

Bit by Bit

English for Information and
Communications Technology



EDIZIONE MISTA
+ LIBRO DIGITALE

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BIT BY BIT

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and Communications Technology



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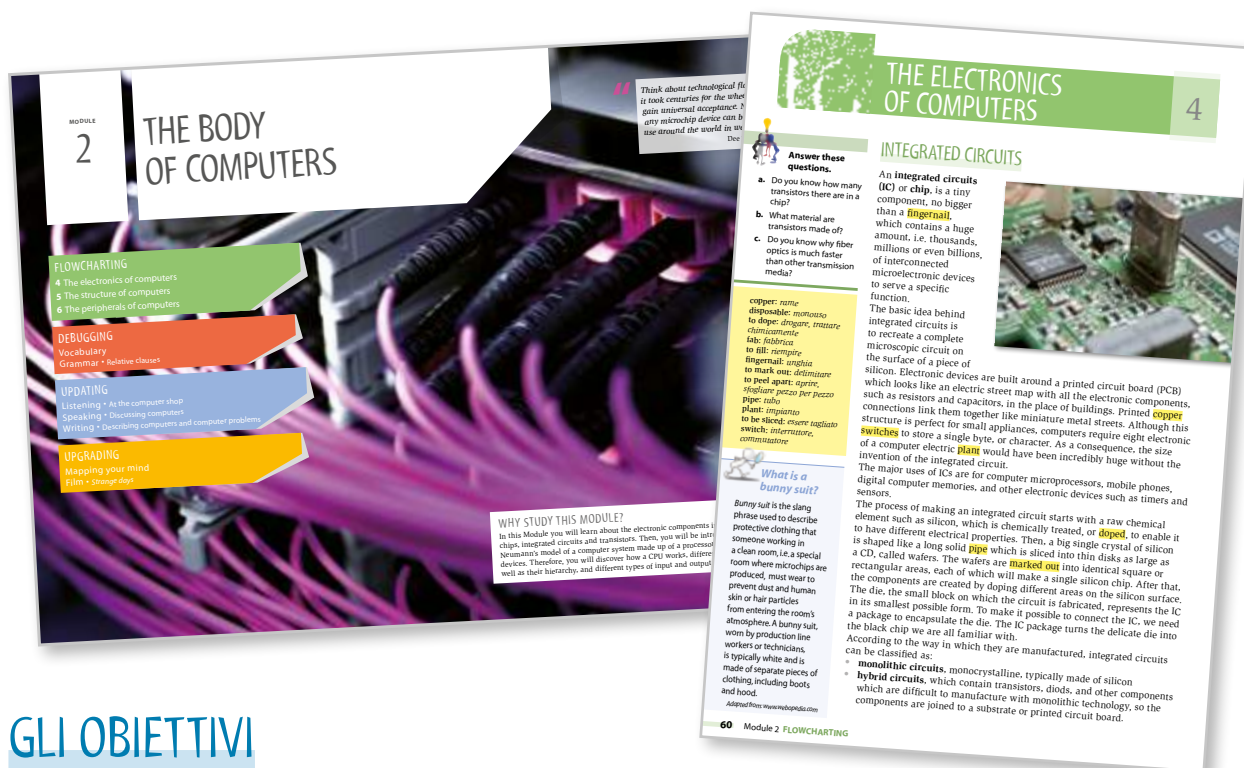
PRESENTAZIONE

L'ARGOMENTO

Bit by Bit è un corso di inglese rivolto in particolare agli studenti dei corsi a indirizzo **Informatico** e, in generale, a coloro che hanno l'esigenza di utilizzare la lingua inglese come strumento di studio e/o di lavoro in questo settore.

Grazie alla ricchezza del materiale proposto, **Bit by Bit** – concepito per promuovere un apprendimento attivo basato sui contenuti (*content-based learning*) – offre la possibilità di scegliere gli argomenti sia in base ai programmi delle materie di indirizzo, sia in base al livello di competenza linguistica degli studenti.

I contenuti sono stati ordinati secondo criteri di graduale complessità concettuale e linguistica (B1, B1+, B2) e vengono esplorati utilizzando le quattro abilità in modo omogeneo ed integrato. I brani, autentici o appositamente pensati per il profilo di apprendente a cui il corso è indirizzato, offrono un assortimento di stili, registri e livelli di difficoltà, e sono tratti da fonti diverse: giornali e riviste, libri e manuali, materiale promozionale e siti web.



GLI OBIETTIVI

Bit by Bit si propone di:

- far acquisire le competenze necessarie per comprendere testi che presentano termini, espressioni, strutture sintattiche e modalità discorsive specifiche del linguaggio settoriale;
- migliorare le capacità di ricezione e produzione orale e scritta, anche tramite attività tipo PET e FEC per il conseguimento rispettivamente del livello B1 e B2 del CEFR, e di attività tipo IELTS per quanto riguarda l'ambito dell'inglese accademico;
- arricchire il patrimonio lessicale sia con il lessico tecnico che generale;
- consolidare abitudini grammaticali corrette e approfondire alcune strutture;
- stimolare l'interesse e la partecipazione attiva degli studenti, dando spazio alla loro esperienza personale e a problematiche di attualità;
- contribuire a sviluppare sensibilità per un utilizzo corretto e consapevole delle nuove tecnologie.

LA STRUTTURA

Bit by Bit è diviso in sei Moduli, ognuno dei quali è ripartito in quattro sezioni:

1 FLOWCHARTING (Contents Section) – Divisa in **Unità**, contiene testi e attività che riguardano i contenuti specifici della specializzazione già affrontati in L1. Ogni unità è suddivisa in brevi **Capitoli** su due pagine – teoria ed esercizi – per favorire non solo uno studio più parcellizzato, ma anche la scelta antologica da parte dell'insegnante. I testi vengono affrontati in modo graduale, attraverso esercizi di *warm-up*, esplorazione del lessico specifico, comprensione scritta e orale, globale e specifica, re-impiego dei termini tecnici e produzione scritta e orale. **Brevi box** permettono di ampliare le conoscenze sugli argomenti:



per approfondimenti generali;



per analisi di fatti e dati;



per curiosità;



per approfondimenti culturali;



per finestre umoristiche.

Un ricco **apparato iconografico** correda i brani di lettura, per ognuno dei quali è previsto un esauriente **glossario**.

ICT AND HEALTH

We all know that ICT can have a massive impact on all aspects of healthcare, from delivering the information people need to lead a healthy lifestyle, to providing new tools to design tomorrow's medicines; from making healthcare systems more efficient and responsive to providing in the home and mobile healthcare technology. For example, today, ICT allows us to track and monitor our health or unhealthy lifestyles thanks to a range of different technological devices such as smart watches, video chats or biosensors that produce push notifications about calories, pulse, pressure, workout routines, cholesterol, etc. Large amounts of data are stored daily, shared and reviewed remotely by doctors, thus allowing patients to be home-managed.

