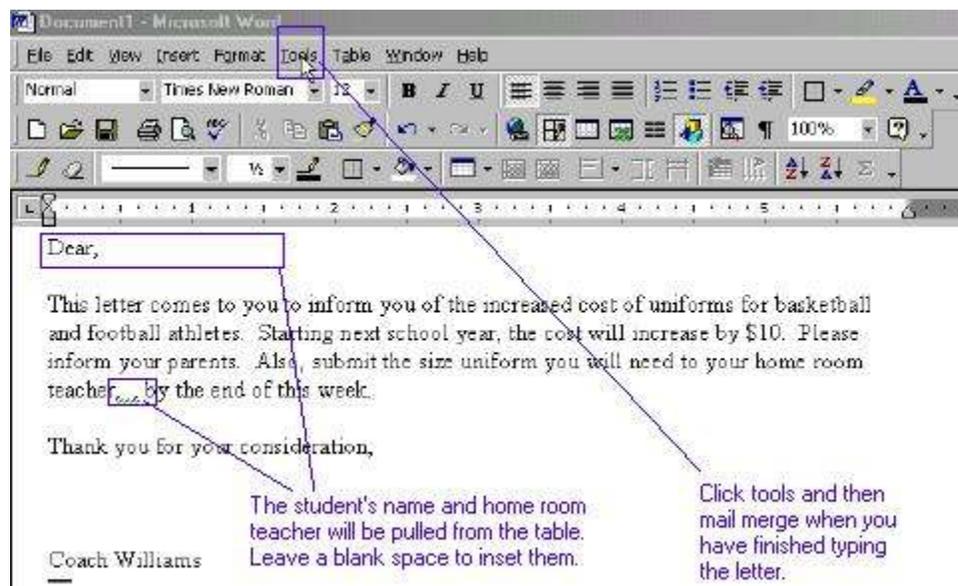
5.6 Mail Merge & Help

5.6.1 Mail Merge

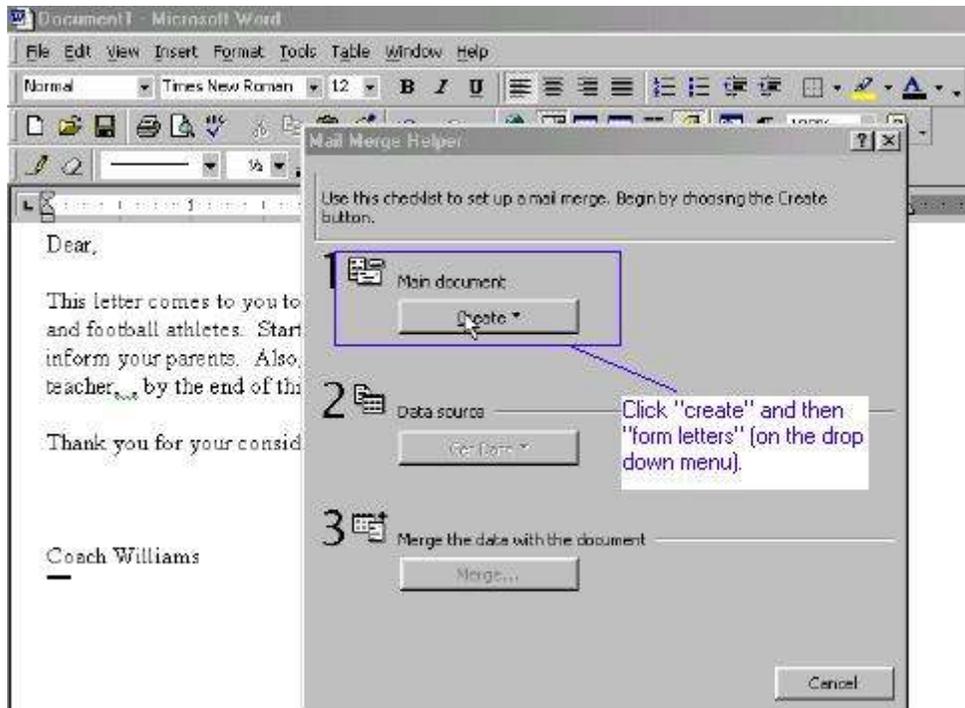
Mail Merge

Ok so you have created your database and filtered out some information in the form of a query. Now you want to send letters to those basketball and football athletes to inform them about the cost of uniforms this school year. It is time to do a mail merge. A mail merge allows you to create one word processing document and insert the names of all the students in your database or query in the appropriate places. Each student can get his own letter with only his information on it. This is how you do it:

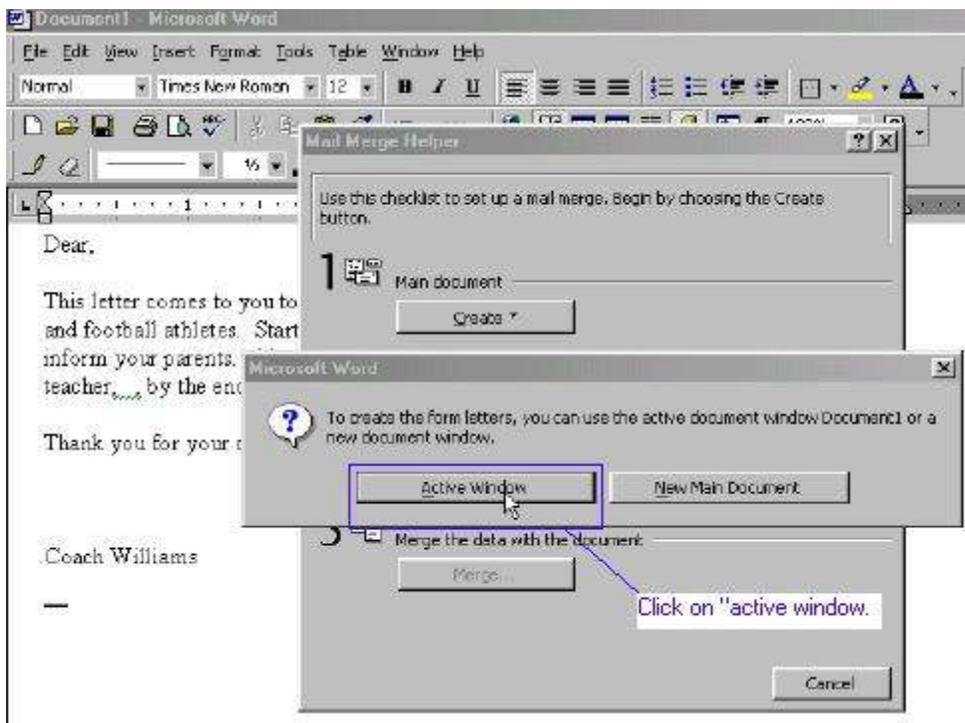
- Type your letter in Microsoft Word. Don't type in the names of the students or any information that you plan to get from your table.
- When you have typed and saved your letter, click on **tools** from the menu bar and then **mail merge**.

