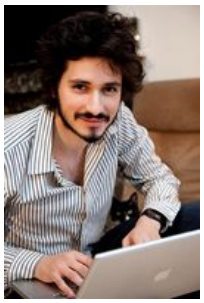
IT03.- Introduction to the IT sector.

Situation



The IT sector is new for Alberto; Alberto is Mikel's closest friend; he works as a waiter at weekends but now has decided to try and improve his professional prospects. When his friend Mikel suggested doing a b-learning course on System and Web Administration he thought it was a good idea.

In blended learning or b-learning you have a combination of traditional, face to face teaching methods with on-line activities. Alberto hadn't heard of b-learning before but he signed up immediately when they told him he would be able to organize his own learning schedule.

In this unit we will look at the history of IT as well as the basic tools and machines and we will try to learn some general notions on safety at work. Let's go...

1.- History.

Situation

Let's start with some facts about the history of computer science. This will introduce Alberto to the topic.

The beginnings of computer science date way back to the 1550s. There are some really important names who contributed to what we nowadays call PC. Read the following text to find out more about those names, the inventions and the dates.

History of Computer Science *(link: https://cs.uwaterloo.ca/~shallit/Courses/134/history.html)*

Self assessment

Read the sentences below and fill in the missing words.

1. Believe it or not, the _____ were the beginning of the technological era.
2. 1959 was an important year because _____ _____ _____ was invented.
3. _____ , _____ _____ _____ were the three inventors related to the invention of mechanical adding machine based upon the binary system? .
4. Who set out the following question? *Is mathematics decidable, that is, is there a mechanical method that can be applied to any mathematical assertion and (at least in principle) will eventually tell whether that assertion is true or not?* _____
5. **Unix**, a very influential operating system, was developed at _____ _____ _____ _____ _____ .
6. _____ _____ used the term “computer virus” for the first time.
7. The first Computer Science Department was formed at _____ _____ in 1962 in .
8. The latest inventions in computing are _____ _____ , _____ _____ _____ _____ _____ _____ _____ .

You should know

The passive voice is a common structure in written texts in English so this may be a good moment to revise some of those verb structures. You can look at File 6 in New English File Intermediate and do some exercises.

The passive voice *(link: http://elt.oup.com/student/englishfile/intermediate/a_grammar/?cc=global&selLanguage=en)*

Further knowledge

Go to this link, which is a lecture, if you want to know more about the development of computers through history. You have an index in which you can choose the desired topic you want to read about.

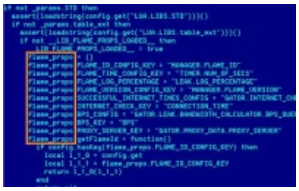
History of computing *(link: http://www.eingang.org/Lecture/)*

2.- Basic concepts.

Situation

Alberto needs to learn about computers, binary, programs, hardware, software, applications and also concepts such as programming, debugging, storing and data processing. Let's start ....

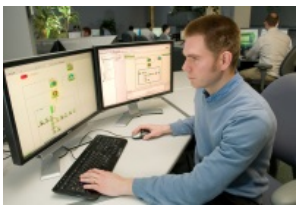
What are the basics of computing? What is a computer? And programming? And debugging? What do all these terms mean and what exactly are they necessary for? Let's have a look at this information from Techtarget:



(link: IT03_CONT_R09_01_Configuracion.jpg)

A computer is a device that accepts information *(link: http://searchsqlserver.techtarget.com/definition/information)* (in the form of digital *(link: http://whatis.techtarget.com/definition/digital)* ized data *(link: http://searchdatamanagement.techtarget.com/definition/data)*) and manipulates it for some result based on a program *(link: http://searchsoftwarequality.techtarget.com/definition/program)* or sequence of instructions on how the data is to be processed. Complex computers also include the means for storing data for some necessary duration. A program may be invariable and built into the computer or different programs may be provided to the computer (loaded into its storage and then started by an administrator or user). Today's computers have both kinds of programming.

Binary describes a numbering scheme in which there are only two possible values for each digit: 0 and 1. The term also refers to any digital encoding/decoding *(link: http://searchnetworking.techtarget.com/definition/encoding-and-decoding)* system in which there are exactly two possible states. In digital data memory, storage, processing, and communications, the 0 and 1 values are sometimes called "low" and "high," respectively.



