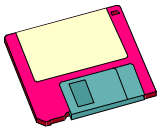
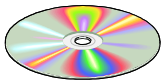
Introduction to Computer Hardware

Desktop PC: A computer that is flat and usually sits on a desk. The original design for a home computer.	
Tower PC: A computer that is upright--it looks like someone took a desktop PC and turned it on its side. In catalogs, the word d*esktop* is sometimes used as a name for both the flat design style pictured above and the tower design.	
Monitor: The monitor is a specialized, high-resolution screen, similar to a high-quality television. The screen is made up of red, green and blue dots. Many times per second, your video card sends signals out to your monitor. The information your video card sends controls which dots are lit up and how bright they are, which determines the picture you see.	
Keyboard: The keyboard is the main input device for most computers. There are many sets of keys on a typical “windows” keyboard. On the left side of the keyboard are regular alphanumeric and punctuation keys similar to those on a typewriter. These are used to input textual information to the PC. A numeric keypad on the right is similar to that of an adding machine or calculator. Keys that are used for cursor control and navigation are located in the middle. Keys that are used for special functions are located along the top of the keyboard and along the bottom section of the alphanumeric keys.	

Mouse: An input device that allows the user to “point and click” or “drag and drop”. Common functions are pointing (moving the cursor or arrow on the screen by sliding the mouse on the mouse pad), clicking (using the left and right buttons) and scrolling (hold down the left button while moving the mouse). http://www.ckls.org/~crippel/computerlab/tutorials/mouse/page1.html	
Mother Board: The main circuit board inside the computer--the big green panel that sits on the bottom of a Desktop PC or along the side of a tower. All the main parts of the PC plug into the motherboard to share data.	
Processor (CPU): The chip that performs the majority of calculations and instructions needed to make your computer run. The processor is attached to the motherboard. It is often called the computer's "brain."	
Memory (RAM): (Random Access Memory) Fast computer chips that temporarily store information while a PC is in use. These chips are the computer's *short-term* memory used to run applications. Most new PCs have at least 128 megabytes of memory.	
Hard Drive: The main storage area inside your computer (usually called a **C: drive**). The hard disk or hard drive stores your computer's operating system, the programs that are installed on your computer, and most of your files. Hard drive capacity is measured in gigabytes. Most new computers have at least 20 gigabytes of memory.	

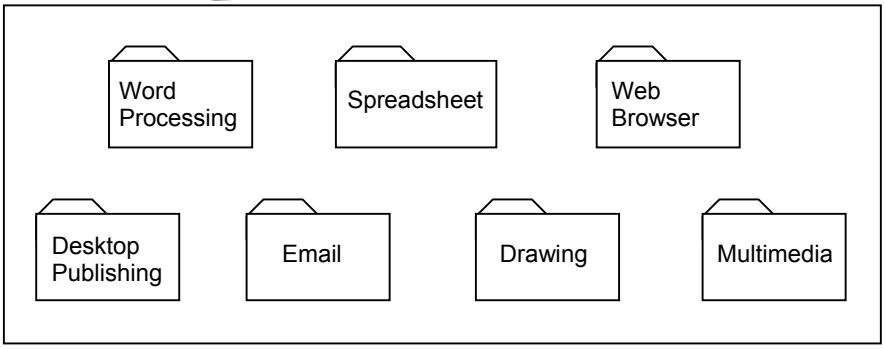
Floppy Disk: A 3.5" square holding a flexible magnetic disc that holds information or data. You need a floppy drive (usually called an **A: drive**) to read the floppy. A floppy disk can hold only 1.44 megabytes, but it is portable and allows you to make extra copies of your files.	 Floppy Disk	Floppy Drive
CD-ROM: (**C**ompact **D**isk **R**ead-**O**nly **M**emory) A removable disk which can store large amounts of information. Because it is Read-Only, new information cannot be saved to it. Requires a CD-ROM drive (usually called a **D: drive**) to read the information. A CD-ROM can hold 650 - 800 megabytes of information, much more than a floppy disk can hold. Some new computers have a **CD-RW** (**C**ompact **D**isk **R**e**W**ritable) drive which allows the user to save information onto a CD. This is done with lasers in a process called "burning". Once the information is saved onto the CD, it can be read on any CD-ROM drive.	 CD-ROM or CD-RW	CD-ROM or CD-ReWritable Drive
Sound Card: A device that can reproduce almost any sound, including music, speech, and sound effects. A computer must contain a Sound Card in order to produce sounds. You can attach speakers and/or a microphone to the sound card.		
Modem: A device that translates data from your PC into a form that can be sent to other computers over regular phone lines. The modem also receives signals from other computers and converts it into something your computer can understand. A modem is the device most home computers use to connect to the Internet.		

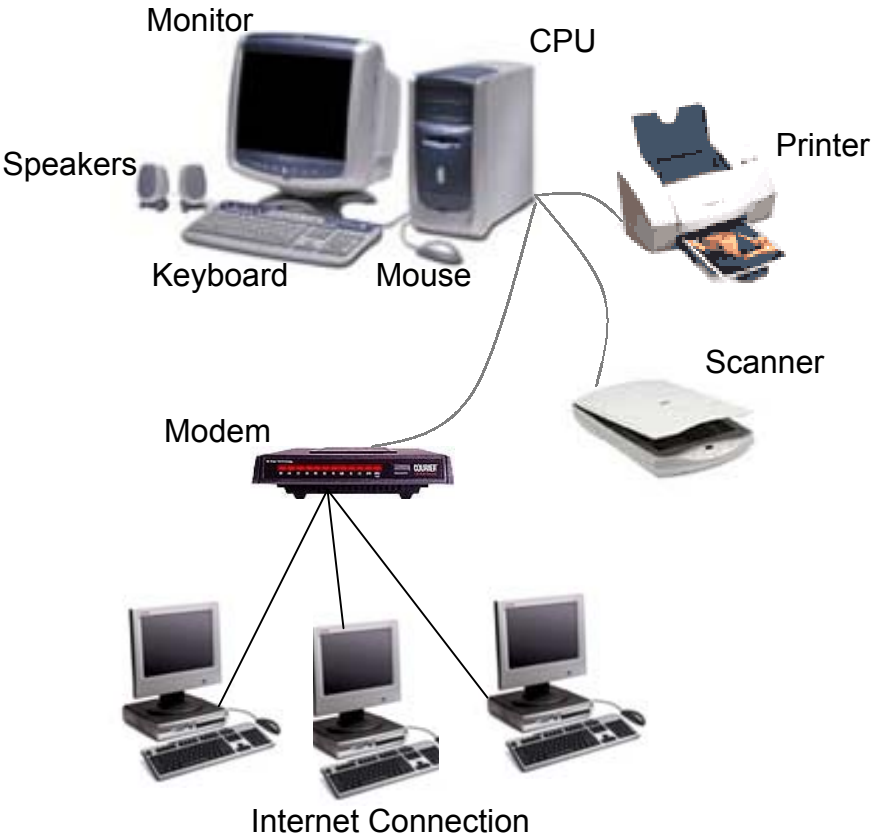
Putting It All Together

You (Computer Operator)

Operating System (GUI)

Programs (Software)





Bits, Bytes, Kilobytes, Megabytes & Gigabytes

Bit: We measure the information stored in a computer's memory and disk drives using **bits**. A bit is the smallest unit of measurement.