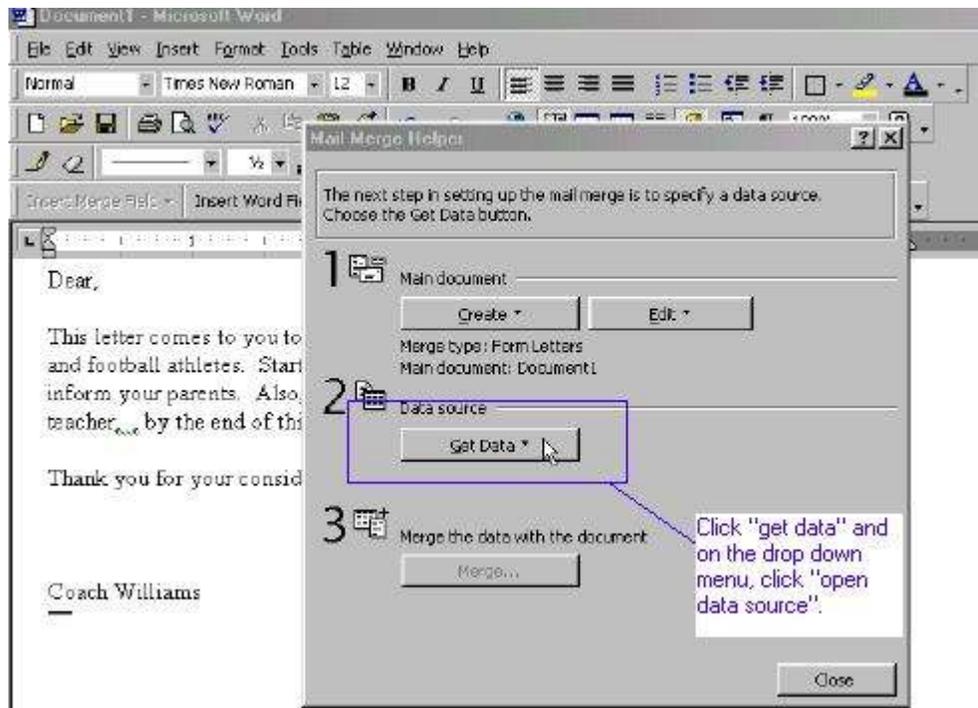


- Click on **create** and then **form letters**.

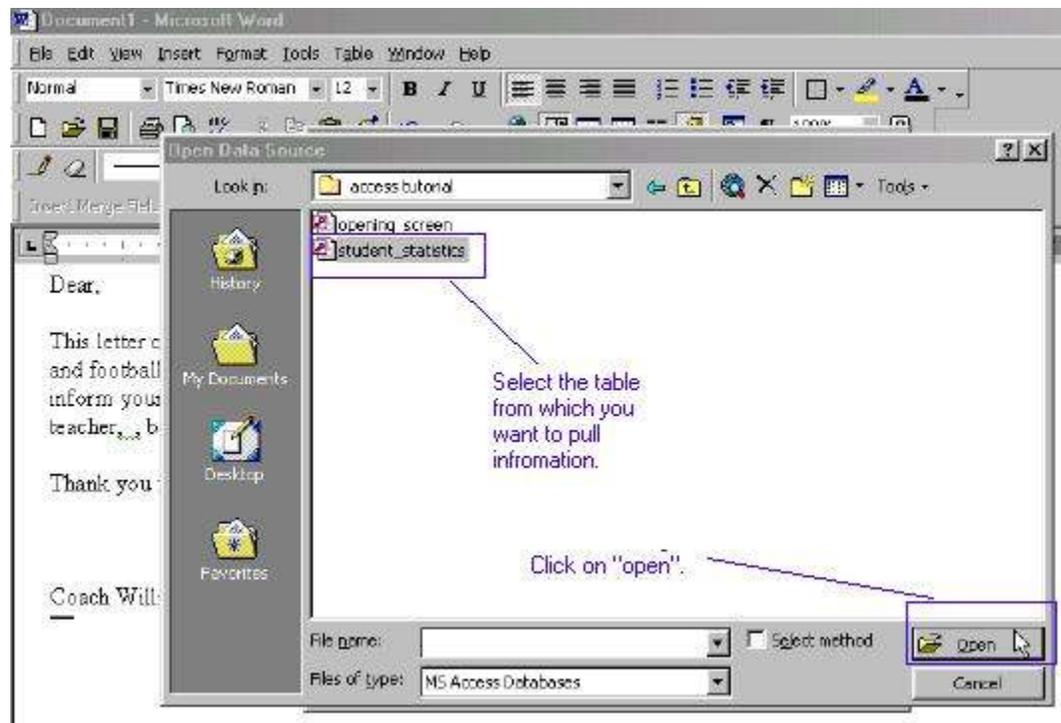


- Click on active window, get data, open data source.



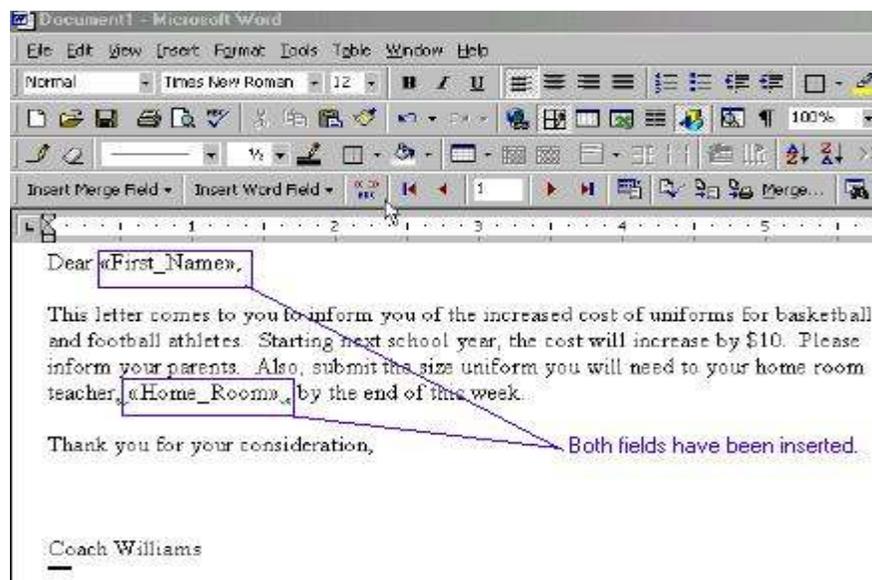
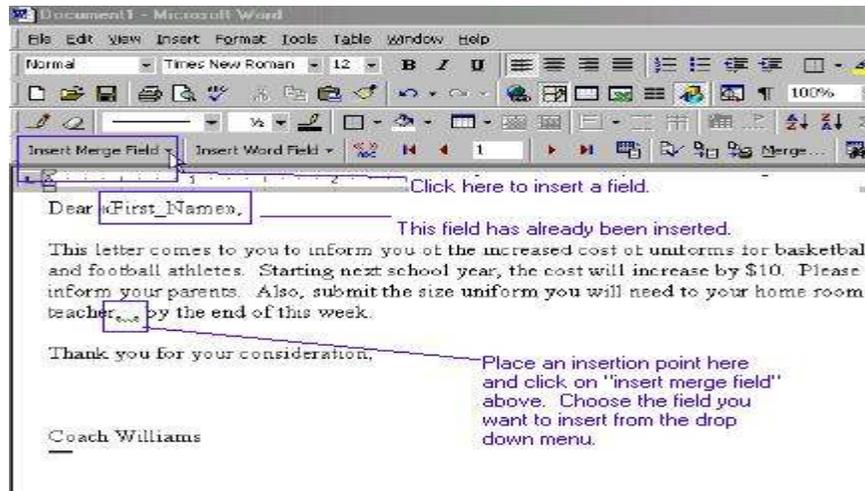


- Find your database file and open it.

