



# Types of Computer



## Table of Contents

Types of Computer .....	2
Micro-computers .....	2
Personal Computers .....	2
Desktop Computer .....	2
Laptop Computers.....	2
Netbook Computer .....	3
Tablet Computers .....	4
Smart Phones .....	4
Palm Top.....	5
Personal Digital Assistant (PDA's).....	6
Mini Computers .....	6
Mainframe Computers.....	7
Super Computers .....	8
Embedded computer .....	8

## Types of Computer

There are many different types of computer available today. They range from giant super computers right down to small handheld personal organisers.

Computers today are categorized based on size, cost and performance. They fall into four major categories:

1. **Micro-computers**
2. **Mini-computer**
3. **Mainframe**
4. **Supercomputers**

This will give you a brief overview of the different categories of computers available and an idea of what they are used to do!

## Micro-computers

**Micro-computers** are designed for personal use in the office or at home and are often referred to as a PC (Personal Computer). In this class of computer there are also different types, such as desktops, Laptops, netbooks, Palm-tops/PDAs (Personal Digital Assistants), organizers and calculators.

## Personal Computers

### Desktop Computer

Modern PC's are very powerful and are now relatively inexpensive. You will find very similar machines both in the home and the office environment.

PC's can carry out millions of calculations per second and store large amounts of data – typically anything from 120GB to 1TB.

Personal computers tend to be set up and left in one place, they are not designed to be mobile or carried around with you.

They are useful for lots of different types of tasks:

Running office applications such as word processing, spreadsheets and databases

- For CAD design such as designing kitchens
- Editing video
- Creating and playing music
- Accessing the internet for research, work and entertainment.



Figure 1 - Desktop PC

**Challenge – See if you can find out some extra facts about this topic that are mentioned above!**

## Laptop Computers

A laptop computer is a portable computer which is mobile and small enough to carry around with you. They can literally be used on your lap or placed onto desks or tables.

Most laptops have an integrated keyboard which is often smaller in size than a standard keyboard. They also have a touchpad and buttons next to the keyboard which can be used in place of a traditional mouse.

The screen is attached to the base of the laptop and it folds down to protect it when the laptop is not in use.

Laptops have a powerful battery inside which means they can be used anywhere if the battery is flat, the laptop can still be used as long as an electrical socket is available.

Modern laptops are every bit as powerful as a personal

computer. They have as much processing power, the same amount of memory and large hard disks. All of the software applications that you would install and use on a PC can be installed on a laptop.

They can also be connected to the internet via Wi-Fi, 3G or a physical network connection.

The battery life can also be an issue as they will need recharging regularly.

Some people find the keyboard difficult to use, especially if it is a lot smaller than a standard keyboard.



Figure 2 - Laptop Computer

**Challenge – See if you can find out some extra facts about this topic that are mentioned above!**

### Netbook Computer

Netbook computers are much smaller both in size and weight than a traditional laptop. They still have an integral keyboard, touchpad and an attached screen but they are specifically designed to be ultra-lightweight and small enough to carry in one hand.

Netbooks are typically around 10 inches in size (diagonally across the screen) but they are becoming increasingly smaller as technology advances.

Unlike a laptop, they may not have a traditional hard drive to store the operating system, applications and data. Instead they may use 'flash' memory instead (some netbooks do not have a hard disk). This means that they don't have as much storage capacity, with many netbooks having only 20 – 120GB of storage whereas laptops will have 120Gb to 1TB of hard disk space.



Figure 3 - Netbook Computer

Also, they may have less RAM than a laptop, with many having between 512Mb and 1GB, compared to a laptop's 1 – 2GB of RAM. This means that they may be slightly slower at processing data than a laptop or a PC, but in reality you are unlikely to notice the difference. The real difference comes with very data intensive applications such as games.

**Challenge – See if you can find out some extra facts about this topic that are mentioned above!**

### Tablet Computers

A table computer is a mobile, quite thin device, having a flat surface. The device can be easily held in your hand.

It contains a touch screen which is operated using your fingers in various ways such as tapping, double tapping, swiping and pinching.

The screen view can be changed automatically from landscape to portrait mode by simply changing the orientation of the tablet. This is possible because the tablet has an in-built three axis gyroscope unlike standard laptops.



Figure 4 - Tablet computer

Other sensors include an accelerometer, magnetometer, and one or more cameras. It can also receive GPS signals for mapping and geo-location.

Tablet computers can connect to the internet using Wi-Fi or 3G – although you might need to pay a monthly fee to use this service and there may be a limit on the amount of data that you can download each month.

Storage within the tablet is by solid state flash memory rather than a hard disk that is commonly used in a laptop.

Tablet computers run from an internal battery which needs to be recharged after a number of hours.

The unique combination of advanced sensors and a fairly powerful CPU has resulted in an incredible array of imaginative applications (Known as 'Apps') being developed. For example, there is a star gazing app that shows the stars that would be seen on a clear night sky by simply holding the tablet up in the air in the relevant direction. There are 'augmented reality' apps that make use of the camera to overlay information on the screen being viewed.

**Challenge – See if you can find out some extra facts about this topic that are mentioned above!**

### Smart Phones

Quite recently the mobile phone has developed into what is now called a 'smartphone'. These are true multifunction devices. Yes, they can do all that a mobile phone can do, but also so much more. They have replaced the PDA's and become a computer in your pocket.