Despite the benefits of ICT in healthcare, there are potential **hazards** when using computers, smartphones and other technological devices; the problems mostly come from over-use. The main health hazards are:

- **Repetitive strain injury (RSI)**: this is caused by typing or using a mouse over a long period of time. It causes painful **muscle** damage and can get so bad that the sufferers may become unable to use their hands. You should take frequent breaks and use a comfortable keyboard.
- **Eye strain**: this is caused by looking at the screen for too long: back lighting makes it worse. Many people who use computer screens for long periods have to wear glasses or contact lenses. You should make sure lighting levels are comfortable and have periodic eye checks.
- **Backache**: this is caused by bad posture at the computer. You should use an ergonomically designed chair, sit at the correct height and take breaks to stretch your muscles frequently.
- **Stress**: computers can cause very stressful situations, such as losing your work, getting a virus, being unable to connect to the Internet and so on. Stress is also caused by too much work. This can cause headaches and affect a person's behaviour towards others; it can also cause depression and mental illness. You should take regular breaks to avoid stress.

5 Match these words from the text to their synonyms/definitions. Then, read and give the text a heading. Say if the sentences are true or false. Correct the false ones.

1. Blooming	a. Integrated
2. Embedded	b. System that alerts you of danger
3. Wearable	c. Guardians
4. Warning system	d. Developing
5. Cantakers	e. Successful
6. Rate	f. Present-day
7. Effective	g. Statistics
8. Current	h. Suitable to bear

Cyber Physical System (CPS) is a blooming technology with a wide range of applications. It concerns the system of embedded computers that monitors and controls some physical processes and which can therefore help medicine as, for example, when it takes care of patients at risk of a heart attack. Embedded systems provide efficient and quick solution by microscopic devices, such as low cost zigbee chips, which make it possible, thanks to a small **wearable** wireless monitoring system, to inspect the patient's ECG signals, immediately transmit them to control units, and, in case of emergency, send an alert warning system on the caretakers' mobile. This life saving system reduces the mortality rate of heart patients and acts as an effective heart care service to patients. Advancement in Microelectromechanics, i.e. the micro sensor technology, has created a enormous impact on the current medical health care scenario. It is well known that low cost technology and hence the effectiveness of the system is improved.

Adapted from: *Intelligent Systems and Control (ISCC), 2015 IEEE 9th International*

1. Innovative microscopic sensor technologies are really expensive.
2. CPS stands for cyber physical system.
3. First a warning system sends an alert signal and then the monitoring system inspects the patient's signals.
4. Helping patients who have had a heart attack is the only type of application of CPS.
5. CPS is a very fast and successful solution.
6. Its small size is one of the advantages of the new system.

6 Discuss these points. Which one do you agree

MAPPING YOUR MIND

COMPUTERS

- AI
- security
- healthcare
- robotics
- machine learning
- networks
- cloud computing
- research fields
- Pros: physical development, no physical barriers, e-learning
- Cons: addiction, poor relationships, fake identities
- effects on: health, education, the environment, work, culture
- ICT and society
- Computer science: computational thinking, problem solving, multiple domains, creativity (not just programming)
- Computer history: 1st generation: vacuum tube technology, 2nd generation: transistors, 3rd generation: integrated circuits, 4th generation: small microprocessors, 5th generation: AI, quantum computers
- Computing (2014): telecommunications, robotics, environment, 3D reality, bio-computing, energy
- Computer types: mainframes, servers, supercomputers, embedded systems, desktops, laptops, notebooks, workstations, tablets, smartphones, PDAs, wearable computers

Image Editing

Image editing is considered a creative process. It involves removing unwanted elements such as **dust specks** and **scratches** from the image, like rotating and cropping, correct for lens **aberrations**, make **retouching** changes or adding special effects to it. Often, the tasks of image editing are (1) **cropping** and need intense processing.

In digital image processing, image (4) **editing** is basically categorised into (5) **image editing** and parametric image editing. Pixel editing focuses on altering the image by working at the pixel level. Parametric image editing, on the other hand, focuses on changing the appearance of the image without altering the (6) **pixels**.

There are benefits associated with image editing. It helps to produce the (7) **best** possible image in the interests of the viewers. However, advanced software for image editing is expensive and often requires (8) **time** for an individual to understand and become familiarised with its features. Furthermore, edited images can be considered false or **misleading**, causing image editing to have a negative reputation for some people.

Adapted from: <https://www.techopedia.com/definition/7686/image-editing>

1. What is the difference between pixel editing and parametric image editing?

2. What are the drawbacks of advanced software for image editing?

3. Why does image editing have a negative reputation?

7 (14) Listen to the extract and write:

1. who the professionals are that might use photo editing software and what for
2. who the beginners are that might use photo editing software and what for.

PHOTO EDITING SOFTWARE

Photo editing software allows the user to edit and adjust existing images and photos, which have been **digitally** converted and stored as digital data. The original images can be:

- photographs on film or in a book, or hand-drawings on paper converted into digital images with a scanner. These images are usually stored as bitmap files, though they can be converted to other formats, e.g. JPEG. A JPEG is a compressed bitmap; when you convert a bitmap to a JPEG, you lose some of the picture quality, but in a way that is not noticeable to the human eye, e.g. they might be slight colour changes.
- images made using a digital camera, and then downloaded onto a computer as JPEG files.

Photos can be edited using a program on the computer or within the web browser. Among photo editing computer programs, the most widely used are: Windows Paint provided with Windows O/S, Adobe Photoshop, which is very expensive and aimed at professionals, and GIMP, which is an open source alternative. The most common applications that allow you to edit your photos within the web browser are: Photoshop Express Editor, Picasa and Picnik. And if you want to share your photos, you can use: Flickr, Picasa and Photobucket.

Although some programs offer more features than others, all of them offer the following:

- **air brushing**, to cover up **skin** imperfections, change eye colour and make people look slimmer
- **red-eye removal**, to correct the effect a flash can have on eye colour
- **cropping**, to select part of the image and **get rid of** the rest
- **special effects**, to make the photo look like an oil painting, sketch or cartoon
- **brightness and contrast**, to brighten the photo if it is too dark or if it is too light. You can change the contrast or adjust the richness of colours
- **layers**, to add elements to an existing photo.

More advanced techniques include: image **enhancement**, image restoration and morphing. **Image enhancement** is a process used to **highlight** or enhance a particular aspect of the image or change its structure. An example of this technique is **false-colouring**, or **pseudo-colouring**, which consists in changing the colour of the whole image or assign colours to certain parts; **restoration** is a process to eliminate **flaws** or degradations, while **morphing** is a technique that distorts the original image frame to frame until a predetermined final image is obtained.

And if you want to keep your photos once you have edited them, there are several programs to help you share and store your photos on line.

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aberration: deviazione, anomalia
in crop: tagliare
dust speck: particella di polvere
enhancement: miglioramento
flow: flusso
to get rid of: sbarazzarsi di
to highlight: evidenziare
previously: precedentemente
scratch: graffio
skin: pelle

The most common file formats for images in use today are:
JPEG: used by cameras and for Internet images
GIF: Internet images with large blocks of colour
PNG: designed to replace GIF
TIFF: primarily used in the print industry.

Cropping

- 2 **DEBUGGING** – Si occupa dei contenuti della disciplina ponendo particolare attenzione all'arricchimento **lessicale** e **strutturale**.
- 3 **UPDATING** – Offre testi e attività di consolidamento dei contenuti appresi per sviluppare le abilità di **Listening**, **Speaking** e **Writing**.
- 4 **UPGRADING** – Propone una mappa (**Mapping your Mind**), strumento utile per rappresentare la rete di relazioni tra i vari argomenti del Modulo, e **clip di opere cinematografiche** che offrono spunti di riflessione e svago su aspetti contenutistici del Modulo.