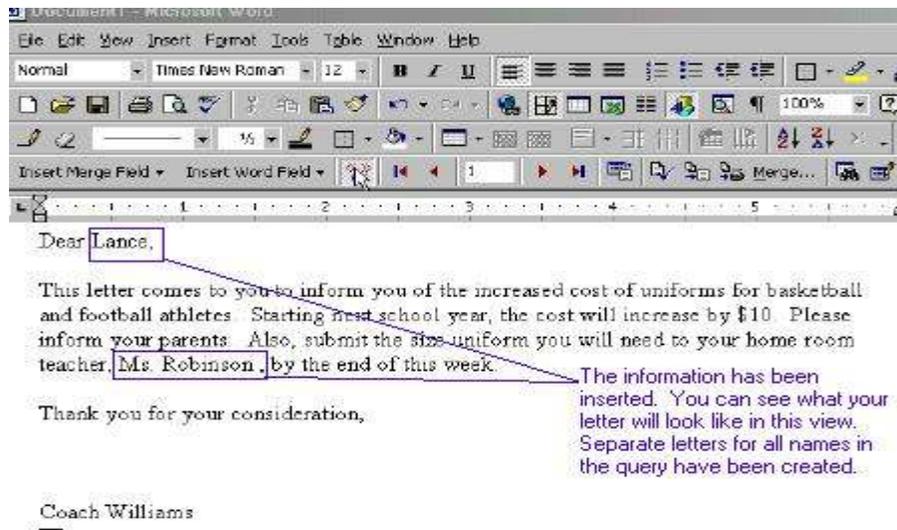


- Open your query.

- Click on the field name to want to insert. Be sure to type in the appropriate spaces. They will not be put there automatically. The field will be inserted at exactly the point you tell it. You must type a space after "dear" if you want there to be a space between it and the student's name.



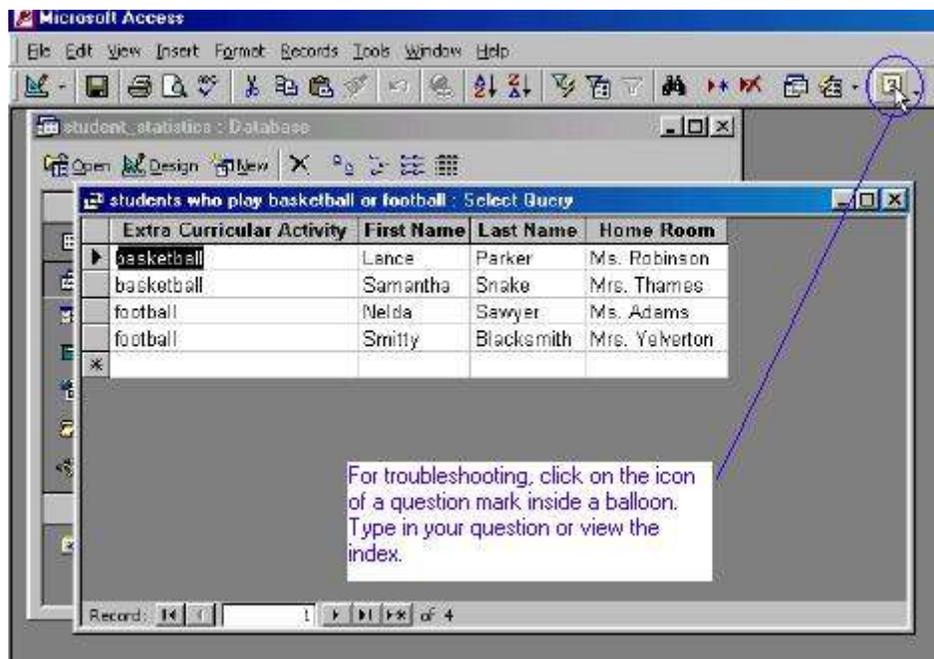
- Once you have inserted all the fields, click on the button that looks like this <<ABC>> to see how your letter will look after it is merged.
- Save your file.



5.6.2 Help



Microsoft access always has a help icon on screen. It looks like a question mark inside a thought bubble (like the ones in the comic strips). You can click on Contents to get a list of major topics; Answer Wizard to type a specific question; or Index to type key words that may be listed.



Module 6

Networking and Internet

Networking and Internet requires you to understand the concept of a networking and Internet and demonstrate competence in using a networking and Internet.

Learning Objectives :

After completing this section, you shall be able to

- Understand what a network is and how it is connected and operated.
- Know the Types of Network.
- Understand the advantages of network
- Understand the usage of network
- Topologies
- Understand what a File Server is, what a Workstation is
- Know about Unshielded Twisted Pair (UTB) cables and its categories
- Browse the Web and understand the concept of email.

Module 6 Networking & Internet

6.1 Introduction

6.1.1 What is Network?



What is a Network?

A network is the interconnection of computers for the sharing of information and resources.

Why Network Computers?

Allow people to share information, software, and any resources, including hardware, more efficiently.

What Networking Can Do?

- Printer sharing
- Printer spooling
- Disk sharing
- File sharing

Why Network Classroom Computers?

- Program security
- Personal work files are much more secure
- Reduced need for floppy disks
- Shared files
- Shared printers
- Shared resources
- Easy maintenance

6.1.2 Administrative Networks



Using Computers for School Administration

- Storing student demographic information
- Scheduling students
- Storing school-wide attendance records and generating daily attendance reports
- Storing student achievement records and generating reports for parents
- Generating reports for the State Department of Education

Major Benefits of Administrative Networks

- Many people can simultaneously view and edit student records
- Data entry can be more efficient
- Centralized storage of student information
- Backing-up copies of all critical information files is centralized
- Access to productivity software is shared
- Access to expensive peripheral equipment is shared

Major Concerns of Using Administrative Networks

- The security of the system
- Input errors are much more difficult to prevent
- Considerable cost
- In-service training for network users

Approaches to Implementing an Administrative Network

Install an "administration only" network

- limited to a relatively small number of people
- security of the information on the network
- user of the network by new users can be phased in

Install a School-Wide network

- both administrative and instructional programs will coexist
- allow student performance results to be integrated into the administrative system for record keeping and reporting
- attendance can be viewed and updated from anywhere in the school
- allow electronic communication to everyone in the school

- provide an excellent infrastructure for individualized instruction
- entail a significant leap in sophistication and complexity, and require a great deal of planning

One of the most common mistakes school administrators make is to spend considerable amounts of money on the hardware and software for computerized administration packages, but not to budget for staff training. Training is the key component in the successful implementation of computers in school offices.

6.1.3 School-Wide Networks



Why Consider School-Wide Networking?

