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Presents:**



Introduction to Computers

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Head of Systems

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COMPUTERS I

COMPUTER TYPES:

MACINTOSH COMPUTERS (a.k.a. "Macs")



Macintosh computers are the evolved version of the Apple Computer. Apple was the first computer company to implement the GUI ("Graphics User Interface"), standard in all computers today. Macs are consistent cross platform (older programs run on newer machines), easy to set up, have excellent graphics capabilities, and read and recognize PC disks. Macintosh computers typically have "Mac" or "Apple" somewhere in their name and all run the Macintosh Operating System. Recent models include: iMac, iBook, PowerBook G4 and the Power Mac G4.

PERSONAL COMPUTERS (a.k.a. "PC's")



PC's used to be known as IBM's or IBM clones (other computer brands that mimicked the IBM). PCs are easy to upgrade, easy to repair, and have more programs (software) written for them than Macintosh computers. PC Brands include: Compaq, Dell, Gateway, Hewlett-Packard, IBM, Toshiba and NEC, as well as many others. If you're uncertain as to what your computer is, it's probably a PC.

This document will mostly cover PC computers, but the hardware and computer sizes apply to both the Mac & PC.

COMPUTER SIZES:

DESKTOP COMPUTER



Desktop computers generally more powerful than laptop computers. The thinking part of the computer (CPU) can rest either horizontally (older systems) or vertically (tower). Desktop computers usually come with a separate monitor, keyboard and mouse.

LAPTOP/NOTEBOOK COMPUTER



Laptop computers are light, portable and usually not as powerful as a desktop computer. The monitor is an LCD (liquid crystal display) and can be adjusted for better resolution. The monitor, keyboard and mouse are all built into the computer to save space.

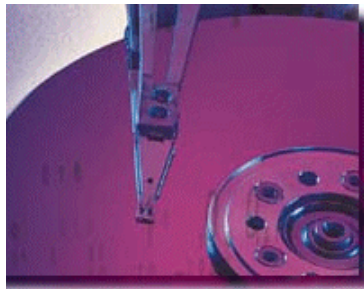
COMPUTERS I



COMPUTER TERMINOLOGY:

- **HARDWARE** is anything you can physically touch. This includes the computer, monitor, keyboard, mouse, modem, and printer as well as physical devices installed inside your computer.
- **SOFTWARE** is any computer program that you run. Common software programs are: Microsoft Word, Microsoft Excel, AOL, Internet Explorer, Netscape and Windows Explorer.
- **THE OPERATING SYSTEM** is a built-in program that allows user to communicate with the hardware and software. Some current operating systems include: Macintosh, DOS, Windows 3.1, Windows 95, Windows 98, Windows 2000, Windows ME, Windows XP, Unix and it's free alternative, Linux.

STORAGE MEASUREMENTS:



Electronic storage is measured in bytes - with one byte equal to any character you can type on the keyboard. Bytes are so small that they're fairly useless as a means of measurement. The sizes increase exponentially. Therefore:

- **1 KB (one kilobyte)** is about 1,000 bytes (it's actually 1,024 bytes, or 2 to the 10th power; everything on the computer is stored in base 2). One kilobyte is equivalent to about half the text on this page.
- **1 MB (one megabyte)** is about 1,000 kilobytes (or approximately a million bytes). A 3½" floppy disk stores 1.44 megabytes, or about a 720-page book (or two more reasonably sized books).
- **1 GB (one gigabyte)** is about 1,000 megabytes (or 1,000,000 kilobytes), or approximately 2,000 books worth of text.

COMPUTERS I



HARDWARE: **THE CENTRAL PROCESSING UNIT (CPU)**

- **PROCESSOR:**

The processor controls the speed of your computer. The processor speed is measured in MHz or GHz (a hertz is once cycle of the hard drive per second) and is determined by the microprocessor chip - most commonly an Intel Pentium (III or 4), Athlon or Celeron. A Pentium III chip is equivalent to a Celeron chip. Until recently, Intel had a monopoly on the microchip market. NYSL Library computers range from 133 MHz (very slow) to 2 GHz (fast). Processor chips can be replaced on older computers to have a faster machine.

