

Computers – Definitions and Hardware

Computers are everywhere. While you probably recognize laptops, desktops, and hand-held devices as computers, you may not recognize the computers in a car, a microwave, or a watch. Many electronic devices are run by very small computers.

For the sake of this class, we will consider computers as stand-alone units. The personal computer of thirty years ago has much in common with current desktop and laptop computers, and even a lot in common with the hand-held devices including tablets and phones. By learning the major parts, the role of software, and the processes of the computer, they become a bit less mysterious.

The Parts You Can Touch...

*** Note: You should know what the parts are, and what they do.**

The physical parts of the computer are called hardware. Let's take a closer look at a desktop computer to learn about the parts. Some of the items in the picture may not be used much anymore, but most still apply.

You may not believe me, but the screen that you look at is not the computer, and neither is the keyboard you type on. A computer, strictly speaking, is the part that actually processes information and handles the data. Back in the 1960s, this was as big as a room and made of tubes with the air sucked out (called vacuum tubes). Now, they're tiny enough to fit in your phone.



FIGURE 1-7
Typical computer hardware.

The System Unit...

Your system unit is the main “box” of the computer. It has all of the working ability. The main parts of the system unit are the **case**, and the **motherboard**. The case is nothing more than plastic or metal that house the electronics. The computer can run without it, but it does protect it from water and dust. In some modern computers, as well as phones, the case, screen, and keyboard are all part of the same unit.



Motherboard of cell phone...

The motherboard is a set of circuits. It can perform simple logic functions. Part of the motherboard is the Central Processing Unit or **CPU**. This is often called a **microprocessor**. It is a very compact set of circuits that control how information is processed. Have you seen the Intel® sticker or commercials? Intel makes these microprocessors. The CPU is the “brains” of the computer.

Drives...

A computer doesn't only need to process information, it needs to store it too. A drive is capable of storing large amounts of memory. The main drive of a computer is called the **hard drive**. Original hard drives had hard, rotating discs, and that's where they got their name. As people needed more and more memory, **external hard drives** were invented that could plug into the computer. This was before flash drives (see next section) were invented. Drives changed a little when the CD and DVD were invented. The user had more control over the memory at that point. CDs were not just for music, but for data storage. As technology improved, CDs made way for DVDs, which could hold video. Computers were improved and gained the technology to write to discs. The term **CD/DVD R/W** code means that the computer drive could handle CDs and DVDs both, and could both read and write to the discs.

Memory...

Drives and memory are closely related. They have nearly become the same thing. Think of a car. The place where you put the people is the memory, and the engine is the drive. They can't really work without each other.

Memory has grown a lot since the invention of computers. A cell phone has more power than a government computer of the 1960s. One invention that has changed memory is the **flash drive**. This saves memory to a chip rather than a hard disc. Several types of media have been used as memory storage over the years, but we'll explore that more when we learn computer history.



Inside a flash drive...

There are two special terms to learn that relate to memory. They are RAM and ROM. Both of these stand for types of memory. **RAM** stands for Random Access Memory. This is changeable memory, and usually the larger amount of RAM a computer has, the faster it can process. RAM does have the problem that if it's interrupted, it is lost. If the power goes out and you haven't saved a document, you may lose it. This is because it's in the RAM until you save it.

The other type of memory is the **ROM** or the Read-Only Memory. ROM is permanent memory, and is given the nickname of “firmware” because it's the cross between hardware and software. The programs that boot your computer, like Microsoft, Apple, or Linux information, is stored as read-only memory. The ROM is protected from changing, and is very stable.

Cards...

The ability to process memory is only the beginning of computer function. Modern computers have video and sound. They can access the Internet and talk with other computers. For laptops and desktops, this is done with cards.