A school-wide network can be defined as a network connecting computers throughout the school, providing communication between those computers, and giving each computer access to all of the resources on the network.

- Access for everyone -- any time, anywhere
- Security and control
- Ease of maintenance

Uses for a School-Wide Network

- Networks for student learning
- Network access to the Internet
- Networks for school administration

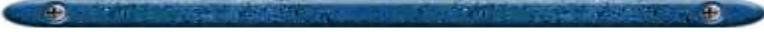
Keys to successful School-Wide Networks

- develop long-term and short-term plans
- involve the school staff
- has a realistic vision
- define goals and objectives
- determine the needs of the users
- focus what should be done, not the technology
- allow future flexibility while meeting present needs
- learn from those who have designed school networks before
- plan for the support for teachers and students, office staff and administrators, and technical support for hardware and software

Required Resources for a School-Wide Network

- hardware
- software
- physical facilities
- furniture
- supplies

6.1.4 Why do we use networks



Computers have become an important part of today's scenario. For Example in school it is an important tool for both teachers and students. An effective way to connect these computers, and everyone using them, is to set up a network. Networks have many uses in an academic setting.

Shared resources

Local connections such as a directly connected printer or resources like printers or file servers shared over a small LANs

Inter-Computer Communication

Some services such as Usenet News involve communications between computers where no human operator is involved.

File transfer and Archives

Freeware, shareware, etc.

Inter-Personal Communication

E-mail

Interactive Communications

Chat software: MUDS, MOOs, graphic and 3-D environments, collaborative computing

6.1.5 Advantages of networks

No matter what type of computer equipment you are using, installing a network will make your life as an educator run more smoothly. Current networking software provides many advantages for the educational environment.

Program Security

- Store copies of programs in locked, read-only spaces on the server
- Protect program files from unauthorized copying
- Prevent tampering with programs

More Secure Personal Work Files

- Save personal work in private spaces on hard disk
- Password protected from inadvertent or malicious copying and/or deletion
- No loss of information from damaged or lost floppy disks

Reduced Need for Floppy Disks

- Floppy disks are needed only for archiving old files
- Boot disks may be needed to start up workstations (Remote booting removes the need for boot disks.)

Shared Files

- Share data and program files to all network users
- Publicly accessible area to store assignments, tests, clipart, and other files
- No copying of entire class sets of data disks

Shared Printers

- Share the cost of printers among all users
- Gain access to different types of printers
- Current networking software has built-in print spooling capabilities

Easy Maintenance

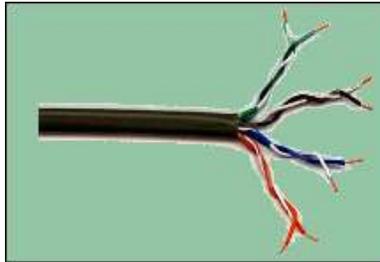
- Well-planned network meets needs for several years
- Single major task of maintenance of boot disks for workstations

6.2 What constitutes a network?

6.2.1 Network Media



Unshielded Twisted Pair (UTP) Cable



- consist of two insulated copper wires arranged in a regular spiral pattern to minimize the
- electromagnetic interference between adjacent pairs
- low frequency transmission medium
- low cost, small size, and ease of installation
- limited distance, usually less than 100 meters
- the most popular and is generally the best option for school networks

Categories of UTP Cable

Category 1 Voice Only (Telephone Wire)

Category 2 Data to 4 Mbps (LocalTalk)

Category 3 Data to 10 Mbps (Ethernet)

Category 4 Data to 20 Mbps (16 Mbps Token Ring)

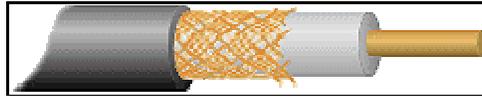
Category 5 Data to 100 Mbps (Fast Ethernet)

- Category 5 cable is widely used for a 10 Mbps Ethernet network
- 10BaseT is the IEEE 802.3i standard specification for 10Mbps Ethernet transmission over UTP (Category 3, 4, or 5) cable
- The standard connector for UTP cable is an RJ-45 connector, which looks like a large telephone modular connector



RJ-45 connector

Coaxial (Coax) Cable



- like the wire used to connect a TV or VCR
- has an inner conductor surrounded by a braided mesh
- both conductors share a common center axial, hence the term "co-axial"
- bandwidth of up to 400 Mhz
- highly resistant to signal interference
- used for long distance (300-600 meters)
- quite bulky and sometimes difficult to install
- the most common type of connector used with coaxial cables is the BNC (Bayone-Neill-Concelman) connector



BNC connector

- has two types of coaxial cable:

Thin coaxial cable

- refers to as thinnet
- 10Base2 is the IEEE standard for Ethernet running on thin coaxial cable
- the 2 refers to the approximate maximum segment length being 200 meters
- is popular in school networks, especially linear bus networks

Thick coaxial cable

- refers to as thicknet
- 10Base5 is the IEEE standard for Ethernet running on thick coaxial cable
- the 5 refers to the approximate maximum segment length being 500 meters
- has an extra protective plastic cover that helps keep moisture away from the center conductor
- difficult to bend and install
- used for long distance linear bus networks

Fiber Optic



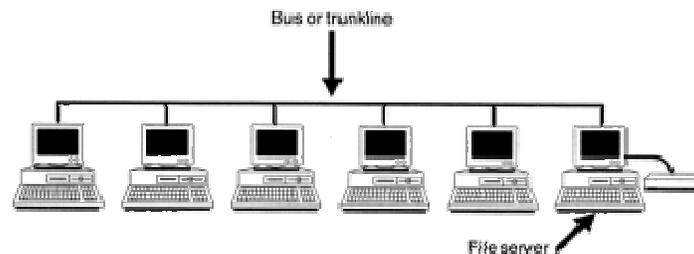
- consist of a center glass core surrounded by several layers of protective materials
- immunity to environmental interference
- greater capacity (bandwidth of up to 2 Gbps)
- used for distances up to 100 kilometers
- carry information at vastly greater speeds
- very expensive
- small size and lighter weight
- difficult to install and modify, require highly skilled installers
- adding additional nodes is difficult
- 10BaseF refers to the specifications for fiber optic cable carrying Ethernet signals

Wireless

- use high frequency radio signals or infrared light beams to communicate between the workstations and the server
- need transceiver/antenna to send and receive data
- widely used for connecting laptop computers to the LAN
- expensive
- poor security
- slower than LANs using cabling
- susceptible to electrical interference from lights and radios

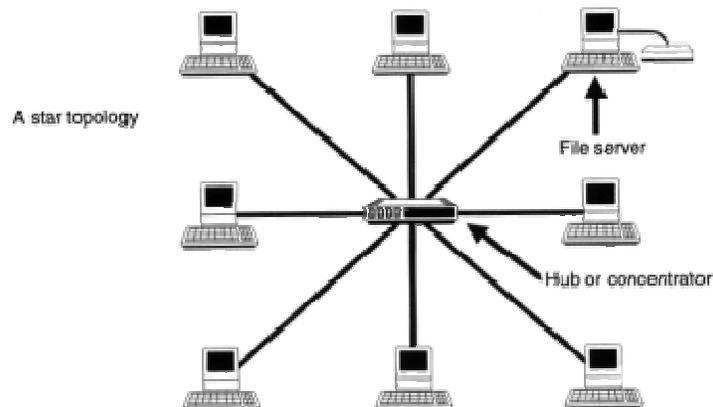
6.2.2 Topologies

Linear Bus (Trunkline)