A program in computing is a specific set of ordered operations for a computer *(link: http://searchwindowsserver.techtarget.com/definition/computer)* to perform. In the modern computer that John von Neumann outlined in 1945, the program contains a one-at-a-time sequence of instructions that the computer follows. Typically, the program is put into a storage area accessible to the computer. The computer gets one instruction and performs it and then gets the next instruction. The storage area or memory *(link: http://searchmobilecomputing.techtarget.com/definition/memory)* can also contain the data that the instruction operates on. (Note that a program is also a special kind of "data" that tells how to operate on "application or user data.")

Hardware is the physical aspect of computers, telecommunications, and other devices. The term arose as a way to distinguish the "box" and the electronic circuitry and components of a computer from the program you put in it to make it do things.

Software is a general term for the various kinds of programs used to operate computers and related devices. (The term hardware *(link: http://searchnetworking.techtarget.com/definition/hardware)* describes the physical aspects of computers and related devices).

Further knowledge

Computer Basics *(link: http://vfu.bg/en/e-Learning/Computer-Basics--computer_basics2.pdf)*

Basic computer concepts *(link: http://whatis.techtarget.com/reference/Learning-Path-Basic-Computer-Concepts)*

Solved exercise

Answer the following questions based on the text above:

1. What is a *program*?
2. What is *software*?
3. What is *hardware*?
4. What is the *binary system*?

Further knowledge

To know more about computing click on this link. Look at the sequence list below, choose the topic you wish and find out more.

Computer Basics *(link: http://whatis.techtarget.com/reference/Learning-Path-Basic-Computer-Concepts)*

Self assessment

Say whether these definitions of types of machining operations are TRUE or FALSE.

- ☐ *(link:)*
  1.- A file is an entity of data available to system users that is uncapable of being manipulated as an entity.
- ☐ *(link:)*
  2.- Client/server describes the relationship between two computer programs within in a network, in which one program, the client, makes a service request from another program, the server, which fulfills the request.
- ☐ *(link:)*
  3.- I/O (input/output), pronounced "eye-oh," describes any operation, program, or device that transfers data to or from a computer. Typical I/O devices are printers, hard disks, keyboards, and mouses.
- ☐ *(link:)*
  4.- Digital describes electronic technology that generates, stores, and processes data in terms of two states: positive and non-positive.

Quotation

A **computer** is a general purpose device that can be programmed *(link: http://en.wikipedia.org/wiki/Computer_program)* to carry out a set of arithmetic or logical operations. Since a sequence of operations can be readily changed, the computer can solve more than one kind of problem.
Conventionally, a computer consists of at least one processing element, typically a central processing unit *(link: http://en.wikipedia.org/wiki/Central_processing_unit)* (CPU) and some form of memory *(link: http://en.wikipedia.org/wiki/Memory_%28computers%29)* . The processing element carries out arithmetic and logic operations, and a sequencing and control unit that can change the order of operations based on stored information. Peripheral devices allow information to be retrieved from an external source, and the result of operations saved and retrieved.

In World War II *(link: http://en.wikipedia.org/wiki/World_War_II)* , mechanical *(link: https://en.wikipedia.org/wiki/Mechanical_computer)* analog computers *(link: http://en.wikipedia.org/wiki/Analog_computers)* were used for specialized military applications. During this time the first electronic digital *(link: http://en.wikipedia.org/wiki/Digital_data)* computers were developed. Originally they were the size of a large room, consuming as much power as several hundred modern personal computers *(link: http://en.wikipedia.org/wiki/Personal_computer)* (PCs).[1]

Modern computers based on integrated circuits *(link: http://en.wikipedia.org/wiki/Integrated_circuit)* are millions to billions of times more capable than the early machines, and occupy a fraction of the space.[2] Simple computers are small enough to fit into mobile devices *(link: http://en.wikipedia.org/wiki/Mobile_device)* , and mobile computers *(link: http://en.wikipedia.org/wiki/Mobile_computing)* can be powered by small batteries *(link: http://en.wikipedia.org/wiki/Battery_%28electricity%29)* . Personal computers in their various forms are **icons** *(link: http://en.wikipedia.org/wiki/Icon)* of the Information Age *(link: http://en.wikipedia.org/wiki/Information_Age)* and are what most people think of as “computers.” However, the embedded computers *(link: http://en.wikipedia.org/wiki/Embedded_system)* found in many devices from MP3 players *(link: http://en.wikipedia.org/wiki/Digital_audio_player)* to fighter aircraft *(link: http://en.wikipedia.org/wiki/Fighter_aircraft)* and from toys to industrial robots *(link: http://en.wikipedia.org/wiki/Industrial_robot)* are the most numerous.

