

TASK 1

Computers and devices



It's the 21st century and we use computers in every aspect of our lives. You can find them almost everywhere: at your school, at home, at your parents' workplace. Even the new cell phones are small computers.

But what exactly is a computer? A computer is an electronic device that can store, retrieve and process data. You can use it to type documents, draw images, listen to music, watch movies, communicate with friends and much more.

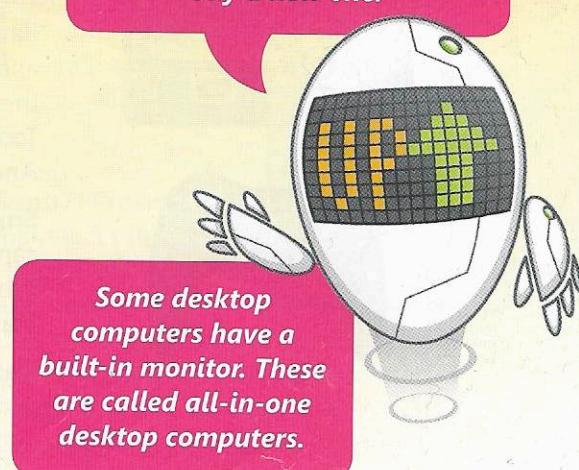
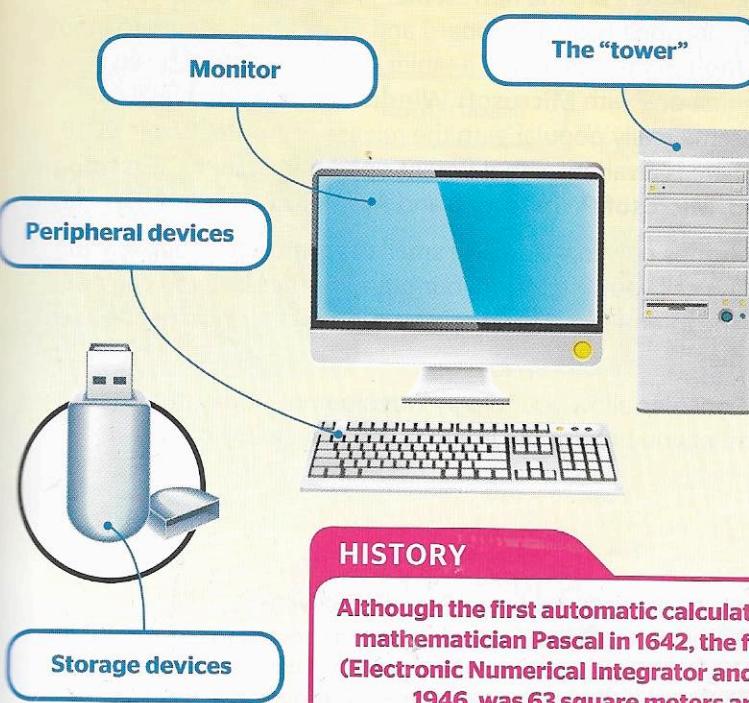
Today, different types of computers are available on the market and vary in size and power. The most common term we use for a computer is PC, which stands for Personal Computer. Personal computers are the ones that you have in your house or at school. But you can find computers almost everywhere in different forms: phones, ATMs, supermarkets, cars, even washing machines all use small computers.

Desktop computers

You can find desktop computers in every household and workplace and they come in different sizes: small, medium or large.

A desktop computer does not consist of one device, but it has parts that are connected together.

The advantage of desktop computers is that they can be upgraded. You can remove the parts that are old and replace them with new ones. This way, you can have an updated computer without having to buy a new one.



Some desktop computers have a built-in monitor. These are called all-in-one desktop computers.

Laptop computers or Notebooks

Laptop computers are portable PCs that you can carry almost anywhere you want because they are small, light and they use a battery. But keep in mind that the battery can last between 2 and 7-8 hours.

Laptop computers are so small in size that it's not easy to upgrade them. You may upgrade their memory or hard disk, but you cannot make any other changes.