- consist of a main run of cable with a terminator at each end
- the file server, workstations, and peripherals are connected to the linear cable
- easy to connect a node to a linear bus
- less expensive, require less cable
- entire network shuts down if there is a break in the main cable
- difficult to identify the problem if the entire network shuts down

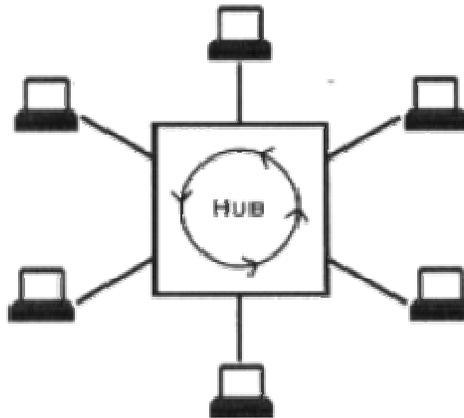
Star



- each node connected directly to a central network hub or concentrator
- a separate cable connects to each computer, and if one cable breaks, only a single computer should be affected
- the hub or concentrator manages and controls all functions of the network. It also acts as a repeater for the data flow
- easy to install and wire
- no disruptions to the network when connecting or removing devices
- easy to detect network problems

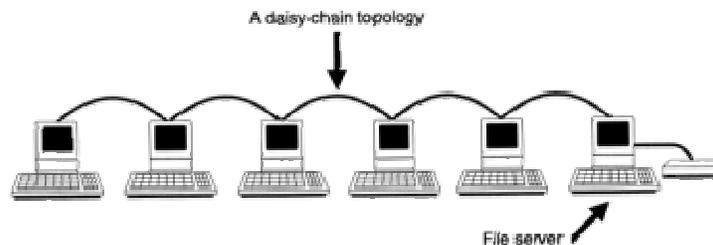
- more expensive, requires a hub and more cable length than a linear bus topology
- all nodes shut down if the hub or concentrator fails

Star Wired Ring (Token Ring)



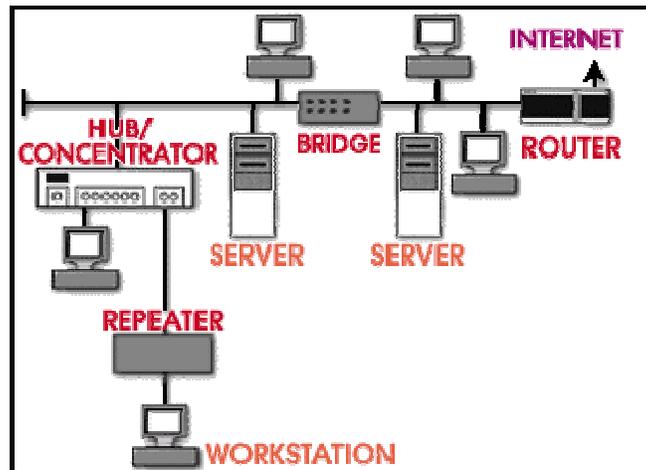
- developed by IBM
- employ a special coded message called a token that the operating software passes in sequence to each computer on the network
- created for IBM-compatible computers
- 4 or 16 Mbps using twisted pair

Daisy-Chain



- similar to a bus, except the electrical signal is routed through each computer as it moves along the line
- easy to install
- entire network shuts down if there is a problem on a node
- mainly used on the Macintosh network
- slow
- not practical in multi-room network installations

6.2.3 Network Hardware



File Server

A File server is a high capacity computer that provides various resources to the network. the heart of a network

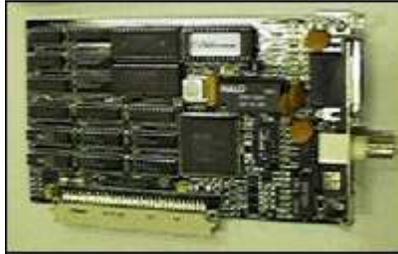
- need a very fast computer with a large amount of RAM and storage space, a fast network interface card, and a tape back-up device
- need network operating system such as Novell Netware, Windows NT server, or Apple Share
- control the communication of information between the nodes on a network

Workstations

A computer in a network is called workstation or client.

- a computer connected to a network
- need a network interface card
- not necessarily need floppy disk drives or hard disks since files can be saved on the file server

Network Interface Cards (NICs)



NIC provides the link between your computer and your network.

- provide the physical connection between the network and the workstation
- most are internal, with the card fitting into an expansion slot inside the computer
- some build on the motherboard
- affect the speed and performance of a network
- three common network interface connections: Ethernet cards, LocalTalk connectors, Token Ring cards

Hubs/Concentrators

A hub is a device whose primary function is to send and receive signals along the network between the nodes connected to it.

- connect multiple devices to the network
- commonly found in star and star-wired ring topology networks
- entire network shuts down if there is a problem on a hub
- serve as a central meeting place for cables from computers, servers and peripherals
- usually configured with 4, 8, 12, or 24 RJ-45 ports

Repeaters

A repeater is a device that regenerates and amplifies signals to create long-distance networks

- simply receive, amplify and rebroadcast the signals
- some repeaters provide basic error-checking
- can be separate devices or they can be incorporated into a concentrator
- inexpensive, used to overcome distance limitations

Bridges

A bridge is a device that links two homogenous packet-broadcast local networks. It accepts all packets from each network addressed to devices on the other, buffers them, and retransmits them to the other network.

- connect two or more networks using the same address method or protocol
- can provide some addressing information
- monitor and manage the traffic to maintain optimum performance on both sides of the network
- often used when LANs reach their capacity of nodes

Switches

A switch is a high-speed multiport bridge. Today, switches are replacing multiport repeaters or concentrators in a UTP environment.

- an intelligent hub that maintains a bridging table, keeping track of which hardware addresses are located on which network segment
- more efficient than with any other type of hub
- ability to dedicate bandwidth to each port on the switch

Routers

Routers are similar to bridges in that they link two or more physically separate network segments. The network segments linked by a router, however, remain logically separate and can function as independent networks.

- translate information from one network to another; similar to a super-intelligent bridge
- maintain a map of the network, select the best route for data
- access to more network level knowledge than is available to bridges
- information on source addresses, destination addresses, path distances, and in some cases,
- segment bandwidth and segment status are contained in the router's routing table
- translates local addresses (eg. "spot") into network addresses (eg. 131.44.99.12)
- can translate messages with different addressing methods
- can act as firewalls (many ISP's block traffic at the router level)
- direct signal traffic efficiently
- route messages between any two protocols
- can route messages between linear bus, star, and token ring topologies
- can route messages across fiber optic, coaxial, and twisted-pair cabling

6.2.4 Network Operating System

A network operating system is a supervisory software program that resides on the server. It controls how the network operates by defining who can use the network and how information and peripherals are shared among users.