(Wikipedia)

Solved exercise

Read the following article carefully. Look at the index below the introduction; it will give you an idea of the general contents. Make sure you have a good look at the sections called "History" and “Programs”.

Computers *(link: http://en.wikipedia.org/wiki/Computer)*

Now do the exercise:

1. Give some examples of computer types
2. Which is the distinguishing feature between computers and other machines?
3. What are bugs?

Self assessment

Read more about programs/programming. This article talks about how they are formed, what they do, ... Then get ready to complete the exercise below.

Computer Program *(link: http://en.wikipedia.org/wiki/Computer_program)*

Now fill in the gaps with the following words: study, instructions, task, software, executing, function, develop.

A **computer program** , or just a **program** , is a sequence of _____ , written to perform a specified _____ with a computer *(link: http://en.wikipedia.org/wiki/Computer)* . A computer requires programs to _____ , typically _____ the program's instructions in a central processor *(link: http://en.wikipedia.org/wiki/Central_processing_unit)* . The program has an executable *(link: http://en.wikipedia.org/wiki/Execution_%28computing%29)* form that the computer can use directly to execute the instructions. The same program in its human-readable source code *(link: http://en.wikipedia.org/wiki/Source_code)* form, from which executable programs are derived (e.g., compiled *(link: http://en.wikipedia.org/wiki/Compiler)*), enables a programmer to _____ and _____ its algorithms *(link: http://en.wikipedia.org/wiki/Algorithm#Formalization)* . A collection of computer programs and related data *(link: http://en.wikipedia.org/wiki/Data)* is referred to as the _____ .

A piece of advice

Remember to check the meaning of new vocabulary from time to time.

2.2.- Computer Maintenance.

Situation

Whenever Alberto hears the word "maintenance" he thinks of repairing breakdowns. However, maintenance also involves routine operations to keep a computer in working order. Maintaining a computer involves three things: keeping it **physically clean** , protecting it from **malware** , and **backing up** your important files.

You should know

A good maintenance of your computer, guarantees a good performance. Read the following article and watch the video that comes along carefully and do the exercise below.

Computer maintenance *(link: http://www.gcflearnfree.org/computerbasics/14)*

Self assessment

Say whether these sentences are TRUE or FALSE.
In order to clean the monitor you can use any glass cleaner available.

○ True ○ False

Never spray any liquids directly onto the screen.

○ True ○ False

The best way to protect your computer is to install an antivirus program and to stay smart when browsing the Internet and using your email.

○ True ○ False

There is no way you can prevent the loss of any important documents, photos, or other files.

○ True ○ False

The right elements for a correct physical maintenance for your computer are: compressed air cans and anti-static wipes.

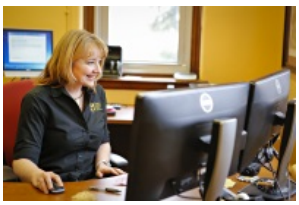
○ True ○ False

Further knowledge

Maintenance and smart browsing are essential for an ideal performance of our computer. Take a look at the following guide that deals with different aspects of maintenance.

Maintenance *(link: http://www.dummies.com/how-to/computers-software/pcs-laptops/maintenance.html)*

2.3.- Professional Fields.



It is a difficult task to define the professional area of IT technicians as it covers a wide scope. However, we could mention 5 major types that encompass the IT world: repair technicians, network technicians, help desk and customer service technician, server technician and computer forensics.

Further knowledge

For more details about the duties or services each type of technician has to fulfill take a look at the following article.

Types of technicians *(link: http://www.wisegeek.org/what-does-a-computer-technician-do.htm)*

Solved exercise

Answer the following questions based on the text and links above

1. What do people trained in repairs focus on?
2. What is a network technician responsible for?
3. What is a help desk?
4. What do server technicians specialize in?
5. What do computer forensics technicians do?

3.- A Safe Workstation.