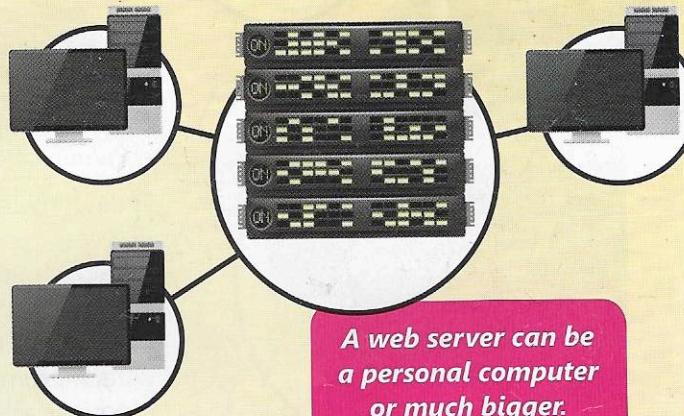


A notebook is a type of laptop that is smaller in size.

You can also connect peripheral or storage devices to laptops.

Servers

A server is a main computer that usually provides different services to other computers. For example, a file server is a computer where all the students of a school can store their files and a web server is a computer that helps you browse the Internet. When you click a link, the web server brings the page you requested to your computer.



A web server can be a personal computer or much bigger.



Other type of computers

Supercomputers are really powerful computers with high processing capacity. They are usually big in size, have many processors and can perform millions of calculations at the same time.

Tablet computers are the newest members of the computer world. They usually don't have a keyboard and use a touch screen to input data. Although the concept of a tablet PC goes back to the 60's and the first one with **Microsoft Windows** was created in 2001, they became really popular with the release of **Apple iPad** in 2010. Today, there is a variety with different operating systems, like **Google Android**, **Microsoft Windows 8** and **Apple iOS**.

Smartphones nowadays are like small computers. Of course, you can always call your friends or your grandmother, but you can also browse the Internet, send and receive e-mail, chat with friends and play games.

Game Consoles allow you to play video games. Today, the latest consoles let you browse the Internet and play online games.

BE SAFE

In order to avoid the possibility of losing your work or any damage to parts of the hardware due to power failure, it's important to have your computer connected to a **UPS (Uninterruptible Power Supply)**. A UPS contains a small battery that will give you extra power for a short period of time, in order to save your work properly.

Hardware and Software

When we refer to the word "computer" as a concept and not as a device, two things come to mind: hardware and software.

Hardware is the electrical and mechanical part of a computer. It's all the parts that make up the computer, like the monitor, the motherboard, the chips, etc.

Software is a collection of all the programs that are installed on a computer. These are programs that you need in order to operate your computer, such as the operating system or applications that you need to be able to work, like **Microsoft Word** or **Adobe Photoshop**.

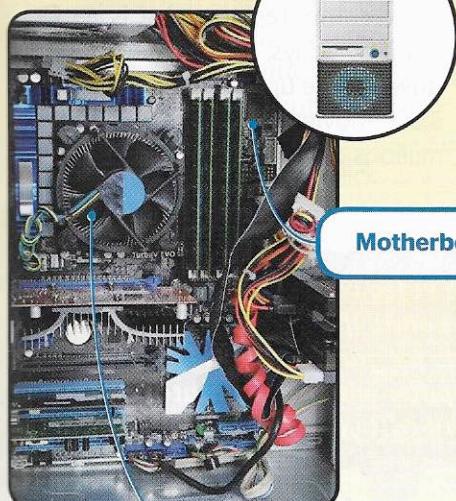
Now it's time to explore the hardware, the different parts of a computer. Let's find out what's inside "the machine."

Main parts of a computer

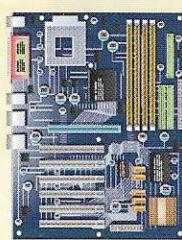
In order to be functional, a computer needs some specific parts of hardware: a motherboard, memory (RAM), a CPU and a hard disk drive. Then, you need a monitor, a keyboard and a mouse to work with your PC. Let's see what these are and how we can use them.

The CPU consists of two parts that work together: the ALU (Arithmetic and Logical Unit), which does all the calculations and logical operations and the CU (Control Unit), which controls and decodes the data from the memory to the CPU.

All the data in the CPU and memory is stored using a form of electricity. So, when the computer is turned off or there is a power failure, all this data is lost.