Il testo contiene inoltre tre **Appendici**:

- **Biz bits** – Offre testi e attività relativi al mondo del commercio e dell'economia, con particolare riferimento al settore dell'informatica e delle telecomunicazioni.
- **Careers** – Descrive le varie fasi della ricerca di un lavoro come ad esempio il Curriculum Vitae e il colloquio di lavoro, e analizza diversi profili lavorativi nel settore dell'ICT.
- **How to** – Contiene schede pratiche su come scegliere un computer, fare l'upgrading e come risolvere i problemi più frequenti.

TEACHER'S BOOK

Programmazione didattica per modulo • Soluzioni degli esercizi • Audioscript delle attività di ascolto • Note didattiche • Schemi per unità • Prove di verifica formative per ogni Unità sommative per Modulo • Domande per il colloquio dell'Esame di Stato • Compiti di realtà.

ONLINE RESOURCES

Disponibili sul sito www.edisco.it:

- file audio formato MP3 delle attività di ascolto
- attività extra per recupero e approfondimento

- agganci letterari
- esercitazioni Eucip Core
- esercizi di Reading Comprehension tipo FCE e IELTS.

LISTENING

DIGITAL LIBRARIES

1. **TEST** You will hear a radio interview about digital libraries. Decide if the sentences below are correct (Yes) or incorrect (No).

2. **TEST** Listen to the text again and complete the gaps with the right words, using no more than two words.

SPEAKING

PAST AND FUTURE

3. **DISCUSS** In turn, talk about the photographs for about a minute, and also answer a question about your partner's photograph.

4. **DISCUSS** What are the benefits of watching TV with other people?

VOCABULARY

1. Match these nouns to the correct pictures.

anatomical model • skin image • morphing • cloth image • landscape • air brushing • red-eye removal • generation • architectural animation • prosthetic make-up • false colouring

FILM

STRANGE DAYS

PRODUCTION: USA 1995
DIRECTOR: Kathryn Bigelow
STARRING: Ralph Fiennes (Lenny Nero), Juliette Lewis (Faith Justini), Angela Bassett (Mace Mason), Tom Sizemore (Max Petter), Michael Wincott (Philo Gant).

A SYNOPSIS

The story takes place in Los Angeles during the last two days of 1999. The protagonist, Lenny Nero, a former LAPD (Los Angeles Police Department) vice cop, now deals with data discs containing memories and emotions recorded directly from the cerebral cortex of people. These discs allow viewers to experience the participants' recorded emotions through a brain wave transmitter (SQUID). SQUID is described as a drug and Lenny is highly dependent on it, always trying to recreate through it the emotions that he experienced with Faith his former girlfriend, a beautiful singer. Lenny is a loser, still pathetically in love with her and relying on his two friends, Mace Mason, a bodyguard and limousine driver who is secretly in love with him, and a private detective, Max Petter.

On 31st December, Lenny receives a disc which contains the memories of a murderer while killing a prostitute. Iris. He and Mace start to investigate and discover a conspiracy of blackmail, murder and rape. Iris's death is tied to a cover-up of the murder of Jeriko One, a highly amplified SQUID by Iris's killer, and Philo Gant, Faith's manager, is also killed in the same way. Faith is involved in the conspiracy with Mace, who is thrown off the balcony by Lenny after a hand to hand fight. In the meantime Mace is pursued by two other criminals who are finally arrested. The new year is coming and, with it, the New Millennium and Lenny, who is no longer in love with Faith, kisses Mace passionately.

BEFORE VIEWING

1. Answer the questions.

2. After reading the synopsis, how do you imagine the SQUID?

3. Would you like to record happy moments to "feel" them later?

4. The protagonist's surname is Nero. Do you remember a famous Nero in history? What was he famous for?

5. What is the connection between Nero and discs?

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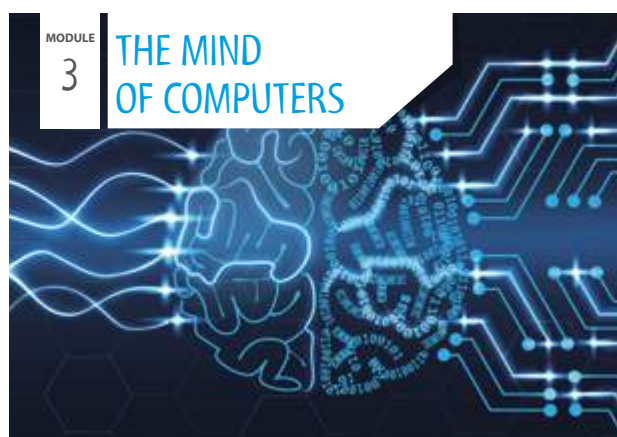
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DEBUGGING

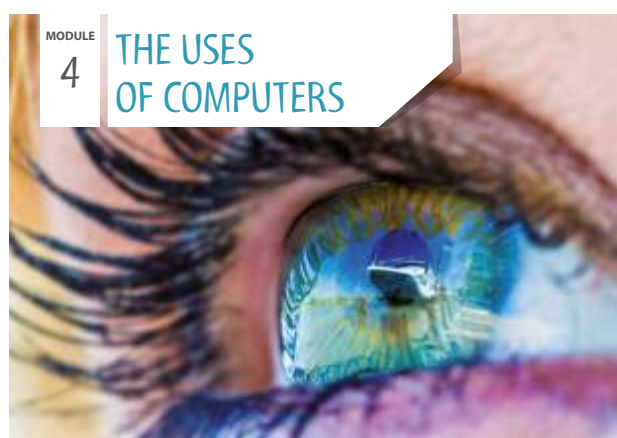
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EXTRA ACTIVITIES

Extra exercises, questions, reading and listening comprehensions for the six modules

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Module 2 – Isaac Asimov, *The Machine That Won The War*

Module 3 – George Orwell, *1984*

Module 4 – Philip K. Dick, *Do Androids Dream Of Electric Sheep?*

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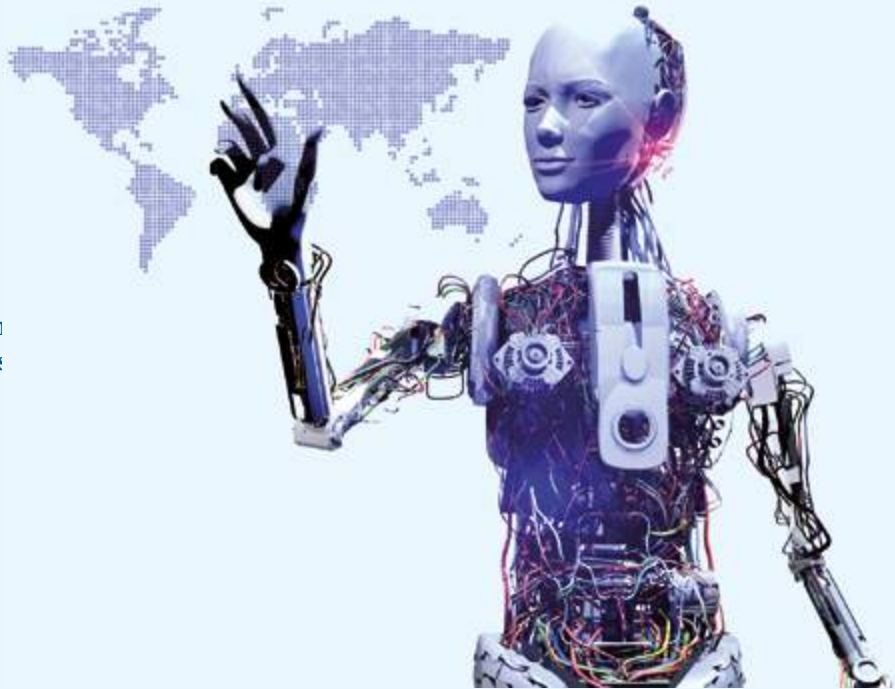