Situation

Using a computer can cause back, neck and shoulder pain, eyestrain, and RSI (Repetitive Strain Injury). But you can reduce these risks with proper workspace design, better posture and good habits, such as taking rest breaks.

Let's have a look at the *European Agency for Safety and Health at Work* ...

Read the following information taken from *Wikipedia*:

"*The European Agency for Safety and Health at Work (EU-OSHA) was set up in 1996 in Bilbao, Spain. Its mission is "to make Europe's workplaces safer, healthier and more productive. This is done by bringing together and sharing knowledge and information, to promote a culture of risk prevention".*
The Agency has a staff of occupational safety and health (OSH), communication and administrative specialists. At the national level, it is represented through a network of focal points, which are usually the lead OSH bodies in the individual Member States.
The European Risk observatory was set up in 2005 as an integral part of the European Agency for Safety and Health at Work. Demographic changes and developments in the organisation of work and production methods are generating new types of risks to workers' safety and health. The Risk Observatory aims to identify new and emerging risks and to promote early preventive action. It describes trends and underlying factors and anticipates changes in the working environment and their likely consequences to health and safety."

So what are the basic rules of safety at work? What should we know about safety gear or ergonomics?

You should know

Watch this video about creating a safe workspace. Take a few minutes to think about the advice given. Then do the exercise below:

Creating a safe workspace

(link: https://www.youtube.com/watch?v=8M9HtW_SAQM)

Long description *(link: IT03_CONT_R20_Video_CreatingSafeWorspace.html)*

Self assessment

Look at these sentences and fill in the gaps.

- Using a computer involves a lot of repetitive motions, motions that can lead to aches and pains. You can avoid this bearing in mind [ ] .
- Make sure you place your [ ] so you're sitting in a [ ] , [ ] position.

- Position your [ ] at a comfortable height. Your wrists should be [ ] and [ ] to avoid any strain. Place your mouse [ ] [ ] [ ] the keyboard.
- Your monitor should be a comfortable distance away from your eyes - somewhere between [ ] - [ ] [ ] . It should also be at [ ] [ ] or slightly lower.
- To avoid strain and fatigue [ ] - [ ] - [ ] is a good rule to follow.
- [ ] and [ ] [ ] is another thing that can affect your productivity.

Further knowledge

Computer ergonomic gears play an important role in your welfare. Click on this link for examples of ergonomic items.

Ergonomic gear *(link: http://www.ergopro.com/)*

Solved exercise

According to thefreedictionary.com *(link: http://www.thefreedictionary.com/)* ergonomics is " *The applied science of equipment design, as for the workplace, intended to maximize productivity by reducing operator fatigue and discomfort.* "

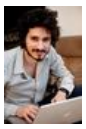
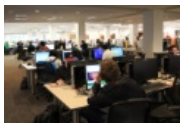
Read the article on the following link and answer the questions.

Workplace ergonomics *(link: http://comp1220uwigroup.weebly.com/ergonomics.html)*

1. What do we mean when we say "ergonomically correct"?
2. What are some of the potential hazards of prolonged computer work?
3. What can you do to prevent those problems?

Anexo.- Licencia de Recursos.

Licencias de recursos utilizados en la Unidad de Trabajo.

Recurso (1)	Datos del recurso (1)	Recurso (2)	
	Autoría: Nicolás Exposito Licencia: CC BY 2.0 Procedencia:http://www.flickr.com/photos/71625667@N00/3242267317		Autoría: Blue F Licencia: CC by Procedencia: http://www.flic
	Autoría: Utah State Library Licencia: CC by-nc-sa Procedencia: http://www.flickr.com/photos/47585381@N04/5637892621/		Autoría: be OH Licencia: CC by Procedencia: http://www.flic
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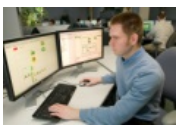
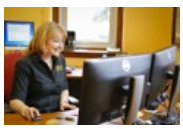
	Autoría: marsmettnn tallahassee Licencia: CC by-nc-sa Procedencia: www.flickr.com/photos/71744937@N07/7297167486/		Autoría: Argon Licencia: CC by Procedencia: http://www.flic
	Autoría: Argonne National Laboratory Licencia: CC by-nc-sa Procedencia: https://www.flickr.com/photos/argonne/6862639724/		Autoría: CAFNI Licencia: CC by Procedencia: https://www.fl