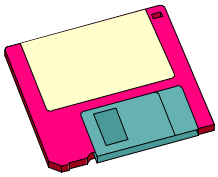
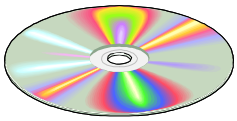
Byte: 8 bits grouped together equal one byte. A byte is still a very small piece of information--one byte is equal to one character or one letter of the alphabet. Since a byte can only hold a very small piece of information, we often think in terms of kilobytes, megabytes, and gigabytes.

Kilobyte (KB): Normally defined as 1,024 bytes, although many people round it to 1,000. An average word-processing document will consume about 100 kilobytes.

Megabyte (MB): Defined as roughly 1,000 kilobytes or 1,000,000 bytes. While documents are usually measures in kilobytes, *whole programs are measured in megabytes*. A few years ago, when you purchased a new program at the store, it most often came on a floppy disk. Each floppy disk holds up to 1.44 megabytes of information. Programs were smaller then, so you would only need a few disks to hold the whole thing. These days, the size of programs have become much bigger, so that virtually all new programs come on CD-ROM. A CD-ROM can hold over 650 megabytes!

Gigabyte (GB): Defined as roughly 1,000 megabytes. The increasing size of programs has resulted in larger hard drives. Hard drives used to be measured in megabytes -- a computer from 1988 might have had a 30-megabyte hard drive! Now, the average hard drive in a new computer is about 20 gigabytes.

1 Bit	Smallest Unit
1 Byte	8 Bits
1 Kilobyte (KB)	1,000 Bytes
1 Megabyte (MG)	1,000 Kilobytes
1 Gigabyte (GB)	1,000 Megabytes

Average Word Processing Document	A one page, single-spaced letter	20 KB
Floppy Disk		1.44 MB (or 1440 KB)
CD-ROM		650-800 MB (or 650,000–800,000 KB!)
Hard Disk		Size varies, but a new hard disk is typically 20 GB (or 20,000 MB or 20,000,000 KB!).

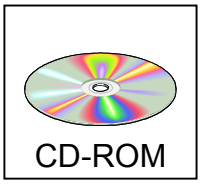
Storage vs. Memory

Storage refers to where your computer keeps all the data/information that it uses (i.e. any programs that you might run, files that you have created, or the computer's operating system). Your 3 main storage locations are:

Hard Disk

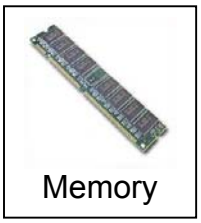
1. The **Hard Drive** or **C:\ Drive**
2. The **Floppy Drive** or **A:\ Drive**
3. The **CD-ROM Drive** or **D:\ Drive**.

Floppy


CD-ROM

The computer's operating system and most frequently used programs (such as Microsoft Word) are stored on the **hard disk**. You might also store documents and other files you've created on the hard disk. **Floppy disks** are used to store files you've created so that you might work on them in multiple locations. They are also a good way to back up important information on your hard drive. **CD-ROMs** are used to store large programs. A CD-ROM can store over 650 MB of data, but remember that you can only save new information if it is a CD-R (because the **ROM** stands for "**Read Only Memory**").

Memory chips are the fast computer chips used to temporarily store information while a PC is on. Hard disk space, however, is what the computer uses to store unused files and programs. When the computer is on and you are running programs, these programs are temporarily held in the computer's memory for easy access. When the computer is turned off, the hard disk still holds all your files and programs, but the memory is emptied.


Memory

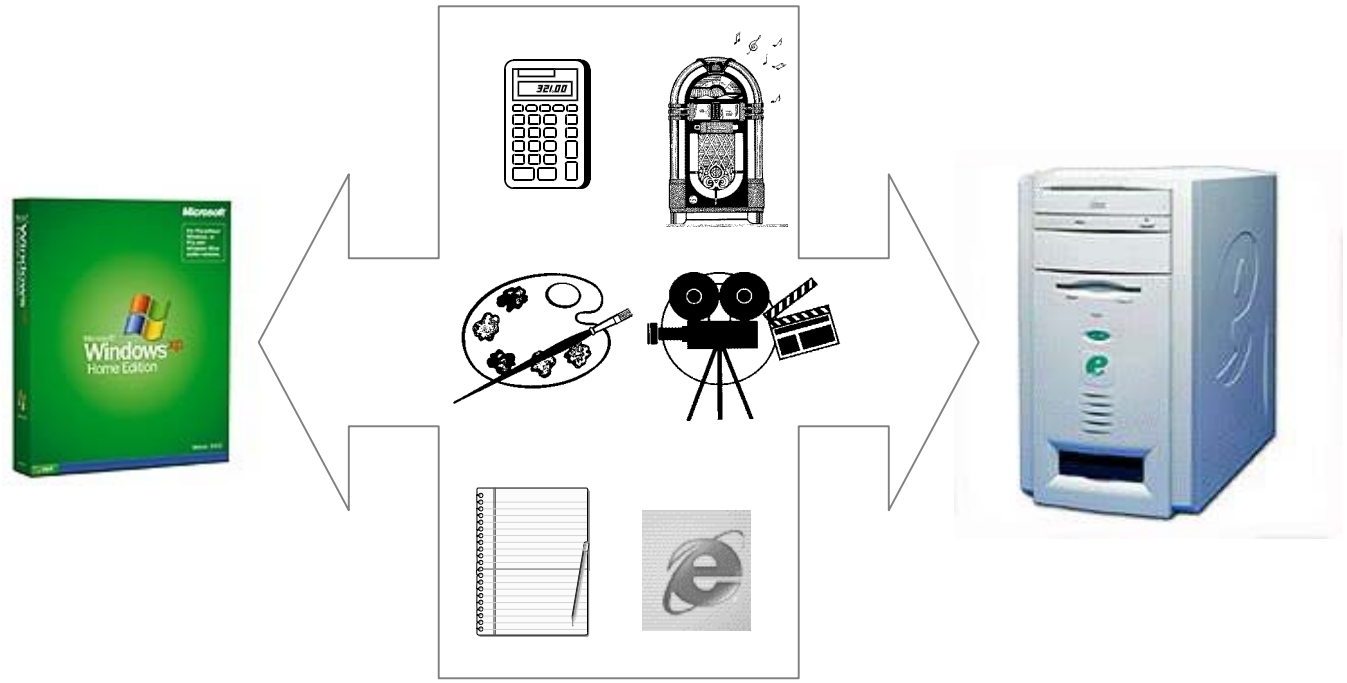
Think of the difference between storage and memory as the difference between cabinets and drawers in your kitchen and your kitchen countertop. The storage areas in the computer are like cabinets and drawers in your kitchen. When you are not cooking, your pots, pans, bowls and ingredients are all stored away in cabinets and drawers. When you are preparing a meal, however, you take things out of their storage places and put them on the countertop to use them. The countertop here is like the computer's memory. When you are finished cooking, the ingredients, pots, pans, and bowls all go back to their storage areas because you no longer need them and your countertop is wiped completely clean.

Most computers today have at least 128 MB of memory, which means that your computer can handle up to 128 MB of information at a time.

What is an Operating System?

An **operating system** links you to your programs (also called applications or software) and then links your programs to the computer's hardware. It controls how the computer does its most basic tasks, like storing files or talking to printers.