Novell Netware

- most popular
- good solution of a PC and Mac network

Microsoft Windows NT

- getting popular
- good solution of PC networks
- easier to set up than Novell Netware

AppleShare

- Macintosh only
- does not scale to fit a large network

UNIX/NFS

6.3 Others

6.3.1 Media Access Method



How computing devices access the network cable and send data is known as the media access method. There are four commonly used media access methods: Ethernet, Token Ring, Local Talk, and FDDI.

Ethernet

- most popular media access method
- use access method called CSMA/CD (Carrier Sense Multiple Access/Collision Detection)
- allow for linear bus, star, or tree topologies
- transmit data over UTP, thin-coaxial, thick-coaxial and fiber optic cables at rates of 10 Mbps
- Fast Ethernet supports 100 Mbps, but requires faster hubs and network interface cards

Token Ring

- developed by IBM in the mid 1980s
- use a star-wired ring topology over shielded and unshielded twisted-pair wiring
- a central hub (referred to as a "MAU" Multistation Access Unit) is at the center of the ring
- Two versions of Token Ring: 4 Mbps and 16 Mbps
- use a token passing process to circulate packets around the ring.
- more expensive than Ethernet
- good option for PC networks

Local Talk

- developed by Apple Computer, Inc. for Macintosh computers
- best suited to small networks of Macs
- allow for linear bus, star, or tree topologies using twisted pair cable
- up to 32 devices (computers, printers, and file server)
- slow, data transmits at only 230 Kbps
- use the CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance) process for transmitting data. CSMA/CA is similar to CSMA/CD
- single network can be up to 1,000 feet (305 meters)

6.3.2 Terminology



10Base2 - Ethernet specification for thin coaxial cable, transmits signals at 10 Mbps (megabits per second) with a distance limit of 185 meters per segment.

10Base5 - Ethernet specification for thick coaxial cable, transmits signals at 10 Mbps (megabits per second) with a distance limit of 500 meters per segment.

10BaseF - Ethernet specification for fiber optic cable, transmits signals at 10 Mbps (megabits per second) with a distance limit of 1000 meters per segment.

10BaseT - Ethernet specification for unshielded twisted pair cable (category 3, 4, or 5), transmits signals at 10 Mbps (megabits per second) with a distance limit of 100 meters per segment.

Backbone - A cable to which multiple nodes or workstations are attached.

Cable - Transmission medium of copper wire or optical fiber wrapped in a protective cover.

Coaxial cable - Cable consisting of a single copper conductor in the center surrounded by a plastic layer for insulation and a braided metal outer shield.

E-mail - Electronic mail. Messages sent through a computer network; they may also include graphics and files.

Ethernet - The world's most popular networking system. Designed to run all popular network protocols, Ethernet is used on over 40 million computers worldwide. With a transfer speed of 10 million bits per second. Ethernet is the least expensive high speed LAN alternative.

FTP - File Transfer Protocol. The Internet protocol (and program) used to transfer files between hosts.

Fast Ethernet - A new Ethernet standard that supports 100 Mbps using category 5 twisted pair or fiber optic cables.

Fiber optic cable - A cable, consisting of a center glass core surrounded by layers of plastic that transmits data using light rather than electricity. It has the ability to carry more information over much longer distances.

File server - A computer which contains files that can be used by everyone connected to the network.

Hub - A hardware device that contains multiple independent but connected modules of network and internetwork equipment. Hubs can be active (where they repeat signals sent through them) or passive (where they do not repeat but merely split signals sent through them).

Internet - A global network of networks used to exchange information using the TCP/IP protocol. It allows for electronic mail and the accessing and retrieval of information from remote sources.

LAN - Local Area Network. A network connecting computers in a relatively small area such as a building.

mbps - Megabits per Second. A unit showing the speed of a network.

Network interface card (NIC) - A board that provides network communication capabilities to and from a computer.

Network operating system (NOS) - Operating system which runs on the file server designed to pass information and communicate between more than one computer. Examples include AppleShare, Novell NetWare, and Windows NT Server.

Novell - The company which makes Netware, the most commonly used network server software for IBM computers.

Operating system - the software of a computer which controls the execution of programs.

Peripheral - A device attached to a computer, I. E. printer, modem, CD-ROM etc.

Port - A connection point for a cable.

RJ-45 - Standard connectors used for unshielded twisted-pair cable.

Repeater - A device used in a network to strengthen a signal as it is passed along the network cable.

Router - A device which connects two networks and permits packets of information to move between networks only if necessary.

Server - A computer providing a service to network users.

Speed of Data Transfer - The rate at which information travels through a network, usually measured in megabits per second.

Terminator - A device that provides electrical resistance at the end of a transmission line. Its function is to absorb signals on the line, thereby keeping them from bouncing back and being received again by the network.

Topology - Physical topology of a network refers to the configuration of cables, computers, and other peripherals. Main types of physical topology are: linear bus (backbone), star, star-wired ring, and hybrid. Logical topology is the method used to pass the information between workstations. Examples are: Ethernet, AppleTalk, Token Ring, and TCP/IP.

Twisted pair - Network cabling that consists of four pairs of wires that are manufactured with the wires twisted to certain specifications. Available in shielded and unshielded versions.

WWW - World Wide Web is comprised of millions of documents, stored on computers on the Internet. The documents are all linked together and make up most of the information available on the Internet.

WAN - Wide Area Network. A communications network which connects together a number of local networks.

Workstation - A computer connected to a network which is used by a person to run application programs.

6.4 INTERNET

6.4.1. Introduction

Internet is “**NETWORK OF NETWORKS**”. . The Internet is a worldwide collection of computer networks, cooperating with each other to exchange data using a common software standard. Through telephone wires and satellite links, Internet users can share information in a variety of forms. The size, scope and design of the Internet allows users to:

- connect easily through ordinary personal computers and local phone numbers.
- exchange electronic mail (E-mail) with friends and colleagues with accounts on the Internet.
- post information for others to access, and update it frequently.
- access multimedia information that includes sound, photographic images and even video , and
- access diverse perspectives from around the world.



6.4.2. World Wide Web

World Wide Web is a system of interlinked hypertext documents accessed via the Internet. With a Web browser, a user views Web pages that may contain text, images, videos, and other multimedia and navigates between them using hyperlinks. The World Wide Web was created in 1989 by Sir Tim Berners-Lee, working at CERN in Geneva, Switzerland.

6.4.3 Inter Service Provider

An **Internet service provider** (abbr. **ISP**, also called **Internet access provider** or **IAP**) is a company or business that provides access to the Internet and related services. In the past, most ISPs were run by the phone companies. Now, ISPs can be started by just about any individual or group with sufficient money and expertise. In addition to Internet access via various technologies such as dial-up and DSL, they may provide a combination of services including Internet transit, domain name registration and hosting, web hosting, and colocation.

6.4.4 Uniform Resource Locator(URL)

URL is the global address of documents and other resources on the World Wide Web.

The first part of the address is called a **protocol identifier** and it indicates what protocol to use, and the second part is called a **resource** name and it specifies the IP address or the domain name where the resource is located. The protocol identifier and the resource name are separated by a colon and two forward slashes.