- **MEMORY:**

The memory controls the brains of your computer. There are two types of memory: ROM ("Read-Only Memory"), used by your computer for basic operating functioning, and RAM ("Random Access Memory"), used every time you open and run a program. ROM is static and built-in to the system; RAM is flexible and cleaned out every time you restart your computer. SDRAM ("Synchronous Dynamic RAM") allows programs to simultaneously use RAM. RAM denominations run from 32MB (minimal) to 64MB to 128MB, up to 256MB (excellent). RAM can be added to old computers in incremental units (i.e. 32MB or 64MB), if there are available slots inside the machine.

- **STORAGE DEVICES:**

Allows you to add or remove information to your computer. Storage drives can be internal (inside your computer, with only the face showing outside) or external (resides entirely outside the computer). Common storage drives include:

- 1) **Floppy Drive (A: drive):**

The floppy drive lets you copy information from your hard drive onto a disk and vice versa. This drive reads information off of 3½" square disks, known as "floppy disks."

- 2) **Hard Drive (C: drive):**

The hard drive is a permanent storage area inside your computer, used for storing the operating system, programs and any files you create or download from the Internet. By convention, the hard drive is known as the C: drive (the A: and B: drives were used for floppy disks back in the old days).

- 3) **CD-ROM/DVD-ROM Drive (either the D: or E: drive):**

CD-ROMs hold more information than a floppy disk (700 MB, as opposed to the 1.44 MB on a floppy), but were initially "Read-Only" (meaning that you couldn't reuse them). Nowadays, many new computers come with a CD-RW (Read-Write) drive or a DVD-ROM drive (allows you to play DVD movies on your laptop).

COMPUTERS I

HARDWARE

MONITOR



The monitor is the primary way the computer communicates with you. A monitor has a much higher resolution than a television to allow for easy reading of the small text onscreen and is more expensive for this reason. Older desktop computer monitors use a cathode ray tube similar to a television set. Laptops and newer computers use an LCD display (liquid crystal), which cuts down on the overall space needed for the monitor. The picture on the left is an LCD monitor.

KEYBOARD

The keyboard is the main way for you to communicate with your computer. The keyboard has four major types of keys and four special keys:



MAJOR:

- Typewriter Keys, arranged in QWERTY style
- Function Keys [F1-F12], originally used to shorten applications
- Arrow Keys, used to maneuver around text and on the monitor
- Numeric Keypad used for fast keying of numbers

SPECIAL:

- CONTROL Key [CTRL], used for program shortcuts (hold down both keys simultaneously),
- ALTERNATE Key [ALT], used in DOS to activate menus,
- ENTER Key (or RETURN on older models), used to send a command to the computer or insert a paragraph
- BACKSPACE Key, allowing you to delete what you just typed. BACKSPACE will delete one character to the left of the cursor (blinking prompt); DELETE will delete one character to the right of the cursor.

MOUSE

The mouse is another way for you to communicate with your computer. The most common mouse actions are:



- Click: Press and release the left mouse button once. This selects a program
- Double-click: Press and release the left mouse button twice fast. This will run a program. You can also click once on the program icon (small picture) and hit <ENTER> on the keyboard.
- Right-click: Press and release the right mouse button once. This gives additional, advanced information about a program.
- Drag: Position the mouse pointer on the object. Press and hold down the left mouse button. While holding the button, move the pointer to the appropriate area and release the mouse button.

COMPUTERS I

HARDWARE (cont)

PRINTER



The printer allows you to make a hard copy of information displayed on the monitor. The three major printers today are: dot matrix, ink-jet and laser. Dot matrix printers use a grid of dots to create an image on paper, ink-jet printers shoot color and black ink onto paper via small nozzles, and laser printers engrave a temporary image on the internal drum to transfer to paper. Out of the three, laser printers are the only waterproof (i.e. no smudging) printers. This document was printed on a laser printer.

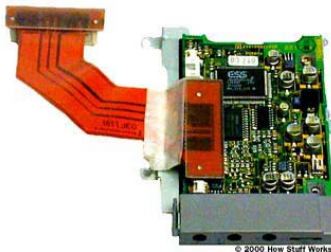
MODEM or ETHERNET CARD



Modems (which "modulate/demodulate" sound) connect your computer to a phone line to connect to the Internet. Most modems operate at 56K (56 kilobytes of data transferred per second).