Motherboard



A **motherboard** is the main circuit of the computer, which all the other parts are connected to. The CPU, the memory, the hard disk drive and any peripheral devices are all connected to the motherboard. The motherboard's "job" is to make all these parts communicate and work together.

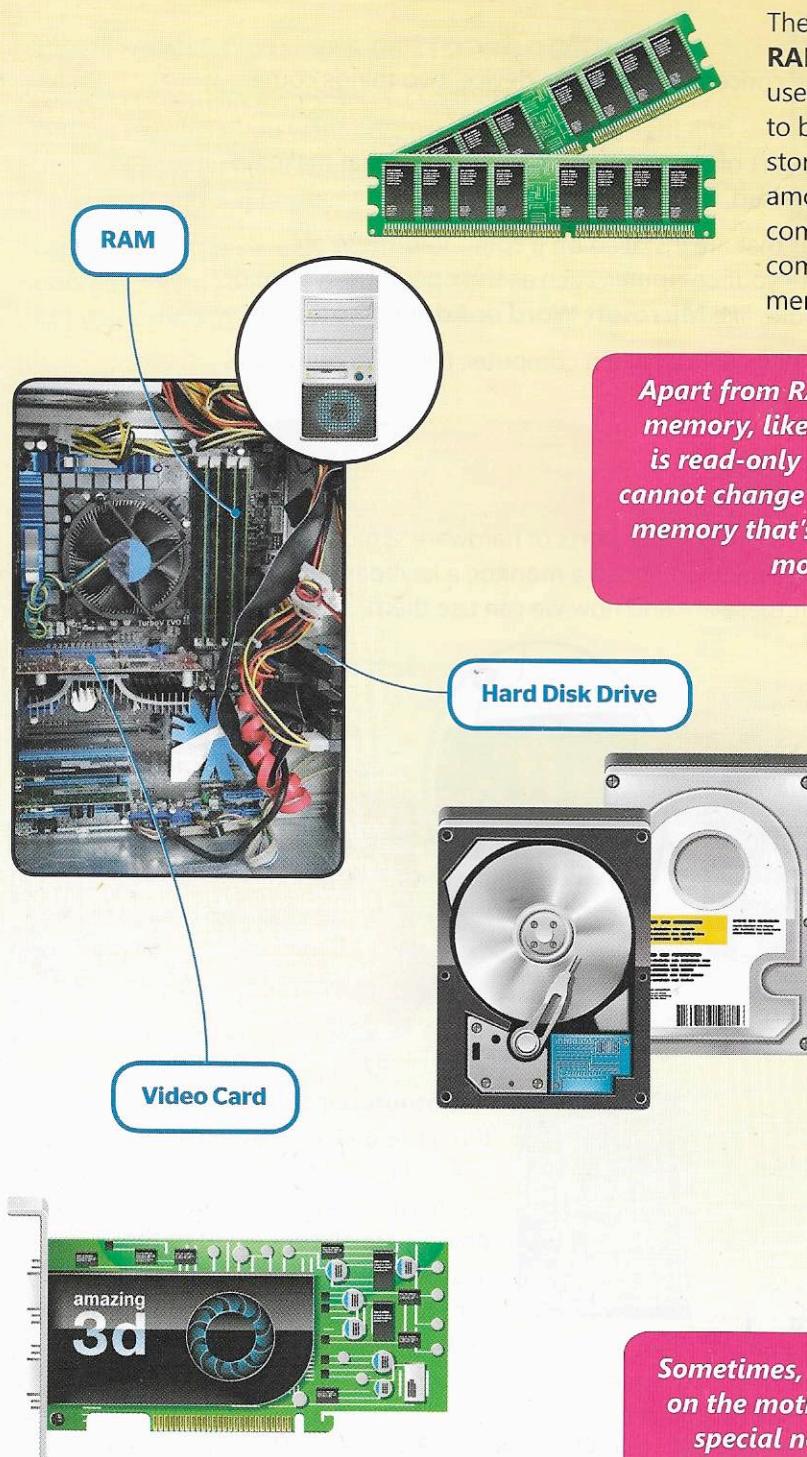


The **CPU (Central Processing Unit)** is the "brain" of your computer. It's the part that makes all of the arithmetic, logical and input/output operations, so that your computer can make all these amazing things. The faster the CPU, the more data it can process in a short period of time. The speed of a CPU is calculated in Hertz (Hz). In other words, we count in Hz how much data the CPU can process in a period of time.