6.4.5 Hyperlink

An element in an electronic document that links to another place in the same document or to an entirely different document. Typically, you click on the hyperlink to follow the link. Hyperlinks are the most essential ingredient of all hypertext systems, including the World Wide Web.

6.4.6 Make up and structure of web address

The first part of a URL (before the two slashes) tells you the type of resource or method of access at that address. For example:

- http - a hypertext document or directory
- ftp - a file available for downloading or a directory of these files
- news - a newsgroup
- file - a file located on a local drive, for instance, the hard drive of your computer

Here are a few examples:

http://www.learnthenet.com

The home page for Learn the Net.

ftp://rtfm.mit.edu/pub/

A directory of files at MIT available for downloading.

news:rec.gardens.roses

A newsgroup on rose gardening.

http://blogs.reuters.com/soccer

A blog about soccer.

The second part is typically the address of the computer where the [data](#) or service is located. Additional parts may specify the name of a file, the port to connect to, or the text to search for in a [database](#).



You enter the URL of a site or web page by typing it into the **Address** bar of your web browser.



Browsers can store the URLs that you want to revisit by adding them to a special list. Netscape Navigator and Firefox call them **Bookmarks**; Microsoft Explorer calls them **Favorites**. Once you add a URL to your list, you return to that web page simply by clicking on the name on the list, instead of retyping the entire URL.

Most of the URLs you will use start with **http**, which stands for **Hypertext Transfer Protocol**, the method by which HTML files are transferred over the Web. Here are few other things to know about URLs:

- A URL usually has no spaces.
- A URL always uses forward slashes (/).
- URLs aren't case sensitive. So typing "http://www.learnthenet.com" or "HTTP://WWW.LEARNTHENET.COM" or any variation of upper and lower case letters takes you to the same page.
- If you type a URL incorrectly, your browser will not be able to locate the site or resource you want. Should you get an error message or access the wrong site, make sure you spelled the address correctly.
- You can find the URL behind any link by placing your cursor over the link. The pointer turns into a hand and the URL appears in your browser's **status bar**, usually located at the bottom of your browser window.

6.5 Web Browser

6.5.1 Meaning

A **web browser** is a software application which enables a user to display and interact with text, images, videos, music and other information typically located on a Web page at a website on the World Wide Web or a local area network. Text and images on a Web page can contain hyperlinks to other Web pages at the same or different website. Web browsers allow a user to quickly and easily access information provided on many Web pages at many websites by traversing these links. Web browsers format HTML information for display, so the appearance of a Web page may differ between browsers

6.5.2 Types of Web Browsers

Some of the Web browsers available for personal computers include Internet Explorer, Mozilla Firefox, Safari, Opera, Flock and AOL Explorer, in order of descending popularity (in March 2008) Web browsers are the most commonly used type of HTTP user agent. Although browsers are typically used to access the World Wide Web, they can also be used to access information provided by Web servers in private networks or content in file systems.

6.5.3 Search Engines

A **Web search engine** is a search engine designed to search for information on the World Wide Web. Information may consist of web pages, images and other types of files.

Some search engines also mine data available in newsgroups, databases, or open directories. Unlike Web directories, which are maintained by human editors, search engines operate algorithmically or are a mixture of algorithmic and human input.

6.6 Security Issues On The Internet

6.6.1 How To Identify A Secure Web Address?

Anytime a web page asks you for sensitive information, you need to be able to identify if the page is secure or not. The ability to recognize a secure web connection is extremely important as online fraud cases have increased substantially from year to year.

There are two general indications of a secured web page:

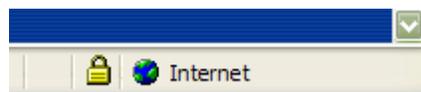
- Check the web page URL

Normally, when browsing the web, the URLs (web page addresses) begin with the letters "http". However, over a secure connection the address displayed should begin with "https" - note the "s" at the end.

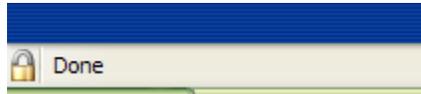
Try it! - Visit our home page (<http://www.ssl.com>). Note the URL begins with the "http" meaning this page is not secure. Click the link in the upper-right hand corner to "Log in". Notice the change in the URL? It now begins with "https", meaning the user name and password typed in will be encrypted before sent to our server.

- Check for the "Lock" icon

There is a de facto standard among web browsers to display a "lock" icon somewhere in the window of the browser (NOT in the web page display area!) For example, Microsoft Internet Explorer displays the lock icon in the lower-right of the browser window:



As another example, Mozilla's Firefox Web Browser displays the lock icon in the lower-left corner:



THE LOCK ICON IS NOT JUST A PICTURE! Click (or double-click) on it to see details of the site's security. This is important to know because some fraudulent web sites are built with a bar at the bottom of the web page to imitate the lock icon of your browser! Therefore it is necessary to test the functionality built into this lock icon. Furthermore, it is very important to **KNOW YOUR BROWSER!** Check your browser's help file or contact the makers of your browser software if you are unsure how to use this functionality.

Try it! - Visit our home page (<http://www.ssl.com>). Click the link to "Log in" to initiate a secure session. Note the lock icon display in YOUR browser. Click the icon, or double-click (varies by browser), and examine the security information displayed about the web site. If there is no display at the bottom of your browser try clicking "View" in the main menu and make sure "Status Bar" is checked.

6.6.2 Digital Certificate For A Web Site

Digital certificate is an electronic "credit card" that establishes your credentials when doing business or other transactions on the Web. It is issued by a certification authority (CA). It contains your name, a serial number, expiration dates, a copy of the certificate holder's public key (used for encrypting messages and digital signatures), and the digital signature of the certificate-issuing authority so that a recipient can verify that the certificate is real. Some digital certificates conform to a standard, X.509. Digital certificates can be kept in registries so that authenticating users can look up other users' public keys.

6.6.3 Encryption

In cryptography, **encryption** is the process of transforming information (referred to as plaintext) using an algorithm (called cipher) to make it unreadable to anyone except those possessing special knowledge, usually referred to as a key. The result of the process is **encrypted** information (in cryptography, referred to as cipher text). In many contexts, the word **encryption** also implicitly refers to the reverse process, **decryption** (e.g. "software for encryption" can typically also perform decryption), to make the encrypted information readable again (i.e. to make it unencrypted).

6.6.4. INTERNET THREAT (Viruses, Worms, Trojan Horses, Spyware)

A **computer virus** is a computer program that can copy itself and infect a computer without permission or knowledge of the user. The term "virus" is also commonly used, albeit erroneously, to refer to many different types of malware and adware programs. The original virus may modify the copies, or the copies may modify themselves, as occurs in a metamorphic virus. A virus can only spread from one computer to another when its host is taken to the uninfected computer, for instance by a user sending it over a network or the Internet, or by carrying it on a removable medium such as a floppy disk, CD, or USB drive. Meanwhile viruses can spread to other computers by infecting files on a network file system or a file system that is accessed by another computer. Viruses are sometimes confused with computer worms and Trojan horses. A **worm** can spread itself to other computers without needing to be transferred as part of a host, and a **Trojan** horse is a file that appears harmless. Worms and Trojans may cause harm to either a computer system's hosted data, functional performance, or networking throughput, when executed. In

general, a worm does not actually harm either the system's hardware or software, while at least in theory, a Trojan's payload may be capable of almost any type of harm if executed. Some can't be seen when the program is not running, but as soon as the infected code is run, the virus kicks in. That is why it is so hard for people to find viruses themselves and why they have to use spyware programs and registry processors.

Malware is software designed to infiltrate or damage a computer system without the owner's informed consent. It is a portmanteau of the words **malicious** and **software**. The expression is a general term used by computer professionals to mean a variety of forms of hostile, intrusive, or annoying software or program code.

6.6.5 Anti Virus Softwares

Antivirus software are computer programs that attempt to identify, neutralize or eliminate malicious software. Antivirus is so named because the earliest examples were designed exclusively to combat computer viruses; however most modern antivirus software is now designed to combat a wide range of threats, including worms, phishing attacks, rootkits, trojan horses and other malware. Antivirus software typically uses two different approaches to accomplish this:

- Examining (scanning) files to look for known viruses matching definitions in a virus dictionary, and
- Identifying suspicious behavior from any computer program which might indicate infection.

The second approach is called heuristic analysis. Such analysis may include data captures, port monitoring and other methods.

So anti viruses should be updated regularly to protect the computer against threat.

6.6.6 Firewall & Hackers

A firewall is a dedicated appliance, or software running on another computer, which inspects network traffic passing through it, and denies or permits passage based on a set of rules.

A firewall's function within a network is similar to firewalls with fire doors in building construction. In the former case, it is used to prevent network intrusion to the private network. In the latter case, it is intended to contain and delay structural fire from spreading to adjacent structures

User name and password should be used to protect from various internet threat.

Apart from all mention above one should be very careful while using web services because

some risks are associated with online activity like: unintentional disclosure of personal information, bullying or harassment, targeting of users by predators.

Hackers

Crackers is the term non-destructive hackers use when referring to those who break in systems with criminal intent. A lot of hackers are teenagers full of creativity, curiosity, and bravado. Hacking -- finding weaknesses and faults in the network systems they break in -- is a mental sport and challenge to them. Some leave digital graffiti to prove they have been there. They are at the very least, trespassers. More worrisome to information technology security officers are those who are motivated by malice or greed to wreck havoc. This includes disgruntled employees or competitors.

6.6.7 Scams & Frauds

There are also scam artists in the Internet who will entice you with work at home scams, easy loans, masters and doctoral degrees from diploma mills that are no more than a mailbox at a shopping mall, pyramid schemes, and miracle cures. Be wary of online auctions, too. A lot of consumers have been burned when they bid for computers and never heard from the person who auctioned it off. Minimize your risk by limiting the amount you spend, and by using only a credit card which protects the owner from paying more than \$50 if there is a dispute on the sale.

6.6.8 Freebies

Some people will say nothing's really free. You at least pay for your Internet connection through a monthly subscription with an ISP. The Internet was initially built by government funding and a lot of schools and institutions are still supported by federal and local funds. More and more business institutions and commercial groups are jumping into the bandwagon if you notice the rise of banner ads in "free Websites." Nonetheless, the concept of "free" remains strong, and many Netizens intend to keep it that way. A lot of time this concept collides with copyright restrictions. People who think twice about shoplifting in a store don't hesitate to steal somebody else's work in the Internet. *Warez* is the slang for pirated software that can be downloaded off the Internet. This has been called a "victimless crime" because the item in question is not lost. However, copyright makes it clear that this violates the copyright owner's right to make copies and distribute her work. It is one thing to help yourself to a *freeware* because the software developer wants to make his product available at no cost, and entirely another to get a *shareware* which means you are only permitted (and you agree when you click the "I Agree" button) to use it for a limited period of time. If you decide to keep it after the trial period is over, Scout's honor, you are supposed to pay for it or delete it.

Other creative and intellectual works that are offered free in many personal websites include MP3 music files, clip arts, and photos. We will discuss copyright and fair use policy in another page, but suffice to say, "not for profit" is no longer a valid defense in many of these cases.

6.6.9 Conclusion

Advocates of free speech and intellectual freedom aver that the Internet must be protected from both -- abuse and controls -- if it is to remain useful to everybody. That is, free from hate and intolerance, political restraints, intrusion or violation of privacy, and so on. In many discussions on the social issues affecting the Internet, ethics may go hand in hand with equity, particularly on the issue of universal access and the digital divide. A good way to spouse these ideals would be to educate people to exercise responsibility and self-regulation when they step into the cyberspace.

6.7 E-mail

Electronic mail is the most popular feature of the Internet. For most people this is the first and perhaps the only activity they engage in. Basic e-mail is text-based and therefore easy to generate. To date, this medium of communication has become more versatile through MIME capabilities and Web-based e-mail that allow users to send and receive binary files as attachments like graphics, spreadsheets, presentations, videos, sounds, Web pages and executable programs. E-mail messages can also carry hypertext links that will lead to Web pages with the click of the mouse button.

6.7.1 How it works

E-mail messages are transmitted the same way as most Internet data using the TCP/IP protocols. The message is broken down into packets and sent through different routes in the Net and decoded back into whole form upon reaching its destination. The beauty of the e-mail is that more often than not it actually works although people use different e-mail software. This is unlike most application software where the sender and recipient need to have the exact same program to write and read messages. Most e-mail software will automatically decode the message.

6.7.2 Anatomy of E-Mail Message

The basic e-mail message contains the following parts:

To:	e-mail address of recipient	ex. jdoe@email.com ex. "John Doe" <jdoe@email.com> ex. jdoe@email.com,johnd@email.edu, <i>(if you have more than one recipient)</i>
From:	e-mail address of sender	
Subject:	Topic of message	ex. Meeting Next Week
Date:	will appear in recipient's e-mail and sender's file copy, but not in compose message format.	ex. March 16, 2000 2:36:57 PM EST ex. Mon, 20 Mar 2000 23:15:44 -0600

CC:	"carbon copy" - adopted from business communication protocol when typewriters ruled the day	<i>e-mail address(es) of other people who are furnished a copy of the message</i>
BCC:	"blind cc" - when recipient does not need to know who else got a copy of the message. May or may not appear in sender's file copy depending on e-mail software used	
Attachments	In some e-mail readers (software) this appears as a paper clip symbol	<p>ex. logo.gif <i>(gif indicates this is a graphic)</i></p> <p>ex. photo1.jpg <i>(the extension identifies this graphic as a JPEG file)</i></p> <p>ex. primer.doc <i>(doc is the extension for a Word document)</i></p> <p>ex. happy.exe <i>(when in doubt DON'T open any exe attachments, these are notorious carriers of viruses. This particular example is a worm or Trojan Horse).</i></p>
Body	this is where the body of message goes	<p>ex. We look forward to hearing your ideas about the School Safety Program at the faculty meeting on Monday, March 20 at 10:00 a.m. at the faculty conference room. As you have requested we are attaching some photos and background information about our school.</p>
Signature	personalized information about sender	<p>ex. John Doe Principal Somewhere Elementary School Tel (123) 4567-8910</p>