Ethernet cards resemble modems, but allow you to connect your computer to the Internet at a higher speed either through a cable modem or DSL line. Speeds range from 192K to 1.5M (amount of data transferred per second).

SOUND CARD



Computers come with an internal speaker (which broadcasts the startup beeps). However, in order to hear complex sounds (i.e. songs, lectures, speech) off your computer, you will need to have a sound card and speakers attached. CD-ROM drives can either play music through the sound card or through their own build-in speaker jack.

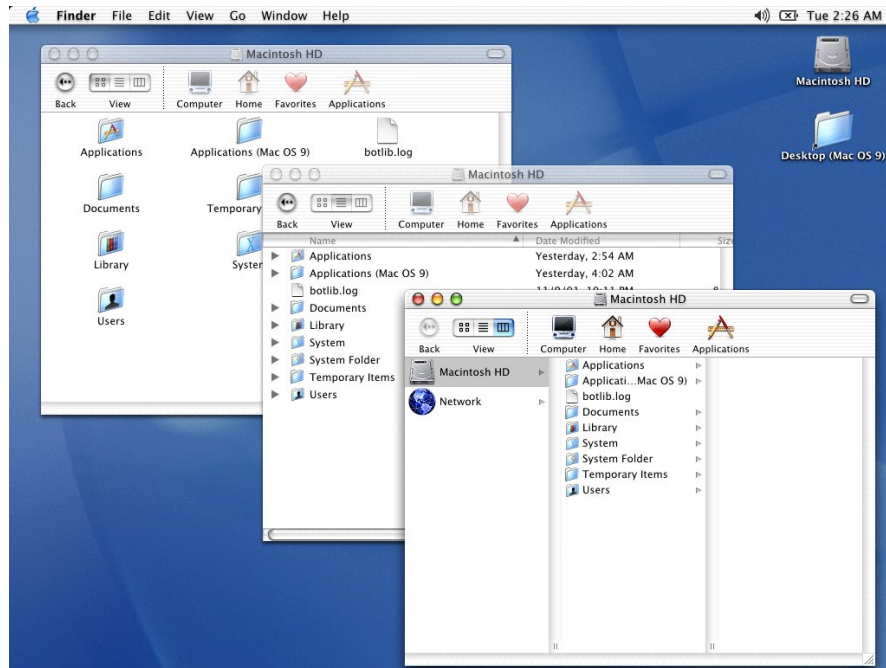
SCANNER



Scanners allow you to put pictures into digital form for web pages, sending through e-mail, and desktop publishing. They work similarly to a photocopier. The two common types of scanners are flatbed (desktop) and hand-held (portable).

COMPUTERS I

OPERATING SYSTEMS: MACINTOSH



Macintosh OS X

There are a couple of easy ways to tell that you are using a Macintosh computer instead of a PC. The first tip is that there is a toolbar running across the top of the screen, with an Apple logo in the upper left corner (PC's keep the toolbar on the bottom of the screen). The second is that the icons are aligned to the right of the desktop (PC icons usually sit on the left side). And the final way is that there is no right-click option – everything works off of single or double-clicks.

To navigate around the Macintosh desktop, use your mouse to point and click. Clicking once on an item selects it, clicking twice opens it. Double clicking on a folder will open it and display its contents. Double clicking on a program will cause it to run. Double clicking on a file will open the file within the program that created it.

Data is displayed in windows. Each window contains:

- The Move Bar on the top, which the user can click and drag to move the window;
- The Scroll Bar on the right and bottom sides, which the user can click in order to scroll either up and down or left to right to display more data.
- The Resize Box on the bottom right corner, which the user can click and drag to change the size of the window;
- The Minimize/Maximize Box on the top of the window, which the user can click to zoom the window to its maximum size and back
- The Close Box, on the top left, which the user can click to close the window.