SMART TIP

The BIOS (Basic Input/Output System) is the initial program that is executed when the computer starts. It identifies and initializes all the devices that are connected to your computer.

1. Learning the basics / Computers and devices



Video Card (graphics card or display adapter) turns the data that is processed from the CPU into images on the monitor. The better the video card, the better the quality of the images. This is especially evident in computer games. Modern video cards are like small computers, and they have their own CPU and fast memory, in order to offload the main CPU.

Apart from RAM, computers have other types of memory, like ROM or CPU cache memory. ROM is read-only memory that stores data, but you cannot change it. CPU cache memory is high speed memory that's inside the CPU and deals with the most frequently used data.

Hard Disk Drive (HDD) is the main storage device of your computer. You can use it to store and retrieve information. All the programs, including the operating system, and all the files that you have created by yourself or copied from other devices are stored inside the hard disk drive. The main characteristic of a hard disk drive is that it can hold a lot of information. Its storage size, as we say in computer language, is very big. Nowadays, a single hard disk drive can be up to 3TB. It can hold 3,000 movies, 800,000 songs and millions of pictures and documents.

Sometimes, the video card is integrated on the motherboard. If you don't have special needs for gaming or video editing, a computer with an integrated video card will cost you less money.



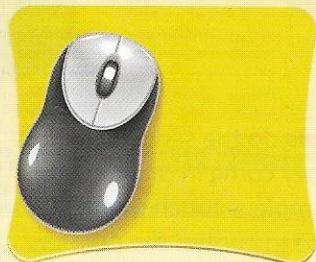
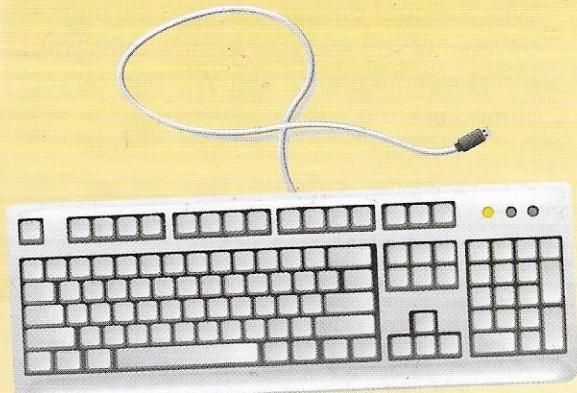
PERIPHERAL DEVICES

Peripheral devices are devices that are connected to a computer, but they are not part of it. In other words, they extend the computer's capabilities, but they are not necessary for a computer to function. These devices are divided into 4 categories: input devices, output devices, input/output devices and storage devices.

Input Devices

Input devices are devices that help the user input data, such as text, photos, songs and movies, or control the computer.

The **keyboard** is one of the main input devices. Through the keyboard, the user can input text and give commands to a computer. It's like a typewriter, but you type on screen and not on paper.



The **mouse** is a pointing device that helps the user point to objects on the screen and execute commands by clicking on them. A typical mouse has two main buttons, but modern mice have more buttons that help you execute frequently used commands with one click.



A **microphone** helps you record your voice, save it in digital form and then make changes with audio editing programs.



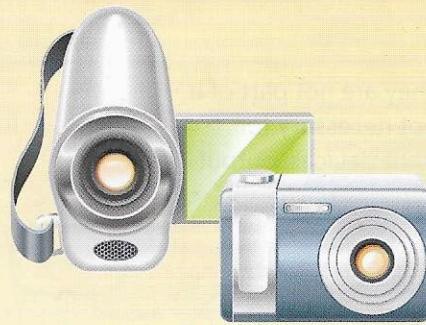
A **gamepad** is a game controller that helps you give commands and move on the screen. If you play video games, you already know it. Usually, a gamepad has a cross pad or a controller stick and some action buttons.