EXTRA MATERIAL

- The basics of ICT systems
- Hardware and its evolution
- Uses of the computer
- Operating system and programming
- Telecommunications and networks
- ICT security and society
- Robotics
- Exploiting the net
- Networks

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- Population and Language
- Habits
- Political geography
- The political system
- Political parties and elections
- Education
- Social security
- Economy



MODULE

1

THE BIRTH AND ROLE OF COMPUTERS

FLOWCHARTING

- 1 Computer Science and ICT
- 2 ICT and society
- 3 Computers

DEBUGGING

Vocabulary
Grammar • Prefixes, Suffixes and Compound nouns

UPDATING

Listening • Digital libraries
Speaking • New technological trends in teaching and studying
Writing • Learning with technology

UPGRADING

Mapping your mind
Film • *Bicentennial Man*



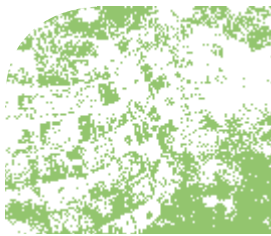
The digital revolution is far more significant than the invention of writing or even of printing.

Douglas Engelbart



WHY STUDY THIS MODULE?

In this Module you will be invited to enter and discover the world of Computer Science and ICT and reflect on the pros and cons of living in the digital age. Moreover, the module will explore the use of ICT in different fields such as health, work and education. Last but not least, you will be provided with a bit of computer history from big old mainframes to modern computers and other digital devices.



Answer these questions.

- Can you think of a definition for computer science?
- Do you know what ICT refers to?
- Do you think you are digitally literate?

to achieve: *raggiungere*
to acquire: *acquisire*
to be aimed: *essere mirato*
to broaden: *ampliare*
to coin: *coniare*
competitor: *concorrente*
domain: *dominio*
to encompass: *comprendere*
founder: *fondatore*
nebulous: *oscuro*
to outline: *delineare*
to pursue: *intraprendere*
resilience: *resilienza*
somewhat: *piuttosto*
vastness: *ampiezza*

COMPUTER SCIENCE: WHAT'S IN A NAME

Computer Science, sometimes abbreviated CS, is not just the study of programming. It's a good card to play when looking for a real job opportunity in the new global economy and when trying to compete more successfully on the job market and **pursue** one's career.

In the 1960s, George Forsythe, the **founder** of the first Computer Science Division of Stanford University, considered this new scientific field as the educational system's right answer to the continuous developments and advances in computing courses at his university.

Forsythe **coined** the term and defined the discipline as "the theory of programming, numerical analysis, data processing, and the design of computer systems" (Knuth D.E., *George Forsythe and the development of computer science*, Published by ACM, 1972). However, since 1961, when this term was first used, Computer Science has always been a **somewhat nebulous** topic because of the **vastness** of its fields of application.

Nowadays, Computer Science courses are focused on allowing students to **acquire** computational thinking and to develop their flexibility, creativity and curiosity. This goal has been **achieved** partly thanks to the introduction of the Liberal Arts Degree in Computer Science in the 1980s, which is **aimed** at **broadening** the students' skills in problem solving, reasoning and analysis.

In fact, computing professionals are expected to manage the different steps of team-work activities and to communicate with experts coming from multiple fields: after all, it's only by knowing the project application **domains** and all of their specific languages well, that new and strategic plans can be defined to **outline** good software projects.

One of the most complete definitions of Computer Science is given by the Linux Information Project (LINFO): "Computer science is the study of the storage, transformation and transfer of information. The field **encompasses** both the theoretical study of algorithms (including their design, efficiency and application) and the practical problems involved in implementing them in terms of computer software and hardware".

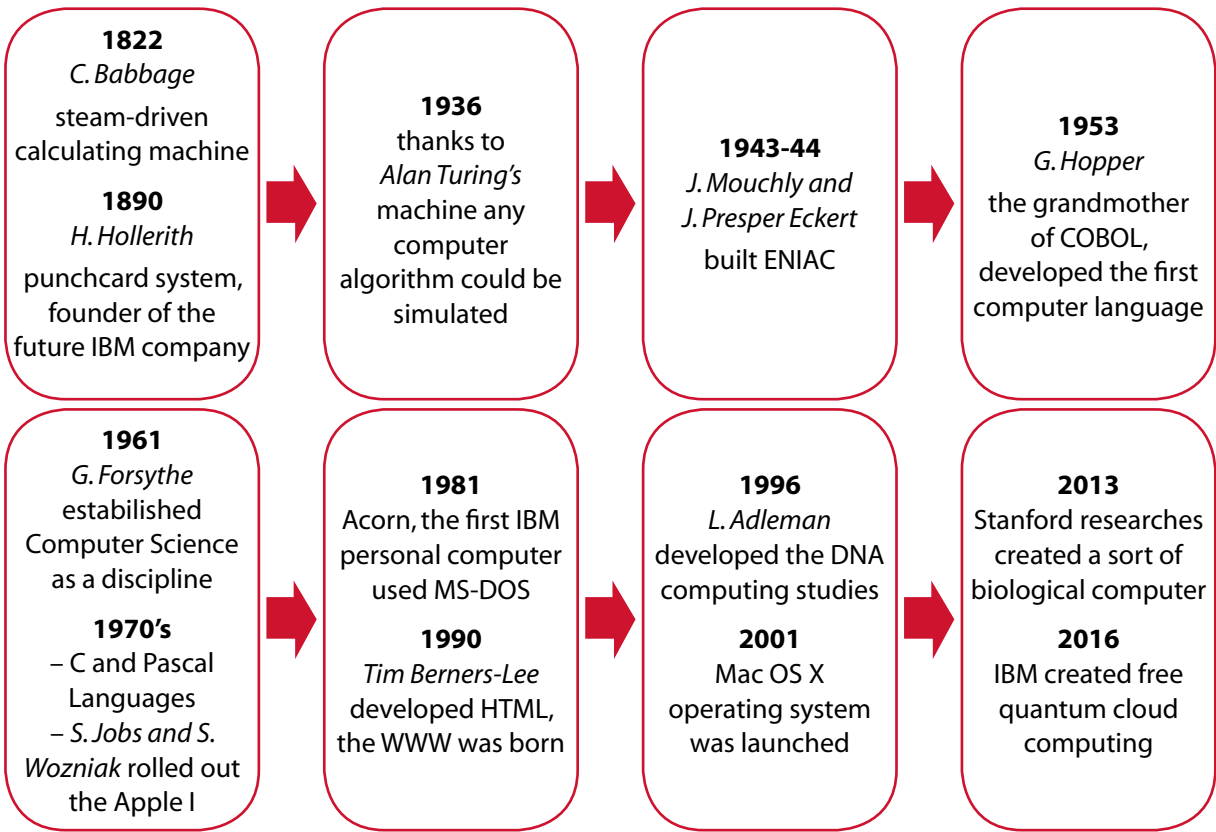
It is therefore a field in continuous evolution, flexibility and **resilience** being two basic and necessary qualities when approaching the subject, not forgetting updating, which remains the keyword to be successful in this open land of **competitors**.