Macintosh OS X also includes a docking station at the bottom of the screen and jewel-like Close(X), Minimize (-) & Maximize (+) buttons in red, yellow and green:



Docking Bar



Close/Minimize/Maximize

COMPUTERS I

OPERATING SYSTEMS: PC

```
A:\>dir C:\05data

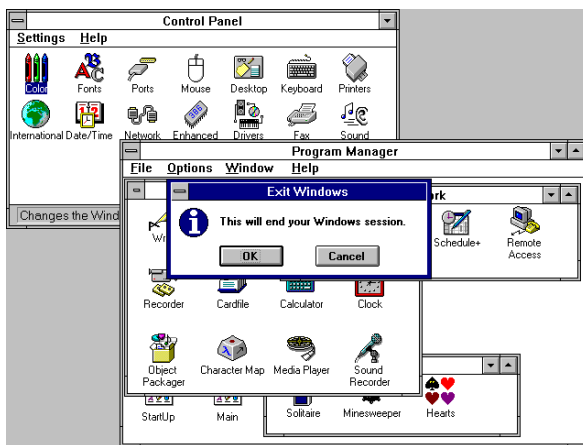
Volume in drive A has no label
Volume Serial Number is 032B-0092
Directory of A:\C:\05data

.                <DIR>                03-09-98  11:42p  .
..               <DIR>                03-09-98  11:42p  ..
BOTTOM  DOC             14,848   06-23-97  2:14p  Bottom.DOC
TOP     DOC             14,336   06-23-97  2:13p  Top.DOC
HANDED  TXT              5,155   07-16-97  3:50p  HANDED.TXT
WORLD   XLS             18,432   07-12-97  1:55a  world.xls
4 file(s)                52,771 bytes
2 dir(s)                 674,816 bytes free

A:\>_
```

DOS: Disk Operating System

MS-DOS (Microsoft DOS) is the underlying platform (or operating system) for Microsoft Windows 3.1, 95 and 98. In DOS, all software is assigned a three-digit code (or extension) following the ".", still used on all Windows machines today. On the image to the right, the **DOC** extension means that the two file are Microsoft Word documents (named BOTTOM and TOP, respectively). **TXT** extension means that it is text (named HANDED) and **XLS** extension means that it is a Microsoft Excel document (named WORLD)



Microsoft Windows 3.1

The first upgrade from DOS was a graphics user interface that allowed the user to run several programs simultaneously (multitasking). Windows 3.1 suspiciously resembled the Macintosh operating system and is still running on some of the older PC's (it takes up less space than the next upgrade, Microsoft Windows 95). Microsoft no longer supports Windows 3.1, meaning that if you have a problem with it, you are on your own.

Microsoft Windows 95

The major features of Microsoft Windows 95 (which will cross over into subsequent versions) are:

- The Desktop: the space used to run programs. My Computer and Recycle Bin will always be on the desktop.
- The Start Menu: located in the bottom left-hand corner of the screen, contains a menu of programs installed on your computer.
- The Taskbar: located across the bottom of your screen, keeps track of all programs you have running.
- The System Tray: located in the bottom right-hand corner of the screen, shows all programs automatically running at startup. You will always have a clock showing in the bottom right-hand corner.



Unfortunately, Microsoft also no longer supports Windows 95.

COMPUTERS I

Microsoft Windows 98

Windows 98 has all of the features of Windows 95, but with easier access to the Internet and faster 32-bit access (this means that the computer can read 32 bits of information at a time; a byte is 8 bits). It is also more integrated into the Internet (Favorites will show up on the Start Menu, and you can type a web address in any address bar). Otherwise, there is very little noticeable difference between the two operating systems. Windows 98, Second Edition, is probably the most stable of all of Microsoft's current operating systems



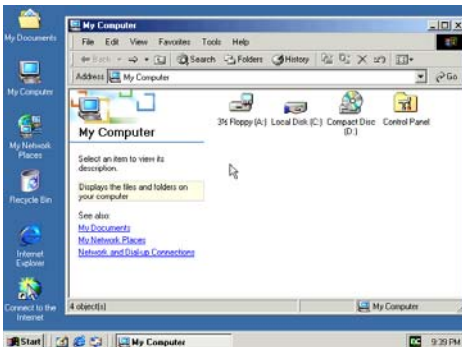
Microsoft Windows ME (Millennium Edition)

Windows ME (Millennium Edition) lacks Windows 2000 stability, but boots faster (starts up) than Windows 98. It's geared more for the consumer than business, and offers a system "roll-back" option for every 10 hours. Windows ME is being gradually replaced by Microsoft Windows XP, Home Edition.



Microsoft Windows 2000 (a.k.a. Windows NT 5.0)

Windows 2000 is designed primarily for businesses, diminishes the amount of crashes and conflicts with earlier versions, gives better access to files, and has more networking features than Windows 98. Windows 2000 has lower system requirements than XP, has no product activation charge.