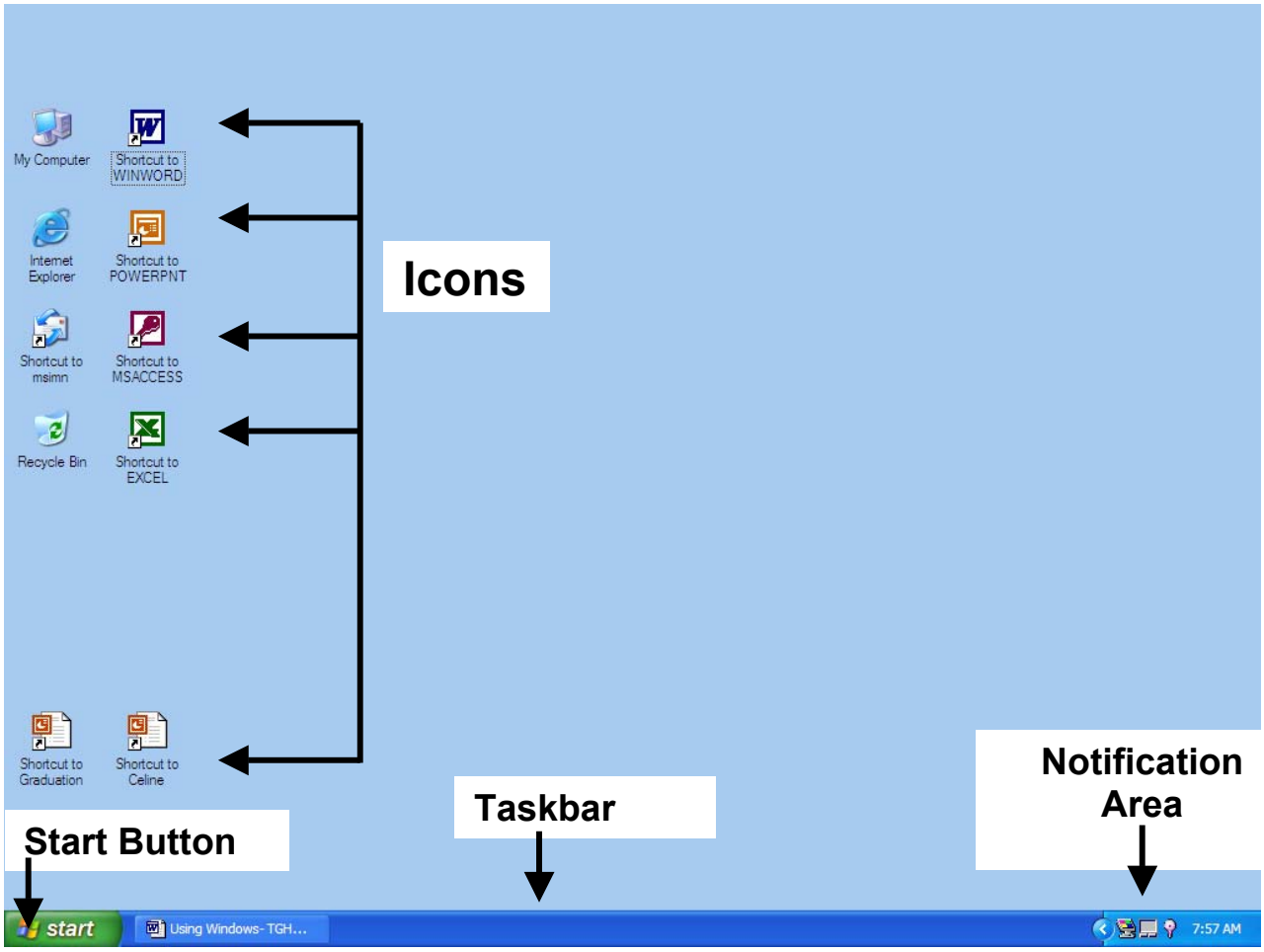
Microsoft Windows XP is an example of an operating system. It uses graphics (pictures) to connect you to the computer's hardware and software in an easy-to-understand (hopefully!) way. Microsoft Windows XP also comes with many free, built-in programs that can help you create documents, movies and images, calculate figures, enjoy some music, browse the Internet, or play a few games.



Other examples of operating systems:

1. **Windows 2000/NT**: these recent versions of Windows are commonly used for computers that are networked together
2. **DOS**, **Windows 3.0**, **Windows 95, Windows 98 and Windows ME:** older
   Mac OS: operating system used by Apple Macintosh computers

Exploring the Desktop

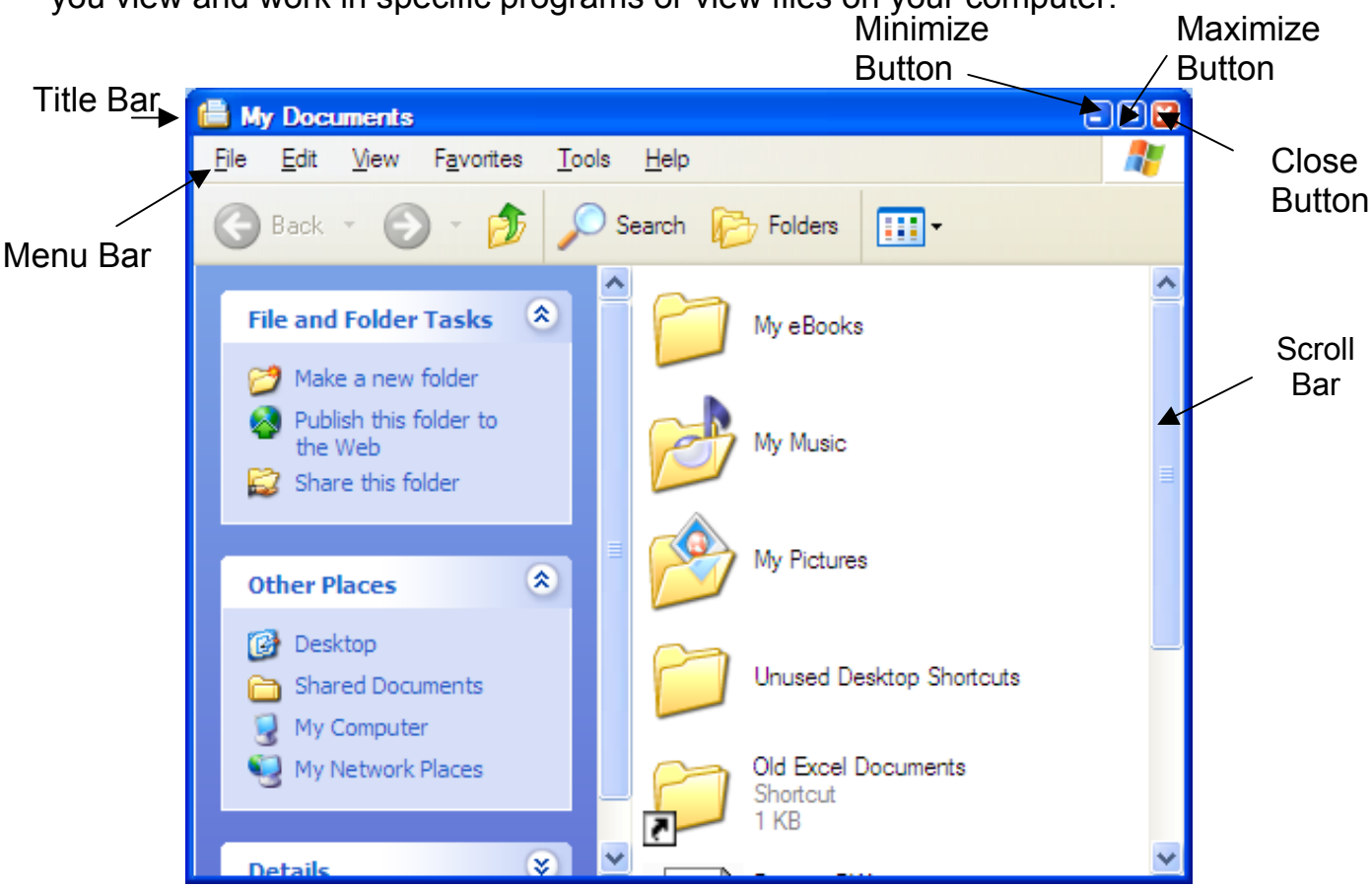


Desktop: The opening screen in Windows XP. It contains **Icons**, the **Start Button**, the **Taskbar**, and the **Notification Area**.

1. **Icons:** Small pictures that represent the things you work with when you are using your computer. Icons can represent files, programs, folders, disk drives, Control Panel tools, shortcuts, or the Recycle Bin.
2. **Start Button:** The button found at the left end of the Taskbar that is labeled Start. Click here to open the Start Menu, where you can open other programs and menus.
3. **Taskbar:** The bar that appears at the bottom of the desktop. It shows you what programs or tasks are open. In the picture above, the Taskbar shows that the program Microsoft Word is open.
4. **Notification Area:** The area found at the right end of the Taskbar. It can give you quick access to changing your computer's volume, display properties, or mouse settings. It also displays the current time and date.

Working in Windows

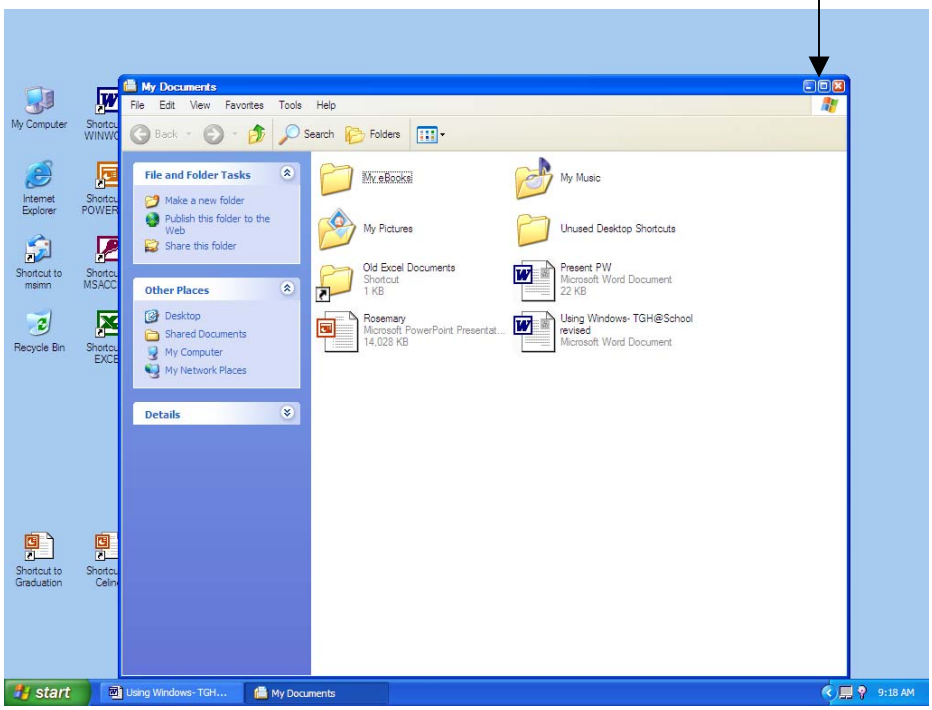
What is a Window? A **Window** is a rectangle on your screen that organizes how you view and work in specific programs or view files on your computer.



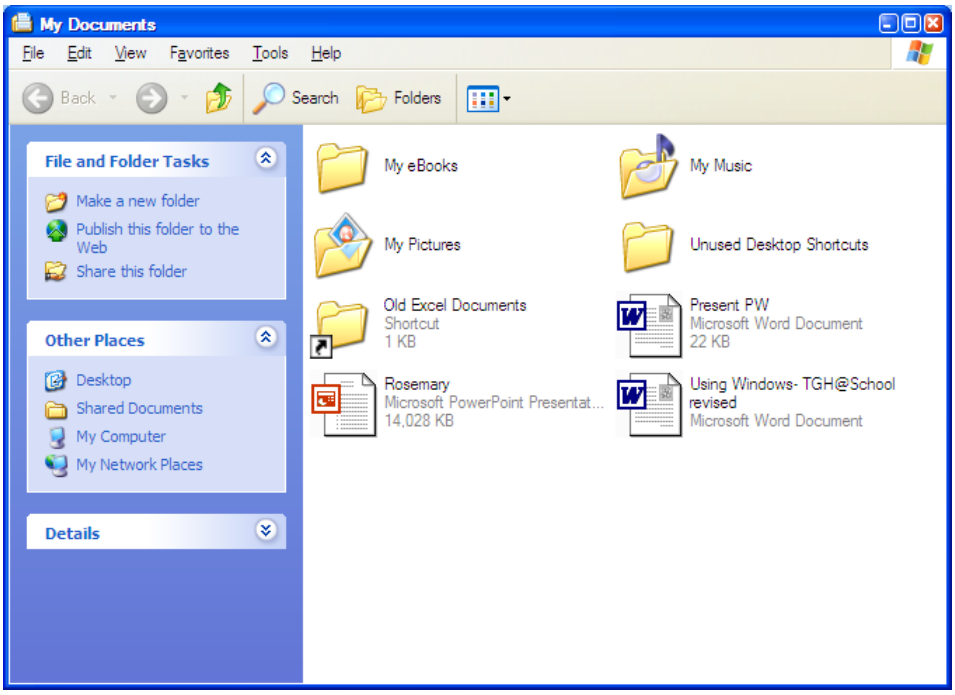
1. **Title Bar** - horizontal bar at the top of a window that holds the window's title or the name of the program you're using
2. **Menu Bar** - bar located under the title bar that lists available menus
3. **Status Bar -** bar at the bottom of a window that displays how many objects or icons are in the window
4. **Minimize Button** - shrinks your window to a button on your taskbar
5. **Maximize Button** - enlarges your window to completely cover your screen
6. **Close Button** - closes an open window
7. **Scroll Bar** – the rectangle at the side or bottom of the window that allows you to guide through the contents of a window (it will appear when there are a many files to display

To maximize a window:

1. Click on the window's **Maximize Button**.

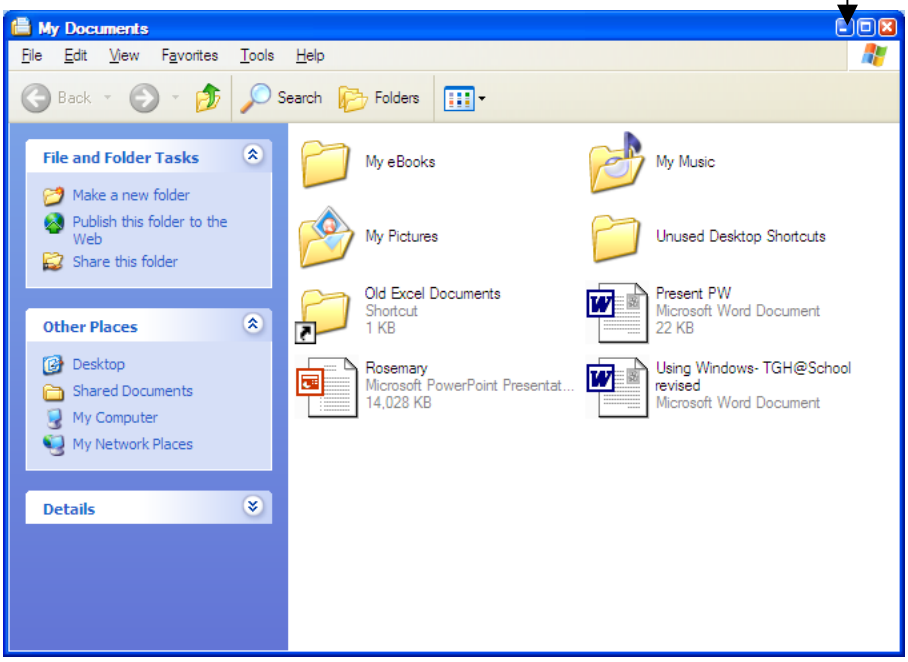


2. Your Window will expand to its largest possible size.



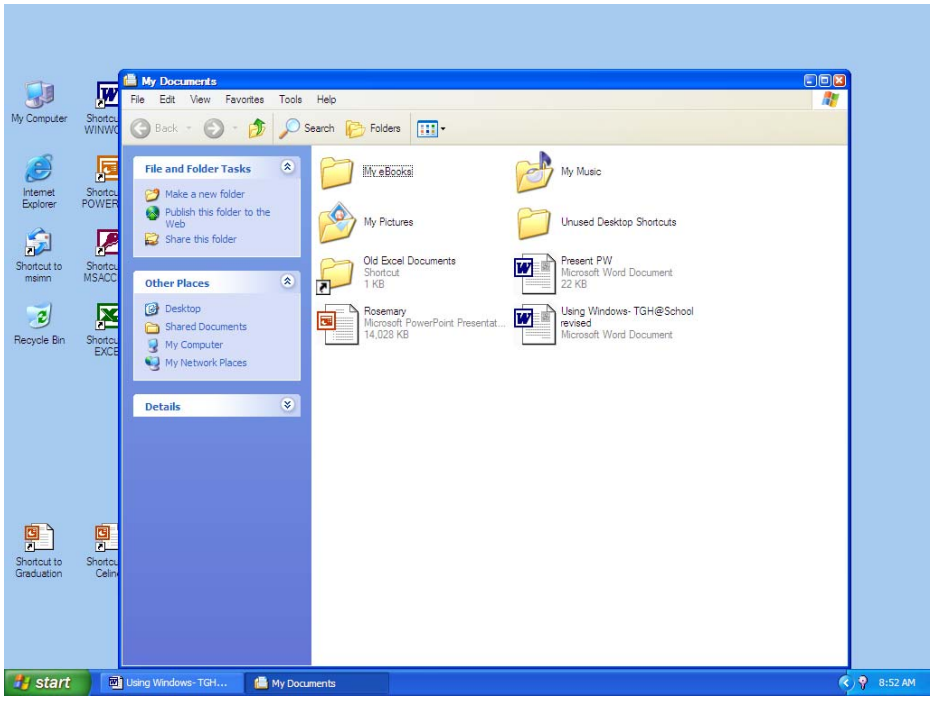
To restore a window:

1. Click on the **Restore Button.** It looks like two Squares locked Together.



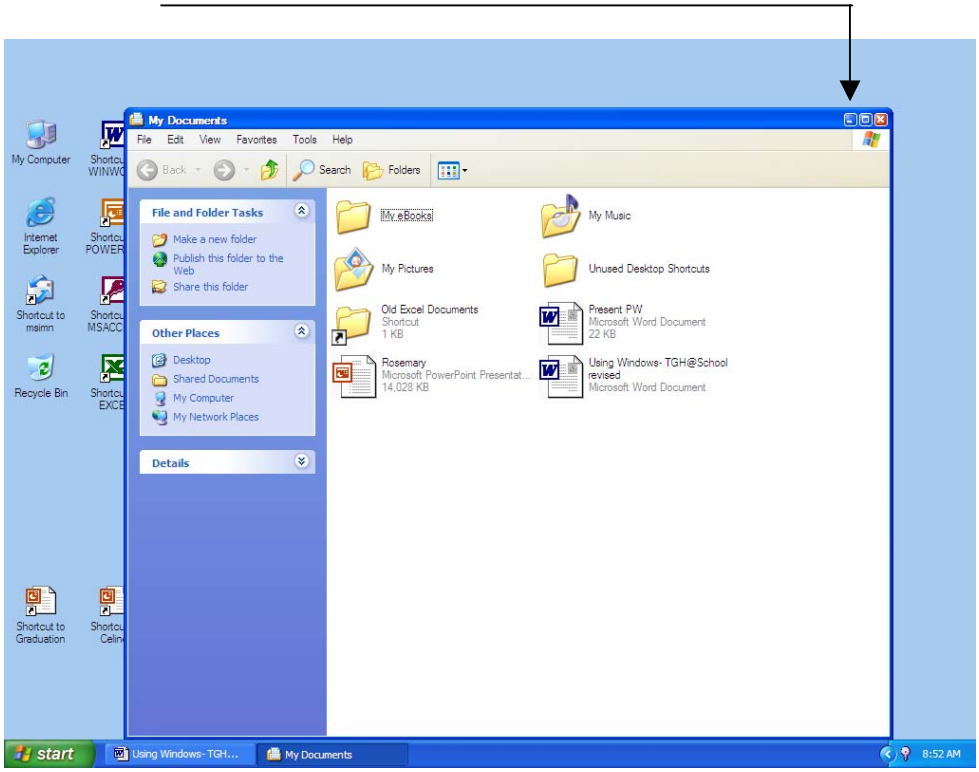
2. Your window will now return to its previous size – a medium size.

⇨ Notice how the **Scroll Bar** disappears. You do not need it because the window is big enough to show all of the objects.

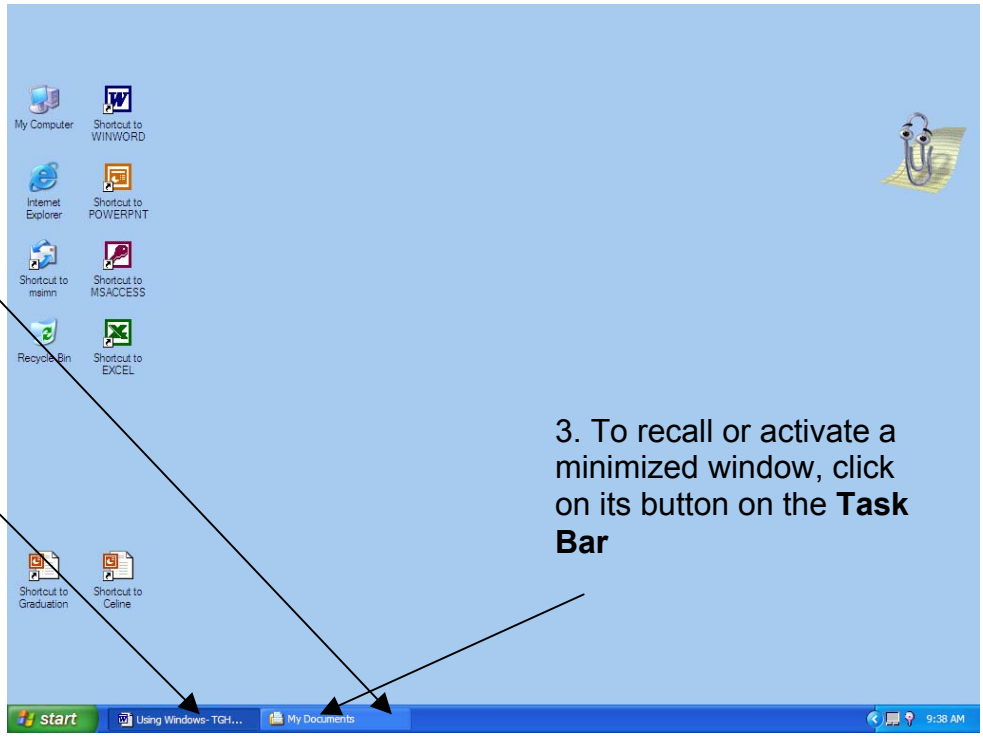


To minimize a window:

1. Click on the **Minimize Button** in the top right hand corner of your window.



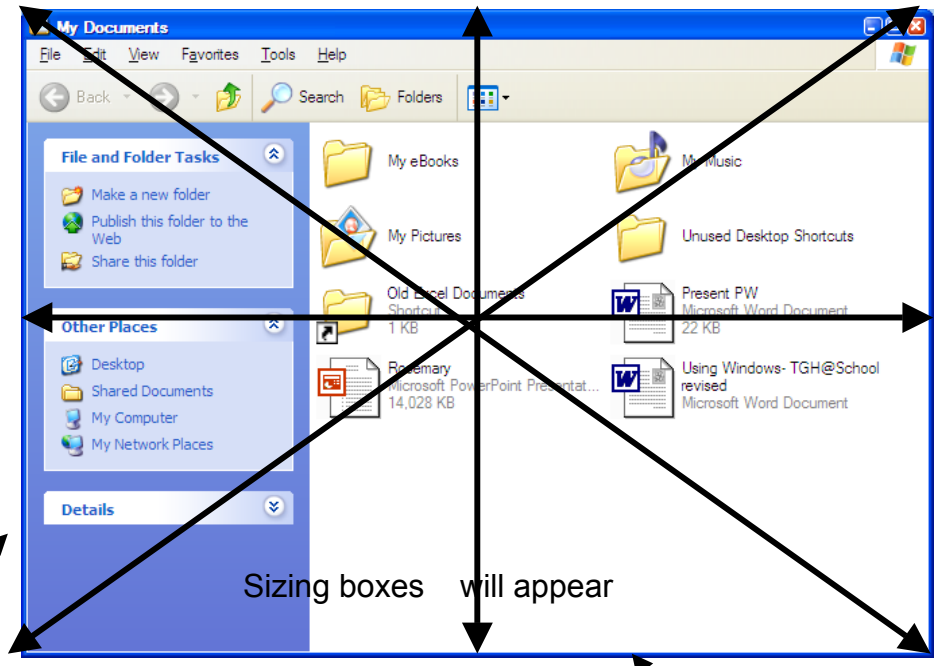
2. Your window will shrink to a button on the **Task Bar.** In this picture, I have two documents minimized: **My Documents** and **Using Windows TGH…**



3. To recall or activate a minimized window, click on its button on the **Task Bar**

To resize a window:

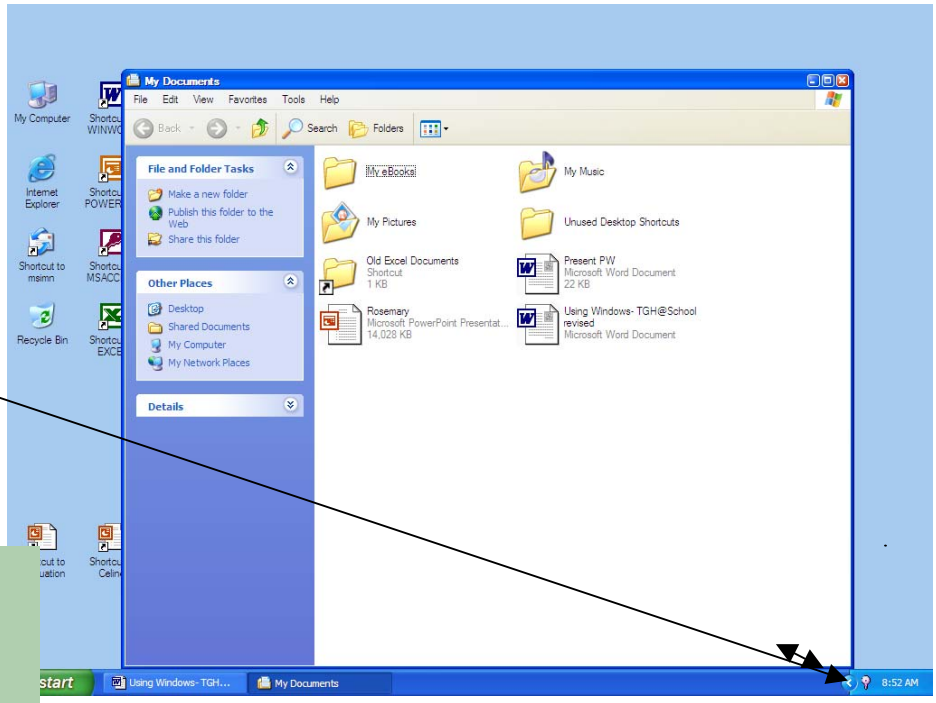
1. Move your mouse pointer to the center of the **Window** and **Click once. 8 Sizing Boxes** appear. One in each corner, and one in the middle of each side of the window.

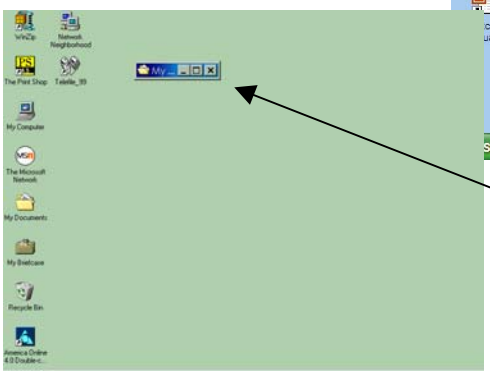


Window Border

Window Border

2. As soon as a double-headed arrow appears, hold your mouse button down and drag the window to the size you want it to be.

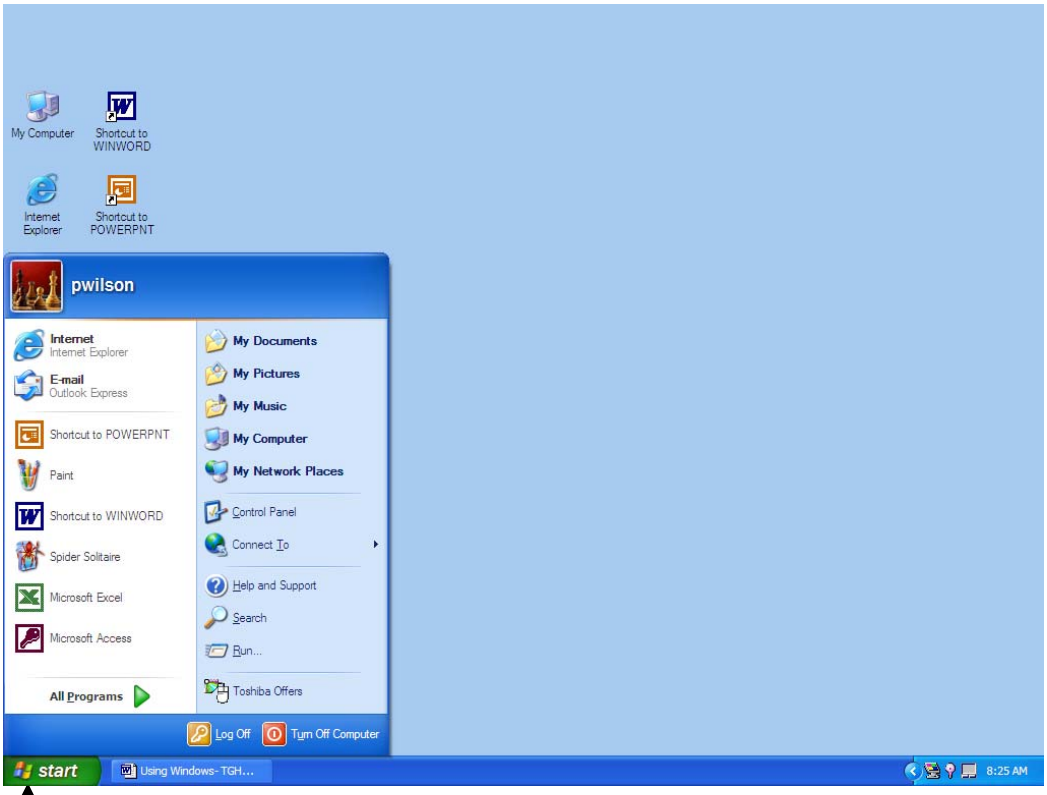




3. This is how little I could make the **My Documents** window when I resized it!

Exploring the Start Menu

You can find the **Start Button** in the corner of your screen. Just like the name suggests, this is an excellent place to *start* your work. When you click on the **Start Button**, a special list called the **Start Menu** appears.



Start Menu

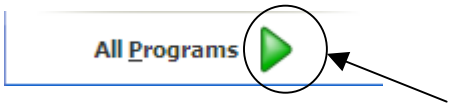
Start Button

Start Menu Options:

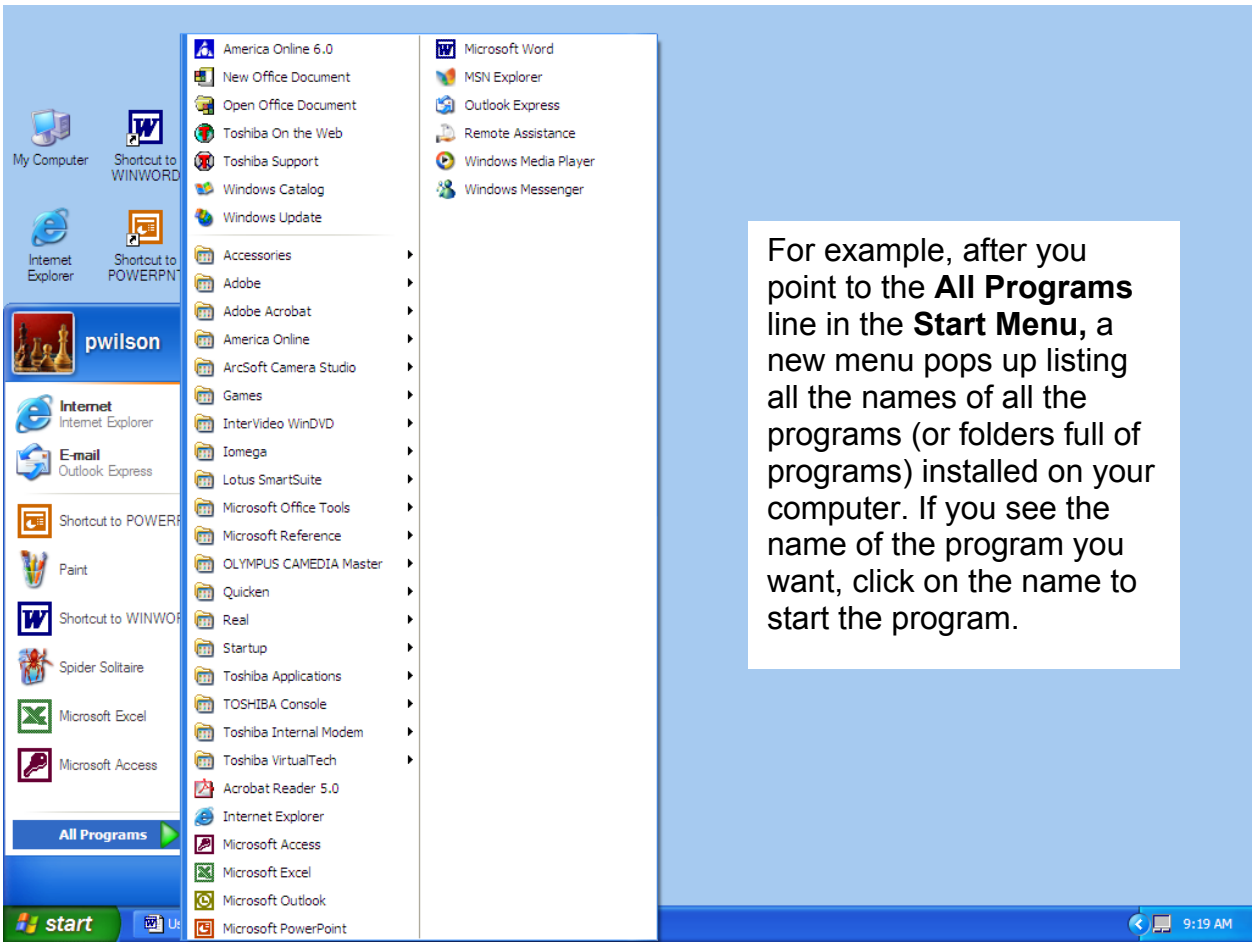
1. **All Programs** - Point your mouse here to see what programs (or applications) are installed on your computer.
2. **Programs** - See a list of the last 8 programs you used. This is a quick way to get back to a file you have been working on.
3. **My Documents** – Point your mouse here to see this folder that holds files saved here.
4. **My Pictures** - Point your mouse here to see pictures saved in this location.
5. **My Music** - Point your mouse here to see music files stored here.
6. **My Computer** - Point your mouse here to see Shared Folders, Hard Disk Drives and CD – Removable Devices
7. **My Network Places** – Allows you to program your computer on a network
8. **Control Panel** - Allows access to Appearance and Themes, Network and Internet Settings, Sound, Speech and Audio Devices, Performance and Maintenance, Add or Remove Programs, Users Accounts, Printer and Other Hardware Settings, Date and Time Settings, and Accessibility.
9. **Connect To** – Pint here if you want to connect to your ISP (Prodigy)
10. **Search** - Point here if you want Windows to search for a particular file on any of the computer's storage drives.
11. **Help and Support** - Click here to bring up the Windows XP Help Menu. A great place to go if you need tips on using Windows XP.
12. **Run** - Can be used to run (or start up) programs, but is usually used to install new software on a computer.
13. **Log Off** – If you use a password to sign onto Windows, this option allows you to end your Windows session.
14. **Turn Off Computer** - Click here when you are ready to shut down Windows for the day or when you need to restart the computer.

Getting around the Start Menu:

To move through the **Start Menu**, point your mouse to one of the menu options.



When this little green arrow appears at the end of a menu option, pointing to that option will open a new menu.



For example, after you point to the **All Programs** line in the **Start Menu,** a new menu pops up listing all the names of all the programs (or folders full of programs) installed on your computer. If you see the name of the program you want, click on the name to start the program.

To create a shortcut for a program on the desktop:

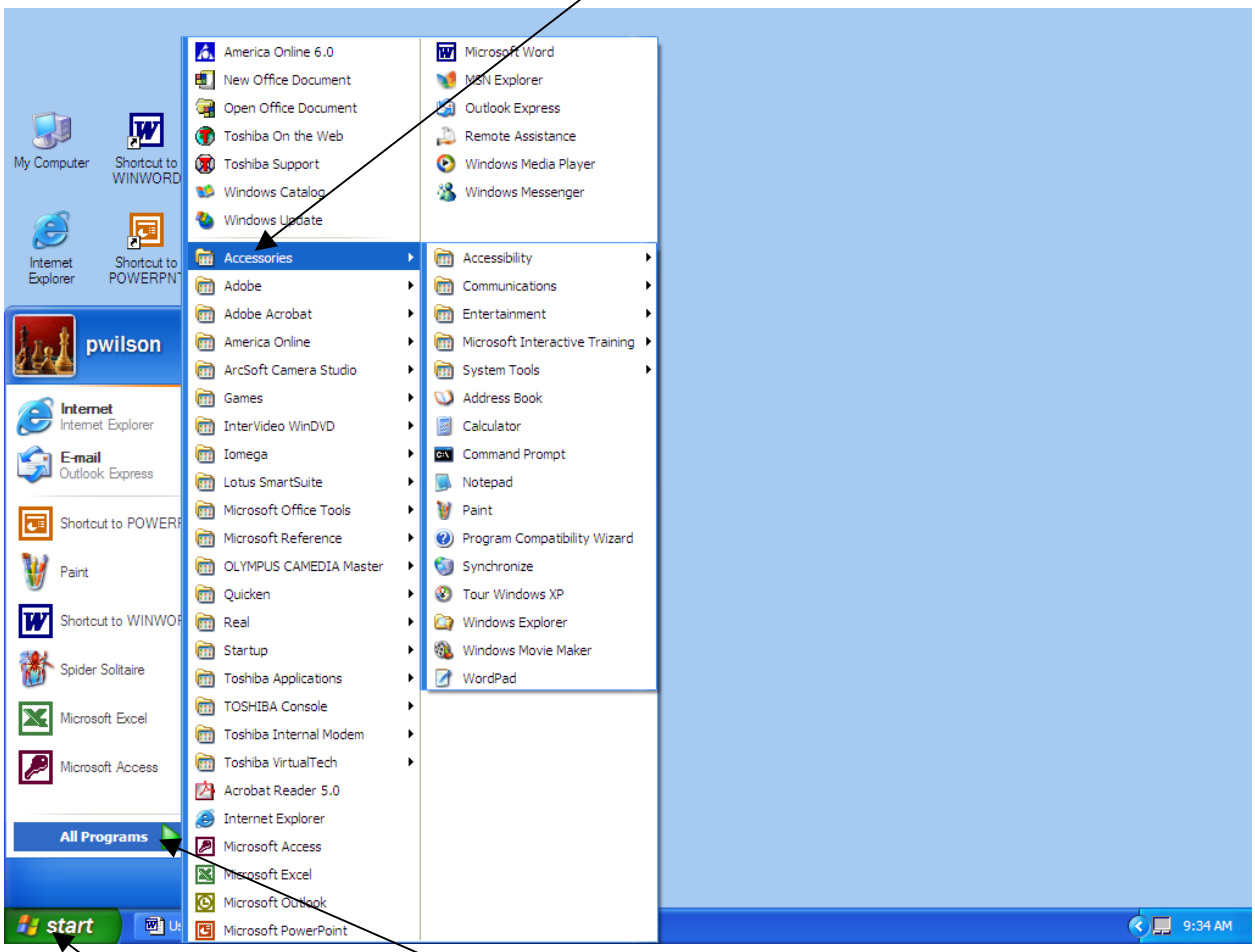
1. On the Start menu, click **All Programs**.
2. Right click on the application from the list (for example, Microsoft Word or Internet Explorer) and select **Send To > Desktop**. A shortcut will appear on the desktop.

Exploring Accessories

Accessories are free programs that come with Windows XP. They are good to know about because you can find them on any computer running Windows and they can do some pretty handy things.

To get to Accessories:

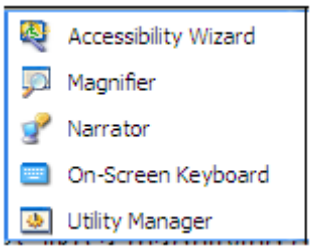
3. Move the mouse pointer to the **Accessories**



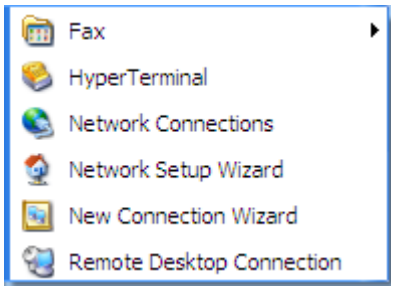
1. Click on the **Start Button**

2. Move the mouse pointer to the **All Programs**

1. **Accessibility** – These programs will adjust Windows XP for special hearing, vision and mobility needs. For example, the Magnifier works like a magnifying glass to enlarge portions of your screen to make them easier to read.

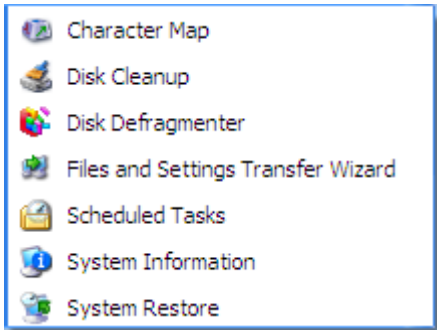


2. **Communications** - These programs are used to connect to the Internet, connect one computer to another, or to actually dial your telephone for you. Most likely, you will not need to use any of these (most Internet service companies provide software that set up your Internet connection).

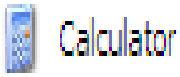


3. **Entertainment** - If your computer has Windows XP, a sound card, speakers, and a CD-ROM drive, you can play audio CDs through the **Real Player** program. You can also record and edit sounds here, adjust the computer's volume and play multimedia files. I like the CD Player option best!

4. **System Tools** - These built-in programs are here to help you maintain your computer. You should not try to use them unless you are certain about their function. The two I use regularly are **Disk Cleanup** and **Disk Defragmenter**. We'll learn more about them in a future lesson.



5. **Calculator** - This program works just like a regular calculator. You can enter numbers and operators either with your keyboard or with your mouse. Note--to divide, use the **/** key and to multiply use the ***** key.



6. **Notepad** - This is a quick little word processing program. You can type in text, save what you have written, and print out what you have typed. That's about the extent of what it can do--it's a fairly limited word processing program.

7. **Paint** - An excellent drawing program. You can use it to practice your mouse skills and create your own artwork.

8. **WordPad** – The other word-processing Program that comes with Windows XP. This Is one more complex than Notepad – you can change text formatting, save documents and print out what you have typed. This program is less complicated than many fuller programs (like Microsoft Word), so it's a great place to start if you are new to computers. It's an easy-to-use program for writing letters, reports, or term papers. It's major shortcoming: it has no spell checker!

Of all these accessories, the ones I use most often are the **Calculator**, **Real Player**, **Paint**, **Disk Cleanup**, **Disk Defragmenter**.