The new British School Curriculum from September 2014 identifies three core areas in the study of Computing: Computer Science, Information Technology (IT) and Digital Literacy.

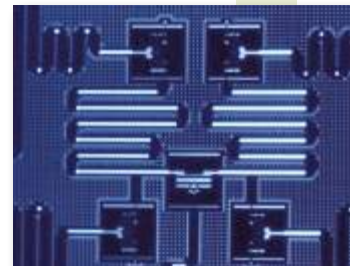


1 **Read this brief time-line of Computer Science. Are the statements true or false? Correct the false ones.**



1. Tim Berners Lee launched the Apple I.
2. Turing's machine simulated any computer algorithm.
3. COBOL, Pascal and C are programming languages.
4. In 2001 Computer Science was recognised as a scientific discipline.
5. The first IBM personal computer launched the OS X system in 2001.
6. In 2013 IBM free quantum cloud computing was created.

T	F
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐



2 **You will hear five different people explaining the reasons why they have decided to study Computer Science. Match each statement with the right speaker.**

Speaker 1, Sarah	☐	a. I want to create something that one day can help to change the world.
Speaker 2, Jonathan	☐	b. I want to have a high-paid job that satisfies me.
Speaker 3, Bob	☐	c. When I chose to start this course my family didn't encourage me.
Speaker 4, Sally	☐	d. I think that computer science and coding skills are now fundamental in the current job market.
Speaker 5, Tim	☐	e. In order to succeed, any company has to take part in the technological revolution.

3 **PAIR WORK. Choose one of the successful milestones from the computer science timeline in the first activity. Tell each other what you know about:**

- what sort of innovation was introduced and by whom
- when it was launched
- what its evolution/s is/are.

to accomplish: realizzare
all in all: nel complesso
altogether: al tempo stesso
to boost: incentivare, aumentare
to crack: craccare (decodificare)
cyber-threat: minaccia informatica
driverless: senza autista
to be expected: essere atteso
healthcare: cura della salute
headset: cuffie
to be overlooked: essere trascurato
to patch: riparare, curare
to prove: dimostrare
wound: ferita

THE FUTURE OF COMPUTER SCIENCE

Computer Science is at the heart of an increasing number of valuable projects. Human life has been significantly influenced by CS fast-growing developments and new long-term researches have been promoted in multiple domains of application such as **Security and Privacy, Health-care, Robotics, Artificial Intelligence (AI), Machine Learning, Networks and Communication, Big Data and Cloud Computing.**

For example, at MIT (Massachusetts Institute of Technology), origami medical robot prototypes have already been invented and their potentialities in the field of medicine and **healthcare** are being analysed: they could be used, for example, to **patch wounds**, to make the human body absorb the right dose of medicine at the right time or to **accomplish** planned tasks; the first Volkswagen's **driverless** car **is expected** on the market by 2019; in 2050 aircrafts are expected to have no windows, but **headsets** that will be supported by virtual reality visors positioned over the passengers' heads to project 3D films or videogames; IBM's Watson project of machine learning has opened new possibilities to develop evolutionary customer-care services working with extremely large amounts of data; the AI community in the educational field, with its projects of intelligent tutoring systems, MOOCs - Massive Open Online Courses, and machine translation technologies, etc. has been reasoning on the effects resulting from promoting digital literacy in the school systems, and so on.

However, this ever growing amount of data raises the problem of security which must not **be overlooked**, and that's why some further research in the CS field is being carried out to develop up-to-date protection plans. The Political Science Department of the University of Bucharest, for example, is working on a map of **cyber-threats** in order to plan new tactics to face hackers' attacks and design algorithms hard to be **cracked**. **All in all**, CS was created only very recently, but it is encompassing an increasing number of fields of our life every day, while **altogether proving** that its potentiality is huge and forever growing. Governments are investing in it too, as is the case of Europe, which, with its Programme Horizon 2020, is now trying to **boost** the fields of research to support innovative ideas following three basic priorities:

1. excellent science
2. industrial leadership
3. societal challenges.

Each of the priority fields develops strong links with computing as, for example, in the section of Future and Emerging Technologies (FET), where the project AQUTE has been developing quantum technologies as its main objective.

In a few words, we are living in the infancy of our 'computing' future.



Investments in research

UK gross domestic expenditure in research in 2014 represented 1.67% of GDP, while in Italy it was about 1.30%.

Backache

According to researchers 87% of young people suffer from backache. The remaining 13% don't have a computer or a laptop. Will future developments reduce backache?



4 ^{1.2} **Listen to this interview about the future of Computer Science. Complete the sentences and note down who is speaking.**

	KEN CALVER	JIM GRIFFIOEN	JOURNALIST
1. We'll try to discover ...			
2. Historically, computer scientists ...			
3. How do I know ...			
4. How much of a challenge it is ...			
5. Even though I'm a longstanding faculty member, ...			
6. Our goal is ...			

5 **Watch this short video on YouTube: "Human Meets Humanoid - World's Strangest". Then, comment on it with your classmates.**



Video: <https://www.youtube.com/watch?v=3IFuv1AVouM>

Published: 17 June 2014 • Category: Science and Technology • Licence: YouTube standard

6 **Read this list of existing and future innovations. Look for some information on the Internet and then report on one to the class.**

1. Smartphone-connected contact lenses
2. Smartphone Earthquake detector application
3. DNA testing and sequencing/human genome mapping
4. Non-invasive laser/robotic surgery (laparoscopy)
5. Quantum computing
6. Back-up memory of human brains



The Russian entrepreneur Dmitry Itskov founded **2045 Initiative** with the aim of developing the technology to transfer an individual's personality to a more advanced non-biological carrier and extend life to the point of immortality.

7 **Translate this text from an interview with Maryanne Wolf, developmental psychologist and cognitive scientist at Tufts University.**

"The Reading Brain in the Digital Age"

La domanda è: dal momento che l'essere umano non è nato con la capacità di leggere, come l'ha acquisita? E cosa succede adesso che andiamo verso un'era digitale? La realtà è che la struttura del cervello ci permette di imparare a leggere perché possiamo creare nuove connessioni tra le nostre parti più vecchie. Questo significa che non c'è un unico cervello ideale, c'è un cervello per leggere il cinese, uno per l'inglese, uno per l'italiano, e significa anche che ci saranno caratteristiche comuni che permetteranno di formare la nuova evoluzione del cervello che legge. La domanda più grande è: "a cosa somiglierà questo nuovo cervello?". Potrebbe essere una versione ridotta di un circuito capace di fare più cose contemporaneamente e di farle molto velocemente. Ma non sarebbe mai in grado di sviluppare quelli che io chiamo "processi di approfondimento nella lettura", che richiedono tempo e molto pensiero. Ecco un problema per la nostra generazione...