Microsoft Windows XP (a.k.a. Windows NT 5.1)

Windows XP is faster than 2000 and the interface is more colorful. Windows XP comes with Movie Maker, built-in CD writer support, speech recognition, a firewall and Remote Desktop Connection, allowing you to connect to your computer remotely. You need to register your copy with Microsoft when you buy XP. There are two versions of XP on the market: Professional and Home Edition.



COMPUTERS I



TURNING ON THE COMPUTER

On desktop computers, the "On" button is the largest button on the front of the computer. Press this button to turn on your computer. The smaller, less prominent button is a "Reset" button and only works when the computer is on. On laptop computers, the "On" button is usually located on the left-hand side, towards the back. The laptop button is somewhat depressed and requires you to hold it in for a second or more to start the computer (to prevent accidental activation during travel). When you turn your computer on, it will run a check for all attached hardware (i.e. monitor, printer, keyboard, mouse). If there is a disk in the floppy disk drive, it will try to boot from this and will give you an error message ("Non-System Disk") if it's not a system-disk. Remove the disk and tap any key on the keyboard to resume the boot.

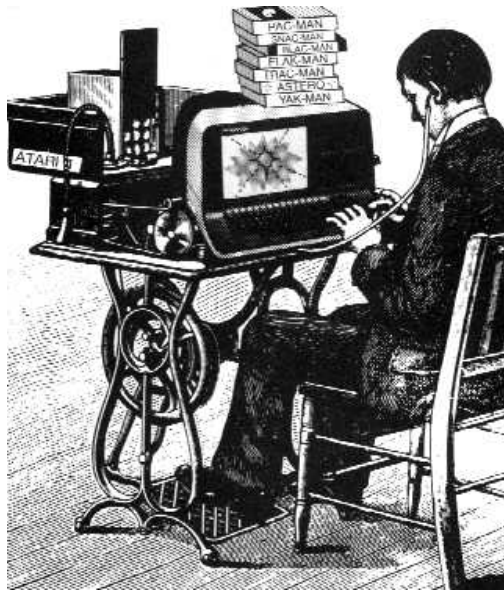
TURNING OFF THE COMPUTER

It is possible to turn off the computer at any time by pushing the same button that you used to turn it on. However, this will upset your computer and cause it to run a nasty error message when it starts up the next time ("Your computer was shut down improperly"). A better way to turn off your computer is by clicking the "Start" button in the lower left-hand corner of your screen and selecting "Shut Down" from the option menu. This avoids the nasty error message and makes startup easier for the computer (and you).

RESTARTING THE COMPUTER

You will only need to restart your computer if it crashes (i.e. everything on the screen freezes or if it's caught in a programming loop). The best way to restart your computer is by holding down the Ctrl, Alt & Delete buttons (known as CONTROL-ALT-DELETE) simultaneously. If your system isn't entirely frozen, this will bring up a menu of currently running programs, which you can close down individually (look for a "Not Responding" error message next to a program). Hold down Ctrl-Alt-Delete twice to restart your computer entirely (you will lose any unsaved information on your computer), or push the second, smaller button on the front (also known as the "panic" button) to restart your computer. Restarting your computer will clear out all the program information in RAM (a good thing, since one of these programs might have crashed your computer in the first place).

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RUNNING A PROGRAM

There are several different ways to run a computer program:

1. **(EASY)** If there is a desktop icon of the program, double-click the icon. OR
2. **(SOMEWHAT EASY)** From the Start Menu Button, click "Start" then move up to "Programs" and click on it. Move left onto the cascading menu, looking for your program (it may be in yet another cascading menu). Click on it to run (e.g. Windows Explorer is found in Start → Programs → Windows Explorer). OR
3. **(LABOR-INTENSIVE)** Double-click on "My Computer" in the upper right-hand folder. Double-click on "C:." Look in each folder for your programs (most are stored in the folder "Program File"). Once you've found your program, click on the icon twice to run. OR
4. **(LESS LABOR-INTENSIVE)** From the Start Menu, click "Start" then "Run" then "Browse". Look in each folder for your program (it will be the same layout as "My Computer"). Click on it once and select "Open". Click "OK" to run the program. OR
5. **(STILL LESS LABOR-INTENSIVE)** From the Start Menu, click "Start" then "Find" then "Files or Folders". Make sure the "Look in" portion is on the C: drive. Type the name (or part of the name) of your program and click "Find Now". When your program shows up below, click the program twice to run it.