Gamepads have evolved during the last years. Some are wireless, like Nintendo's Wii controller, which allows you to control your player through a stick. If you want to play a game that involves a racket, you wave your controller as if it were a real racket. But there are also controllers like Microsoft Kinect, which allow you to interact with the game console or computer without holding or touching anything. Kinect works by "watching" your body movements and "listening" to your oral commands.

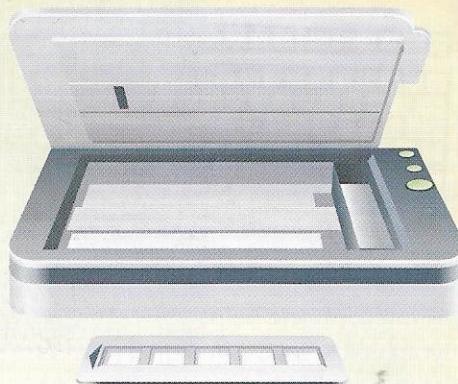
HISTORY

In the past, there used to be separate computer monitors and monitors for entertaining, like televisions. Today, we tend to combine these technologies. For example, with a computer monitor, you can get data processing and entertainment, whereas televisions allow computer functions like surfing on the Internet, etc.





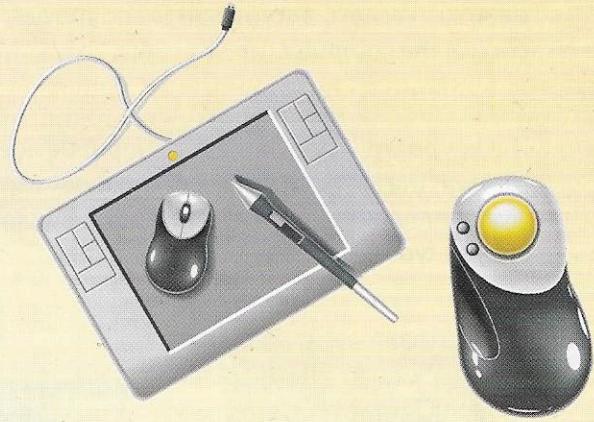
With a **digital camera**, you can take photos or video of you and your friends. Later, you can store your photos or movie clips on your computer.



Using a **scanner**, you can scan documents, photos or even small objects and you can store them in a digital form inside your computer.



With a **web camera**, you can make video calls and talk to your friends, no matter where you are.

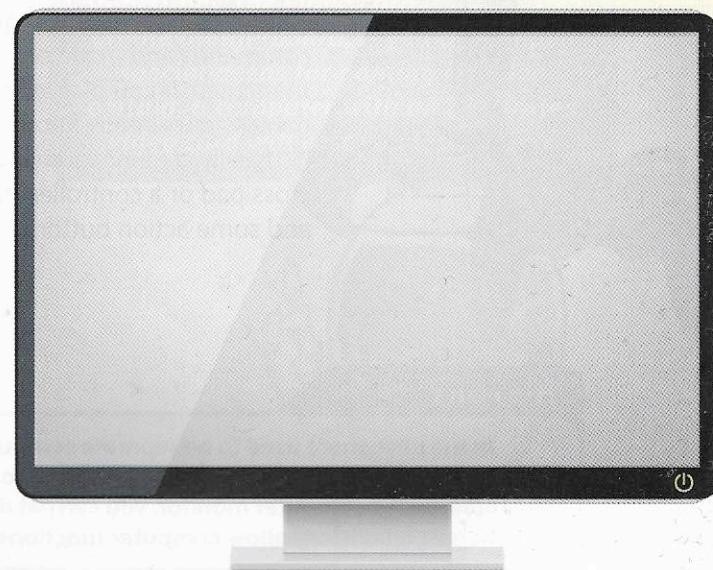


Pointing devices do the same job as a mouse, but they come in different shapes. For example, a touch pad is a pad that you use to control the pointer in your laptop. A track ball is a mouse that has a big ball on top of it, which you roll in order to move the pointer.

Output devices

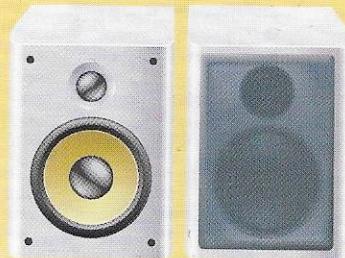
Output devices are all the devices that are connected to your computer and "show" you the results of data processing. Some types of output are text, graphics, audio, and video.