Part of the reason for the improvement in their capability has been the addition of some extra sensors in the device – namely the gyroscope that can measure angles, tilt and orientation.

They also contain GPS chips to pick up your exact location and touch screen technology.

Smart phones are now supported by thousands of independent developers around the world who dream up new things you can do with smartphones.

There are 'apps' that tell you the name of any song just by listening to a few bars of music, apps to find out what is on at your local cinema, apps that track your exercise and calories, games, video players, joke generators and so on.

Basically, if you want to do something with your smartphone, there is generally an app to help you!

All these are available in the 'app store' of the smartphone maker. Some apps are free; some are available for purchase for a small fee.



Figure 5 - Smartphones

**Challenge – See if you can find out some extra facts about this topic that are mentioned above!**

### Palm Top

A palmtop computer is similar to a laptop computer but it's small enough to fit into the palm of your hand (hence the name!).

Palmtops are usually not very powerful since the CPU's require a large battery and get hot – both problems in a small device.

A typical palmtop has a very small keyboard – too small to type on normally. Instead the user types using both thumbs. Also there is no room for a track pad, so touchscreen or a tiny joystick is used instead.

Palmtops are extremely portable, but the small keyboard and screen make the devices tiring to use for long periods.

What do you think a palmtop computer has turned into?



Figure 6 - Palmtop computer

### Personal Digital Assistant (PDA's)

A PDA is similar to a palmtop computer, except it is even more compact, and typically has no keyboard, using a touchscreen for all data input. Since the screen is so small, many PDA's have a small stylus (plastic stick) that is used to press things on the screen.

Most PDA's use some sort of handwriting-recognition system to allow the user to write on the screen, and to have their writing converted into text.

PDA's tend to be used as 'digital diaries' allowing users to take their email, documents, appointments, etc. with them wherever they go!

Note: You don't see PDA's any more since the onset of the smartphone, as a smartphone can do everything a PDA can do and much, much more!



Figure 7 - PDA

### Mini Computers

**Mini-computer** is a general purpose computer sometimes about the size of a small filing cabinet. It is faster, more expensive and has a higher storage capacity than the average desktop model. The mini-computer is oriented towards multiple users.

In size and power, minicomputers lie between workstations and mainframes. In the past decade, the distinction between large minicomputers and small mainframes has blurred, however, as has the distinction between small minicomputers and workstations. But in general, a minicomputer is a multiprocessing system capable of supporting from 4 to about 200 users simultaneously.

A multiprocessing system refers to a computer system's ability to support more than one process (program) at the same time.

1. Multiprocessing operating systems enable several programs to run concurrently. UNIX is one of the most widely used multiprocessing systems, but there are many others, including OS/2 for high-end PCs. Multiprocessing systems are much more complicated than single-process systems because the operating system must allocate resources to competing processes in a reasonable manner.
2. It refers to the utilization of multiple CPUs in a single computer system. This is also called *parallel processing*



Figure 8 - Multi-processing computer

## Mainframe Computers

**Mainframe computers** are large, powerful computers that carry out many different tasks for many different people at the same time.

They are slower than a supercomputer but they are far less expensive. They may cost around four million pounds to purchase.

Mainframes can execute billions of instructions per second and can process large amounts of data simultaneously.



Figure 9 - Mainframe computer

They are usually connected to a large number of peripheral e.g. printers, terminals, disk drives, etc.

They are used by large companies such as:

- Utility companies, e.g. gas and electric suppliers to calculate customers' bills
- Banks – for managing thousands of customers accounts each day
- Insurance companies – for keeping track of policies and claims
- Airlines – for dealing with bookings, tickets, cancellations, etc.
- Police – for storing and processing all the data collected each day about crimes.

Mainframe computers need to be operated by specialist, trained staff. They are usually kept in air conditioned rooms away from the office or factory floor.

**Challenge – See if you can find out two extra facts about this topic that are mentioned above!**

## Super Computers

**Super computers** are the fastest and most expensive computers in the world.

They cost over a hundred million pounds to build and very few organisations can afford to purchase one.

They are mainly used by large universities who do a lot of research, weather modelling, etc., and by organisations such as pharmaceutical companies for drug research or by the military for weapons research.

Whilst supercomputers are working, they generate so much heat that they need to be housed in specifically

designed rooms with environmental controls and air conditioning systems. It is vital that the atmosphere is kept free of dust particles and special filters are used to keep the air clean.

There may be many miles of cables which connect the computer to various peripherals. In order to hide the cables, false floors and ceilings are often needed.

Supercomputers usually need their own back-up electricity generator to ensure that they can continue to work even if there is a power failure.



Figure 10 - Super computer

**Challenge – See if you can find out two extra facts about this topic that are mentioned above!**

## Embedded computer

An **embedded computer** is a single chip that contains all of the elements that are essential for any computer, i.e.:

- RAM
- ROM
- CPU
- Input
- Output
- Clock

Another term often used for an embedded computer is 'micro-controller'. This is because the main purpose of an embedded computer is control something.

For example, the Raspberry Pi is an extremely popular single board computer that is intended to help school students learn about computer programming.

All of the following also contain and embedded computer:

- Telephones
- Televisions
- Cameras
- Washing machines
- Microwave cookers
- Dishwashers
- Cars



Figure 11 - Raspberry Pi

**Challenge – See if you can find out two extra facts about this topic that are mentioned above!**