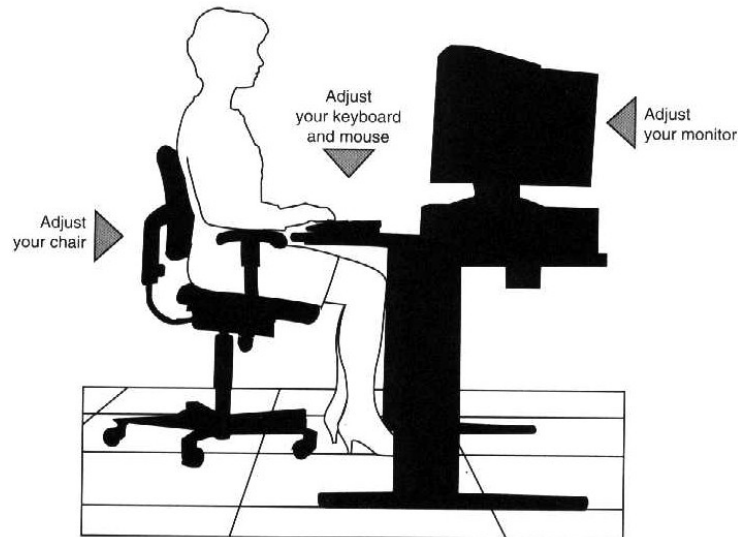
PLACING A SHORTCUT ON THE DESKTOP

Find a clear section of your desktop. Right-click the mouse button and select "New" and "Shortcut". Select "Browse" to find the program (you will only have to do this once). Select "Open" and "Next". Name the shortcut (whatever you want). Click "Finish".

Alternately, locate the item you want easy access to using "My Computer" or Windows Explorer. Use the right mouse button to drag the item to the desktop. Release the mouse button and select "Create Shortcut(s) here".

Note: When you delete a shortcut, the original file is not deleted. However, if you delete the original file, the shortcut is not automatically deleted.

COMPUTERS I



COPYING A FILE

Double-click "My Computer". Find the file or folder you want to copy, and then click it once. On the file menu, point to "Send To", and then click the drive where you want to copy the file or folder. You can select multiple items by pressing and holding down the <CTRL> key as you click each item you want, or by clicking "Select All" on the Edit menu to select every item in the window.

DELETING A FILE

Double-click "My Computer". Find the file or folder you want to delete, and then click it. On the File menu, click "Delete". A quicker way to delete a file is to drag it to the Recycle Bin on the desktop. The files you place here aren't removed from your hard disk until you "empty" the Recycling Bin.

DUPLICATING A FILE

Select the file by clicking on it once. Choose "COPY" from the Edit Menu (or hold down <CTRL>-C). Choose "PASTE" from the Edit Menu (or hold down <CTRL>-V). If you haven't changed folders, this will create a duplicate copy of the original file (a folder cannot have two files with the same name).

SAVING A FILE

To save a file you've just created, look in the upper left-hand menu of the program you're running. There should be the text words "File". Click on these words to bring down a master menu. The options here will usually include "Open", "Close", "Save", "Print" and "Quit". Move down to "Save" (usually denoted by a small icon of a disk, as well as the keyboard shortcut <CTRL>-S). If the document is new, you will need to type a name to file it under. If you're modifying an existing document, the changes will be saved under the same name.

PRINTING A FILE

To print a file or document, open it, and then click "File" and "Print" (the keyboard shortcut is <CTRL>-P).

COMPUTERS I



SEARCHING FOR FILES & FOLDERS

If you don't know where a document or folder is, you can use the find command to find and open it. Click the "Start" button then point to "Find". Click "Files or Folders". Click the box, and then type the name of the file or folder you want to find. To specify where to search, click the arrow next to the "Look In" box, or click "Browse". To start the search, click "Find Now." Shortcuts: from the desktop, press <F3>. Inside any folder, press <CTRL>-F

INSTALLING NEW SOFTWARE

The easiest way to install software is to insert the CD-ROM in your computer and follow the online instructions. If the installation program doesn't automatically run, or if it's on a floppy disk instead of a CD-ROM, look for a file called **install.exe** or **startup.exe** and double-click it. Upon completion of the installation, the program will ideally install an icon on both your desktop and Start Menu (you may have to restart your computer before you can use the new program).