The **monitor** or screen or VDU (Visual Display Unit) is the main output device of a computer. It provides a visual display of the user's interaction with the computer.



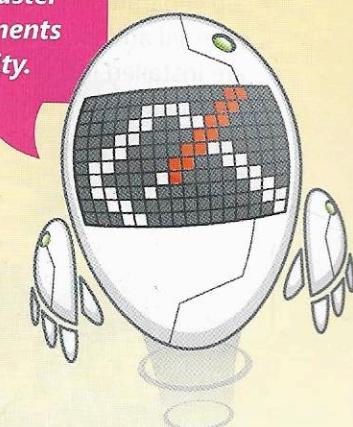


We use **printers** to print the results of data processing, like documents or photos, on paper. We use inkjet printers, which use liquid ink to print on paper, or laser printers, which use dry ink (toner), like a photocopier.



We use **speakers** to listen to music from our computer, or listen to the sound from video games or movies. You can use 2 speakers for stereo sound or you can have more speakers (5.1 or more) to listen to surround sound.

Inkjet printers are cheaper than laser printers, but laser printers are faster and produce documents with better quality.



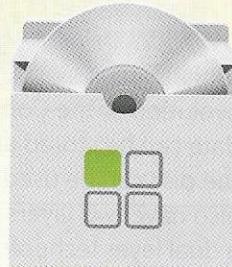
Input/Output devices

These are devices that can both input and output data into and from your computer. A few years ago, they were not so popular, but as time passed, they became more widely used.



You probably know what a **touch screen** is and chances are you've already used one. A touch screen allows you to input data to your computer with your fingers, but you can see the results on screen at the same time. More and more devices are using this technology nowadays, especially tablet PCs and smartphones.

Storage devices help us store data not only on our computer, but also on external devices, in order to move it to other computers. Storage capacity and reading/writing speed are the main characteristics of storage devices. We measure storage capacity in bytes. Bytes are like litres for liquids. The more bytes a device can hold, the more data it can store. To make things easier, we have multiple units. So there are bytes (B), kilobytes (KB), megabytes (MB), gigabytes (GB) and terabytes (TB).



Multiply by 1024:
1 KB = 1024 bytes
1 MB = 1024 kilobytes
1 GB = 1024 megabytes
1 TB = 1024 gigabytes

When you type in Notepad, every letter counts as one byte.



Hard Disk Drive (HDD): The hard disk drive is the main storage device of a computer. It can hold up to a few terabytes and can store thousands of movies, songs and millions of documents. Hard disk drives are very fast at transferring data and are separated into two categories: internal and external. Internal drives are installed inside the computer and external drives are portable that you can carry anywhere and connect to any computer.



DVD-RW Drive: DVD stands for Digital Versatile Disc and it's the evolution of the Compact Disc. More data can be stored and both sides of the disc can be used. Each side can also have two layers of data. DVDs use a dual layer technology that allows the disc recorder to write data from the inside to the outside for the first layer and from the outside to the inside for the second layer. The storage capacity of a simple DVD starts at 4.7GB and can reach 17GB for a two-sided, dual layer disc.



CD-RW Drive: CD stands for Compact Disc, a disc that appeared in the '80s. The CD became very popular because it is not expensive, it can hold about 700 MB of data and there is little possibility of data loss. Before CDs, data was stored on magnetic storage devices like floppy disks. The problem was that when you put them near a strong electromagnetic source, like cell phones or speakers, you could lose all your data. CDs prevent this because their data is not stored magnetically.



Blu-ray Drive: Blu-ray Disc (BD) is the evolution of the DVD. More data can be stored than on a DVD and the surface of the disc is more scratch-resistant. A Blu-ray Disc can hold up to 50GB of data, 70 times more than a CD!



Memory Card / USB Flash Drive: Memory cards and USB flash drives have totally replaced the old floppy disks. We use memory cards in digital cameras, video cameras or smartphones and we use USB flash drives (or USB memory sticks) to store data that we want to carry with us. They are so small that you can hang them on your keyring, but they can hold a lot of gigabytes of data! Actually, as time passes, their storage capacity is growing bigger and bigger.