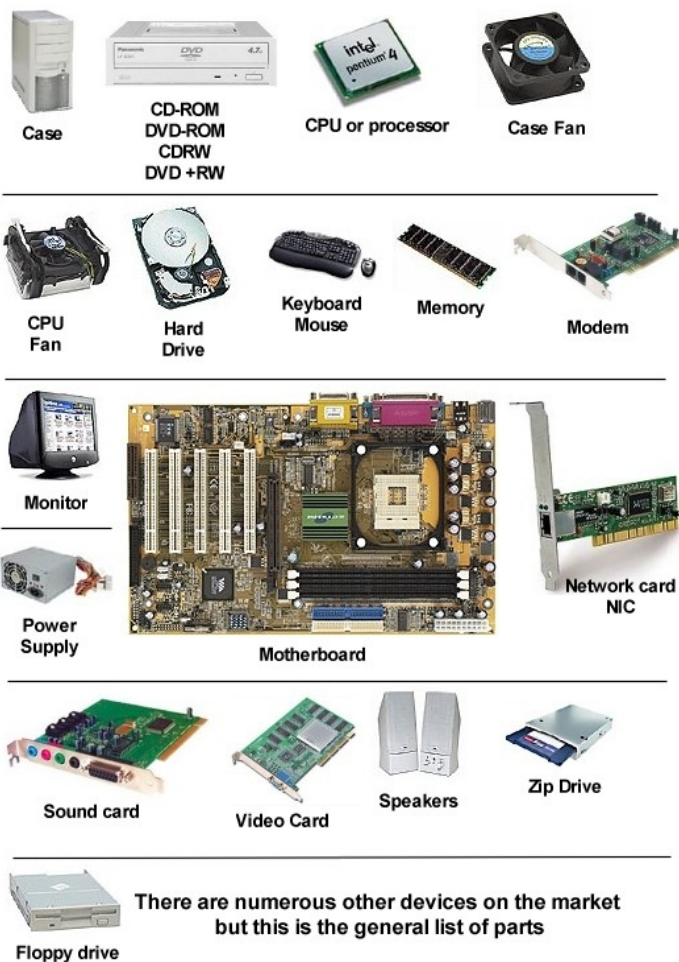
A card is add-on hardware that gives a computer more abilities. A **sound card** allows the computer to produce sounds. A **video card** lets the computer produce better images on the screen. There are **network cards** that allow computers to communicate as well.

Once upon a time, computers had a separate box that allowed them to call other computers. This used the phone lines to send data. The device is called a **modem**. This is no longer separate, but is included in the computer as an internal modem, which is a card. Wireless cards may also be included.

Basic cards are included inside the case of most computers now. It is still possible to upgrade to a better card that has more ability. Those who need great graphics are willing to pay more to get a better card.

Power Supply...

A computer couldn't run without power. Hand-held devices and laptops run primarily on battery power. This is one type of **power source** a computer can have. The other type is the electricity you'd get from the wall. It can be accessed through a **power cord**. Inside the case, there are sets of resistors and circuits that control how much power the computer is using. If these weren't there, the computer would burn up with electricity. Because there is a good deal of electricity in a computer, it does get very warm. When used for long periods of time, or when wearing out, computers can get extremely hot. To lessen the problem, computers have **fans** installed. Most have at least two. The case fan will blow air from outside of the computer to the inside. This helps to cool the electronics. Additionally, the CPU may have a separate fan, because it gets the hottest of all computer parts.



PERIPHERAL DEVICES...

A peripheral device is anything that can be plugged into the main computer unit. The monitor (screen) of a desktop computer is considered peripheral. The mouse, printer, keyboard and other devices are all peripheral. Some computers have attached these devices, and so the line between the main computer and the extra devices is blurry.

Input Devices...

An input device is anything the user can manipulate that will put data into the computer. By changing, typing on, or even moving one of these devices, it sends data to the computer. An input device is usually plugged into a card through a **port**. This is where the outside device connects with the inside device.

The main input devices used are the **keyboard** and the **mouse**. When a key on a keyboard is pressed, it sends an electrical signal to the computer. This is translated into the character pressed. The mouse or touch pad senses motion and translates that into motion on the screen. There are also buttons which work like keyboard buttons.

Other input devices include **microphones**, **scanners**, **memory devices**, and even game and other consoles. Each of these takes motion, sound, or information from the outside world and puts it into the computer.



Video card with three ports...

Output Devices...

An output device takes information inside the computer and presents it in a way that is understandable to the user. The most basic output device is the screen, or **monitor**. In hand-held devices, this is a touch screen, and is also an input device. In a laptop or a desktop, it is output only. Other output devices include the **speakers** which deliver sound information, the **printer**, video projectors, and attached **fax machines** (which are mostly replaced by email). Some consider removable memory devices a form of output as well.

Conclusion...

In a nutshell, these are the main parts of the computer. Computers will continue to change, but the main components remain the same. There will always be input, output, power, processing, and memory.

Learn these parts well, and then proceed to your quiz.