REMOVING OLD SOFTWARE

To remove old programs that you don't want taking up space on your hard drive, click Start -> Settings -> Control Panel. Select "Add/Remove Programs" from the menu icons. Find the program you wish to remove, then click "Remove." Caution: if you want to use the program again, you will have to install it from scratch.

FAST PROGRAM EXIT:

Use the Windows shortcuts in the upper right-hand corner of your program to

- 1) bring the program to your taskbar, freeing up your desktop,
- 2) minimize / maximize your working window on your desktop, or
- 3) close your program entirely.

The external box is for the program itself (i.e. Microsoft Word), the internal box is for the application (i.e. computer notes written in Microsoft Word).

COMPUTERS I



TIPS & TRICKS

1. **BACKUPS:** If you have the installation disks (i.e. MS Windows 95, Word, etc.), back up only the files that you've created yourself (i.e. documents, spreadsheets, photos). For ease of backup, keep all original material in one location, with subfolders for individual breakdown.
2. **STARTUP DISK:** Make a system startup disk by clicking *Start→Settings→Control Panel→Add/Remove Programs→Startup Disk*. With a startup disk, you will always be able to boot your computer to a C: prompt (useful for troubleshooting).
3. **HARD COPY:** Keep a notebook by the computer and copy down discoveries and error messages verbatim. These will often tell you exactly what is wrong with the computer (even if it's in a horribly garbled manner).
4. **SCANDISK:** Run SCANDISK (checks your hard drive for errors) weekly and DEFRAG (defragments your hard drive and speeds up your computer) after large installations by manually clicking *Start→Run* and typing either "scandisk" or "defrag" at the prompt.
5. **CD-ROM:** If you have space on your hard drive, take the Windows 95 (or 98) CD-ROM and copy the /win95/ (or /win98/) file directly onto your hard drive. Whenever you change any system settings and are prompted for the CD-ROM, point to this folder instead (it contains all the system settings). Very useful if you need to reinstall Windows 95. For newer operating systems (Windows 2000, ME and XP), these CD-ROM images are stored locally on the hard drive as CABS files.
6. **GAMES:** Solitaire is an excellent way to become comfortable with using the mouse and is part of the Windows 95 and 98 CD-ROM for this very reason. To play Solitaire on your computer, select *Start→Programs→Games→Solitaire*

COMPUTERS I

GLOSSARY & ACRONYMS:



- ASCII: American Standard Code for Information Interchange (text-based format)
- Binary: A code comprised of 1 or 0
- Bit: A basic unit of information; either a 1 or 0
- Byte: a string of 8 bits (e.g. 10001101), equivalent to a single keyboard char.
- CD-ROM: Compact Disc - Read Only Media, stores large amount of information
- Compatible: two items (programs, OS, people) that work with each other
- CPU: Central Processing Unit, where data is processed
- DOS: Disk Operating System
- Export: sending data to another program or location
- File: a collection of specific information stored in a given place
- GUI: Graphical User Interface
- Hard copy: a paper version of information on the screen
- Hardware: physical equipment in system (computer, drives, printer, etc.)
- Import: to bring in data from another program
- KB: a kilobyte, or 1,024 bytes (2 to the 10th power)
- MB: a megabyte, or 1,024 kilobytes (or 1,048,576 bytes).
- Memory: place in computer where information is stored,
- Modem: a device that translates data into sounds to send over phone line.
- Monitor: device containing screen on which words & pictures appear
- Multitasking: running more than one program at a time
- Network: two or more computers connected together
- OS: Operating System, a special program that manages the computer
- Peripheral: all hardware other than computer itself (i.e. monitor, mouse, keyboard)
- RAM: Random Access Memory; temporary memory of computer
- ROM: Read-Only Memory; non-erasable memory built into computer
- Software: program that can be run on a computer
- Virus: computer program designed to cause damage to computer

NOTE: For an excellent, comprehensive dictionary of computer terms, browse through [Microsoft Press Computer Dictionary Third Edition](#) (004 M) at the New York Society Library

COMPUTERS I

NOTES: