A Hands-on Practice Manual

on

Computer Hardware & Networking

Mrs.A.V.N.College Polytechnic

VISAKHAPATNAM

NAME: _____

PIN: _____

BRANCH: D.CM.E

YEAR: 2nd year   SEMESTER: IV

<u>Certificate</u>

This is to certify that this is a bonafide lab work done by Mr./Ms. _____of _____branch bearing the **PIN** number _____ during the year _____and the number of experiments conducted by him/her are_____

_____

Signature of Lab In-charge

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PREREQUISITES AND PRECAUTIONS FOR SYSTEM TROUBLESHOOTING

The troubleshooting tips provided here are to primarily solve an existing problem, not to create a new one.

In case performing a certain action makes you uncomfortable, call in someone with more expertise. And if you do decide to proceed with any of our Advanced Steps, please be careful before proceeding.

Points to remember while troubleshooting

- Prior to opening your computer's case, check to see if the machine's warranty is still valid. If so, send it back to the manufacturer for repair, as digging around inside the case can void the warranty.

- You may also try calling your PC's manufacturer for tech support, especially if you've already paid for it. Often, tech support can provide quick fixes or will replace faulty components that are still under warranty. Many manufacturers offer online chat, email support, and other options in addition to phone support.

- Take the appropriate safety measures, before making any hardware adjustments –
    - First, purchase an antistatic wrist strap and mat. Static electricity can severely damage your computer's internal components.
    - Keep the computer plugged into the wall but the power switch turned off when working with its internal components.
    - Remember to hold on to the metal part of the computer's case when handling any electrical parts.

- Before you reseat, remove, or replace any internal components, arm yourself with a working knowledge of computer components, what they do, and how they interact with one another.

- Location of the computers core internal components (hard disk drive, processor, RAM, graphics card, etc.) vary from machine to machine, therefore knowledge of the same is necessary.

- Hardware, BIOS (basic input-output system, built-in software that controls the keyboard, mouse, display, and other hardware and functions), firmware, and other software tools vary by manufacturer.

- Keep all of your computer documentation, driver CDs, and warranty information in a safe place. Be sure to use your computer's manuals before changing any settings.

Experiment -2

General Do's and Don'ts

By completing this module, you will be able to understand and learn the following

- ➢ **How to maintain the Computers cleanly**
- ➢ **How to take care of the disks**
- ➢ **Materials used for Computer cleaning**
- ➢ **Cleaning the case & other Plastic materials**
- ➢ **Cleaning the key board and Mouse**

Do:

- ➢ Always shut down your computer properly
- ➢ Do regular Scan disk 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 an 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't:

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

Taking Care of disks

Do:

- ➢ Delete all files you no longer need from your disk
- ➢ Use an anti virus program to scan for viruses on a disk
- ➢ Do not try to erase and record information on a disk by write-protecting it

Don't:

- ➢ Do not use magnets around a disk
- ➢ Do not separate the disk
- ➢ 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

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
  - o soft lint-free cloth's
  - o soapy water - a drop or two of dishwashing detergent in a gallon of water
  - o cotton swabs
  - o eraser
  - o water spray bottle to hold the soapy water
  - o used fabric softener cloth

- ➢ You may have to buy the following at a computer or office supply store
  - o floppy disk drive cleaner kit
  - o CD-ROM drive cleaner kit
  - o compressed air

Cleaning the case and other plastic surfaces

- ➢ Use a damp lint-free cloth to clean the case
  - o Spray the water on the cloth. **NEVER SPRAY WATER ON A COMPUTER OR OTHER ELECTRICAL DEVICES!**
  - o 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
- ➢ Use fabric softener cloth to help remove static charges on the screen
  - o static charges attract dust to the screen
  - o a fabric softener cloth has anti-static chemicals on it
  - o wipe the screen very lightly with the used fabric softener cloth
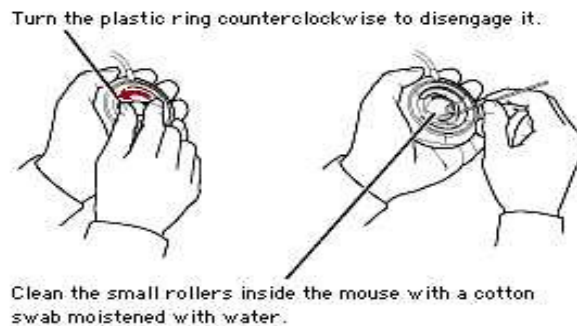 - o Do not use a fresh fabric softener cloth. It will leave streaks.

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
  o 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
  o Use damp cotton swabs to clean the rollers inside the mouse. Be sure to rotate the rollers to get all of the dirt off them
  o Wash the ball in warm soapy water. Wipe dry with a lint-free cloth
  o Blow out the inside of the mouse to remove any dust
  o 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
  o Be very careful. You can easily damage the computer or hurt yourself
  o Do not touch the chips or other electrical components
  o Use a vacuum cleaner to remove dust carefully
  o 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

Ideal PC CONFIGURATION

By completing this module, you will be able to understand Ideal configuration for the various purposes.

S No	Item	For Normal Office applications	For Developers	For TV, Video Conference	For Multimedia Development
1	**Processor**	Intel or AMD basic level processors	Intel or AMD Dual core Processors	Intel or AMD Dual Core Processor	Intel or AMD Core 2 or Quadra processors
2	**Processor Speed**	1.6 GHz onwards	2.0 Ghz onwards	2.4 Ghz onwards	3Ghz
3	**System Bus**	800 MHz FSB	800 Mhz FSB	800 Mhz FSB	1024 MHz FSB
4	**Standard Memory and Type**	400 Mhz and 1 GB Standard Memory	800 Mhz and 1 GB Standard Memory	800 Mhz and 1 GB Standard Memory	800 Mhz and 2 GB Standard Memory
5	**Hard Disk**	120 GB SATA	160 GB SATA	160 GB SATA	2X160 GB SATA
6	**Display**	Integrated with mother board	AGP card	AGP card with 64 MB RAM	AGP with 256 MB RAM
7	**Sound Card**	-	Integrated	Stereophonic	Stereophonic
8	**NIC**	If networked	10/100 MBps	10/100 Mbps	10/100 Mbps
9	**Keyboard, Mouse, USB Devices**	As per need	As per need	As per need	As per need

Experiment - 3

Important internal devices of CPU

> **By completing this module, you will be able to understand and learn the following**
>
> ➢ **Important parts of CPU**
> ➢ **Mother Board and its components**
> ➢ **Memory – RAM & ROM**
> ➢ **Sound card , Video Card and Net work card**
> ➢ **Installing Storage device**

Main parts of the computer:

Floppy Drive

Net work

CD - Drive

Sound Card

Connecting Cards

Graphics Card

RAM

Processor   System Fan   Mother Board
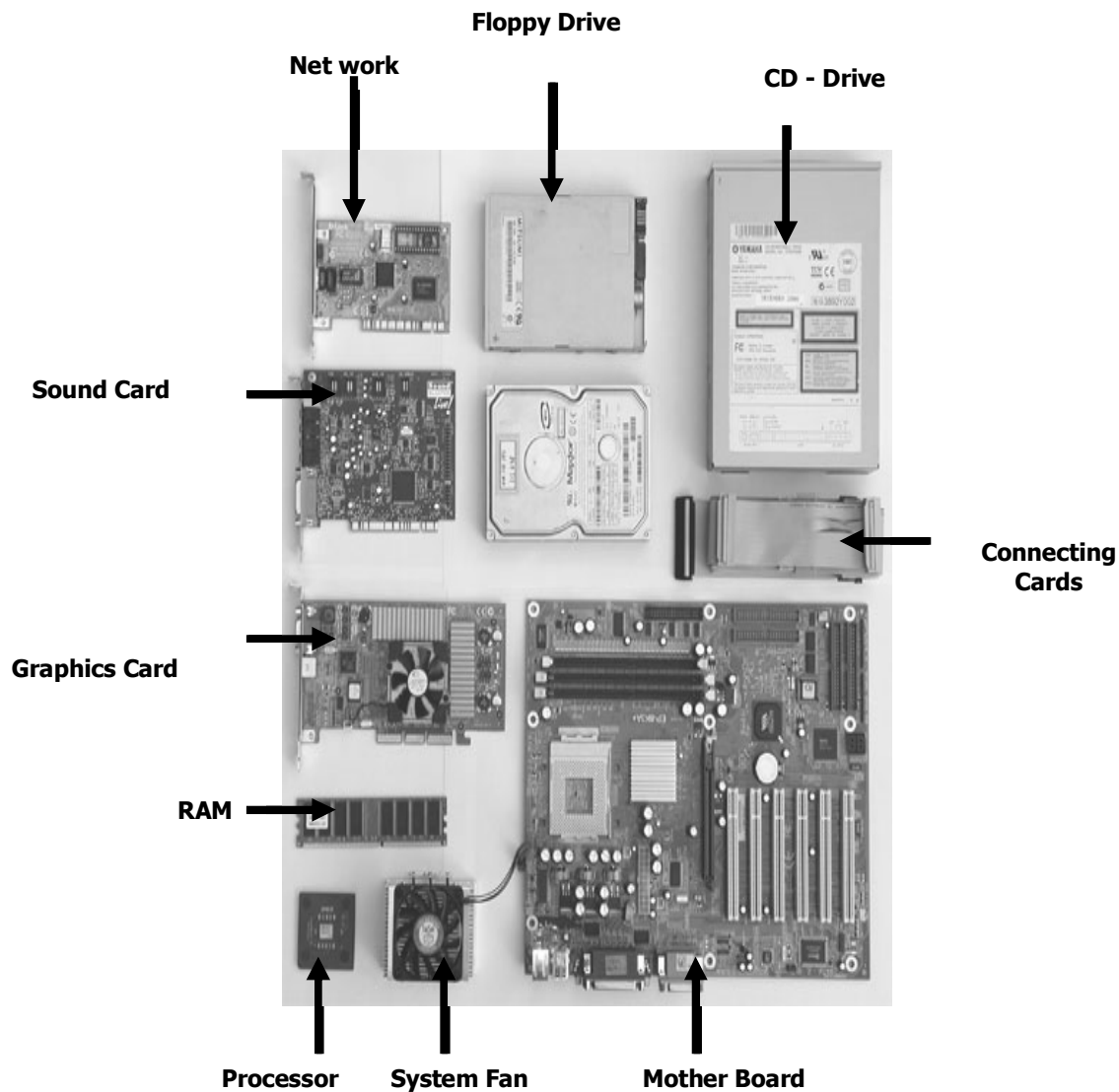
Processor:

The processor is the main part of the computer. The greater the number of GHz the faster the speed of Personal Computer (PC) and the more expensive the processor will be. The processor is also known as the CPU or Central Processing Unit.

Mother Board:

- If the processor is the main part of the computer and the RAM is the memory, then the motherboard is the backbone of the computer.
- This is the circuit board that contains the slots and sockets that everything else plugs into.
- Many motherboards now come with onboard sound, eliminating the need for a sound card, video, networking ports and USB ports.
- Several different types of slots can be found on your board. It is important to know what these are for, as the number of them on your motherboard will affect the number of hard disks, memory chips, graphics cards, optical cards, modems, network cards, sound cards.
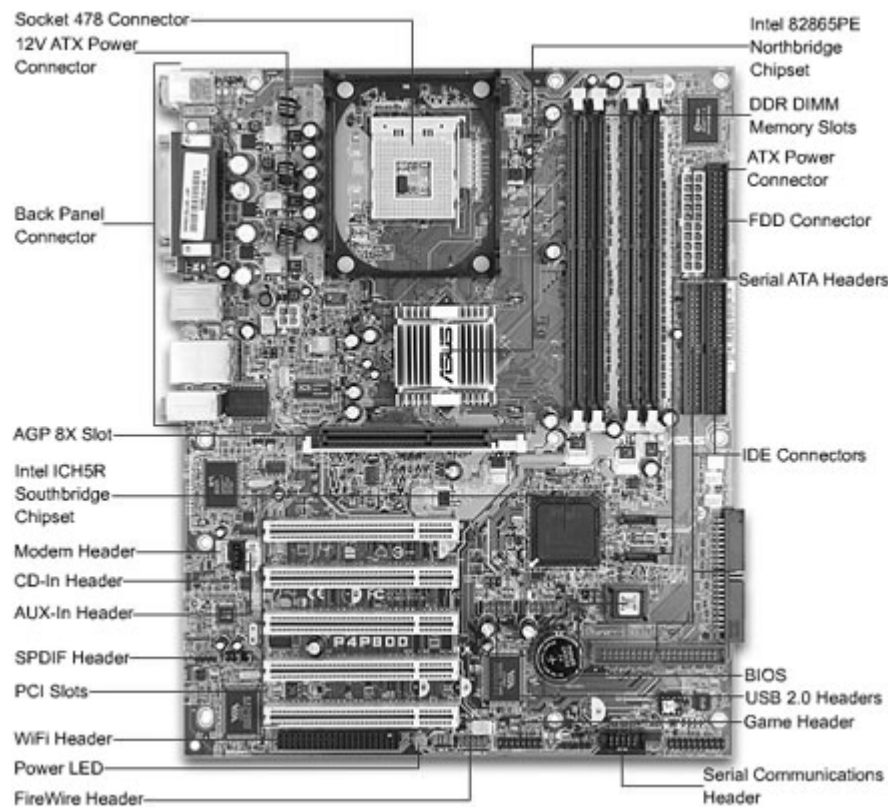
Note: Diagram of a motherboard. Note that the location of these components vary, depending on your motherboard.

AGP slot: This is for the graphics card; you only need one AGP slot.

DIMM slot: This is for your memory. There are several different types of memory. 2 slots = good, 4 slots = better.

PCI slot: This is for cards like sound card, network card, modem etc. These slots will be the ones you use most often, so make sure that mother board have plenty - at least four.

CPU socket: Make sure that the socket type is right for the processor you have chosen and the case chosen.

Back panel of CPU:

There will also be a number of ports on the edge of your motherboard, which will form part of the back panel of your PC.

In the example on the right there are PS/2 ports for connecting keyboard and mouse, a parallel port for a printer or scanner, serial ports that will rarely be used, a couple of LAN ports, four USB ports and a sound port. More and more devices like printers and scanners are connecting the computer using USB.
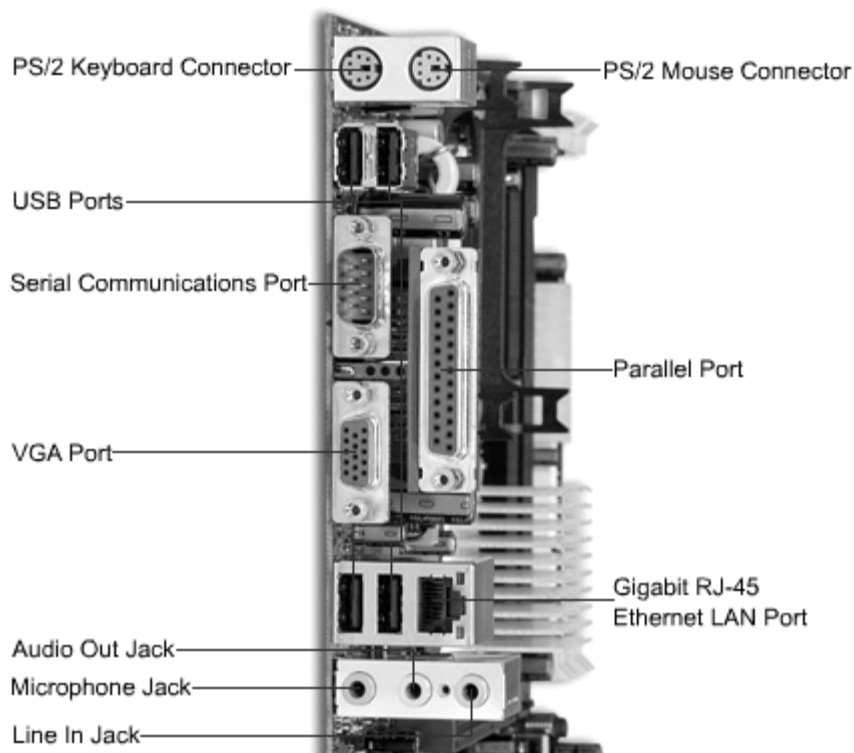
Memory

RAM-Random Access Memory:

- Memory is also known as RAM**.** The more memory you add to a computer in theory the faster it will be.

ROM - Read-Only Memory

- It is an integrated-circuit memory chip that contains configuration data.

- ROM is commonly called firmware because its programming is fully embedded into the ROM chip.

- ROM is hardware and software in one, as data is fully incorporated at the ROM chip's manufacture, data stored can neither be erased nor replaced.

- ROM gives permanent and secure data storage. However, if a mistake is made in manufacture, a ROM chip becomes unusable / useless.

- The most expensive stage of ROM manufacture, therefore, is creating the template. If a template is readily available, duplicating the ROM chip is very easy and affordable.

- A ROM chip is also non volatile so data stored in it is not lost when power is turned off.

RAM versus ROM

RAM	ROM
• provides the user random access to stored data	• provides the user random access to stored data
• provides only short-term memory, since data stored in RAM is lost when power is turned off	• Provides long-term storage, since data is permanently etched into the ROM chip.
• RAM's data can frequently and speedily be altered and changed at will	• ROM cannot be reconfigured at all

Sound Card:
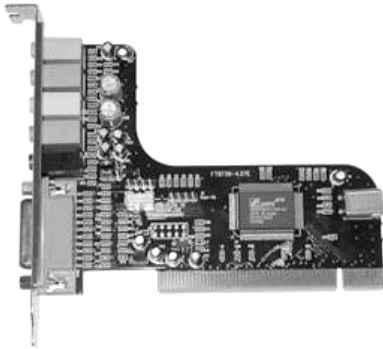
- Responsible for any noise that comes out of your PC (apart from the whirring of fans and spinning drives). Most motherboards now come with built in sound chips.

Video Card:
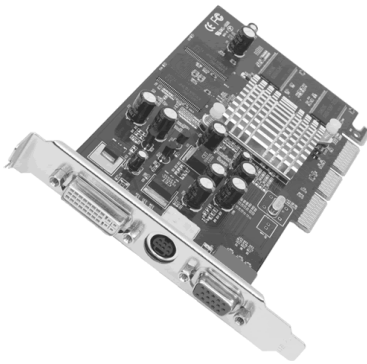
- A video card also referred to as a graphics accelerator card, display adapter, graphics card, and numerous other terms.
- It is an item of personal computer hardware whose function is to generate and output images to a display.
- It operates on similar principles as a sound card or other peripheral devices.

Network Card:
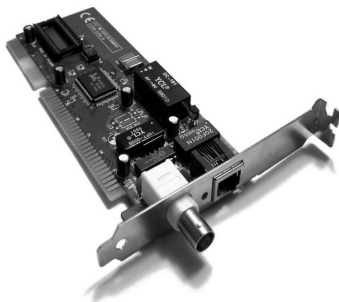
- A network card, network adapter, LAN Adapter or NIC (network interface card) is a piece of computer hardware designed to allow computers to communicate over a computer network.

Installing RAM
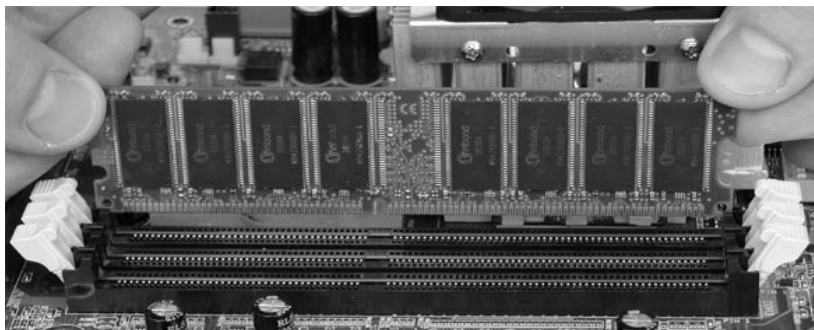
Inserting Sound and Graphics card
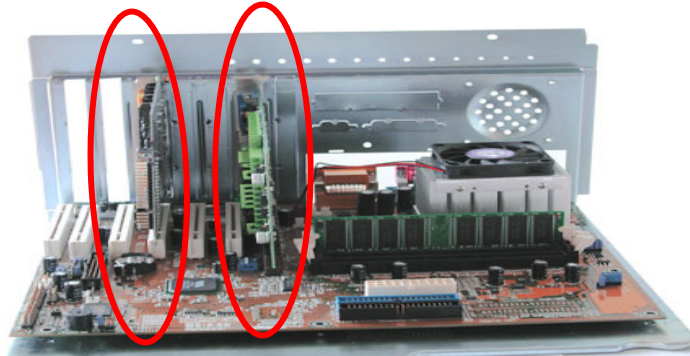
Storage Device

- A Hard drive is the main storage area of the computer. All software is likely to be stored on it along with all the files.
- A hard drive works in a similar method to the floppy disk, data is stored by magnetizing sections of the disk creating a one, or not magnetizing sections creating a zero.

Steps in –'Inserting the Hard Disk':

- Place hard disk drive into the HDD mounting slot of the case;
- Ensure the IDE/ATA connector is facing outwards.
- Screw the HDD to the case using screws provided with the HDD or the ATX case.
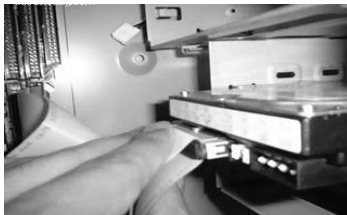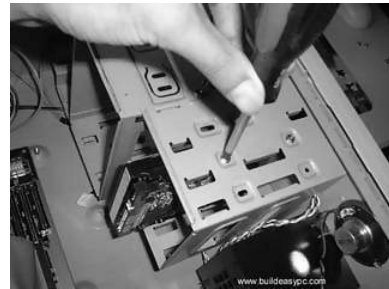
- Insert the ATA 66 cable into the ATA connector of the HDD.
- Make sure the pin 1 on the cable is connected to pin 1 on the HDD connector. Pin 1 is the red or pink strip on the edge of an ATA cable.

- Most new IDE/ATA cables are designed so that it will only go in one way which will correspond to pin 1.

- Push the power cable into the power connector as shown. The power cable is designed to go in one way, so you shouldn't have any problems.
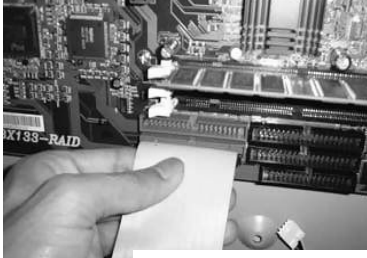
- Connect the other end of the ATA 66 cable to the primary ATA socket of your motherboard as shown.
- Ensure the pin 1 on the cable connects to the pin 1 on the ATA socket.

Steps in – 'Installation of CD-ROM / DVD-ROM

- Connect the IDE cable to the drives IDE connector.

- Make sure the pin 1 on the cable is connected to pin 1 on the drives IDE connector. Pin 1 is the red or pink strip on the edge of an IDE cable.

- Connect the other end of the IDE cable to the IDE socket on your motherboard as shown below. Ensure sure you connect the cable to pin 1.

- The IDE socket could be your primary or secondary socket depending which socket you choose. If your HDD is on the primary IDE socket and your secondary IDE socket is free, then it is better to use your secondary IDE socket for the CD/DVD-ROM.

Optical drive:
- An optical drive is a collective term for CD drives, DVD drives, CD RW burners and DVD burners.
- All of these devices read information from an optical disk which is different from the magnetic media like floppy disks.

Experiment- 4

Flash Memory & Cache Memory

> - **By completing module you will be able to understand about the flash Memory and important types of flash memories available in the market**
> - **Cache memory and it's importance**

- Flash memory is non-volatile computer memory that can be electrically erased and reprogrammed.
- It is a technology that is primarily used in memory cards and USB flash drives (thumb drives, handy drive, memory stick, flash stick, jump drive, "Cap N' Go") for general storage and transfer of data between computers and other digital products.
- It is a specific type of EEPROM (Electrically Erasable Programmable Read-Only Memory) that is erased and programmed in large blocks.
- The application examples include: PDAs (personal digital assistants) and laptop computers, digital audio players, digital cameras and mobile phones.
- It has also gained popularity in the game console market, where it is often used instead of EEPROMs or battery-powered SRAM for game save data.
- Flash memory is non-volatile, which means that it does not need power to maintain the information stored in the chip.
- Flash memory offers fast read access times (although not as fast as volatile DRAM memory used for main memory in PCs) and better kinetic shock resistance than hard disks.

Popular flash memory devices

Memory Stick: A Memory Stick is an IC (Integrated Circuit) which is stored in a compact and rugged plastic enclosure.

Memory Sticks are designed to store data and to enable the transfer of data between devices equipped with Memory Stick slots.

Compact Flash: A Compact Flash card is an IC (Integrated Circuit) which is stored in a compact and rugged plastic enclosure. Compact Flash cards are designed to store data and to enable the transfer of data between devices equipped with Compact Flash slots. Current Compact Flash capacities range up to 8GB.

SD Card: A SD Card (Secure Digital Card) is an IC (Integrated Circuit) which is stored in a compact and rugged plastic enclosure.

SD Cards are designed to store data and to enable the transfer of data between devices equipped with SD Card slots.

Current SD Card capacities range up to 16 GB.

Multimedia Card (MMC): A MultiMediaCard (MMC) is an IC (Integrated Circuit) which is stored in a compact and rugged plastic enclosure.

Multi Media Cards (MMC) are designed to store data and to enable the transfer of data between devices equipped with MultiMediaCard (MMC) slots.

Current MultiMediaCard (MMC) capacities range up to 2GB.

Cache Memory

- Cache Memory is a special high speed mechanism. It can be either a reserved part of main memory or an independent high speed storage device.

- In Personal Computers, There are two types of caching are commonly used are memory caching and disk caching.

- A memory cache, sometimes called a cache store or RAM cache, is a portion of memory made of high-speed static RAM (SRAM) instead of the slower and cheaper dynamic RAM (DRAM) used for Main Memory.

- Memory caching is effective because most programs access the same data or instructions over and over. By keeping as much of this information as possible in SRAM, the computer avoids accessing the slower DRAM.

- Some memory caches are built into the architecture of microprocessors.
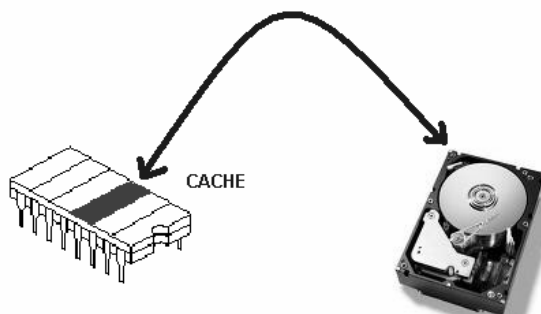
CACHE

- Disk caching works under the same principle as memory caching, but instead of using high-speed SRAM, a disk cache uses conventional main memory.

- The most recently accessed data from the disk is stored in a memory buffer. When a program needs to access data from the disk, it first checks the disk cache to see if the data is there.

- Disk caching can dramatically improve the performance of applications, because accessing a byte of data in RAM can be thousands of times faster than accessing a byte on a hard disk.

    For example, Internet connection is the slowest link in computer. So the browser (Internet Explorer, Netscape, Opera, etc.) uses the hard disk to store HTML pages, putting them into a special folder on the disk.

    The first time you ask for an HTML page, the browser renders it and a copy of it is also stored on your disk. The next time, on your request to access this page, your browser checks if the date of the file on the Internet is newer than the one cached.

    If the date is the same, your browser uses the one on your hard disk instead of downloading it from Internet. In this case, the smaller but faster memory system is your hard disk and the larger and slower one is the Internet.

- There are other caches like **page cache, L1 cache, L2 Cache, virtual memory**.

    L2 Cache: If there is some special memory bank in the motherboard which is small but very fast and two times faster than the main memory access. That's called a level 2 cache or an L2 cache.

    L1 cache: If there is smaller but faster memory system directly into the microprocessor's chip and this memory will be accessed at the speed of the microprocessor and not the speed of the memory bus, That's an L1 cache.

If the question that " why can't we make all memories at the same speed in such away that there is no need of cache memory?" is rised

The answer would be : " Yes, memories can be all made at the same speed. But it's too expensive. To reduce the charges, we have to use a small memory for cache."

Experiment - 5

Sound & Video Card Troubleshooting

> **By completing this module you will be able to understand and learn about the trouble shooting of Sound and Video card in the system.**

Sound card trouble shooting

I. Making sure that you have a card and drivers for the installation

- First, be sure that you have a sound card installed on your system and have speakers or headphones connected to it.

- The sound card is usually a card in the back of your machine, although some newer machines have them installed on the motherboard.

- Check that the wire from your speakers or headphones is connected to the "Speaker Out" or " Spk Out" slot on the back of you machine.

Once you have checked these connections and you know that you have a sound card and headphones or speakers, follow this guide:

Check that you have the drivers for the card installed:

1. In Windows 95/98/NT, go to "Start" - > "Settings" - > "Control Panel" and double click the "Multimedia" icon. This should bring up the "Multimedia Properties" box

2. On the Audio tab, you should see two areas: Playback and Recording. If these are greyed out and have "None" listed under preferred device for these sections, then your sound card drivers have not been installed

3. If you have a device listed here, such as "AWE64 Wave Out" or "Sound Blaster 16" then your drivers are installed. Make sure to check the "Show volume control on the taskbar" option
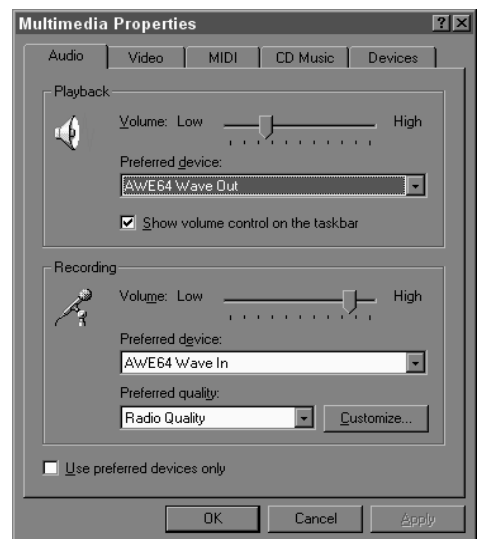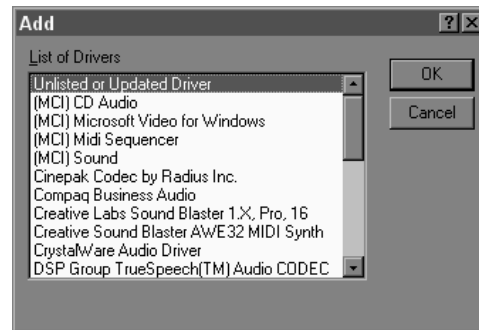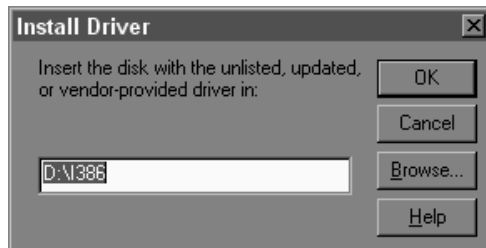
If you do not have drivers installed.

1. Consult your sound card documentation or follow this basic guide on how to install drivers for your sound card.

2. You will need the disk or CDROM that was given to you along with your sound card initially

3. Switch to the "Devices" tab of the Multimedia Properties box
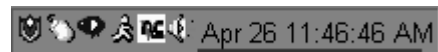
4. Click "Add."

5. Choose "Unlisted or Updated Driver" and click "OK."

6. Enter the path to the disk or CDROM that came with the Sound Card and hit "OK."
7. Select your card and click "OK"
8. Your machine may need to reboot

## II. Checking Sound Levels and Speaker Volume

Once you know you have a card and drivers installed, check the volume and make sure it is at an audible level.

1. Go to the system Volume Control by double clicking the small speaker icon next to the "Time" field on the taskbar. If you do not have this icon, follow the instructions above on getting to the "Multimedia Properties" box and click "Show volume control on the taskbar."

(Actual Volume Control Options may vary slightly depending on your configuration.)

2. Make sure the "Play Control" or "Master" and the "Wave" controls are set to a high enough level and make sure that your speakers have the volume turned up high enough
3. If the sound level available from your card is too low, you may need to use headphones or amplified speakers. Before doing this you should ensure that both master volume and "wave" levels are set to their maximum, and not muted.
4. If you add speakers be sure the power supply is plugged in, and the power switch is on
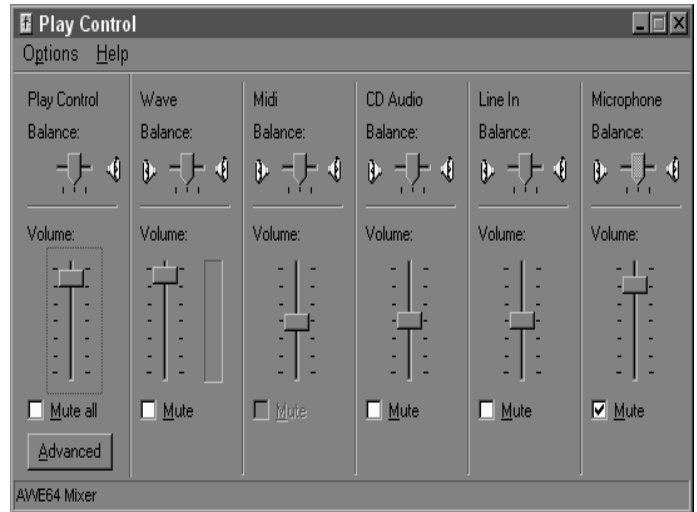
Troubleshooting Video Card

- Resolving video card problems can be costly if you opt to replace the hardware when a problem does occur.
- Before you take such drastic measures, you should consider other solutions such as updating the driver.

Here are some of the common problems that can arise from video cards and some suggested solutions.

Video Cards

There are several video-related components that are responsible for displaying the characters. The hardware components include : the monitor, video card (also referred to as the video adapter card), and the motherboard.

Problems with any of these components can cause problems with your computer's display.

For a quick refresher, the video adapter card is a board that is plugged into your computer's system board and monitor to provide display capabilities.

There are many different types of video cards available on the market. However, most are susceptible to the same common types of problems.

A few common video card related problems along with the possible trouble shooting tips are dicussed below :

No Display on the Monitor

- One common problem that occurs is that the operating system, such as Windows XP, never appears. In other words, the computer starts up but nothing appears on the monitor.

  - o Assuming that you have already ruled out the monitor as being the source of the problem, your next step should be to take a look at the video card.

  - o This particular problem can be caused from several different things such as a video card that is not properly seated or a loose connection from the video card to the monitor.

- Troubleshooting this problem will require you to locate the video card inside your computer and verify the following:

  - o Assuming that the video card adapter is separate from the motherboard, you should check that the card is properly seated.

  - o Sometimes one end of the card may come out of the slot when it is initially screwed, resulting in no display appearing on the monitor.

  - o Verify the correct jumper settings for video cards that are mounted to the motherboard. This will require you to check the documentation that was sent with the hardware.
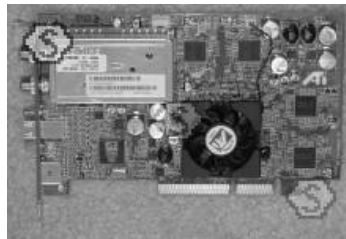
  - o The cable running from the monitor to the video port may also be the one of the reason for the problem.

  - o Examine the monitor cable to ensure that there are no broken or bent pins. A bent pin can usually be straightened using a pair of sharp-nosed pliers. In the case of a broken pin, you will need to contact the manufacturer of the monitor to determine if the cable can be replaced.

  - o Also check that the cable running from the monitor to the VGA port is secure. Although these may seem like simple trouble shooting steps, it is often the simple ones that people over looked.

Operating System does not appear

- If the contents of the start up process appear on the monitor but the display is blank after it is complete, this would indicate that there is an operating system video related problem.

  - For example, an incorrect video driver may have been installed such as one that is not compatible with the operating system.

- Trouble shooting this problem in Windows XP

  - you will have to start the computer in **Safe Mode by pressing [F8] when the Starting Windows message appears**.

  - From the **boot menu** select the **Safe Mode option**. This will force Windows XP to start using the standard VGA driver, instead of the video driver that is used when the operating system is started normally.

  - Once the computer is started in Safe Mode, you can install the correct video driver using Device Manager. These steps are outlined in detail under the heading "**Updating Video Drivers**" later in the article.

  - The video problem discussed above can also be the result of over clocking. This is a popular method used to get more performance out of a hardware component such as a video card adapter. however, it can result in display problems.

    - The problem can once again be resolved by starting Windows XP is Safe Mode and configure the video card to operate at its default speed.

Poor Display

A poor display on a monitor can mean a number of different things like -

- Images may appear to be fuzzy.

- Text that appears on the screen may be distorted and difficult to read.

- The monitor may flicker.

A poor display can also lead to other problems such as head aches and sore eyes. Therefore, this is definitely a problem that you are going to want to correct as soon as possible.

A poor display can be caused by a number of different things. You should first verify that the latest driver for the video adapter has been installed. You can determine which driver version is currently installed in Windows XP by completing the steps outlined below:

1. Right click the Windows desktop and click Properties.

2. From the Display Properties dialog box, click the Settings tab.

3. Click the Advanced button.

4. Click the Adapters tab.

5. Click the Properties button under Adapter Type as shown below.

6. Click the Driver tab.
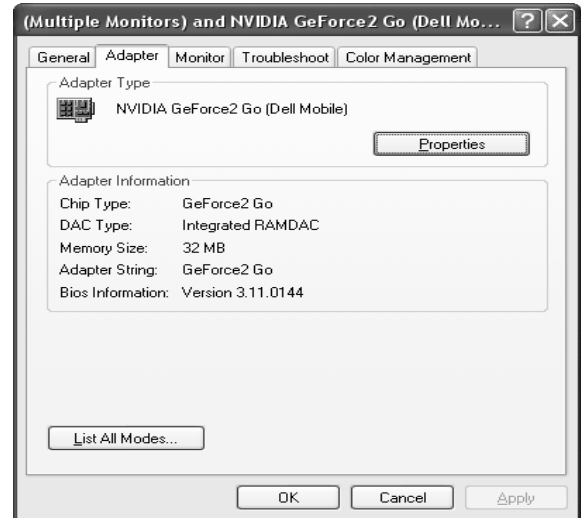
- Select the Properties button under Adapter Type to locate specific driver information including the driver version.

- You can find the version information beside the Driver Version field. Compare this version with the latest version on the manufacturer's Web site.

- If the driver needs to be updated complete steps four through seven listed under the section entitled "Updating Video Drivers".

- If the latest driver is installed, you may need to adjust the resolution and refresh rate (this is the rate at which the video card redraws the screen) for the video adapter card. Incorrect display settings can cause problems with your display.

Screen Resolution

- To configure display settings, right click the Windows XP desktop and click Properties to open the Display Properties dialog box.

- Select the Settings tab shown below to change the resolution settings. Use the slider under Screen resolution to adjust the settings. Typically, a 17 inch monitor will have a default resolution of 800x600.
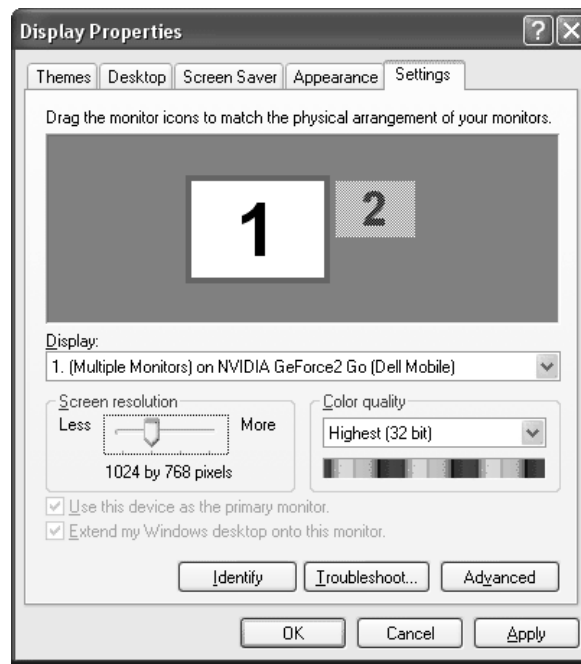
Use the Settings tab from the Display Properties dialog box to change the resolution.

- If you are unable to select the desired resolution that should be supported by the video card, you will need to again check that the operating system has correctly identified the card.

- In Windows XP, you can use Device Manager to make sure the card has been properly detected. If the card has not been properly identified, you will once again need to check the driver.

- It is usually recommended that you use the drivers supplied by the manufacturer instead of the drivers included with Windows.

- The screen resolution may also be limited if the wrong monitor is selected.

- To check the monitor selection, once again open the Display Properties dialog box and select the Settings tab. Click the Advanced button and select the Monitor tab.

- In case the monitor listed is not correct, you will need to update the driver for the monitor.

Refresh Rate

- In case the problem still persists after adjusting the resolution, your next step should be to adjust the refresh rate.

- Lower refresh rates tend to cause flickering so it is important to verify this setting.

- You can adjust the refresh rate using the Settings tab from the Display Properties dialog box.

- Once again, select the Settings tab and click the advanced button.

- Select the Monitor tab as shown below. Use the drop down arrow to adjust the refresh rate to about 70 MHZ. Remember that a higher refresh rate will reduce the amount of flickering.

- As with the screen resolution, if you are unable to select the desired refresh rate, go back to the video driver to make sure the latest one is installed.
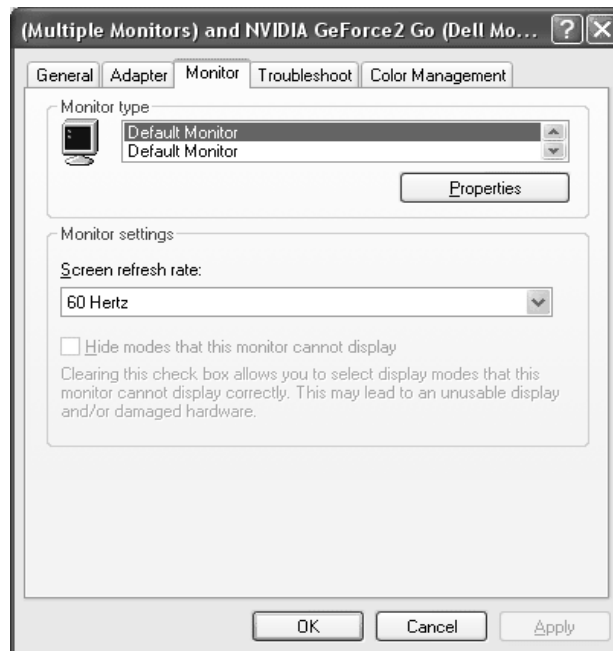
Use the Monitor tab to adjust the refresh rate

Note: It is important to verify that the monitor supports the screen resolution and refresh rate configured in the Display Properties dialog box. The documentation or manual that came with your monitor should identify the values that are supported.

Problems Displaying Videos or Animations

Problems with videos and animations are usually attributed to a display adapter driver that does not support DirectDraw.

- If videos and animations are not correctly displayed on the monitor, your first step should be to determine if the video card adapter driver supports DirectDraw.

- This can be accomplished using the DirectX Diagnostic Tool.

    o From the Run command type *DxDiag.exe* and click OK.

    o From the Display tab, click the Test DirectDraw button.

    o Windows XP will perform a series of tests.

    o If your display does not pass each of the tests, you will need to update the video adapter.

- If updating the video adapter driver does not solve the problem, verify that your video card is indeed supported by the operating system installed on your computer.

- If you are running Windows, you can check the Hardware Compatibility List (HCL) to determine if the video card adapter is supported.

Updating Video Drivers

This is one of the most common problems with video cards.

- Faulty or incorrect video drivers can result in such things as operating system instability, video subsystem problems, and so on

- Most video cards are provided with drivers on a floppy disk or a CD-ROM

- One may use the drivers that usually come along with the hardware or visit the manufacturer's Web site to obtain a more recent one

- The drivers should come with a text file outlining the installation process

- The first step in updating the driver is to identify the make and model of your video card

- In Windows XP, you can see a list of all the hardware components within Device Manager

- The video card should be listed under Display Adapters as shown

- In case it is has not been recognized by Windows XP, it may be listed under Unknown Devices. Double click on the video adapter listed to identify the make and model. This information can be used to retrieve the latest driver from the manufacturer's Web site
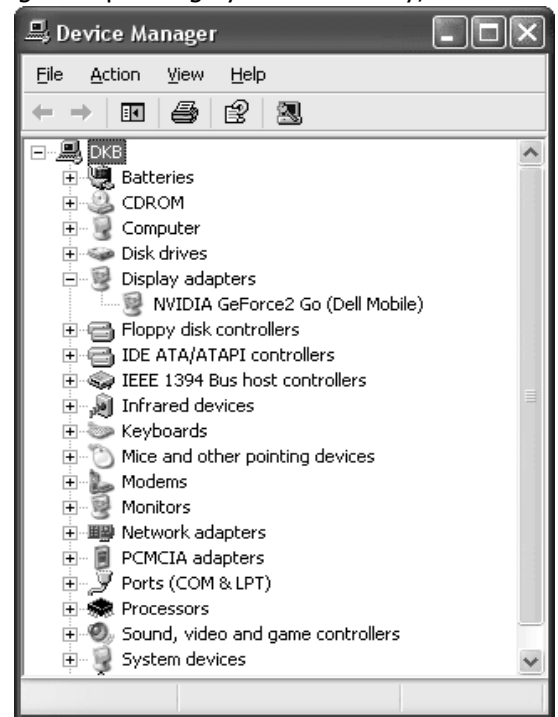
Device Manager will list the Display Adapter installed in the computer

If you are running Windows XP, you can update a device driver using the steps listed below:

1. Right click My Computer and click Properties.

2. From the Hardware tab, click Device Manager.
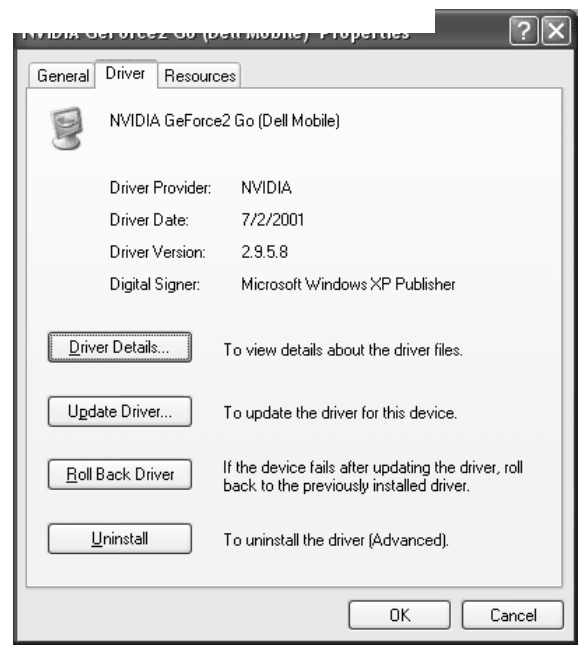
3. Within Device Manager, double-click the video adapter listed under Display Adapters.

4. Click Update Driver as shown below to open the Hardware Update Wizard.

5. Accept the default option, Install the Software Automatically. Choose the Install from a List or Specific Location option if you have the updated driver so you can indicate the file location. Click Next.

6. Windows searches for an updated driver and instructs you if an updated driver has been found.

7. Click Finish once the updated driver has been installed.

From the Driver tab, click the Update Driver button

- The majority of video adapter card problems can be solved by ensuring that the correct driver is installed and that the display settings are properly configured based on the capabilities of your hardware.

- In case you are unable to resolve the problem using the recommendations described as given above, chances are the manufacturer of your video adapter card already has a solution.

EXPERIMENT -6

Troubleshooting Device Manager Issues in Win XP

By completing this module you will be able to understand and learn the trouble shooting the device manager.

Device Manager is an OS feature that lets you view and change the properties of all devices attached to your computer.

When you use Device Manager, you can:

☺ Determine if the hardware on your computer is working properly

☺ Change hardware configuration settings

☺ Identify the device drivers that are loaded for each device and obtain information about each device driver

☺ Change advanced settings and properties for devices

☺ Install updated device drivers

☺ Disable, enable, and uninstall devices

☺ Reinstall the previous version of a driver

☺ Identify device conflicts and manually configure resource settings

🕐   Print a summary of the devices that are installed on your computer

Typically, Device Manager is used to check the status of computer hardware and update device drivers on the computer.

If you are an advanced user, and you have a thorough understanding of computer hardware, you can use Device Manager's diagnostic features to resolve device conflicts, and change resource settings.

To access Device Manager, use any of the following methods:

- 🕐 Click Start, and then click Control Panel
- 🕐 Click Performance and Maintenance, and then click System
- 🕐 Click the Hardware tab, and then click Device Manager
  Or
- 🕐 Click Start; click Run, and then type "devmgmt.msc" (without the quotation marks).
  Or
- 🕐 Right-click My Computer, clicks Manage, and then clicks Device Manager.
  Or
- 🕐 Right-click My Computer, click Properties, click the Hardware tab, and then click Device Manager

You can view the Details tab to see the following device information:
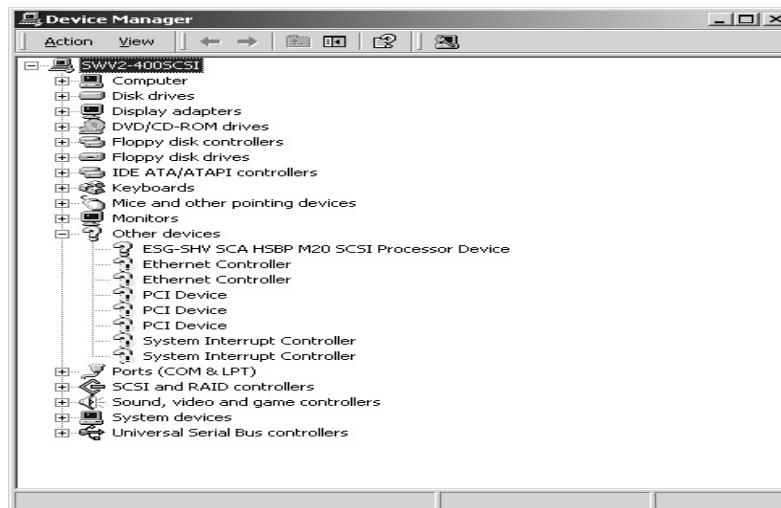
NOTE: Not all of these properties will be populated for a given device. In other words, although all of these properties are listed, some may not contain information when viewing a particular device.

➢ Troubleshooting Device Conflicts in the Device Manager

Troubleshooting Information

- If there is a problem with a device, it is listed in the hardware tree. Also, the problem device has a symbol that indicates the type of problem

- A black exclamation point (!) on a yellow field indicates the device is in a problem state. Note that a device that is in a problem state can be functioning

- A problem code explaining the problem is displayed for the device

- A red "X" indicates a disabled device. A disabled device is a device that is physically present in the computer and is consuming resources, but does not have a protected-mode driver loaded

- A blue "i" on a white field on a device resource in Computer properties indicates that the **Use automatic settings** feature is not selected for the device and that the resource was manually selected. Note that this does not indicate a problem or disabled state.

A green question mark "?" in Device Manager Means that a compatible driver for this device is installed, indicating the possibility that all of the functionality may not be available. Note that this applies only to Windows Millennium Edition (Me).

NOTE: Some sound cards and video adapters do not report all of the resources that they use to Windows. This can cause Device Manager to show only one device in conflict, or no conflicts at all. This can be verified by disabling the sound card, or by using the standard VGA video driver to see if the conflict is resolved.

Note that this is a known problem with S3 video adapters and 16-bit Sound Blaster sound cards, or those sound cards that are using Sound Blaster emulation for Sound Blaster compatibility.

When you double click a specific device in Device Manager, you see a property sheet. The property sheet has a **General** tab.

NOTE: Some devices may have other tabs besides the **General** tab. Not all property sheets have the same tabs; some devices may have a **Resources** tab, **Driver** tab, and **Settings** tab, or some combination of these.

At the top of the property sheet, there is a description of the device. When you click the **Resources** tab, the window in the middle of the tab indicates which resource types are available for the selected device.

The list box at the bottom contains a **Conflicting device list**. This list indicates a conflict with an error code.

Note the **Use automatic settings** check box. If Windows successfully detects a device, this check box is selected, and the device should function correctly. However, if the resource settings are based on Basic Configuration <n> (where <n> is any number from 0 to 9), it may be necessary to change the configuration by selecting a different basic configuration from the list. If the particular configuration you want for the device is not listed as a basic configuration, it may be possible to click the **Change Setting** button to manually adjust the resource values.

For example, to edit the Input/Output Range setting:

- ⊕ Click the **Use automatic settings** check box to clear it.

- ⊕ Click **Change Setting**.

- ⊕ Click the appropriate I/O range for the device

NOTE: To disable a device in **Device Manager**, right-click the device, and then click **Disable**. If the issue continues to occur, you may need to contact the manufacturer of your computer or motherboard to inquire about how to obtain and install a BIOS update for your computer.

EXPERIMENT - 7

General troubleshooting tips for printers

By completing this module you will be able to understand and learn how to manage general printer problems, that we normally face.

It is not possible to describe all of the steps one might take to fix every make, model, and type of printer. However in many cases, following these simple set of procedures, and a logical approach may save your time or money.

1. Refer the User Manual

- Read the manual thoroughly and follow the steps to connect the printer to PC

  - o In general, the printers are having connectivity with parallel port of PC and nowadays the USB connectivity is also available with the printer.
  - o Also we can connect the printers in the network if they are coming with RJ 45 connectors.

2. Check the manufacturer's web site

- Suppose if you have missed somewhere the user manual of printer, you may access the concerned manufacturer's web site for the details of the printer.

3. Check the plug at Power outlet

- ➢ Ensure the printer is plugged into a live outlet. If it is plugged into a surge protector, make sure it is on.

4. What if the power is on but there is no print out?

- ➢ Make sure that the power is on and there is no error lights (LEDs) lit.

- ➢ If there are error lights, refer to the **user manual/manufacturer's web site**.

- ➢ You should hear the print mechanism initialize when power is applied and most printers have at least one light which will be illuminated when it is on.

5. Check whether it is online or not.

- ➢ Online means, most of the printers are connected directly to the PC. Please check whether the connectivity between PC and printer as per user manual or not.

6. In case it is beeping , try to find out the reason for it.

- ➢ Most printers will beep once or twice during or after initialization. If it beeps more than that or beeps constantly, it is an indication that something is wrong. Most of the printers will beep when out of paper or out of ink.

7. Check wether you are able to give a test-print.

- ➢ Most printers have a built-in diagnostics program which can be very useful for troubleshooting problems and test-printing without a computer. They are usually initiated by pressing a button or two while turning on the printer. Check your user manual.

- ➢ If the printer test-prints OK, you don't have any problem with print mechanism of the printer. Then you may check the connectivity of the printer.

8. Check wether it has ink or toner

- ➢ Check wether the ink or toner of the printer is there .
- ➢ In case it is there check if it is properly filled or not.
- ➢ Check if the heads of the toners are clean or not. One must have to clean them periodically.

9. Check wether it has enough paper for printing purpose

- ➢ Be sure the paper is installed correctly and there is enough of it. Most printers have a paper-out detector. On most dot matrix printers it is a photo diode. If form-fed paper is not aligned correctly (usually on the left side) the diode won't see it.

10.   Check whether the printer is jammed?

- • Paper jams are frequently the reason for malfunction in many printers. Always read the manual on how to clear a jam.
  - o Don't be in a rush with your printer as you can easily damage a printer or even get hurt, if you do not follow instructions in the user manual.
  - o Don't move a print head unless the instructions direct it. You can damage the belt, etc.

- • Turn the power off & unplug it, before you start doing something .

- o Laser printers have some very fine wires to remove static charges from the paper near the fuser mechanism which will break if you are not very careful. Also, the fuser itself can be very hot (it fuses/melts toner to the paper).

11. Check wether the RAM is sufficient

- ➢ The printer memory could be full and not getting prints and prints may be stuck in print queue. Turn-off the printer, wait a few seconds and turn it back on.

12. Check whether the software (print drivers) installed or not

- ➢ We have to check the correct device drivers (software) of the printer installed in OS.
- ➢ Refer installation steps in windows, DOS, Linux in to user manual or vendors web site

13.   Check the printer connectivity with right port in BIOS settings

- ➢ Check Cable connectivity with printers Check the following points -

   a) The pins of DB25 connector are properly connected or not

   b) Check the various connectivity's of either side (e.g USB, DB25 etc)

   c) Many printers now require an IEEE 1284 and Bi-Directional. USB cables shouldn't be

      longer than 15 feet.

   d) Check for bent pins. Try another cable.

- ➢ **Is there something else connected to the printer port?**

   Disconnect it and uninstall the device drivers for it.

Experiment - 8

Uninterrupted Power Supply (UPS)

> **By completing this module you will be able to understand various types of UPSs available in the market.**

UPS is an electronic device that continues to supply electric power to the load for certain periods of time during a loss of main power from electricity board or when the power fluctuates from normal limits.

The generic standard for UPS system defines the limits on the amplitude and duration of deviation of the output voltage acceptable for switching power supply loads.

To make a power supply uninterruptable, we need energy storing backup for the period of time in the form of battery, an AC-DC Charger, and AC-DC Inverter.

Types of UPS

- **Stand By UPS**
- **Inline UPS**
- **Online UPS**

Stand by UPS includes a transfer switch that switches the load to the battery /inverter, in case the primary AC Power source fails. The transfer time typically is 1-5 ms and the power to the load will be interrupted.

Inline UPS also called as line interactive UPS which under normal condition smoothes and to some degree regulates the input AC voltage by a filter and a tap changing transformer.

The bidirectional inverter/charger is always connected to the output of the UPS and uses a portion of AC power to keep battery charged. When the power fails, the transfer switch from AC to Battery and provides output power.

Online UPS always delivers all or at least a portion of the output power through its inverter even under normal conditions. There are two types of online convertors 1) Double conversion and 2) Delta Conversion.

1) Double Conversion Online UPS is continuously processing the whole power through series connected AC-DC rectifier /charger and DC-AC inverter.

2) Delta Conversion UPS includes an additional "Delta Convertor" that delivers a portion of the output power directly to the load and provides the power

EXPERIMENT - 9

Virus

By completing this you will be able to understand viruses and its threats

Virus and its threats

➢ A virus is a computer program which can copy itself or infect the system without the knowledge of the user.

➢ A virus can spread from one system to the other system, whenever a file with virus in an infected system is accessed from another system.

➢ Some viruses may cause damage to the system by infecting the files, deleting the files, formatting the hard disk etc.

➢ To protect the system from virus one should have knowledge of each program or a file they download into their computer. Since it is difficult, we can use anti-virus software which can help the system by protecting it from virus.

Tips and tools to prevent virus into the system

➢ Keep anti-virus software up-to-date and make sure that it is working properly

➢ Scan the files with anti-virus software before you download it from the Internet and execute it

➢ Be careful while exchanging the files between the systems through disks or through network .While using the disk make sure that it is write protected, so that it prevents from accidental deletion and changes made to the files on the disk

➢ While using Microsoft office make sure that macro virus protection option is enabled

Note: A Macro virus is a computer virus that infects Microsoft word and similar application by inserting some undesirable text into the documents or by making some changes to the documents

➢ Take backup of the files which you feel important .This will help you in recovering the file when it is completely affected by virus

➢ Scan the system with anti-virus software daily and keep your operating system up to date with all the latest patches

➢ Some viruses start executing as soon as they appear on the Outlook Express preview pane. So disable that option

➢ Beware of the latest virus threats which may help you in detecting them and take the appropriate action to avoid it

List of anti virus tools available for preventing virus in to the system are given below:

AVG free , Quick Heal, Avira Anti virus , Cleanwin Anti virus,cleaner4.2, AVG Internet security, Bit defender free edition, Bit defender anti virus 2008, Avast 4 Home edition, McAfee Avert Stinger 3.8.0, CalmWin (open source) free anti virus.

UNIT- IX

Tips to deal with a few common PC problems

1) Problem: Computer does not Power up / start up

Initial Steps:

🕑 Make sure that the PC's power cable is plugged firmly into a wall socket or power strip and that the power strip is on

🕑 Try plugging the PC or the power strip into another wall socket

🕑 Ensure that the power cable is firmly connected to the PC's power-supply outlet

- Check to see that the power supply is switched to the "on" position
- Make sure that the power supply is switched to the voltage appropriate to your region
- Attach a working power cable to the PC's power supply and plug it in
- Unplug all external devices from the PC -- including a CD drive or digital camera -- except the monitor. If the computer powers on without the devices, add the peripherals back in one at a time until you can identify the problem device
- Unplug all external devices from the PC -- including a CD drive or digital camera -- except the monitor. If the computer powers on without the devices, add the peripherals back in one at a time until you can identify the problem device

If none of these steps solves the problem, check to see if your computer is still under warranty and send it back to the manufacturer. If the warranty has expired and you are comfortable doing so, proceed to the Advanced Steps below. Otherwise, talk to your volunteer consultant.

Advanced Steps:

- Unplug the computer and open the PC's case. Verify that the power supply is connected to the motherboard
- Make sure that all internal cables are connected and that all of the PCI expansion cards and RAM chips are tightly seated
- Examine the motherboard for noticeable signs of damage, such as cracks or burns. If you see problems, there's a good chance you'll need a new motherboard or a new computer. Consult a technician for further advice
- Remove the RAM and PCI cards and unplug your hard drive(s). Depending on your drive, you'll see either a wide, flat, gray IDE cable; a thinner red Serial ATA (SATA) cable; or a round gray or black SCSI cable. Plug in the power cable. If the computer turns on, begin plugging in additional cables and modules until you identify the faulty component

- Replace your power supply with a known working one or a with new one.
- If none of these steps work, your motherboard or processor is likely fried. Consider taking it to a repair shop or replacing the computer altogether

Procedure to replace power Supply:

- Turn off your computer and all the peripherals (such as your monitor, printer, modem, and scanner).

- Unplug your PC and all the peripherals from their outlets. After that, unplug all peripherals from the back of the computer.
- Move to a well-lit, static-free area, such as a tile floor or a kitchen table. Remove the computer case or panels to expose the interior of your PC. The power supply is enclosed in a metal box located in the corner of your computer case.

2) Problem: Computer Powers up/ starts off, but Monitor is blank.

Initial Steps:

- Ensure that your computer can boot normally and that all of the usual power lights are on
- Make sure that the monitor is plugged firmly into a working wall socket or power strip and that the power strip is on
- Try plugging the PC or power strip into another wall socket
- Verify that the monitor's power button is switched to the "on" position
- Make sure the monitor's brightness and contrast controls are properly adjusted (check your monitor's manual for information on how to do this)
- Check to see that the monitor cable is plugged firmly into the back of the display and that the pinned end is tightly screwed into the computer's video output on the back of the case
- Remove the existing cable and replace it with a known working monitor cable. Connect it to the display and to the computer
- Obtain a working monitor and hook it up to your PC. If this display works, contact a technician or buy a new monitor. If the monitor does not work, your video card may not be working and you'll need to open the desktop's case

If none of these steps solves the problem, check to see if your computer is still under warranty and find out how to send it back. If the warranty has expired, unplug the computer, open up the PC's case, and proceed to the Advanced Steps below.

Advanced Steps:

- Examine the video card for noticeable damage. If you spot defects or burnt components, you'll likely need a new video card

- Reseat the video card.

- Inspect the RAM and all drive cables to make sure they are all tightly seated and connected. If you find loose components or connections, tighten them.

- If your display is still not working, contact a repair shop or consider replacing the video card (or try swapping in a compatible card). To replace the card yourself.

3) Problem: Computer won't Boot From Hard Drive (not able to get to Windows Splash Screen)?

Initial Steps:

- Make sure that there is no bootable media in your floppy or CD drive

- Listen to make sure your hard drive is spinning. If you don't hear or feel motion, or if you don't see an error message on the screen, proceed to the advanced steps given below:

- Remove all external drives or devices and try restarting the computer

- If you receive a series of beeps or error messages, write them down, as they could be instrumental in diagnosing your problem. Beep codes vary by manufacturer, so consult your BIOS documentation for more in-depth info on what those beeps mean. Otherwise, proceed as follows

- Enter your computer's BIOS (access key varies by machine; usually you'll need to push the F1 or Delete key as the computer boots) and write down the current settings before proceeding further

- Keep an eye out for any built-in diagnostic tools; you might be able to find an error by using these

- If no diagnostic tools exist, go to the BIOS's hard drive section and make sure it's configured as "Auto."

- If the BIOS has an auto detect feature, run it to make sure that it can actually detect your hard drive

- If your BIOS has an optimized default option, try loading it and rebooting

- If the BIOS has a failsafe default option, try loading it and rebooting

- Attempt to enter your PC in Safe Mode. (As your computer boots, quickly press the F8 key.) If you can get in, run Windows' built-in diagnostic tool to check your drive for bad sectors and file system errors

- While still in Safe Mode, scan your computer for viruses, Trojans, spyware, and other threats that could be causing problems

- If none of these steps solves the problem, check to see if your computer is still under warranty and find out how to send it back.

- If the warranty has expired, unplug the computer, open up the PC's case, and proceed to the Advanced Steps.

Advanced Steps:

- Make sure that the hard drive is firmly connected to both the power supply and the motherboard

- Reseat the video card

- ⊕ Clear the CMOS by resetting the jumper on the motherboard. Before you do so, consult the motherboard or computer's documentation and be very careful while handling these components

- ⊕ If your computer has more than one stick of RAM, remove them all and try adding them back, starting with the slot closest to the processor. If the PC boots with one and not the other, you likely have a faulty stick of RAM

- ⊕ Make sure that the correct hard drive is set as the primary (master) drive and that the proper cable is connected. (See the back of the hard drive to set master and slave settings

- ⊕ Replace the hard drive cable(s) with known working ones.

- ⊕ Remove the PC's main power supply and replace it with a known working one.

If none of this works you may want to take the drive in for service or replace it altogether. If at all possible, back up your data first.

4) Problem: Windows won't Boot (After BIOS POST has been completed) orPC crashes.

Initial Steps

- ⊕ Make sure that there isn't a disk in your floppy or CD drive

- ⊕ Remove external drives or devices

- ⊕ Enter the Windows Advanced Options menu by pressing the F8 key during the BIOS's Power-On Self Test (POST). Select the option for "Last Known Good Configuration." (Note: if this works, you will lose any recently installed software or newly created files.)

- ⊕ Enter the Windows Advanced Options menu, boot into Safe Mode with networking, and perform a system restore

- ⊕ While in Safe Mode run your antivirus and anti-spyware programs. Remove any detected threats

- ⊕ If that fails, attempt to back up your data using back-up software, burn files to a CD, or consult a professional. You may eventually have to reformat your hard drive and reinstall Windows

Advanced Steps:

- ⊕ Enter the Windows Advanced Options menu and choose the option that enables the bootlog.
- ⊕ Restart, then boot into Safe Mode to compare the new bootlog and the original one. If you get error messages that certain drivers aren't loading correctly, write those down, and update or remove the faulty devices via Windows' Device Manager. You can then reinstall the drivers manually or ask Windows to locate a driver for the device

- ⊕ Insert your Windows Emergency Startup disk or the original CD-ROM and go to the Recovery Console. From there, you can attempt to restore the master boot record, the

first logical sector on your hard drive where the BIOS loads a program to boot your computer

5) Problem: The PC does not boot, the power and HDD LED does not come on, and there is no display on monitor.

- ☺ Check that your main power cable is plugged into the ATX power supply.

- ☺ Make sure you have connected the ATX power connector to the motherboard.

- ☺ Check if the cable for the power switch at front of the PC is connected to the correct pins on the motherboard.

6) Problem: The power LED comes on but the PC does not boot, there is no display on monitor.

- ☺ Check if the processor is firmly into the socket. Check CPU jumpers to verify if CPU frequency is correctly set.

7) Problem: The PC does not boot, but is beeping.

- ☺ Different BIOS manufacturers use various number of beeps to indicate faults with various hardware. In an Award BIOS motherboard you will get following kinds of beeps:

  1 long 2 short: Graphics card is not securely into place, or faulty.

  1 long 3 short: Graphics card is not securely into place, or faulty video memory.

  Continuous beeps: No memory, or memory not securely into place, or could be faulty.

  Continuous high/low beeps: No CPU, or CPU not securely into place, or could be faulty.

Please refer to your motherboard manual to confirm what the beeps are trying to tell you.

8) Problem: The PC boots but the CPU speed is incorrect.

- ☺ The CPU frequency jumper setting is incorrect. Refer to your motherboard manual to set it correctly.

9) **Problem: The HDD is not being detected by the BIOS.**

- ☺ Check if you connected the IDE cable to the motherboard correctly.

- ☺ Check wether the pin 1 on the IDE cable connected to pin 1 on the IDE sockets on both motherboard connector and HDD connector.

- Check if the HDD jumper is set to master and any other device sharing the same cable is set to slave.

10) Problem: Cannot access my CD/DVD-ROM in DOS mode, hence cannot install Windows.

- This is because the CD/DVD-ROM device driver is not installed.
- Install the manufacturer supplied device driver.
- If you do not have a device driver disk, you can use the windows boot disk which will provide access to your CD/DVD-ROM, so that you can install Windows.

10. INSTALLING AND UNINSTALLING THE HARDWARE & TROUBLESHOOTING MALFUNCTIONS OF HARDWARE INSTALLATIONS

You can install most hardware or mobile devices just by plugging them into your computer. Windows will automatically install the appropriate driver if it's available. If it's not, Windows will prompt you to insert a software disc that may have come with your hardware device.

- *Install a USB device*
- *Install a printer*
- *What to do when a device isn't installed properly*
- *Install, view, and manage your devices*
- *Automatically get recommended drivers and updates for your devices*
- *Install or remove a sound card*
- *Install or remove a hard disk drive*
- *How can I decide which drivers are safe to install?*

Typically, the first time you connect a device that plugs into a USB port, Windows automatically installs a driver for that device. Drivers allow your computer to communicate with hardware devices; without one, a USB device that you connect to your computer—for example, a mouse or a webcam—won't work properly.

Before installing a device

Check the instructions that came with the device to see if you need to install a driver before connecting the device. Although Windows usually does this automatically after you connect a new device, some devices require that you install drivers manually. In those cases, the device manufacturer includes a software disc and instructions on installing the driver before plugging in the device.

If your USB device came with software from the manufacturer, check to see if it's compatible with this version of Windows. If it's not compatible, or doesn't say which versions of Windows it's designed for, try plugging the device in first to see if Windows can find a compatible driver.

If the instructions that came with your device contradict the information in this topic, follow those instructions.

Plugging in and turning on a device

Most USB devices that have power switches should be turned on before you connect them. If your device uses a power cord, connect the device to a power source. Then, turn it on before connecting it.
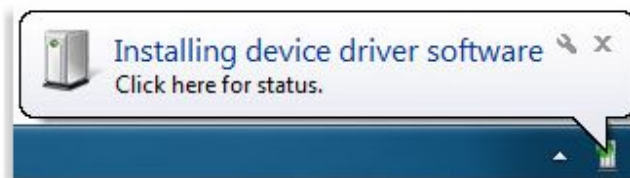
Next, determine which USB port you want to connect your device to. If your computer has USB ports on the front, consider using one of those if you plan to frequently connect and disconnect the device. (You can use any port the next time you plug in the

A typical USB cable and port

device.)

Plug the device into the USB port. If Windows can find and install the device driver automatically, you'll be notified that the device is ready to use. Otherwise, you'll be prompted to insert a disc containing the driver.

Windows will notify you when it finishes successfully installing a device

After installation is complete, check the information that came with your device to see if you need to install any additional software.

Occasionally, a USB device isn't recognized by Windows and doesn't come with a disc containing a driver. In that case, you can try to find a device driver online. Start by checking the website of the device manufacturer—you can often download drivers from the "Support" section of such sites.

Notes

- *When connecting a device to a USB port on a USB hub, monitor, or other device that's plugged into your computer, make sure that the USB port has enough power to support your device. Smaller devices, such as USB flash drives and mice—and devices with their own power cords, such as printers—typically work properly when connected to an unpowered USB hub. Some devices that use more power, such as USB-powered scanners and web cameras, require a hub that has its own power cord to function properly. If a device doesn't work properly when connected to a hub, try connecting it directly to one of your computer's USB ports.*

- *Devices that transfer large amounts of information, such as external hard disks, scanners, and video cameras, function best when connected to high-speed USB 2.0 ports. Some older computers might include only USB 1.x ports, or a mix of USB 1.x and 2.0 ports. If your device requires a high-speed port to function properly, check the information that came with your computer to make sure that the port you're using supports USB 2.0. If your computer includes only USB 1.x ports, you can add USB 2.0 ports by installing a USB 2.0 card inside your computer.*

Disconnecting a device

Most USB devices can be removed and unplugged. When unplugging storage devices, such as USB flash drives, make sure that the computer has finished saving any information to the device before removing it. If the device has an activity light, wait for a few seconds after the light has finished flashing before unplugging it.

If you see the Safely Remove Hardware icon in the notification area on the right side of the taskbar, you can use this as an indication that devices have finished all operations in progress and are ready to be removed. Click the icon and you'll see a list of devices. Click the device you want to remove. Windows will display a notification telling you it's safe to remove the device.

Install a printer

There are several ways to connect a printer to your PC. Which option you choose depends on the device itself, and whether you're at home or at the office.

Always consult the information that came with your model for specific instructions.

Local printers

The most common way to install a printer is to connect it directly to your computer. This is known as a local printer.

If your printer is a universal serial bus (USB) model, Windows should automatically detect and install it when you plug it in.

If it's an older model that connects using the serial or parallel port, you might have to install it manually.

To install (add) a local printer

1. *Click to open Devices and Printers.*
2. *Click Add a printer.*
3. *In the Add Printer wizard, click Add a local printer.*
4. *On the Choose a printer port page, make sure that the Use an existing port button and the recommended printer port are selected, and then click Next.*
5. *On the Install the printer driver page, select the printer manufacturer and model, and then click Next.*
   - *If your printer isn't listed, click Windows Update, and then wait while Windows checks for additional drivers.*
   - *If none are available and you have the installation CD, click Have Disk, and then browse to the folder where the printer driver is located. (For additional help, consult the printer manual.)*
6. *Complete the additional steps in the wizard, and then click Finish.*

Tips

   - *You can print a test page to make sure the printer is working correctly. See Print a test page.*
   - *If you've installed the printer but it doesn't work, check the manufacturer's website for troubleshooting information or driver updates.*

Network printers

In the workplace, many printers are network printers. These connect directly to a network as a stand-alone device. Inexpensive network printers are also made for the home. To learn more, see Install a printer on a home network.

To install a network, wireless, or Bluetooth printer

If you're trying to add a network printer at the office, you'll usually need the name of the printer. If you can't find it, contact your network administrator.

1. *open Devices and Printers.*
2. *Click Add a printer.*

3. In the Add Printer wizard, click Add a network, wireless or Bluetooth printer.
4. In the list of available printers, select the one you want to use, and then click Next.
5. If prompted, install the printer driver on your computer by clicking Install driver.
6. Complete the additional steps in the wizard, and then click Finish.

Removing a printer

If you'll no longer be using a printer, you can remove it from the Devices and Printers folder.

1. Open Devices and Printers.
2. Right-click the printer that you want to remove, click Remove device, and then click Yes.

   If you can't delete the printer, right-click it again, click Run as administrator, click Remove device, and then click Yes.

Notes

  - If you have a multi-function or all-in-one printer, you can often remove the printer from Devices and Printers without affecting other device functions. So, for example, you might continue to see a scanner or fax icon for the device.
  - You can't uninstall a printer if you have unfinished jobs in your print queue. Either delete the jobs, or wait until Windows has finished printing them. Once the queue is clear, Windows will remove the printer.

What to do when a device isn't installed properly

When you connect a new device to your computer, Windows automatically tries to install it for you and will notify you if a driver for the device can't be found. There are several things you can try if this happens:

Make sure your computer is connected to the Internet and automatic updating is turned on

Your computer must be connected to the Internet for Windows to be able to search online for a device driver. To see if your computer is connected to the Internet, open your web browser and try accessing a website. If you're temporarily disconnected, such as when you're traveling with a laptop, wait until you're online again, and then try reinstalling your device.

Windows can't check for the latest drivers unless automatic updating is turned on. Most people turn on automatic updating the first time they use Windows, but if you're not sure you did, you should check to make sure it's turned on. Be sure to select the option to include recommended updates, or Windows will install important updates only. Important updates provide significant benefits, such as improved security and reliability, but recommended updates might include drivers for some of your devices

Manually check for drivers on Windows Update

If you didn't have automatic updating turned on, or you weren't connected to the Internet when you connected a new device to your computer, you should check to see if Windows can now find a driver for your device. Even if your computer is always connected to the Internet, you should still check Windows Updates for optional updates if some of your hardware isn't working properly. Optional updates often contain new driver updates. Windows Update does not install optional updates automatically, but it will notify you when it finds some and let you choose whether to install them.

Install software for the device

If Windows Update can't find a driver for your device, try checking the manufacturer's website for a driver or other software for the device. If your device came with a software disc, that disc might contain software needed to make your device work properly, but first check the manufacturer's website for the latest software and drivers.

If you don't find any new software or drivers for your device on the manufacturer's website, try inserting the disc that came with the device, and then follow the instructions for installing the software.

Note

- *Many drivers come with software that installs the driver for you (often called a self-installing package), but you might have to install some drivers manually as well.*
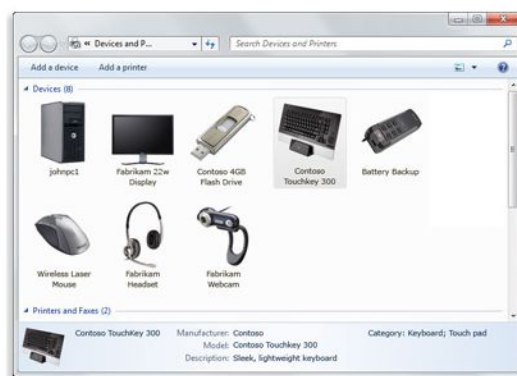
If your device still doesn't work properly after trying these suggestions, a driver might not be available for your device. In this case, try contacting the device manufacturer.

Install, view, and manage your devices

When you want to see all the devices connected to your computer, use one of them, or troubleshoot one that isn't working properly, open the Devices and Printers folder.

To open the Devices and Printers folder

open Devices and Printers in control panel

The Devices and Printers folder gives you a quick view of devices connected to your computer.

Devices displayed in the Devices and Printers folder are typically external devices you can connect to or disconnect from your computer through a port or network connection. Your computer is also displayed.

Devices listed include:

- *Portable devices you carry with you and occasionally connect to your computer, such as mobile phones, portable music players, and digital cameras.*
- *All devices you plug into a USB port on your computer, including external USB hard drives, flash drives, webcams, keyboards, and mice.*
- *All printers connected to your computer, which include printers connected by USB cable, the network, or wirelessly.*
- *Wireless devices connected to your computer, including Bluetooth devices and Wireless USB devices.*
- *Your computer.*
- *Compatible network devices connected to your computer, such as network-enabled scanners, media extenders, or Network Attached Storage devices (NAS devices).*

The Devices and Printers folder allows you to perform many tasks, which vary depending on the device. Here are the main tasks you can do:

- *Add a new wireless or network device or printer to your computer.*
- *View all the external devices and printers connected to your computer.*
- *Check to see if a specific device is working properly.*
- *View information about your devices, such as make, model, and manufacturer, including detailed information about the sync capabilities of a mobile phone or other mobile device.*
- *Perform tasks with a device.*

  When you right-click a device icon in the Devices and Printers folder, you can select from a list of tasks that vary depending on the capabilities of the device. For example, you might be able to see what's printing on a network printer, view files stored on a USB flash drive, or open a program from the device manufacturer. For mobile devices that support the new Device Stage feature in Windows, you can also open advanced, device-specific features in Windows from the right-click menu, such as the ability to sync with a mobile phone or change ringtones.

- *Take steps to fix devices that aren't working properly.*

Troubleshoot a device with a problem

  - *Right-click a device or computer with the yellow warning icon, click Troubleshoot, wait while the troubleshooter tries to detect problems (this may take several minutes), and then follow the instructions.*

11. INSTALLING AND UNINSTALLING THE SOFTWARE AND TROUBLESHOOTING MALFUNCTIONS OF SOFTWARE INSTALLATIONS

You can do a lot with the programs and features included in Windows, but you'll probably want to install other programs.

How you add a program depends on where the installation files for the program are located. Typically, programs are installed from a CD or DVD, from the Internet, or from a network. If you want to uninstall or make changes to a program already installed on your computer, see Uninstall or change a program.

To install a program from a CD or DVD

Insert the disc into your computer and follow the instructions on your screen.

Many programs installed from CDs or DVDs launch an installation wizard for the program automatically. In these cases, the AutoPlay dialog box will appear and you can choose to run the wizard.

If a program doesn't begin to install, check the information that came with the program. This information will likely provide instructions for installing the program manually. If you cannot access the information, you can also browse through the disc and open the program setup file, usually called Setup.exe or Install.exe. If your program was written for an earlier version of Windows, some older programs might run poorly or not at all. If a program written for an earlier version of Windows doesn't run correctly, you can try changing the compatibility settings for the program, either manually or by using the Program Compatibility troubleshooter.

Setting	*Description*
Compatibility mode	*Runs the program using settings from a previous version of Windows. Try this setting if you know the program is designed for (or worked in) a specific previous version of Windows.*
Run in 256 colors	*Uses a limited set of colors in the program. Some older programs are designed to use fewer colors.*
Run in 640 × 480 screen resolution	*Runs the program in a smaller-sized window. Try this setting if the graphical user interface appears jagged or is rendered improperly.*
Disable visual themes	*Disables <u>themes</u> on the program. Try this setting if you notice problems with the menus or buttons on the title bar of the program.*
Disable desktop composition	*Turns off transparency and other advanced display features. Choose this setting if window movement appears erratic or you notice other display problems.*
Disable display scaling on high DPI settings	*Turns off automatic resizing of programs if large-scale font size is in use. Try this setting if large-scale fonts are interfering with the appearance of the program. For more information, see <u>Make the text on your screen larger or smaller</u>.*
Privilege level	*Runs the program as an administrator. Some programs require administrator privileges to run properly. If you are not currently logged on as an administrator, this option is not available.*
Change settings for all users	*Lets you choose settings that will apply to all users on this computer.*

<u>To install a program from the Internet</u>

1. In your _web browser_, click the link to the program.
2. Do one of the following:

   - To install the program immediately, click Open or Run and follow the instructions on your screen.
   - To install the program later, click Save and download the installation file to your computer. When you are ready to install the program, double-click the file and follow the instructions on your screen. This is a safer option because you can scan the installation file for viruses before you proceed.

Note

   o When downloading and installing programs from the Internet, be sure you trust the publisher of the program and the website that is offering the program.

Uninstall or change a program

You can uninstall a program from your computer if you no longer use it or if you want to free up space on your _hard disk_. You can use Programs and Features to uninstall programs or to change a program's configuration by adding or removing certain options.

   1. Go to Control panel and open Programs and Features.
   2. Select a program, and then click Uninstall. Some programs include the option to change or repair the program in addition to uninstalling it, but many simply offer the option to uninstall. To change a program, click Change or Repair.

12. BACKUP AND RESTORATION PROCESS OF DATA IN A SYSTEM

To help ensure that you don't lose your files, you should back them up regularly. You can set up automatic backups or manually back up your files at any time.

   1. Open Backup and Restore in the control panel
   2. Do one of the following:
   3. If you have never used Windows Backup before, click Set up backup, and then follow the steps in the wizard.

4. *If you have created a backup before, you can wait for your regularly scheduled backup to occur, or you can manually create a new backup by clicking Back up now.*

Note

- *It is recommended that you don't back up your files to the same hard disk that Windows is installed on.*

- *Always store media used for backups (external hard disks, DVDs, or CDs) in a secure place to prevent unauthorized people from having access to your files; we recommend a fireproof location separate from your computer. You might also consider encrypting the data on your backup.*

To create a new, full backup

After you create your first backup, Windows Backup will add new or changed information to your subsequent backups. If you're saving your backups on a hard drive or network location, Windows Backup will create a new, full backup for you automatically when needed. If you're saving your backups on CDs or DVDs and can't find an existing backup disc, or if you want to create a new backup of all of the files on your computer, you can create a full backup. Here's how to create a full backup:

1. *Open Backup and Restore in the control panel*
2. *In the left pane, click Create new, full backup.*

Note: You will only see this option if your backup is being saved on CDs or DVDs.

To set up backup after upgrading from a previous version of Windows

After you upgrade Windows, you will need to set up Windows Backup, even if you had a scheduled backup in the previous version of Windows. This is because there are several changes to the backup program. Instead of selecting file types to back up, you can have Windows back up data files saved in libraries, on the desktop, and in default Windows folders, or you can choose specific libraries and folders to be backed up. You can also create a system image of your computer.

Back up your programs, system settings, and files

You can create a system image, which contains a copy of Windows and copies of your programs, system settings, and files. The system image is then stored in a

separate location from the original programs, settings, and files. You can use this image to restore the contents of your computer if your hard disk or entire computer ever stops working.

If you're using Windows Backup to back up your files, you can have a system image created each time your files are backed up. By default, this system image will only include the drives required for Windows to run. To include additional drives in the system image or to create a system image manually, follow the steps below.

1. *Open Backup and Restore in the control panel*
2. *In the left pane, click Create a system image, and then follow the steps in the wizard.*

Restore files from a backup

You can restore backed-up versions of files that are lost, damaged, or changed accidentally. You can also restore individual files, groups of files, or all of the files that you have backed up.

1. *Open Backup and Restore in the control panel*
2. *To restore your files, click Restore my files.*
3. *To restore the files of all users, click Restore all users' files.*
4. *To browse the contents of the backup, click Browse for files or Browse for folders.*
5. *When you are browsing for folders, you won't be able to see the individual files in a folder. To view individual files, use the Browse for files option.*
6. *To search the contents of the backup, click Search, type all or part of a file name, and then click Search.*

Recover lost or deleted files

If you can't find a file on your computer or you accidently modified or deleted a file, you can restore it from your backup (if you are using Windows backup) or you can try to restore it from a previous version. Previous versions are copies of files and folders that Windows automatically saves as part of a restore point. Previous versions are sometimes referred to as shadow copies.

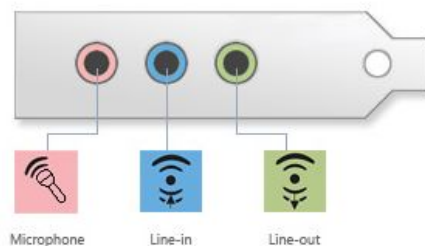# 13. INSTALL OR REMOVE A SOUND CARD

Most new desktop computers come with a built-in sound card that you can replace. If your computer doesn't have a sound card installed or you want to upgrade the sound playback or recording capabilities of your computer, you can install a sound card. Most laptops have built-in sound processing chips (also called sound processors) but not internal sound cards. You can upgrade the sound on a laptop by plugging an external sound device into a USB port or external card slot, but this is rarely done. Sound processors can also be built into desktop computers. You can't remove them, but to upgrade your sound, you can usually install an internal sound card and turn off the sound processor.

Before installing a sound card, check the information that came with it. The guidelines shown here are general, and the sound card documentation might contain important information specific to installing that card. Also, be sure to check the information that came with your computer to see if opening your computer affects the computer's warranty coverage.

Before installing a sound card, you'll need the following:

- *The sound card you want to install*
- *A Phillips screwdriver to open your computer, if needed*
- *An empty PCI slot inside your computer, unless you plan to replace an existing sound card (in which case you can put the new card into that slot)*

If your sound card came with a CD, DVD, or other removable media, it might contain a driver for your sound card. Hold on to that until Windows has finished looking for and installing a driver. Windows does this automatically after you install the sound card in your computer and turn the computer back on. If Windows can't find a good driver for your sound card, then try installing the driver that came with the sound card. Software from the manufacturer might also include other programs for your sound card.

Most sound cards have at least one line-out jack to connect speakers and a line-in jack to connect an audio input device.

To open your computer case

1. Turn off your computer and unplug it from its power source. This is very important. Installing a card in a computer that's plugged in could shock you or damage the card and computer.
2. Open the computer case. Look on the computer cover (usually on the back) for screws or clasps to undo the case. Computer documentation typically includes instructions on how to open the case.
3. After opening the case, ground yourself by touching the metal casing that surrounds the jack where the power cord plugs in. This can help protect you from an electric shock and can help protect the new card and existing computer components from static electricity.

To remove an existing sound card

If you have an existing internal sound card, you should remove it before installing the new card. If your computer has a built-in sound processor, you can proceed to the "To install your new sound card" section of this topic.

1. Locate your sound card. If you're not certain which card is your sound card, follow the wires from your speakers to the back of the card, and then note which slot that card is in.
2. Unplug any speaker and microphone cables from the back of the sound card.
3. If there's a cable inside your computer connecting the sound card to your CD drive, disconnect it. Many newer computers don't have this cable, so if it's not there, you can skip this step.
4. Remove any screw or hook holding your sound card in place.
5. Carefully pull the sound card straight out of the slot. Be careful not to twist or bend the card as you remove it.

Note

The card might need one or two gentle up-and-down nudges to come loose. Even if you're throwing away the old sound card, use caution when removing it to avoid damaging the motherboard. If it seems stuck, it's better to spend a few extra minutes tugging gently than to rip the card out too quickly.

6. If you're not installing a new sound card, install a slot cover if you have one, and replace the screw. Then, close the computer case and replace any screws you removed when opening the case.

To install your new sound card

1. *Locate an empty expansion slot in the computer that will accept your new sound card.*

   If your computer doesn't have an empty slot, you'll have to remove another card before you can install the new one. If you removed an existing sound card, you can use the same slot if your new card uses the same type of expansion slot. Check your computer's documentation if you need to determine the types of expansion slots it has available.

2. *Gently place the sound card on top of the slot. Line up the pins on the sound card with the slot and push the card gently down so that it sits in the slot. Be sure that the card is pushed all the way in and that it's secure. If the pins on the card aren't perfectly aligned with the pins in the expansion slot, the card won't work properly.*
3. *If your computer has an audio cable that connects the CD drive directly to the sound card, plug it into the card. Check the information that came with your sound card to determine the location of the CD audio connector on the card. This cable is rarely necessary with current audio hardware, and in most cases, plugging it in is optional.*
4. *Screw the sound card to the frame. Don't bend the sound card or the frame while tightening the screw. It might be best to tighten the screw barely more than you can tighten it with your fingers.*
5. *Close the computer case and replace any screws you removed when opening the case. Plug your speakers into your new sound card and, if applicable, plug your microphone in too.*
6. *Plug your computer back into its power source and then turn it on.*
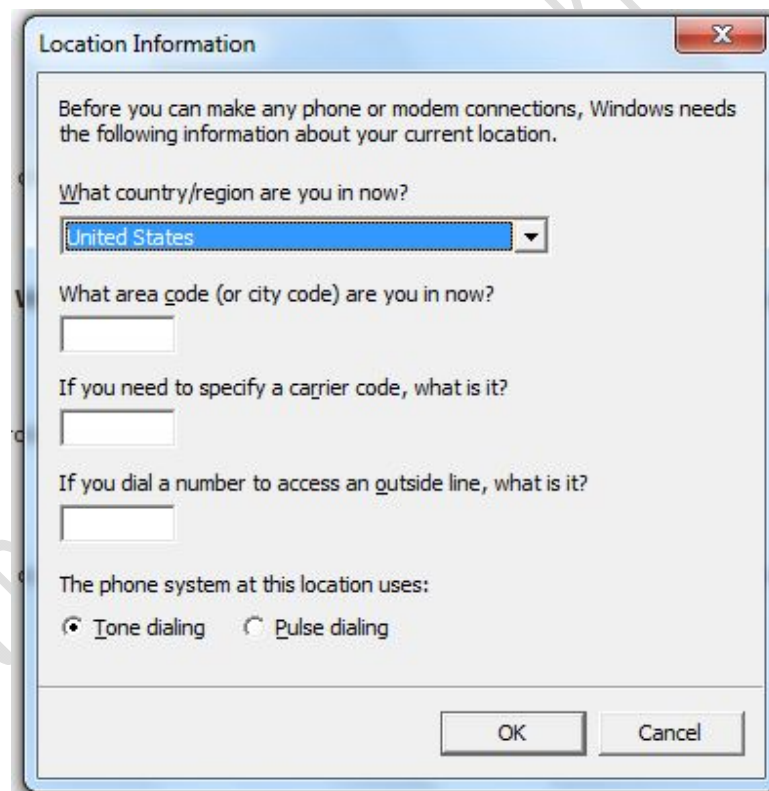
   Windows will install the necessary drivers for your new sound card. If your sound card came with a disc containing software, install that now. Check the information that came with your sound card for the installation steps.

14.INSTALL OR REMOVE A MODEM

Usually, Windows will find, and then automatically install, the necessary drivers when you install a modem. However, if Windows can't find or install the correct driver, you might need to install the modem manually.

To manually install a modem

1. Open Phone and Modem option in the control panel menu.You might need to provide information, such as your country or region and any special phone dialing rules, in the Location Information dialog box before you can access the Phone and Modem dialog box.

2. Click the Modems tab.
3. Click Add, and then follow the instructions in the Add Hardware Wizard.

To remove a modem

If Windows automatically installs the wrong driver, or if you have problems with your modem, you can remove it.

1. Open Phone and Modem option in the control panel menu.
2. Click the Modems tab.
3. Select the modem you want to remove, and then click Remove.

Change modem settings

You can change modem settings, such as the speaker volume.

1. Open Phone and Modem option in the control panel menu
2. Click the Modems tab.
3. Select the modem you want to change the settings for, and then click Properties.
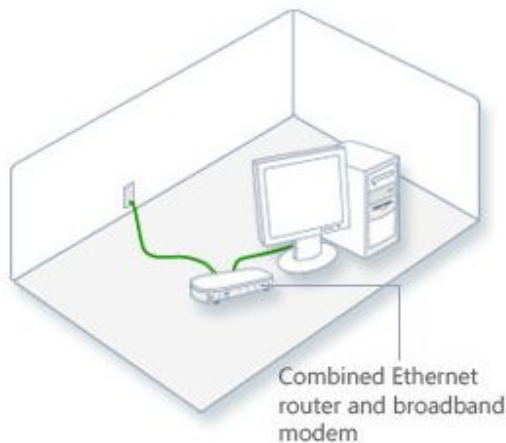4. Change the settings you want, and then click OK.

Set up a broadband (DSL or cable) connection

To set up a Digital Subscriber Line (DSL) or cable connection, you first need an account with an Internet service provider (ISP). For DSL, the ISP is usually a phone company; for cable, it's usually a cable TV provider.

You will also need a modem, a router, or a device that combines the two. Some ISPs will provide you with these devices; if your ISP doesn't, you'll need to buy them. When you have your modem, router, or combination device, either follow the instructions provided by your ISP, or follow the corresponding steps below.

To setup a combined modem and router

1. Plug the device into an electrical outlet.
2. Plug one end of a phone cord or cable into the wide area network (WAN) port of the device, and then plug the other end into the wall jack. The WAN port should be labeled "WAN." (DSL users: Don't use a DSL filter on the phone line.)
3. Plug one end of an Ethernet cable into the local area network (LAN) port on the device, and then plug the other end into the networking port of the computer that you want to connect to the Internet. The LAN port should be labeled "LAN." (If you are connecting wirelessly, skip this step.)
4. Start (or restart) the computer.
5. In the Control Panel, Open connections and Internet .Then open the Connect to the Internet wizard.
6. Follow the steps in the wizard.

Combined Ethernet
router and broadband
modem

A combined modem and router plugged in

Too setup a separate modem and router

1. Plug the modem into an electrical outlet.
2. Plug one end of a phone cord or cable into the modem, and plug the other end into the wall jack. (DSL users: Don't use a DSL filter on the phone line.)
3. Plug one end of an Ethernet cable into the modem, and plug the other end into the wide area network (WAN) port on the router.
4. Plug the router into an electrical outlet.
5. Plug one end of an Ethernet cable into the local area network (LAN) port on the router, and plug the other end into the networking port on the computer that you want to connect to the Internet. (If you are connecting wirelessly, skip this step.)
6. Start (or restart) the computer.
7. In the Control Panel, Open connections and Internet .Then open the Connect to the Internet wizard.
8. Follow the steps in the wizard.
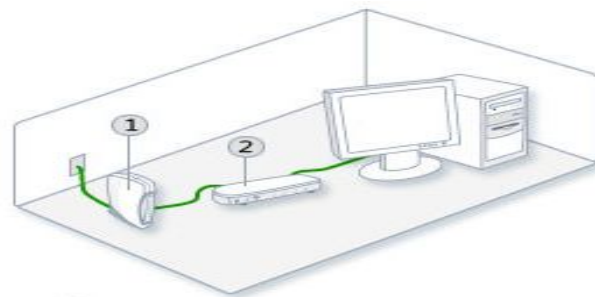
(1) Broadband modem
(2) Ethernet router or hub

A modem and router plugged in

TROUBLESHOOTING CONNECTION PROBLEMS:

Internet connection problems are most commonly caused by disconnected cables or by routers or modems that are not operating properly. First, try these steps:

1. *If you haven't already done so, run the Network troubleshooter to see if it can help diagnose and solve your problem .Click on Control panel ,in that open connections and Internet open the Network troubleshooter.*
2. *Make sure that all cables are connected (for example, make sure your modem is connected to a working phone jack or cable connection, either directly or through a router).*
3. *Restart your modem, and then restart your router. Remove the power cable from the modem and router. After all lights on the device have gone out, wait at least 10 seconds, and then plug the modem and router back in. Some modems have a battery backup that prevents the lights from going out. For this type of modem, press and quickly release the Reset button.*
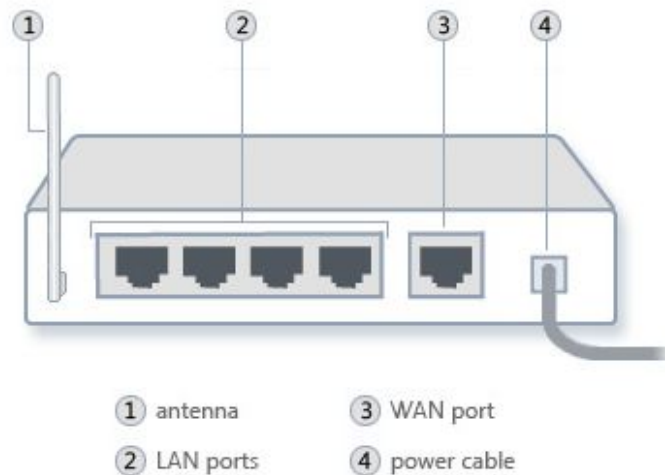
The back of a router, showing the location of the power cable

Problem: The system can't connect to the Internet through a broadband Digital Subscriber Line (DSL) or cable connection

Try these things:

- *Make sure that your modem is turned on.*
- *Check to see that the Ethernet cable is plugged correctly into the Ethernet port on the modem and on your computer. Each end of an Ethernet cable looks like this:*

Ethernet cable

- *Verify that you are not using a DSL filter between the phone jack and the modem.*
- *Check the lights on your modem. These can sometimes indicate the location of the problem—whether it is the Ethernet connection, the power to the modem, or the DSL or cable connection.*
- *Winsock corruption can cause connectivity problems. To fix this, open the Network troubleshooter*

- *Ask your Internet service provider (ISP) to verify that its servers are functioning correctly and that you have an ISP user account and access to the ISP service.*
- *If you have recently replaced your router or modem, ask your ISP if it uses MAC address filtering. If so, your ISP must add your new device to the list of devices that can access the network.*

Problem: the system can't connect to the Internet through a dial-up connection, or system being disconnected
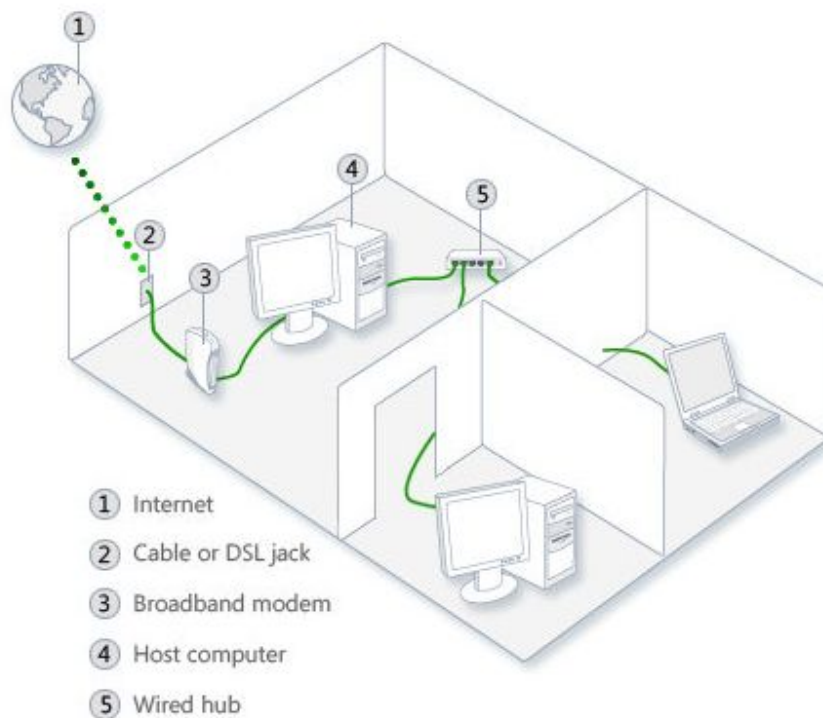
Try these things:

- *Make sure that you are dialing the correct number, including any required access numbers (such as 9), and that the number is not busy.*
- *Make sure that the phone jack is working. To test this, plug in a working phone and see if there is a dial tone.*
- *Make sure that the phone cable is plugged into the "line" jack on your modem, not the "telephone" jack.*
- *Make sure that the phone cable is not defective by plugging a working phone into the "telephone" jack of your modem. If there is a dial tone, the phone cable is working.*
- *If you have call waiting, try disabling it, and then try the connection again.*
- *Your ISP might have disconnected you if you weren't interacting with the website for a while. Try connecting again.*
- *If someone picked up the phone while you were online, you might have been automatically disconnected. Try connecting again.*
- *Most dial-up modems work only with analog phone lines. Verify that you have analog phone lines installed, or, if you have digital phone lines installed, verify that your computer has a digital modem.*
- *Make sure that your modem is working properly. For more information, check the information that came with your modem or go to the manufacturer's website.*
- *Contact your telephone company to verify the quality of your line.*
- *If your computer has two network connections, the networking software must choose which connection to use for network traffic. The networking software picks the connection with the best performance. If connection A has Internet connectivity but slow performance and connection B has no Internet connectivity but better local network performance, the networking software will route network traffic over connection B. This means that you won't be able to view websites, so the networking icon and the network diagram in Network and Sharing Center will report that you only have local connectivity (no Internet). This is correct, but it's not what you want. To force your computer to use connection A—the connection with Internet connectivity—disconnect connection B and try again.*

15. SETTING UP A WIRELESS NETWORK

Hubs, switches, routers, and access points are all used to connect computers together on a network, but each of them has different capabilities.

Hubs

Hubs enable computers on a network to communicate. Each computer plugs into the hub with an Ethernet cable, and information sent from one computer to another passes through the hub. A hub can't identify the source or intended destination of the information it receives, so it sends the information to all of the computers connected to it, including the one that sent it. A hub can send or receive information, but it can't do both at the same time. This makes hubs slower than switches. Hubs are the least complex and the least expensive of these devices.

1 Internet
2 Cable or DSL jack
3 Broadband modem
4 Host computer
5 Wired hub

Network with a hub

Switches

Switches work the same way as hubs, but they can identify the intended destination of the information that they receive, so they send that information to only the computers that are supposed to receive it. Switches can send and receive information at the same time, so they can send information faster than hubs can. If your home network has four or more computers or you want to use your network for activities that require passing a lot of information between computers (such as playing network games or sharing music), you should probably use a switch instead of a hub. Switches cost a little more than hubs.

Routers

Routers enable computers to communicate and they can pass information between two networks—such as between your home network and the Internet. This capability to direct network traffic is what gives the router its name. Routers can be wired (using Ethernet cables) or wireless. If you just want to connect your computers, hubs and switches work well; however, if you want to give all of your computers access to the ……

10. INSTALLING AND UNINSTALLING THE HARDWARE & TROUBLESHOOTING MALFUNCTIONS OF HARDWARE INSTALLATIONS

You can install most hardware or mobile <u>devices</u> just by plugging them into your computer. Windows will automatically install the appropriate <u>driver</u> if it's available. If it's not, Windows will prompt you to insert a software disc that may have come with your hardware device.

- *<u>Install a USB device</u>*
- *<u>Install a printer</u>*
- *<u>What to do when a device isn't installed properly</u>*
- *<u>Install, view, and manage your devices</u>*
- *<u>Automatically get recommended drivers and updates for your devices</u>*
- *<u>Install or remove a sound card</u>*
- *<u>Install or remove a hard disk drive</u>*
- *<u>How can I decide which drivers are safe to install?</u>*

Typically, the first time you connect a <u>device</u> that plugs into a <u>USB</u> port, Windows automatically installs a <u>driver</u> for that device. Drivers allow your computer to communicate with hardware devices; without one, a USB device that you connect to your computer—for example, a mouse or a webcam—won't work properly.

Before installing a device

Check the instructions that came with the device to see if you need to install a driver before connecting the device. Although Windows usually does this automatically after you connect a new device, some devices require that you install drivers manually. In those cases, the device manufacturer includes a software disc and instructions on installing the driver before plugging in the device.

If your USB device came with software from the manufacturer, check to see if it's compatible with this version of Windows. If it's not compatible, or doesn't say which versions of Windows it's designed for, try plugging the device in first to see if Windows can find a compatible driver.

If the instructions that came with your device contradict the information in this topic, follow those instructions.

Plugging in and turning on a device

Most USB devices that have power switches should be turned on before you connect them. If your device uses a power cord, connect the device to a power
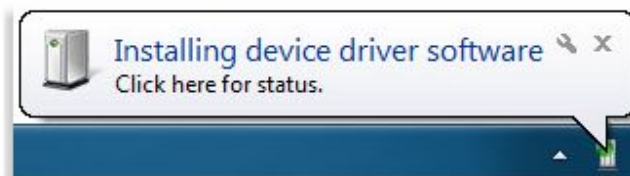
source. Then, turn it on before connecting it. Next, determine which USB port you want to connect your device to. If your computer has USB ports on the front, consider using one of those if you plan to frequently connect and disconnect the device. (You can use any port the next time you plug in the

A typical USB cable and port

device.)

Plug the device into the USB port. If Windows can find and install the device driver automatically, you'll be notified that the device is ready to use. Otherwise, you'll be prompted to insert a disc containing the driver.

Windows will notify you when it finishes successfully installing a device

After installation is complete, check the information that came with your device to see if you need to install any additional software.

Occasionally, a USB device isn't recognized by Windows and doesn't come with a disc containing a driver. In that case, you can try to find a device driver online. Start by checking the website of the device manufacturer—you can often download drivers from the "Support" section of such sites.

Notes

- *When connecting a device to a USB port on a USB hub, monitor, or other device that's plugged into your computer, make sure that the USB port has enough power to support your device. Smaller devices, such as USB flash*

drives and mice—and devices with their own power cords, such as printers—typically work properly when connected to an unpowered USB hub. Some devices that use more power, such as USB-powered scanners and web cameras, require a hub that has its own power cord to function properly. If a device doesn't work properly when connected to a hub, try connecting it directly to one of your computer's USB ports.

- *Devices that transfer large amounts of information, such as external hard disks, scanners, and video cameras, function best when connected to high-speed USB 2.0 ports. Some older computers might include only USB 1.x ports, or a mix of USB 1.x and 2.0 ports. If your device requires a high-speed port to function properly, check the information that came with your computer to make sure that theport you're using supports USB 2.0. If your computer includes only USB 1.x ports, you can add USB 2.0 ports by installing a USB 2.0 card inside your computer.*

Disconnecting a device

Most USB devices can be removed and unplugged. When unplugging storage devices, such as USB flash drives, make sure that the computer has finished saving any information to the device before removing it. If the device has an activity light, wait for a few seconds after the light has finished flashing before unplugging it.

If you see the Safely Remove Hardware icon in the <u>notification area</u> on the right side of the <u>taskbar</u>, you can use this as an indication that devices have finished all operations in progress and are ready to be removed. Click the icon and you'll see a list of devices. Click the device you want to remove. Windows will display a notification telling you it's safe to remove the device.

Install a printer

There are several ways to connect a printer to your PC. Which option you choose depends on the device itself, and whether you're at home or at the office.

Always consult the information that came with your model for specific instructions.

Local printers

The most common way to install a printer is to connect it directly to your computer. This is known as a local printer.

If your printer is a <u>universal serial bus (USB)</u> model, Windows should automatically detect and install it when you plug it in.

If it's an older model that connects using the serial or parallel port, you might have to install it manually.

To install (add) a local printer

1. *Click to open Devices and Printers.*
2. *Click Add a printer.*
3. *In the Add Printer wizard, click Add a local printer.*
4. *On the Choose a printer port page, make sure that the Use an existing port button and the recommended printer port are selected, and then click Next.*
5. *On the Install the printer driver page, select the printer manufacturer and model, and then click Next.*
   - *If your printer isn't listed, click Windows Update, and then wait while Windows checks for additional drivers.*
   - *If none are available and you have the installation CD, click Have Disk, and then browse to the folder where the printer driver is located. (For additional help, consult the printer manual.)*
6. *Complete the additional steps in the wizard, and then click Finish.*

Tips

   - *You can print a test page to make sure the printer is working correctly. See **Print a test page**. If you've installed the printer but it doesn't work, check the manufacturer's website for troubleshooting information or driver updates.*

Network printers

In the workplace, many printers are network printers. These connect directly to a network as a stand-alone device. Inexpensive network printers are also made for the home. To learn more, see Install a printer on a home network.

To install a network, wireless, or Bluetooth printer

If you're trying to add a network printer at the office, you'll usually need the name of the printer. If you can't find it, contact your network administrator.

1. *open Devices and Printers.*
2. *Click Add a printer.*
3. *In the Add Printer wizard, click Add a network, wireless or Bluetooth printer.*
4. *In the list of available printers, select the one you want to use, and then click Next.*

5. *If prompted, install the printer driver on your computer by clicking Install driver.*
6. *Complete the additional steps in the wizard, and then click Finish.*

Removing a printer

If you'll no longer be using a printer, you can remove it from the Devices and Printers folder.

1. *Open Devices and Printers.*
2. *Right-click the printer that you want to remove, click Remove device, and then click Yes.*

   If you can't delete the printer, right-click it again, click Run as administrator, click Remove device, and then click Yes.

   ### *Notes*

   o *If you have a multi-function or all-in-one printer, you can often remove the printer from Devices and Printers without affecting other device functions. So, for example, you might continue to see a scanner or fax icon for the device.*
   o *You can't uninstall a printer if you have unfinished jobs in your print queue. Either delete the jobs, or wait until Windows has finished printing them. Once the queue is clear, Windows will remove the printer.*

What to do when a device isn't installed properly

When you connect a new device to your computer, Windows automatically tries to install it for you and will notify you if a driver for the device can't be found. There are several things you can try if this happens:

Make sure your computer is connected to the Internet and automatic updating is turned on *Your computer must be connected to the Internet for Windows to be able to search online for a device driver. To see if your computer is connected to the Internet, open your web browser and try accessing a website. If you're temporarily disconnected, such as when you're traveling with a laptop, wait until you're online again, and then try reinstalling your device.*

Windows can't check for the latest drivers unless automatic updating is turned on. Most people turn on automatic updating the first time they use Windows, but if you're not sure you did, you should check to make sure it's turned on. Be sure to select the option to include recommended updates, or Windows will install important updates only. Important updates provide significant benefits, such as

improved security and reliability, but recommended updates might include drivers for some of your devices

Manually check for drivers on Windows Update

If you didn't have automatic updating turned on, or you weren't connected to the Internet when you connected a new device to your computer, you should check to see if Windows can now find a driver for your device. Even if your computer is always connected to the Internet, you should still check Windows Updates for optional updates if some of your hardware isn't working properly. Optional updates often contain new driver updates. Windows Update does not install optional updates automatically, but it will notify you when it finds some and let you choose whether to install them.

Install software for the device

If Windows Update can't find a driver for your device, try checking the manufacturer's website for a driver or other software for the device. If your device came with a software disc, that disc might contain software needed to make your device work properly, but first check the manufacturer's website for the latest software and drivers.

If you don't find any new software or drivers for your device on the manufacturer's website, try inserting the disc that came with the device, and then follow the instructions for installing the software.

Note

- *Many drivers come with software that installs the driver for you (often called a self-installing package), but you might have to install some drivers manually as well.*
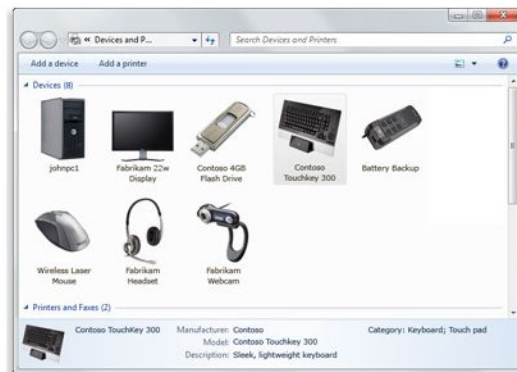
If your device still doesn't work properly after trying these suggestions, a driver might not be available for your device. In this case, try contacting the device manufacturer.

Install, view, and manage your devices

When you want to see all the devices connected to your computer, use one of them, or troubleshoot one that isn't working properly, open the Devices and Printers folder.

To open the Devices and Printers folder

open Devices and Printers in control panel

The Devices and Printers folder gives you a quick view of devices connected to your computer.

Devices displayed in the Devices and Printers folder are typically external devices you can connect to or disconnect from your computer through a port or network connection. Your computer is also displayed.

Devices listed include:

- *Portable devices you carry with you and occasionally connect to your computer, such as mobile phones, portable music players, and digital cameras.*
- *All devices you plug into a USB port on your computer, including external USB hard drives, flash drives, webcams, keyboards, and mice.*
- *All printers connected to your computer, which include printers connected by USB cable, the network, or wirelessly.*
- *Wireless devices connected to your computer, including Bluetooth devices and Wireless USB devices.*
- *Your computer.*
- *Compatible network devices connected to your computer, such as network-enabled scanners, media extenders, or Network Attached Storage devices (NAS devices).*

The Devices and Printers folder allows you to perform many tasks, which vary depending on the device. Here are the main tasks you can do:

- *Add a new wireless or network device or printer to your computer.*
- *View all the external devices and printers connected to your computer.*
- *Check to see if a specific device is working properly.*
- *View information about your devices, such as make, model, and manufacturer, including detailed information about the sync capabilities of a mobile phone or other mobile device.*
- *Perform tasks with a device.*

When you right-click a device icon in the Devices and Printers folder, you can select from a list of tasks that vary depending on the capabilities of the device. For example, you might be able to see what's printing on a network printer, view files stored on a USB flash drive, or open a program from the device manufacturer. For mobile devices that support the new Device Stage feature in Windows, you can also open advanced, device-specific features in Windows from the right-click menu, such as the ability to sync with a mobile phone or change ringtones.

- *Take steps to fix devices that aren't working properly.*
  - *Troubleshoot a device with a problemRight-click a device or computer with the yellow warning icon, click Troubleshoot, wait while the troubleshooter tries to detect problems (this may take several minutes), and then follow the instructions.*

11. INSTALLING AND UNINSTALLING THE SOFTWARE AND TROUBLESHOOTING MALFUNCTIONS OF SOFTWARE INSTALLATIONS

You can do a lot with the programs and features included in Windows, but you'll probably want to install other programs.

How you add a program depends on where the installation files for the program are located. Typically, programs are installed from a CD or DVD, from the Internet, or from a network. If you want to uninstall or make changes to a program already installed on your computer, see <u>Uninstall or change a program</u>.

To install a program from a CD or DVD

Insert the disc into your computer and follow the instructions on your screen.

Many programs installed from CDs or DVDs launch an installation wizard for the program automatically. In these cases, the AutoPlay dialog box will appear and you can choose to run the wizard.

If a program doesn't begin to install, check the information that came with the program. This information will likely provide instructions for installing the program manually. If you cannot access the information, you can also browse through the disc and open the program setup file, usually called Setup.exe or Install.exe. If your program was written for an earlier version of Windows, some older programs might run poorly or not at all. If a program written for an earlier version of Windows doesn't run correctly, you can try changing the compatibility settings

for the program, either manually or by using the Program Compatibility troubleshooter.

Setting	Description
Compatibility mode	*Runs the program using settings from a previous version of Windows. Try this setting if you know the program is designed for (or worked in) a specific previous version of Windows.*
Run in 256 colors	*Uses a limited set of colors in the program. Some older programs are designed to use fewer colors.*
Run in 640 × 480 screen resolution	*Runs the program in a smaller-sized window. Try this setting if the graphical user interface appears jagged or is rendered improperly.*
Disable visual themes	*Disables <u>themes</u> on the program. Try this setting if you notice problems with the menus or buttons on the title bar of the program.*
Disable desktop composition	*Turns off transparency and other advanced display features. Choose this setting if window movement appears erratic or you notice other display problems.*
Disable display scaling on high DPI settings	*Turns off automatic resizing of programs if large-scale font size is in use. Try this setting if large-scale fonts are interfering with the appearance of the program. For more information, see <u>Make the text on your screen larger or smaller</u>.*
Privilege level	*Runs the program as an administrator. Some programs require administrator privileges to run properly. If you are not currently logged on as an administrator, this option is not available.*
Privilege level	*Runs the program as an administrator. Some programs require administrator privileges to run properly. If you are not currently logged on as an administrator, this option is not available.*
Change settings for all users	*Lets you choose settings that will apply to all users on this computer.*

<u>To install a program from the Internet</u>

1. In your <u>web browser</u>, click the link to the program.
2. Do one of the following:

- *To install the program immediately, click Open or Run and follow the instructions on your screen.*

- *To install the program later, click Save and download the installation file to your computer. When you are ready to install the program, double-click the file and follow the instructions on your screen. This is a safer option because you can scan the installation file for viruses before you proceed.*

Note

- *When downloading and installing programs from the Internet, be sure you trust the publisher of the program and the website that is offering the program.*

Uninstall or change a program

You can uninstall a program from your computer if you no longer use it or if you want to free up space on your <u>hard disk</u>. You can use Programs and Features to uninstall programs or to change a program's configuration by adding or removing certain options.

1. *<u>Go to Control panel and open Programs and Features.</u>*
2. *Select a program, and then click Uninstall. Some programs include the option to change or repair the program in addition to uninstalling it, but many simply offer the option to uninstall. To change a program, click Change or Repair.*

12. BACKUP AND RESTORATION PROCESS OF DATA IN A SYSTEM

To help ensure that you don't lose your files, you should back them up regularly. You can set up automatic backups or manually back up your files at any time.

1. *Open Backup and Restore in the control panel*
2. *Do one of the following:*
3. *If you have never used Windows Backup before, click Set up backup, and then follow the steps in the wizard.*

If you have created a backup before, you can wait for your regularly scheduled backup to occur, or you can manually create a new backup by clicking Back up now. Note

- *It is recommended that you don't back up your files to the same hard disk that Windows is installed on.*

- *Always store media used for backups (external hard disks, DVDs, or CDs) in a secure place to prevent unauthorized people from having access to your files; we recommend a fireproof location separate from your computer. You might also consider encrypting the data on your backup.*

To create a new, full backup

After you create your first backup, Windows Backup will add new or changed information to your subsequent backups. If you're saving your backups on a hard drive or network location, Windows Backup will create a new, full backup for you automatically when needed. If you're saving your backups on CDs or DVDs and can't find an existing backup disc, or if you want to create a new backup of all of the files on your computer, you can create a full backup. Here's how to create a full backup:

1. *Open Backup and Restore in the control panel*
2. *In the left pane, click Create new, full backup.*

   Note: You will only see this option if your backup is being saved on CDs or DVDs.

To set up backup after upgrading from a previous version of Windows

After you upgrade Windows, you will need to set up Windows Backup, even if you had a scheduled backup in the previous version of Windows. This is because there are several changes to the backup program. Instead of selecting file types to back up, you can have Windows back up data files saved in libraries, on the desktop, and in default Windows folders, or you can choose specific libraries and folders to be backed up. You can also create a system image of your computer.

Back up your programs, system settings, and files

You can create a system image, which contains a copy of Windows and copies of your programs, system settings, and files. The system image is then stored in a separate location from the original programs, settings, and files. You can use this image to restore the contents of your computer if your hard disk or entire computer ever stops working.

If you're using Windows Backup to back up your files, you can have a system image created each time your files are backed up. By default, this system image will only include the drives required for Windows to run. To include additional

drives in the system image or to create a system image manually, follow the steps below.

1. *Open Backup and Restore in the control panel*

In the left pane, click Create a system image, and then follow the steps in the wizard. Restore files from a backup

You can restore backed-up versions of files that are lost, damaged, or changed accidentally. You can also restore individual files, groups of files, or all of the files that you have backed up.

1. *Open Backup and Restore in the control panel*
2. *To restore your files, click Restore my files.*
3. *To restore the files of all users, click Restore all users' files.*
4. *To browse the contents of the backup, click Browse for files or Browse for folders.*
5. *When you are browsing for folders, you won't be able to see the individual files in a folder. To view individual files, use the Browse for files option.*
6. *To search the contents of the backup, click Search, type all or part of a file name, and then click Search.*

Recover lost or deleted files

If you can't find a file on your computer or you accidentally modified or deleted a file, you can restore it from your backup (if you are using Windows backup) or you can try to restore it from a previous version. Previous versions are copies of files and folders that Windows automatically saves as part of a restore point. Previous versions are sometimes referred to as shadow copies.

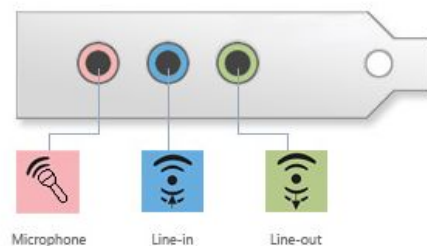## 13. INSTALL OR REMOVE A SOUND CARD

Most new desktop computers come with a built-in sound card that you can replace. If your computer doesn't have a sound card installed or you want to upgrade the sound playback or recording capabilities of your computer, you can install a sound card. Most laptops have built-in sound processing chips (also called sound processors) but not internal sound cards. You can upgrade the sound on a laptop by plugging an external sound device into a USB port or external card slot, but this is rarely done. Sound processors can also be built into desktop computers. You can't remove them, but to upgrade your sound, you can usually install an internal sound card and turn off the sound processor.

Before installing a sound card, check the information that came with it. The guidelines shown here are general, and the sound card documentation might contain important information specific to installing that card. Also, be sure to check the information that came with your computer to see if opening your computer affects the computer's warranty coverage.

Before installing a sound card, you'll need the following:

- *The sound card you want to install*
- *A Phillips screwdriver to open your computer, if needed*
- *An empty PCI slot inside your computer, unless you plan to replace an existing sound card (in which case you can put the new card into that slot)*

If your sound card came with a CD, DVD, or other removable media, it might contain a driver for your sound card. Hold on to that until Windows has finished looking for and installing a driver. Windows does this automatically after you install the sound card in your computer and turn the computer back on. If Windows can't find a good driver for your sound card, then try installing the driver that came with the sound card. Software from the manufacturer might also include other programs for your sound card.

Most sound cards have at least one line-out jack to connect speakers and a line-in jack to connect an audio input device.

To open your computer case

1. *Turn off your computer and unplug it from its power source. This is very important. Installing a card in a computer that's plugged in could shock you or damage the card and computer.*
2. *Open the computer case. Look on the computer cover (usually on the back) for screws or clasps to undo the case. Computer documentation typically includes instructions on how to open the case.*

After opening the case, ground yourself by touching the metal casing that surrounds the jack where the power cord plugs in. This can help protect you from an electric shock and can help protect the new card and existing computer components from static electricity. To remove an existing sound card

If you have an existing internal sound card, you should remove it before installing the new card. If your computer has a built-in sound processor, you can proceed to the "To install your new sound card" section of this topic.

1. *Locate your sound card. If you're not certain which card is your sound card, follow the wires from your speakers to the back of the card, and then note which slot that card is in.*
2. *Unplug any speaker and microphone cables from the back of the sound card.*
3. *If there's a cable inside your computer connecting the sound card to your CD drive, disconnect it. Many newer computers don't have this cable, so if it's not there, you can skip this step.*
4. *Remove any screw or hook holding your sound card in place.*
5. *Carefully pull the sound card straight out of the slot. Be careful not to twist or bend the card as you remove it.*

Note

The card might need one or two gentle up-and-down nudges to come loose. Even if you're throwing away the old sound card, use caution when removing it to avoid damaging the motherboard. If it seems stuck, it's better to spend a few extra minutes tugging gently than to rip the card out too quickly.

6. *If you're not installing a new sound card, install a slot cover if you have one, and replace the screw. Then, close the computer case and replace any screws you removed when opening the case.*

To install your new sound card

1. *Locate an empty expansion slot in the computer that will accept your new sound card.*

   If your computer doesn't have an empty slot, you'll have to remove another card before you can install the new one. If you removed an existing sound card, you can use the same slot if your new card uses the same type of expansion slot. Check your computer's documentation if you need to determine the types of expansion slots it has available.

2. *Gently place the sound card on top of the slot. Line up the pins on the sound card with the slot and push the card gently down so that it sits in the slot. Be sure that the card is pushed all the way in and that it's secure. If the pins on the card aren't perfectly aligned with the pins in the expansion slot, the card won't work properly.*
3. *If your computer has an audio cable that connects the CD drive directly to the sound card, plug it into the card. Check the information that came with*

your sound card to determine the location of the CD audio connector on the card. This cable is rarely necessary with current audio hardware, and in most cases, plugging it in is optional.

4. *Screw the sound card to the frame. Don't bend the sound card or the frame while tightening the screw. It might be best to tighten the screw barely more than you can tighten it with your fingers.*
5. *Close the computer case and replace any screws you removed when opening the case. Plug your speakers into your new sound card and, if applicable, plug your microphone in too.*
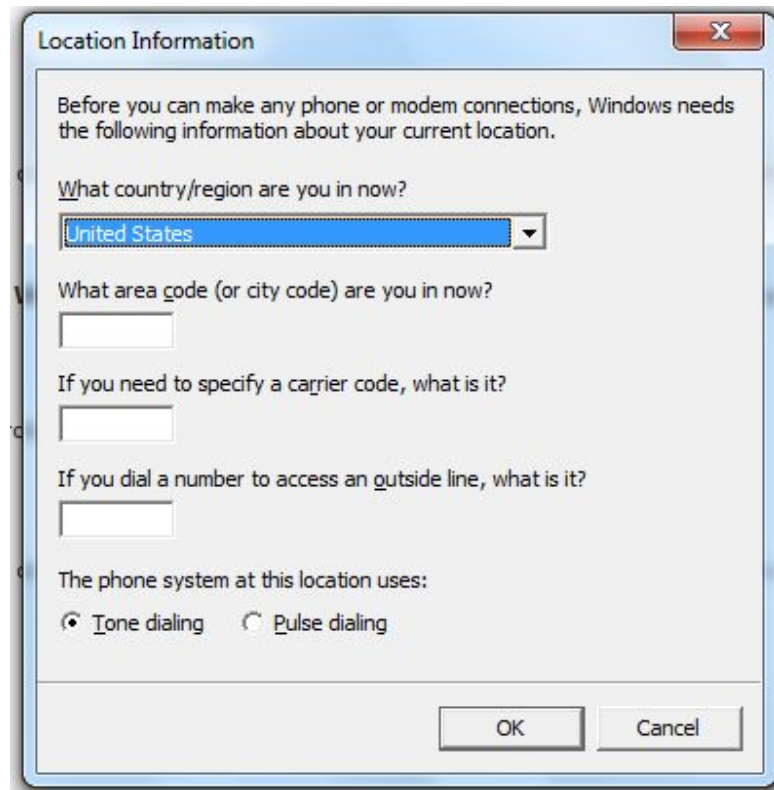6. *Plug your computer back into its power source and then turn it on.*

Windows will install the necessary drivers for your new sound card. If your sound card came with a disc containing software, install that now. Check the information that came with your sound card for the installation steps.

14.INSTALL OR REMOVE A MODEM

Usually, Windows will find, and then automatically install, the necessary <u>drivers</u> when you install a <u>modem</u>. However, if Windows can't find or install the correct driver, you might need to install the modem manually.

To manually install a modem

1. *Open Phone and Modem option in the control panel menu.You might need to provide information, such as your country or region and any special phone dialing rules, in the Location Information dialog box before you can access the Phone and Modem dialog box.*

2. *Click the Modems tab.*
3. *Click Add, and then follow the instructions in the Add Hardware Wizard.*

To remove a modem

If Windows automatically installs the wrong driver, or if you have problems with your modem, you can remove it.

1. *Open Phone and Modem option in the control panel menu.*
2. *Click the Modems tab.*

Select the modem you want to remove, and then click Remove.
Change modem settings

You can change modem settings, such as the speaker volume.

1. *Open Phone and Modem option in the control panel menu*
2. *Click the Modems tab.*
3. *Select the modem you want to change the settings for, and then click Properties.*
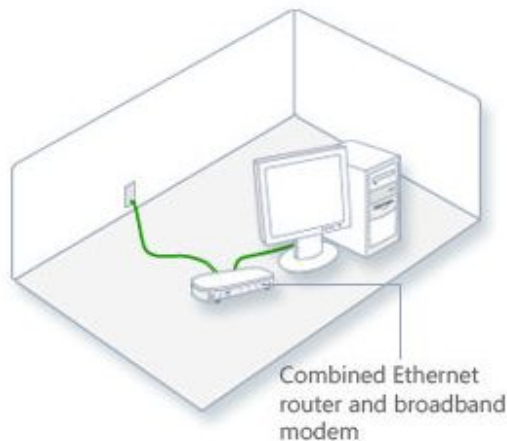4. *Change the settings you want, and then click OK.*

Set up a broadband (DSL or cable) connection

To set up a <u>Digital Subscriber Line (DSL)</u> or cable connection, you first need an account with an <u>Internet service provider (ISP)</u>. For DSL, the ISP is usually a phone company; for cable, it's usually a cable TV provider.

You will also need a <u>modem</u>, a <u>router</u>, or a device that combines the two. Some ISPs will provide you with these devices; if your ISP doesn't, you'll need to buy them. When you have your modem, router, or combination device, either follow the instructions provided by your ISP, or follow the corresponding steps below.

### To setup a combined modem and router

1. Plug the device into an electrical outlet.
2. Plug one end of a phone cord or cable into the <u>wide area network (WAN) port</u> of the device, and then plug the other end into the wall jack. The WAN port should be labeled "WAN." (DSL users: Don't use a DSL filter on the phone line.)
3. Plug one end of an <u>Ethernet</u> cable into the <u>local area network (LAN)</u> port on the device, and then plug the other end into the networking port of the computer that you want to connect to the Internet. The LAN port should be labeled "LAN." (If you are connecting wirelessly, skip this step.)
4. Start (or restart) the computer.
5. <u>In the Control Panel, Open connections and Internet .Then open the Connect to the Internet wizard.</u>
6. Follow the steps in the wizard.

Combined Ethernet router and broadband modem

A combined modem and router plugged in

Too setup a separate modem and router

1. *Plug the modem into an electrical outlet. Plug one end of a phone cord or cable into the modem, and plug the other end into the wall jack. (DSL users: Don't use a DSL filter on the phone line.)*
2. *Plug one end of an <u>Ethernet</u> cable into the modem, and plug the other end into the <u>wide area network (WAN) port</u> on the router.*
3. *Plug the router into an electrical outlet.*
4. *Plug one end of an Ethernet cable into the <u>local area network (LAN)</u> port on the router, and plug the other end into the networking port on the computer that you want to connect to the Internet. (If you are connecting wirelessly, skip this step.)*
5. *Start (or restart) the computer.*
6. *<u>In the Control Panel, Open connections and Internet .Then open the Connect to the Internet wizard.</u>*
7. *Follow the steps in the wizard.*
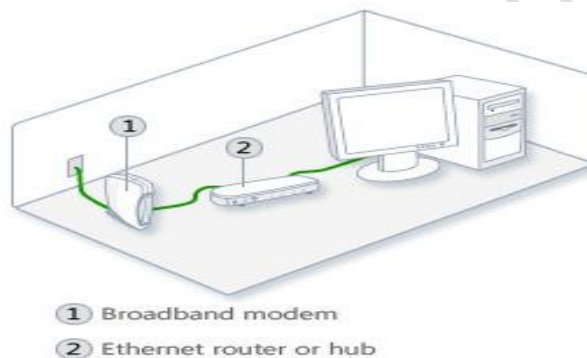
① Broadband modem
② Ethernet router or hub

A modem and router plugged in

TROUBLESHOOTING CONNECTION PROBLEMS:

Internet connection problems are most commonly caused by disconnected cables or by routers or modems that are not operating properly. First, try these steps:

1. *If you haven't already done so, run the Network troubleshooter to see if it can help diagnose and solve your problem .<u>Click on Control panel ,in that open connections and Internet open the Network troubleshooter.</u>*
2. *Make sure that all cables are connected (for example, make sure your <u>modem</u> is connected to a working phone jack or cable connection, either directly or through a <u>router</u>).*

   Restart your modem, and then restart your router. Remove the power cable from the modem and router. After all lights on the device have gone out, wait at least 10 seconds, and then plug the modem and router back in. Some modems have a battery backup that prevents the lights from

going out. For this type of modem, press and quickly release the Reset

① antenna   ③ WAN port
② LAN ports   ④ power cable
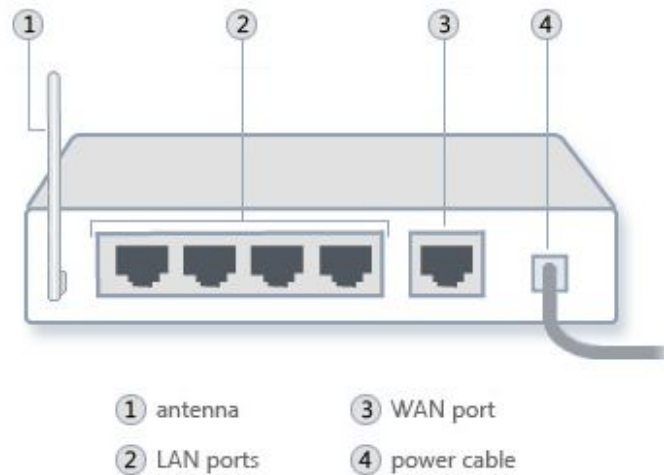
The back of a router, showing the location of the power cable

button.

<u>Problem</u>: <u>The system can't connect to the Internet through a broadband Digital Subscriber Line (DSL) or cable connection</u>

Try these things:

- *Make sure that your modem is turned on.*
- *Check to see that the <u>Ethernet</u> cable is plugged correctly into the Ethernet port on the modem and on your computer. Each end of an Ethernet cable looks like this:*

Ethernet cable

- *Verify that you are not using a <u>DSL filter</u> between the phone jack and the modem.*
- *Check the lights on your modem. These can sometimes indicate the location of the problem—whether it is the Ethernet connection, the power to the modem, or the <u>DSL</u> or cable connection.*

- *Winsock corruption can cause connectivity problems. To fix this, open the Network troubleshooter*
- *Ask your <u>Internet service provider (ISP)</u> to verify that its servers are functioning correctly and that you have an ISP user account and access to the ISP service.*
- *If you have recently replaced your router or modem, ask your ISP if it uses MAC address filtering. If so, your ISP must add your new device to the list of devices that can access the network.*
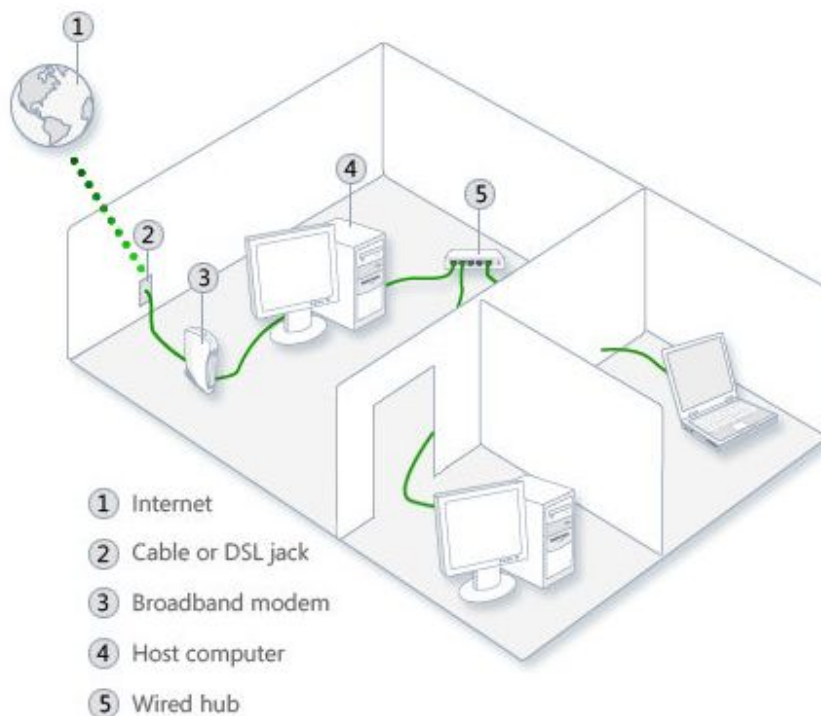
<u>Problem</u>: the system <u>can't connect to the Internet through a dial-up connection, or system being disconnected</u>

- *Try these things: Make sure that you are dialing the correct number, including any required access numbers (such as 9), and that the number is not busy.*
- *Make sure that the phone jack is working. To test this, plug in a working phone and see if there is a dial tone.*
- *Make sure that the phone cable is plugged into the "line" jack on your modem, not the "telephone" jack.*
- *Make sure that the phone cable is not defective by plugging a working phone into the "telephone" jack of your modem. If there is a dial tone, the phone cable is working.*
- *If you have call waiting, try disabling it, and then try the connection again.*
- *Your ISP might have disconnected you if you weren't interacting with the website for a while. Try connecting again.*
- *If someone picked up the phone while you were online, you might have been automatically disconnected. Try connecting again.*
- *Most dial-up modems work only with analog phone lines. Verify that you have analog phone lines installed, or, if you have digital phone lines installed, verify that your computer has a digital modem.*
- *Make sure that your modem is working properly. For more information, check the information that came with your modem or go to the manufacturer's website.*
- *Contact your telephone company to verify the quality of your line.*
- *If your computer has two network connections, the networking software must choose which connection to use for network traffic. The networking software picks the connection with the best performance. If connection A has Internet connectivity but slow performance and connection B has no Internet connectivity but better local network performance, the networking software will route network traffic over connection B. This means that you won't be able to view websites, so the networking icon and the network diagram in Network and Sharing Center will report that you only have local connectivity (no Internet). This is correct, but it's not what you want. To force your computer to use connection A—the connection with Internet connectivity—disconnect connection B and try again.*

15. SETTING UP A WIRELESS NETWORK

Hubs, switches, routers, and access points are all used to connect computers together on a network, but each of them has different capabilities. Hubs

Hubs enable computers on a network to communicate. Each computer plugs into the hub with an Ethernet cable, and information sent from one computer to another passes through the hub. A hub can't identify the source or intended destination of the information it receives, so it sends the information to all of the computers connected to it, including the one that sent it. A hub can send or receive information, but it can't do both at the same time. This makes hubs slower than switches. Hubs are the least complex and the least expensive of these devices.

1 Internet
2 Cable or DSL jack
3 Broadband modem
4 Host computer
5 Wired hub

Network with a hub

Switches

Switches work the same way as hubs, but they can identify the intended destination of the information that they receive, so they send that information to only the computers that are supposed to receive it. Switches can send and receive information at the same time, so they can send information faster than hubs can. If your home network has four or more computers or you want to use your network for activities that require passing a lot of information between computers (such as playing network games or sharing music), you should probably use a switch instead of a hub. Switches cost a little more than hubs.

Routers

Routers enable computers to communicate and they can pass information between two networks—such as between your home network and the Internet. This capability to direct network <u>traffic</u> is what gives the router its name. Routers can be wired (using Ethernet cables) or wireless. If you just want to connect your computers, hubs and switches work well; however, if you want to give all of your computers access to theInternet using one <u>modem</u>, use a router or a modem with a built-in router. Routers also typically provide built-in security, such as a <u>firewall</u>. Routers are more expensive than hubs and switches.
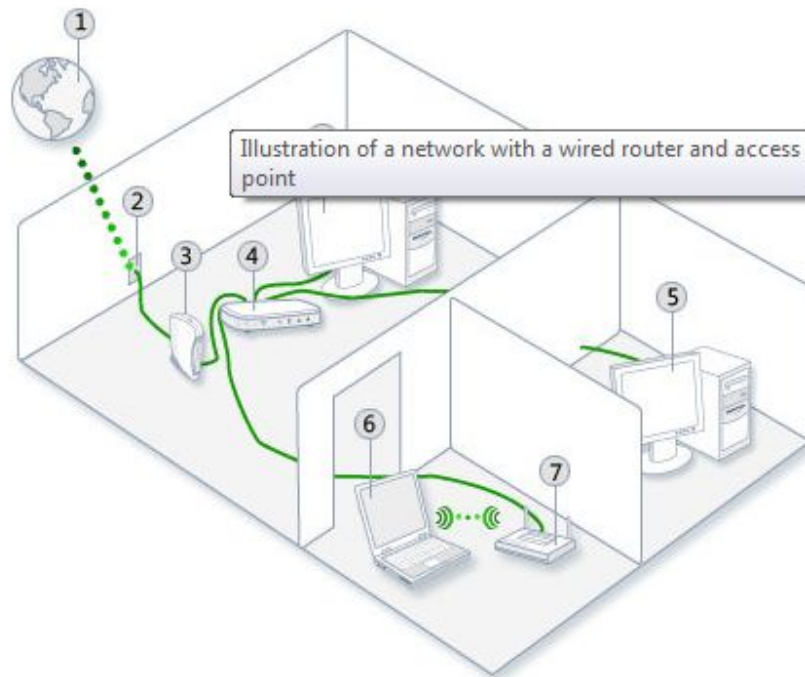
① Internet

② Cable or DSL jack

③ Broadband modem
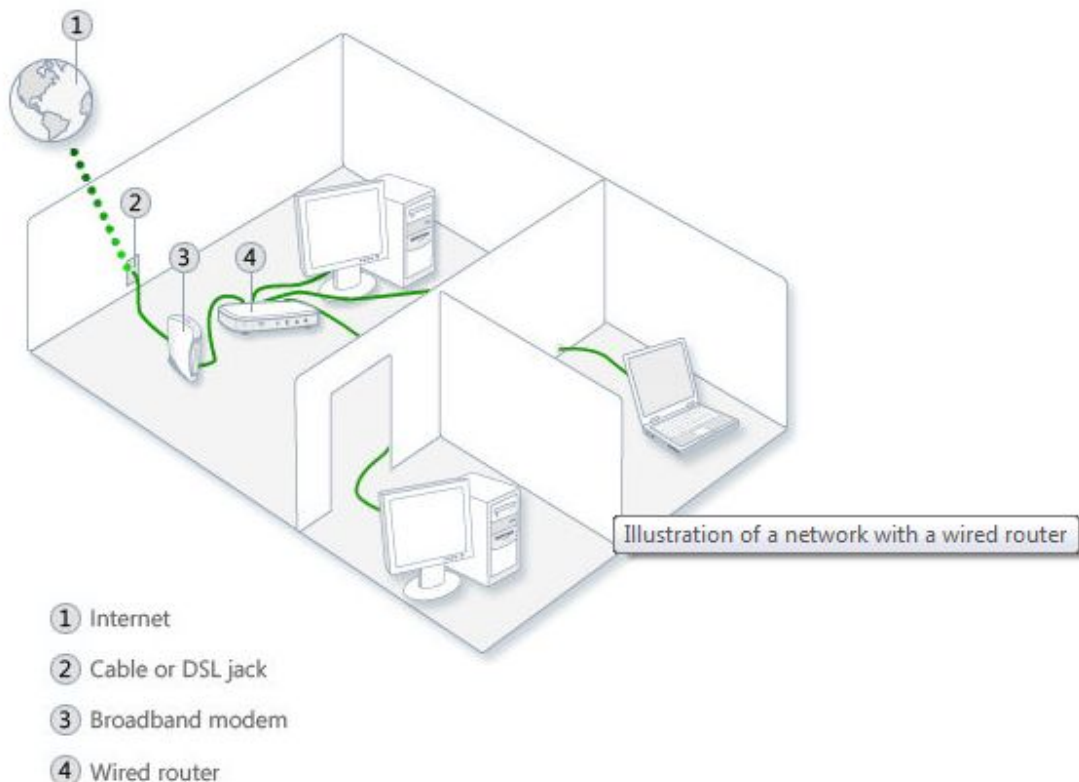
④ Wired router

Network with a wired router

Access points

Access points (also called base stations) provide wireless access to a wired Ethernet network. An access point plugs into a hub, switch, or wired router and sends out wireless signals. This enables computers and devices to connect to a wired network wirelessly. Access points act a lot like cellular phone towers: you can move from one location to another and continue to have wireless access to a network. When you connect to the Internet wirelessly using a public wireless network in an airport, coffee shop, or hotel, you are usually connecting through an access point. If you want to connect your computers wirelessly and you have a router that provides wireless capability, you don't need an access point. Access points don't have built-in technology for sharing Internet connections. To share an Internet connection, you must plug an access point into a router or a modem with a built-in router.

....

Illustration of a network with a wired router and access point

1. Internet
2. Cable or DSL jack
3. Broadband modem
4. Wired router
5. Wired computer
6. Wireless computer
7. Wireless access point

Network with a wired router and access point

Before you can set up your wireless network, you'll need the following items:

Broadband Internet connection and modem

A broadband Internet connection is a high-speed Internet connection—in contrast to a dial-up connection, which is slower and not powerful enough to support a wireless network. Digital Subscriber Line (DSL) and cable are two of the most common broadband connections. You can get a broadband connection by contacting an Internet service provider (ISP). Typically, ISPs that provide DSL are telephone companies and ISPs that provide cable are cable TV companies.

ISPs often offer broadband modems and might even install it for you. Some ISPs also offer combination modem/wireless routers. You can also find these at computer or electronics stores.

Illustration of a cable and DSL modem

Typical cable modem (left) and DSL modem (right)

Wireless router

A router sends information between your network and the Internet. With a wireless router, you can connect computers to your network using radio signals instead of wires. There are a few different types of wireless network technologies, including 802.11a, 802.11b, and 802.11g. We recommend using a router that supports 802.11g because it is fast and provides a strong wireless signal.


Typical wireless router

Wireless network adapters

A network adapter is a device that connects your computer to a network. To connect your laptop or desktop computer to your wireless network, the computer must have a wireless network adapter. Most laptops—and many desktop computers—come with a wireless network adapter already installed. To check if your computer has a wireless network adapter, follow these steps:

1. *open Device Manager in Control panel options*
2. *Double-click Network adapters.*

3. Look for a network adapter that includes "wireless" in the name.
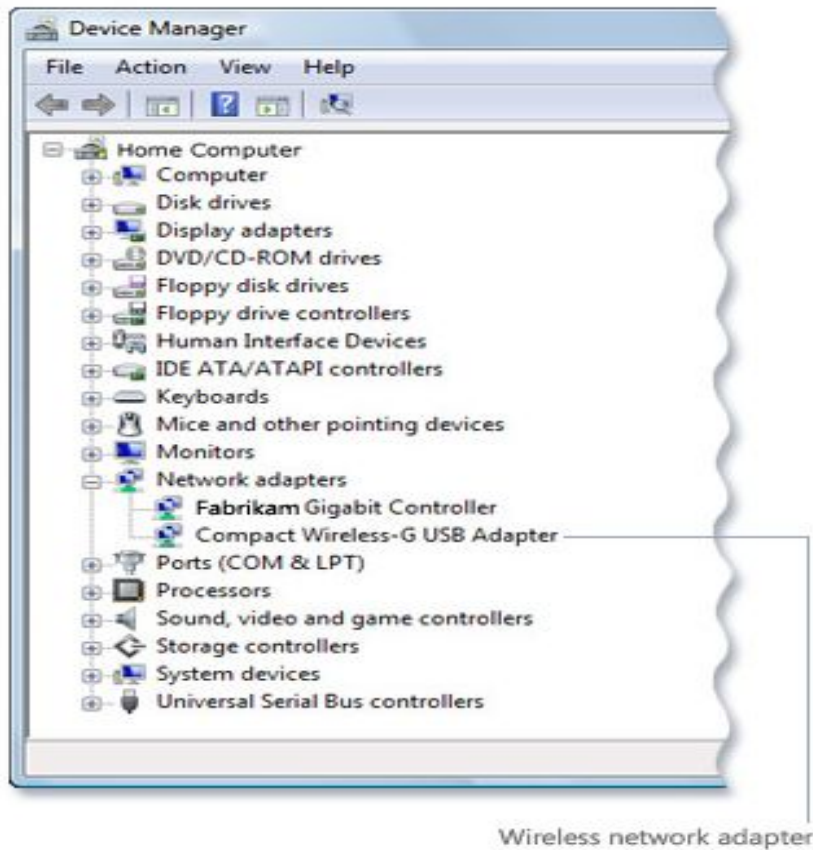
Device Manager showing a wireless network adapter

If your computer needs a wireless network adapter, you can purchase one from a computer or electronics store and install it yourself. The universal serial bus (USB) type are a nice choice because they are small, easy to install, and they can be moved around to different computers. Make sure you get the same type of adapters as your wireless router. The type of adapter is usually marked on the package, typically with a letter, such as G or A.
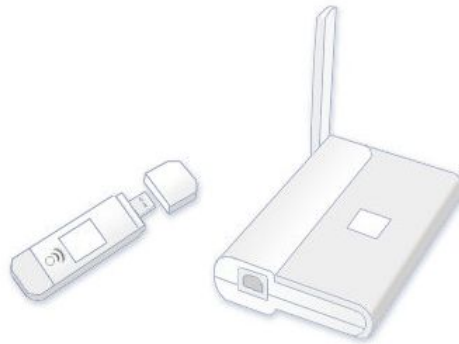
Typical USB wireless network adapters

Setting up the modem and Internet connection

Once you have all of the equipment, you'll need to set up your modem and Internet connection. If your modem wasn't set up for you by your Internet service provider (ISP), follow the instructions that came with your modem to connect it to your computer and the Internet. If you're using Digital Subscriber Line (DSL), connect your modem to a phone jack. If you are using cable, connect your modem to a cable jack.

Positioning the wireless router

Put your wireless router somewhere where it will receive the strongest signal with the least amount of interference. For the best results, follow these tips:

- *Position your wireless router in a central location. Place the router as close to the center of your home as possible to increase the strength of the wireless signal throughout your home.*
- *Position the wireless router off of the floor and away from walls and metal objects, such as metal file cabinets. The fewer physical obstructions between your computer and the router's signal, the more likely that you'll be using the router's full signal strength.*
- *Reduce interference. 802.11g networking equipment uses a 2.4 gigahertz (GHz) radio frequency. This is the same frequency as most microwaves and many cordless phones. If you turn on the microwave or get a call on a cordless phone, your wireless signal might be temporarily interrupted. You can avoid most of these issues by using a cordless phone with a higher frequency, such as 5.8 GHz.*

Securing your wireless network

Security is always important; with a wireless network, it's even more important because your network's signal could go beyond the boundaries of your home. If

you don't secure your network, people with computers nearby might be able to access the information stored on your network computers and use your Internet connection to get onto the web. To help secure your network, do the following:

- *Protect your router by changing the default user name and password. Most router manufacturers have a default user name and password on the router as well as a default network name. Someone could use this information to access your router without you knowing it. To avoid that risk, change the default user name and password for your router. Check the information that came with your device for instructions.*
- *Set up a security key for your network. Just as file cabinets have keys and safes have combinations, wireless networks have a network security key to help protect them from unauthorized access. To set up a network security key, follow these steps:*
    1. *open Network and Sharing Center in connection settings of control panel*
    2. *Click Set up a new connection or network.*
    3. *Click Set up a new network, and then click Next.*

The wizard will walk you through creating a network name and a security key. If your router will support it, the wizard will default to Wi-Fi Protected Access (WPA or WPA2) security. We recommend that you use WPA2, if possible, because it offers better security than WPA or Wired Equivalent Privacy (WEP) security. With WPA2 or WPA you can also use a passphrase, so you don't have to remember a cryptic sequence of letters and numbers.
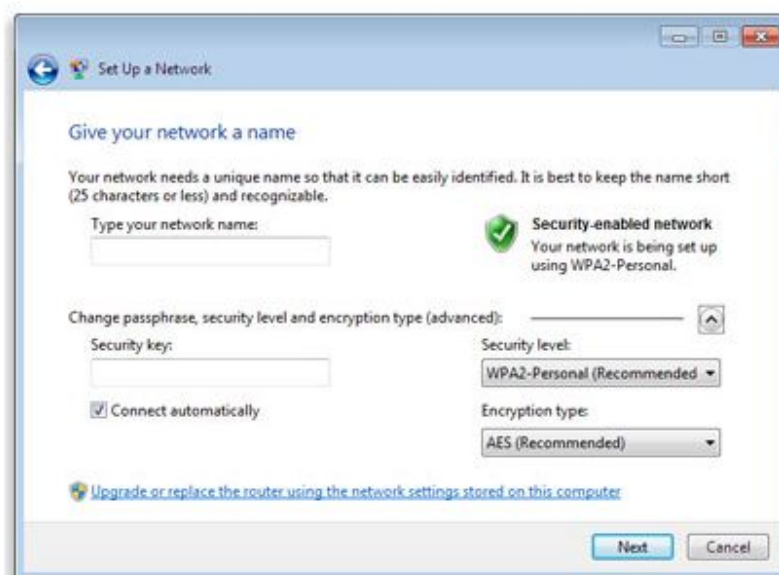
Create a network security key

- *Write down your security key and keep it in a safe place. You can also save your security key on a USB flash drive by following the instructions in the wizard.*
- *Use a firewall. A firewall is hardware or software that can help protect your computer from hackers or malicious software. Running a firewall on each computer on your network can help control the spread of malicious software on your network, as well as help to protect your computers when you're accessing the Internet.*

Adding computers to your network

To connect your laptop or desktop computer to your wireless network, follow these steps:

1. *Open Connect to a Network.*
2. *In the list of networks, click the network that you want to connect to, and then click Connect.*
3. *Enter the security key. You can either type in the key or insert a USB flash drive that contains the security key into a USB port on the computer.*

Sharing files and printers

Most people have a wireless network so they can access the Internet from any room in the house, but they also want the freedom of accessing files and printers wirelessly.

Sharing files

The easiest way to share files on your network is to set up sharing with a homegroup. If you don't have a homegroup, you can share files by placing them in one of the Public folders. Any file or folder you put in a Public folder is automatically shared with the people connected to your network. To turn on Public folder sharing, follow these steps:

1. *open Advanced sharing settings.*
2. *Click the chevron to expand the current network profile.*
3. *Under Public folder sharing, click one of the following options:*
    - *Turn on sharing so anyone with network access can read and write files in the Public folders*
    - *Turn off Public folder sharing (people logged on to this computer can still access these folders)*
4. *Click Save changes. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.*

    You will need to repeat the previous steps on each computer that you want to share files from.

To share your files, save them or copy them to a Public folder on your computer. There is a Public folder for each type of library (Documents, Music, Videos, and Pictures). Every person with a user account on the computer shares these folders. For example, to open the Public Documents folder:

1. *Open the Documents library.*
2. *In the navigation pane, under Libraries, double-click Documents, and then double-click Public Documents.*
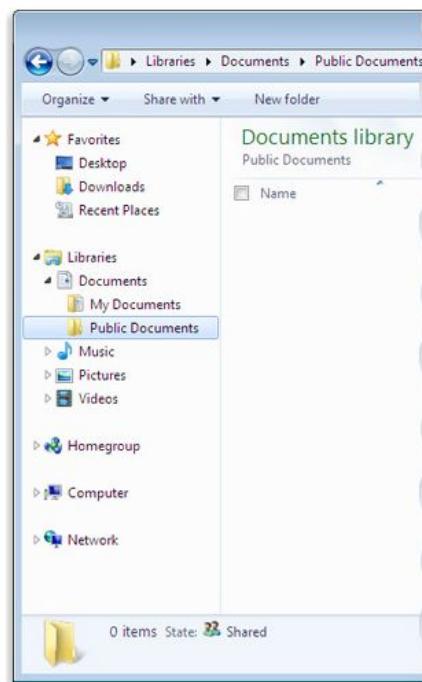
Sharing a printer

If you have a printer attached to one of your computers, you can print to it from any computer connected to your wireless network. The easiest way to share a printer is to select the Printers check box when you set up your homegroup. If you don't have a homegroup, you can follow these steps:

1. *Log on to the computer that has the printer attached to it.*
2. *open Advanced sharing settings.*
3. *Click the chevron to expand the current network profile.*
4. *Under File and printer sharing, click Turn on file and printer sharing, and then click Save changes. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.*

Note

- o *If you have password-protected sharing turned on, people will need a user account with a password on your computer to access your printer.*

To access the printer from any computer on the network, follow these steps:

1. *Open Network option.*
2. *Double-click the icon for the computer that has the printer attached to it.*
3. *Double-click the icon for the printer. Windows will automatically add the printer to your computer and install the printer driver.*

Internet connection methods

If you want to connect to the Internet, here are the options.

Wireless

Choose this if you have a wireless router or network, even if you also have a broadband connection. Also choose this if you're connecting to a hotspot.

Broadband (PPPoE)

Choose this if your computer is connected directly to a broadband modem (also called a Digital Subscriber Line (DSL) or cable modem), and you have a Point-to-Point Protocol over Ethernet (PPPoE) Internet account. With this type of account, you need to provide a user name and password to connect

Dial-up

Choose this if you have a modem but it's not a DSL or cable modem, or if you want to use Integrated Services Digital Network (ISDN) to connect your computer to the Internet.

Sharing one Internet connection among all the computers on your home network saves time because you have to set up only one connection. And it saves money because you don't have to buy an individual Internet account for each computer.

SHARING INTERNET COLNNECTION AMONG DIFFERENT COMPUTERS:

There are two ways to set up Internet connection sharing: by using a router, or by using Internet Connection Sharing (ICS).

Using a router

Each computer connects to a router (sometimes called an Internet gateway device). The router, which can be wired or wireless, connects to a <u>broadband</u>

(DSL or cable) <u>modem</u>, and the modem connects to the Internet. The router and modem can also be purchased as a single device.

① Internet

② Cable or DSL jack

③ Broadband modem

④ Wired router
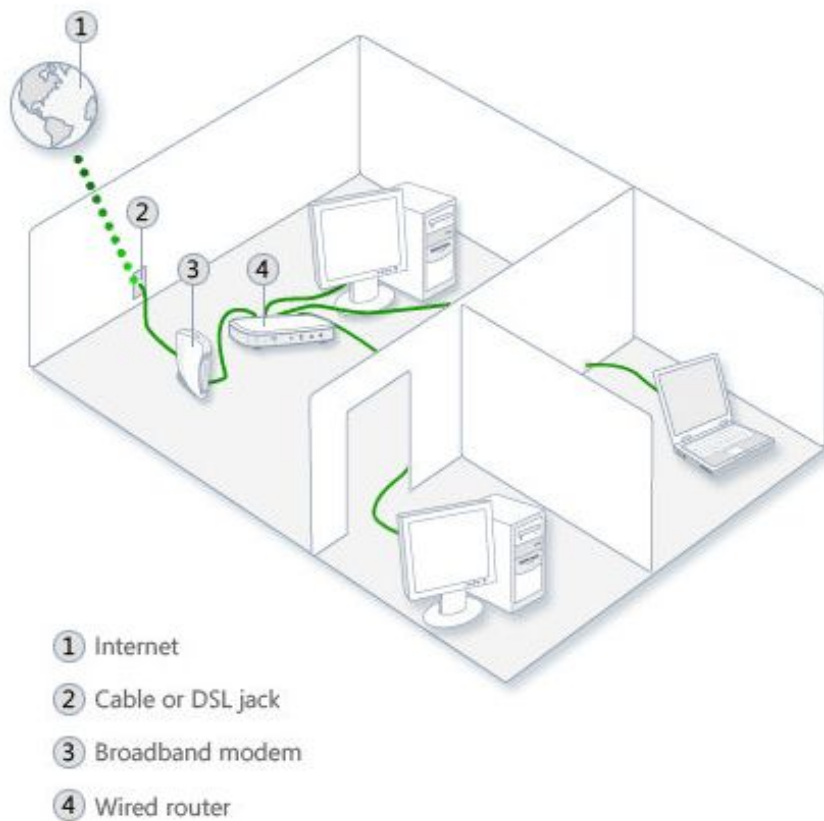
A network using a router and modem

Make sure your router has a built-in <u>firewall</u>. A firewall can help stop unwanted connections to your network from the Internet.

Using ICS

One computer on the network is designated as the host computer. The host computer connects to the Internet and the other network computers share that Internet connection. This method is a bit less convenient because it requires the host computer to be turned on all the time. However, it's the best method if you have a dial-up Internet connection, or if you use a modem with a <u>USB</u> connection.

1. Internet
2. Cable or DSL jack
3. Broadband modem
4. Host computer
5. Wired hub
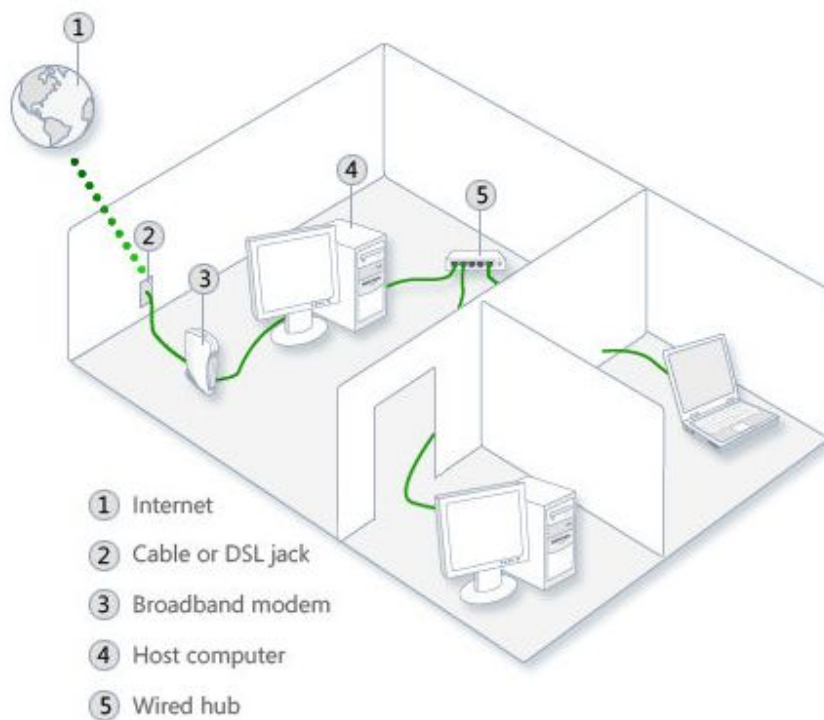
A network using Internet Connection Sharing (ICS)

Note:

- If you share your Internet connection by setting up an <u>ad hoc network</u>, the connection is shared only for that session. When you restart your computer, the connection will no longer be shared.

- If you set up an ad hoc network and share your Internet connection, and then someone logs on to the same computer by using Fast User Switching, the Internet connection will still be shared. Only restarting the computer will end the Internet connection sharing.

17. Study on Antivirus and Antispyware

What is a virus?

A virus is a program that replicates itself. It spreads by making copies of itself on a computer or by inserting computer code into program or operating system files. Viruses don't always damage files or computers, but they usually affect a computer's performance and stability. For a virus to infect a computer or to spread, you usually have to do something, such as open an infected e-mail attachment.

Virus damage can range from slowing computer performance to a loss of information and programs. In the worst case, viruses delete or modify information and programs on your computer. Some e-mail viruses send confidential information in messages when spreading. Even when a virus is not directly damaging information, the process of replication can slow your computer and Internet connection.

Types of viruses

There are many type of viruses. Typical viruses are simply programs or scripts that will do various damage to your computer, such as corrupting files, copying itself into files, slowly deleting all your hard drive etc. This depends on the virus. Most viruses also mail themselves to other people in the address book. This way they spread really fast and appear at others' inboxes as too many people still fall for these. Most viruses will try to convince you to open the attachment, but I have never got one that tricked me. In fact, I found myself emailing people just to make sure they really did send me something. It does not hurt to be safe.

Worms

Worms are different type of viruses, but the same idea, but they are usually designed to copy themselves a lot over a network and usually try to eat up as much bandwidth as possible by sending commands to servers to try to get in. The code red worm is a good example of this. This worm breaks in a security hole in Microsoft IIS (Internet Information Server) in which is a badly coded http server that, despite the security risks, a lot of people use it. When the worm successfully gets in, it will try to go into other servers from there.

Trojans

Trojans are another type of virus. They are simply like a server in which enables hackers to get into and control the computer. A trojan such as Subseven can

enable a hacker to do various things such as control the mouse, eject the cd-rom drive, delete/download/upload files and much more.

MBR viruses

Boot sector viruses are another type, they are similar to file viruses, but instead they go in the boot sector and can cause serious damage when the computer is booted, some can easily format your drive simply by booting your computer. These are hard to remove.

Most viruses have various characteristics. For example, a worm can also be a trojan and also infect the boot sector. It all depends on how the virus is written and what it is designed to do. That's why there are not really strong structured categories, as they can easily mix one in the other.

IDENTIFYING A VIRUS ATTACK

If you can answer "yes" to any of the following questions, your computer might have a virus.

Is your computer running very slowly? A common symptom of a virus is much slower than normal computer performance. However, there can be other reasons for slow performance, including a hard disk that needs defragmenting, a computer that needs more memory (RAM), or the existence of spyware or adware. For more information about spyware, see How to tell if your computer is infected with spyware.

Are you getting unexpected messages, or are programs starting automatically? Some viruses can cause damage to Windows or some of your programs. The results of this damage might include messages appearing unexpectedly, programs starting or closing automatically, or Windows shutting down suddenly.

Is your modem or hard disk working overtime? An e-mail virus works by sending many copies of itself by e-mail. One indicator of this is that the activity light on your broadband or external modem is constantly lit; another is the sound of your computer's hard disk continually working. These are not always symptoms of a computer virus, but when combined with other problems, can indicate a virus infection.

<u>Methods to protect computer from viruses</u>

- *Install an antivirus program. Installing an antivirus program and keeping it up-to-date can help defend your computer against viruses. Antivirus programs scan for viruses trying to get into your e-mail, operating system, or files. New viruses appear daily, so check the antivirus manufacturer's*

website frequently for updates. Most antivirus programs are sold with annual subscriptions, that can be renewed as needed. To find an antivirus scanner, visit the Windows Security software providers webpage.

- *Do not open e-mail attachments. Many viruses are attached to e-mail messages and will spread as soon as you open the e-mail attachment. It's best not to open any attachment unless it is something you are expecting. Microsoft Outlook and Windows Mail help block potentially dangerous attachments.*

- *Keep Windows updated. Periodically, Microsoft releases special security updates that can help protect your computer. These updates can help prevent viruses and other computer attacks by closing possible security holes. Make sure that Windows receives these updates by turning on Windows automatic updating. Use a firewall. Windows Firewall or any other firewall program can help alert you to suspicious activity if a virus or worm attempts to connect to your computer. It can also block viruses, worms, and hackers from attempting to download potentially harmful programs to your computer.*

REMOVAL OF A VIRUS FROM THE COMPUTER:

- *Keep your antivirus program up to date. If you have already installed an antivirus program on your computer, it's important that you keep it up to date. Because new viruses are being written all the time, most antivirus programs are updated frequently. Check your antivirus program's documentation or visit their website to learn how to receive updates. Be aware that some viruses block common antivirus websites, making it so you cannot go to the website to download antivirus updates. If this happens, check with your antivirus vendor to see if they have a disc you can use to install the latest updates. It might be possible for you to create this disc on a computer that is not infected (for example, on a friend's computer)..*

- *Use the Malicious Software Removal Tool. Microsoft offers the Malicious Software Removal Tool, The tool scans your computer for most new viruses and malicious software. After you run the tool, you will get a report that describes any malicious software found on your computer and lists all the viruses it scanned for.*

- *Stop a runaway virus. Viruses are often created specifically to take control of your computer and send copies of themselves from your computer to other computers. You can usually tell this is happening if your computer is performing slowly and accessing the network more frequently than normal. If this is happening, you should disconnect from the Internet and network (if you're on one). If you are connected to the Internet through a physical connection, disconnect the network or phone cable from your computer. If you're connected to the Internet through a wireless connection on a laptop, turn off the wireless adapter on the computer (either by turning off a switch or removing your wireless adapter card). Once your computer is*

disconnected from the Internet, run your antivirus software (from a disc or software on your computer) to remove the virus.

- *Manually remove viruses. Sometimes a virus must be removed manually. This is often a technical process and should only be attempted by computer users who have experience with the Windows registry and who know how to view and delete system and program files in Windows.*
- *The first step is to identify the virus. Run your antivirus software to identify the name of the virus. If you don't have an antivirus program, or if your program does not detect the virus, you can still identify the virus by looking for clues about how it behaves. Write down the text in any messages displayed by the virus or, if you received the virus in e-mail, write down the subject line or name of the file attached to the message. Search the antivirus vendor's website for references to those specific things you wrote down to try to find the name of the virus and instructions for how to remove it.*
- *Once a virus is removed, you might have to reinstall some software, or restore lost information. Doing regular backups can go a long way toward easing the pain of a virus attack.*

Protection Methods

These are ways to help protect your computer against potential security threats:

- *Firewall. A firewall can help protect your computer by preventing hackers or malicious software from gaining access to it.*
- *Windows Update. Windows can routinely check for updates for your computer and install them automatically.*
- *Virus protection. Antivirus software can help protect your computer against viruses, worms, and other security threats.*
- *Spyware and other malware protection. Antispyware software can help protect your computer from spyware and other potentially unwanted software.*

1. Your computer
2. Your firewall
3. The Internet

How a firewall works

18. Study on Security issues over Networks and On-line

The security settings in Internet Explorer can help block potentially unsafe web content. We recommend that you maintain security levels at or above the recommended levels when modifying or customizing your settings.

A website might not be trustworthy if:

- *The site is referred to you through an e-mail message from someone you don't know.*
- *The site offers objectionable content, such as pornography or illegal materials.*
- *The site makes offers that seem too good to be true, indicating a possible scam or the sale of illegal or pirated products.*
- *You are lured to the site by a bait and switch scheme, in which the product or service is not what you were expecting.*
- *You are asked for a credit card as a verification of identity or for personal information that does not seem necessary.*
- *You are asked to provide a credit card number without proof that the transaction is secure.*

When to trust a website

Knowing when to trust a website depends in part on who publishes the website, what information they want, and what you want from the site. If you're not sure whether to trust a website, consider these questions:

Are you visiting a secure site?

Is the website certified by an Internet trust organization?

Is the website owned by a company or organization that you know well?

Does the website ask you for personal information?

On a retail website, is there a way to contact someone by phone or mail?

If you don't recognize the site, do you have other information to help you decide?

When to trust an e-mail message

E-mail is a great way to keep in touch with other people. Unfortunately, it can also open your computer to security risks, computer viruses, and potentially malicious software if you're not careful about the messages and attachments that

you open. Before opening any e-mail message or attachment, be sure that you have an up-to-date antivirus program installed. The antivirus program should be configured to scan messages as they arrive (real-time), and to scan all types of file attachments.

Here are some questions you can ask yourself to help decide whether to open an e-mail message or attachment.

Do you know the person who sent you the e-mail message?

Have you received e-mail from the sender before?

Were you expecting e-mail from this sender?

Does the subject line or attachment file name make sense?

When to trust a software publisher

A software publisher is a person or company that creates or packages software. The publisher can be the website you are downloading a file from or a software retailer. Before deciding to trust a software publisher, ask yourself the following questions.

Is the software from a trusted source?

Do you need the software, and do you know what it does?

Does the software have a digital signature?

How do I know if a wireless network is secure?

There is no way to guarantee complete security on a wireless network. However, there are precautions you can take to help minimize security risks when you use a wireless network.

- Whenever possible, only connect to wireless networks that require a network security key or have some other form of security, such as a certificate. The information sent over these networks is encrypted, which can help protect your computer from unauthorized access. When you view available wireless networks in Connect to a Network, wireless networks that do not have security enabled will be identified with a yellow shield icon.

- Before you connect to a network provided by a wireless Internet service provider (ISP), such as a public network in a coffee shop or airport, read the privacy statement carefully and make sure that you understand which

files, if any, are saved to your computer and what type of information the network provider collects from your computer.

- *If you connect to a network that's not secure, be aware that someone with the right tools can see everything that you do, including the websites you visit, the documents you work on, and the user names and passwords you use. Make sure that you don't work on any company-sensitive information or visit password-protected areas of your business network while you're connected to that network.*

Security zones: adding or removing websites

Internet Explorer assigns all websites to one of four security zones: Internet, Local intranet, Trusted sites, or Restricted sites. The zone to which a website is assigned specifies the security settings that are used for that site. You can choose which websites to assign to the Intranet, Trusted, or Restricted zones. By adding a website to a specific zone, you can control the level of security used on that site. For example, if you have a list of websites that you visit and you completely trust those sites, add those sites to the Trusted zone.

To add a website to a security zone

1. Open Internet Explorer.
2. Navigate to the website that you want to add to a specific security zone.
3. Click the Tools button, and then click Internet Options.
4. Click the Security tab, and then click a security zone (Local intranet, Trusted sites, or Restricted sites).
5. Click Sites.
6. If you clicked Local intranet in step 4, click Advanced.
7. The website should be shown in the Add this website to the zone field. Click Add.

   If the site is not a secure site (HTTPS), clear the Require server verification (https:) for all sites in this zone check box.

8. Click Close, and then click OK (or click OK twice if you clicked Local intranet in step 4).

To remove a website from a security zone

1. Click to open Internet Explorer.
2. Click the Tools button, and then click Internet Options.
3. Click the Security tab, and then click a security zone (Local intranet, Trusted sites, or Restricted sites).
4. Click Sites.
5. If you clicked Local intranet in step 3, click Advanced.
6. In Websites, click the website that you want to remove.
7. Click Remove.
8. Click Close, and then click OK (or click OK twice if you clicked Local intranet in step 3).

19. SETTING UP Wi-Fi Network

<u>*Wireless networking*</u>

A network can be one computer connected to the Internet, or two or more computers connected to each other (and possibly to the Internet as well). In a wireless (Wi-Fi) network, the computers are connected by radio signals instead of wires or cables. Advantages of wireless networks include mobility and the absence of unsightly wires. Disadvantages can include a slower connection speed than a wired network and interference from other wireless devices, such as cordless phones.

Currently, there are four types of Wi-Fi: 802.11b, 802.11a, 802.11g, and 802.11n. The tables below compare these technologies.

802.11b

Speed	*Up to 11 megabits per second (Mbps)*
Pros	*Has good signal range*
Cons	*Has the slowest transmission speed* *Allows for fewer simultaneous users* *Uses the 2.4 gigahertz (GHz) frequency (the same as many microwave ovens, cordless phones, and other appliances), which can cause interference*

802.11a

Speed	*Up to 54 Mbps*
Pros	*Allows for more simultaneous users* *Uses the 5 GHz frequency, which limits interference from other devices*
Cons	*Has a shorter signal range, which is more easily obstructed by walls and other obstacles* *Is not compatible with 802.11b <u>network adapters</u>, <u>routers</u>, and*

	access points

802.11g

Speed	*Up to 54 Mbps*
Pros	*Has a transmission speed comparable to 802.11a under optimal conditions* *Allows for more simultaneous users* *Has good signal range and isn't easily obstructed* *Is compatible with 802.11b network adapters, routers, and access points*
Cons	*Uses the 2.4 GHz frequency so it has the same interference problems as 802.11b*

802.11n

Speed	*Depending upon the number of data streams the hardware supports, 802.11n can transmit data at up to 150 Mbps, 300 Mbps, 450 Mbps, or 600 Mbps*
Pros	*Has the fastest speed* *Uses multiple signals and antennas for better speed* *Allows for more simultaneous users* *Has the best signal range and isn't easily obstructed* *Is resistant to interference from other devices* *Can use either the 2.4 GHz or 5.0 GHz frequency* *If using 2.4 GHz frequency, it's compatible with 802.11g network adapters, routers, and access points*
Cons	*If using the 2.4 GHz frequency, it can have the same interference problems as 802.11b* *This protocol is still being finalized, and some requirements could change*

In the list of available wireless networks, you'll see a symbol that shows the wireless signal strength for each network. The more bars, the stronger the signal. A strong signal (five bars) usually means that the wireless network is close or there's no interference. For best performance, connect to the wireless network

with the strongest signal. However, if an unsecured network has a stronger signal than a security-enabled one, it's safer for your data if you connect to the security-enabled network (but you must be an authorized user of that network to do so). To improve the signal strength, you can move your computer closer to the wireless <u>router</u> or <u>access point</u>, or move the router or access point so it's not close to sources of interference, such as brick walls or walls that contain metal support beams.

View and connect to available wireless networks

If you have a laptop, you can see a list of available wireless <u>networks</u>, and then connect to one of those networks, no matter where you are. The wireless networks appear only if your computer has a wireless <u>network adapter</u> and <u>driver</u> installed and the adapter is enabled.

1. *Click to open Connect to a Network.*
2. *In the list of available wireless networks, click a network, and then click Connect.*

   Some networks require a <u>network security key</u> or <u>passphrase</u>. To connect to one of those networks, ask the network administrator or the service provider for the security key or passphrase.