Adapted from: <http://www.letteratura.rai.it/articoli/maryanne-wolf-levoluzione-del-cervello-nellera-digitale/34053/default.aspx>



INFORMATION AND COMMUNICATIONS TECHNOLOGY

as regards: *per quanto riguarda*
available: *disponibile*
awareness: *consapevolezza*
broadband: *banda larga*
to be devised: *essere ideato*
effort: *sforzo*
to exploit: *sfruttare*
fit: *adatto*
to gather: *raccogliere*
issue: *questione*
policy: *politica*
to prevent: *prevenire*
spread: *diffusione*
spreadsheet: *foglio di calcolo*
worldwide: *in tutto il mondo*



ICT (**Information and Communications Technology**) is an umbrella term used to refer to the evolving digital technology and the aspects of **gathering**, storing, retrieving, processing, analysing and transmitting information and data with the right speed, accuracy and security. The acronym was first mentioned in 1997 by Dennis Stevenson, in the UK, during a Labour Party Commission meeting discussing investment planning for the new educational and business sector of "ICT". Since then, the term has been used **worldwide**, even if, in 2014, in the UK, the word *computing* replaced it. Today, ICT is present in every aspect of society and every business internal structure and economic plan has to do with continual changes **as regards** their professionals, competences, development and research. New strategies and ideas regarding ICT are being developed every day in traditional and innovative application fields such as: telecommunications, robotics, bio-computing, environment and energy, 3D virtual reality, etc.. Moreover, national and international ICT **policies** are being **devised** and a lot of **effort** is being made to pursue new ICT goals such as:

- making public services more and more transparent, **available** and reachable via **broadband**
- reducing digital impact on the climate
- facilitating the access to infrastructures and services, diminishing the ICT economic and geographical limits and barriers
- implementing the educational systems by supporting the acquisition and development of ICT competency at all levels of education.

Individuals, organisations and electronic devices can now acquire a digital identity – that is, a network or Internet equivalent to their real identity –, and its management technology allows users and devices to be recognised and interact with each other. The Polytechnic of Milan, for example, has just designed a new smart city plan **exploiting** the advanced system of communication technology in order to map and **prevent** car accidents by digitally connecting street-light circuits, traffic-lights and means of transport. However, there are clearly many ethical and legal **issues** behind the global **spread** of information technology, as well as the use of these digital alter-egos which hide many risks linked to security and safety, which is why an adequate level of competence in Digital Literacy is needed.



Definitions

Digital Literacy: how to understand digital information and interact with it safely and appropriately.

Information Technology: how data is represented and managed on computers.

Computer Science: how computers work and how to write algorithms, solve problems and create computer programmes.



8 Read Professor S. Saxby's preface to C. Sullivan's text *Digital Identity*, then talk with your classmates about these questions.

"In today's digital environment the concept of identity is an issue of much greater complexity than it was in the days of the offline world. Our digital identity can exist in many forms and for many different purposes. Its existence on the Web becomes a currency that can be unscrupulously traded and abused. It has never been more important to protect the concept of "who we are". We are at the beginning of a new discipline of Web Science in which such issues need to be researched across disciplines. [...]"

1. What do you think your digital identity is like online? What information does it include?
2. What wouldn't you like to share online?
3. Do you think hackers could find more information about you than what you have willingly put online?

9 Read this text and answer the questions.

"Cambridge IGCSE - Information and Communication Technology (0417)"

Cambridge IGCSE is the world's most popular international qualification for 14 to 16 year olds. ICT syllabus encourages learners to develop lifelong skills, which will be useful to them in their work across the curriculum and prepare them for future employment. They will develop understanding of the implications of technology in society, including social, economic and ethical uses and **awareness** of the ways ICT can help in home, learning and work environments. June 2018 is the final examination session in which syllabus 0417 will be included in UK performance tables. The syllabus combines theoretical and practical studies focusing on the ability to use common software applications to solve problems, including word processors, **spreadsheets**, databases, interactive presentation software, web browsers and website design. Learners analyse, design, implement, test and evaluate ICT systems, ensuring that they are **fit** for purpose. Assessment of the practical tests is hardware and software independent. Any hardware platform, operating system, and applications package can be used, providing that learners have the opportunity to demonstrate the full range of skills in the syllabus.

<http://www.cie.org.uk/programmes-and-qualifications/cambridge-igcse-information-and-communication-technology-0417/>

1. What is the IGCSE examination?
2. What are the advantages of learning ICT?
3. What are the implications of technology in society, according to the article?
4. What abilities does the syllabus 0417 focus on?
5. What hardware and software can be used for the assessment?



DIGITAL LITERACY

to avoid: evitare
deadline: scadenza
to deepen: rendere profondo
embedded: compreso, rinchiuso
gap: divario
graduating: di laurea
illiteracy: analfabetismo
to involve: coinvolgere
lifelong learning: apprendimento permanente
netizen: cittadino della rete
to be set up: essere stabilito
whether: che sia

The expression **Digital Literacy** is an umbrella term which refers to multiple literacy competences and skills recognised as fundamental for **lifelong learning**, as a way of expressing individual and group potentialities and as basic steps for future successful careers. In other words, being digitally literate creates good '**netizens**', responsible citizens of the cyber world. That is why new **graduating** programmes have been designed in order to develop new competences to be able to access, analyse, create, reflect and act using digital tools, texts and technology at school, at work and at home, for leisure and for social interaction and citizenship. After the second World War, high **illiteracy** rates slowed down the opportunities of economic growth in less-developed countries worldwide. Consequently, UNESCO and other international non-profit organisations agreed on some international average educational goals to **be set up** as targets to achieve as soon as possible. However, today, the **gap** which separates developed countries from developing ones is even wider. These literacy problems, moreover, do no longer simply **involve** schooling, foreign languages or Maths: the digital revolution has **deepened** and altered them. Even in the more developed countries, some new gaps have grown, for example the gap between what is taught and the skills that students are expected to have acquired by the end of their higher education. According to Walter Isaacson, an American writer and journalist, the protagonists of the digital era have all been people who have managed to create ideal bridges between the Humanities and technology. However, to be able to actually build these bridges, it's important to take into consideration not only *how* to teach using technology (e-texts, flipped classrooms, adaptive learning, personalised learning), but also *what* to teach.

In May 2015 UNESCO, UNICEF, the World Bank and various other associations met in Korea to decide on the objectives of a new international system of education and chose the year 2030 as a **deadline** to accomplish

all of them. Digital Literacy and ICT are two of the main keywords in this *Education 2030 Framework*.

Furthermore, new and more recent international educational theories are considering adding coding as a subject at every level of schooling in order to stimulate critical thinking and problem solving skills. According to these views, learning the value of coding means learning to be flexible, breaking problems down into smaller pieces and being able to learn by yourself. There's no way one can **avoid** using or knowing about ICT: it's a must.



10 **Fill in the right paragraph headings in the right order.**

Visual literacy • Communication literacy • Media literacy • Social Literacy
Technology literacy • Information literacy

The Multi-Literacies of the Digital Age

The term multi-literacies is often used to describe the various aptitudes and abilities that are needed for us to use, understand and create digital media. Under the “digital literacy umbrella” are a wide range of interrelated skills **embedded** in work, learning, leisure, and daily life.

(1) It reflects our ability to access, analyse, evaluate and produce media through the understanding and appreciation of: the art and meaning of various forms of media texts; the impact and influence of mass media and popular culture; how media texts are constructed and why they are produced; how media can be used to communicate our own ideas effectively.

(2) Proficiency in technology is most often associated with digital literacy. This ranges from basic computer skills to more complex tasks like editing a digital film or writing computer code. We have to be careful, though, not to confuse proficiency with knowledge and understanding.

(3) This is another important aspect of being digitally literate that includes the ability to assess what information is needed, to know how to find it online and how to critically evaluate and apply it.

(4) At its most basic, it reflects our ability to understand and produce visual messages, **whether** through objects, actions or symbols. It is essential to both learning and communication in modern society.

(5) These competencies form the foundation for thinking, organising and connecting with others in a networked society.

(6) These competencies are also needed for full participation in digital society, a “participatory culture” that is developed through collaboration and networking.

Adapted from: <http://mediasmarts.ca/digital-media-literacy-fundamentals/digital-literacy-fundamentals>



ACTIVITIES

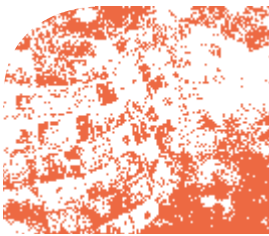
11 **Read this short text and give it a heading. Comment briefly why you agree or disagree with it.**

While Information & Communication Technology (ICT) can reinforce social inclusion, offering new opportunities to many people currently excluded from today’s society, ICT must be accessible to everyone, if we are to avoid creating a new divide between the “digital haves” and the “digital have nots”.



The gap between those people with access to IT and those without access to it, and those who benefit from digital technology and those who do not, is called **digital divide**.

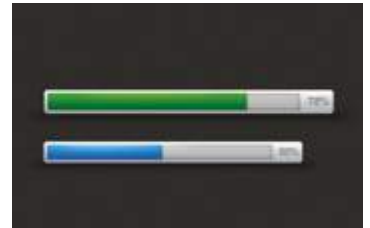




VOCABULARY

1 Match the pictures with the corresponding words in the box.

drop-down list • folder • pop-up menu • progress bar • recycle bin • settings • shortcut icon
tab • task bar • toolbar • wallpaper



1.

2.

3.



4.

5.

6.



7.

8.

9.



10.

11.

to boot
to create a backup
to drag-and-drop
to execute
to load
to log in
to log out
to plug and play

to save
to select
to store
to update
to upload

2 Complete each sentence with a word.

folder • swipe in • paste • share • uninstall • switch off • boot •
process • link • short cut icon • slides

1. Young people too much personal information on line.
2. A is a virtual and tidy location of files.
3. The student's presentation was made up of 20
4. This computer isn't fast enough to all the data.
5. To a PC means to restart its operating system.
6. Today, you have to your room card to get into your hotel room.
7. You can an app if you no longer want it on your mobile.
8. A allows quicker access to data.
9. Don't forget to your mobiles before the beginning of the show.
10. With a word processor it is easy to copy and a text.
11. You can your Instagram account to your Facebook account.

3 Solve the following search puzzle.

S	E	L	E	C	T	O	O	C	C	U
Y	F	O	O	R	T	E	C	L	O	I
S	K	G	R	U	I	B	S	I	P	S
T	O	O	L	B	A	R	P	C	Y	T
E	R	U	X	J	V	E	Z	K	E	A
M	L	T	A	B	G	S	T	O	R	E
T	O	F	V	R	Z	T	Y	P	I	N
O	R	T	E	T	Y	O	Y	L	Z	A
O	M	D	E	O	R	R	H	U	O	B
L	O	A	D	R	E	E	S	G	J	L
S	H	R	U	N	K	U	H	I	D	E
S	R	Q	P	R	U	N	K	N	I	T
X	E	N	D	W	D	E	F	R	A	G
E	X	W	A	L	L	P	A	P	E	R
Z	I	G	T	A	S	K	B	A	R	E
P	H	E	E	O	N	U	G	S	R	E

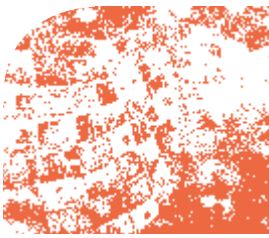
click
copy
defrag
enable
load
logout
plug in
restore
select
shrunk
store
system tools
tab
taskbar
toolbar
update
wallpaper



4 Read the text and complete it with the given words.

pop-up menu • folder • delete • double-click • right-click • select • drag-and-drop • recycle bin

To create a new (1): right-click in a blank area of the desktop, select New from the (2) and choose Folder, type in a new name and press Enter. Then, (3) the folder and create a new file in it following the same instructions, but, this time, (4) File from the New pop-up menu. Name your file "Evidence". Finally, to delete "Evidence", you can do it in two ways, first, you can (5) the file into the (6) icon, or, you can (7) the file and select (8)



GRAMMAR

PREFIXES, SUFFIXES AND COMPOUND NOUNS

PREFIX	MEANING	EXAMPLE
a- / dis- / de-	opposite of / not	<i>asynchronous, disconnect, decode</i>
in- (il- / im- / ir-)	opposite of / not	<i>impossible, irreplaceable, illegal</i>
un-, non-	opposite of / not	<i>uninstall, non-volatile, unzip</i>
mis- / mal-	wrong(ly)/bad(ly)	<i>misuse, misdirect, malfunction</i>
over-	too much	<i>overload, overheat</i>
out-	surpassing	<i>outrun, outperform</i>
re-	again	<i>re-centre, re-designed</i>
multi-	many	<i>multiprocessors, multicore</i>
intra- / inter-	within / inside of	<i>infrared, interface</i>

ADJECTIVAL SUFFIX	MEANING	EXAMPLE
-ful	full of	<i>helpful, useful</i>
-less	without	<i>wireless</i>
-able / -ible	capable of	<i>attachable, flexible</i>
-proof	that can resist something	<i>hackerproof</i>
-ical	connected with	<i>optical, optional</i>

NOUN SUFFIX	MEANING	EXAMPLE
-ability / -ibility	quality of being	<i>usability, accessibility</i>
-ing	doing the action of	<i>programming, coding</i>
-ment / -age	state	<i>development, storage</i>
-tion, -sion	state	<i>communication, conversion</i>
-er, -or	executor of the verb	<i>compiler, operator</i>
-ship	status	<i>leadership</i>
-age	state	<i>shortage, advantage</i>

ADVERBIAL SUFFIX	MEANING	EXAMPLE
-ly / -ally	modality	<i>digitally, virtually</i>
-ward(s)	in the direction of	<i>forward(s), backward(s)</i>
-wise	similar to, as regards	<i>bitwise, bitwise</i>

Compound nouns are groups of words used to define a concept. The word order is reversed in respect to Italian: in English the final word is the most important and the translation proceeds backwards. Only the last word can be made plural, the other words function as adjectives and are therefore invariable.

⇒ *machine language, data-processing applications*

5 Underline prefixes and suffixes and identify compound nouns. Then, give a definition for each word. Use a dictionary if you need to.

1. hosting:
2. unlocked:
3. multifunction:
4. wearable:
5. crowd funding:
6. username:
7. conversion:
8. storyboard:
9. assembler:
10. reboot:
11. unzip:
12. wireless:



6 Put the words in brackets in the appropriate form. Use the given list of prefixes or suffixes.

ir- • -able • -ship • de- • -wise • -al • dis- • un- • -ly • -ful

1. The disk you inserted is not by this computer. (read)
2. I can't open the downloaded file, how can I it? (zip)
3. In modern society it has become harder and harder to our mobile phones. (connect)
4. heartbeats can be detected by cyber-physical systems. (regular)
5. speaking worlds as Facebook create fake communities. (virtual)
6. operators work at the binary level. (bit)
7. Ergonomics office workstations have to be deeply reconsidered at school to avoid impact during ICT lessons. (harm)
8. You are a genius if you can it. (code)
9. Steve Jobs' involved courage and charisma. (leader)
10. A password is essential in UNIX systems while it is in a system running under DOS. (option)

7 Rewrite the sentences below to form compound nouns.

1. A program written in Java
2. Characteristics of the system
3. Introduction to the components of the memory
4. Development of the software for microprocessors
5. Codes for the communication of data
6. System for the management of codes
7. A system of digital computers
8. A language for programming at high-level
9. Instructions used for the control of the program
10. The major languages for programming



ACTIVITIES

- YES NO**

- | | |
|--|--|
| | |
| | |
| | |
| | |
| | |
| | |

- 1..... RADIO INTERVIEW

Next proposal by Campus library: invite families to use **8**.

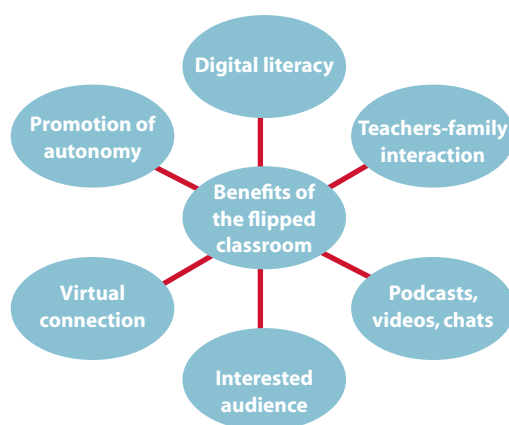
-

SPEAKING

NEW TECHNOLOGICAL TRENDS IN TEACHING AND STUDYING

- 4 IELTS**  **Look at the pictures and try to understand what they are about. Then, practise with a partner discussing these questions.**

1. What are the advantages of both teaching approaches?
2. What the disadvantages?
3. What are the different roles of teacher and students in a flipped classroom?
4. Do you think ICTs are a fundamental support in any of these approaches, and why?



- 5 PET**  **Work in pairs and describe the photo on the right. It refers to the BYOD practice, that is Bringing Your Own Device, to school to work on and with. Finally, discuss on the pros and cons of this practice.**



- 6 PET**  **In pairs, discuss what technological device you would choose if your school followed a BYOD program. Express your opinions using the phraseology below.**

I don't think... could be very useful because...

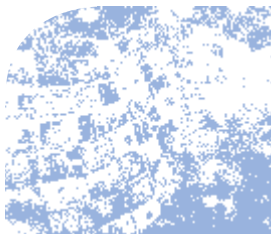
Personally, I think... / I'm absolutely sure that I would use...

The advantages of using... are..., but there are also disadvantages, like...

I believe that... / You can't deny that... / I'd rather...

Do you agree? / What about you? / What's your opinion?

Finally, considering our points of view, the best choice would be...



WRITING



LEARNING WITH TECHNOLOGY

- 7 PET**  **Write a short message to your friend telling him about your first flipped lesson. Use no more than 35/45 words.**

In your message you should include:

- say what you liked
- say what you didn't like
- give him some advice for his future flipped experience.

- 8 PET**  **Read these sentences and complete them so that the second has a similar meaning to the first. Use between 2 and 4 words, including the word given.**

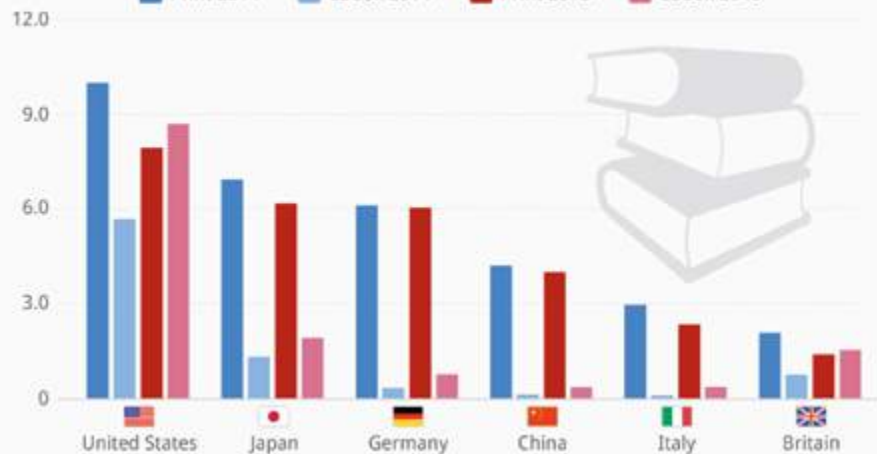
- In the Internet era, everyone can visit a digital library and it is not necessary to leave home.
WITHOUT → In the Internet era, everyone can visit a digital library home.
- Zazzle site offers a huge variety of personal items, clothes and accessories.
SELECTION → On Zazzle you can of items.
- Only 17% of Americans say they visit a library to borrow or download an audio book.
LESS → of Americans say they visit a library to borrow or download an audio book.
- A significant number of Italians say they would like a wider use of technology at libraries.
INCREASED → Italians want at libraries.
- GPS apps allow to locate items inside libraries. **THANKS** → Items may GPS apps inside libraries.
- Gossip magazines are only stored for 6 months in digital libraries. **AFTER** → Gossip magazines are 6 months in digital libraries.

- 9 IELTS**  **Look at the diagram below and describe it in your own words (about 150). You may use the given words and phraseology.**

E-Books Set to Surpass Print in the U.S.

Book market development forecast (in billion U.S. dollars)

■ Print 2014 ■ eBook 2014 ■ Print 2018 ■ eBook 2018



- The table shows...
- There is a positive/negative fluctuation in...
- It is expected that...
- It is clear that...
- To remain dominant
- To drop, to decline, to rise, to increase

MAPPING YOUR MIND





BICENTENNIAL MAN

The story that inspired this (Isaac Asimov's "The Bicentennial Man") was originally a short tale that was published in 1976 in occasion of the anniversary of the American Independence. It won both a Hugo Award and the Nebula Award. A few years later (1992) Asimov wrote the novel "The Positronic Man" with Robert Silverberg.

PRODUCTION: USA 1999

DIRECTOR: Chris Columbus

STARRING: Robin Williams as Andrew, Sam Neil as Richard Martin, Oliver Platt as Rupert Burns

A SYNOPSIS

The NDR series robot Andrew is bought by the Martins to help in housekeeping. The family is composed by Mr and Mrs Martin and their two daughters. The youngest one appears curious about the new arrival, the eldest rejects it. Andrew discovers himself able to feel emotions when he tries to be forgiven for his accidental destruction of a figurine and creating another one out of wood. Andrew's unexpected creative qualities push Mr Martin to take him to a production company, but when the CEO states that it could just be a chip error to be debugged, Mr Martin takes Andrew back home and lets him cultivate his creativity. After a visit to NorthAm Robotics for repairs, Andrew alters his original robot state to be able to express emotions with his face language. He wants to feel more and more human, so he asks Mr Martin for freedom. He obtains it, but he feels lonely, so he starts looking for his similar NDR series robots. He finds out his designer's son, Rupert Burns, and an NDR series female robot, Galatea. Andrew decides to support Burns's research on the creation of humanlike organs for robots. In the end, Andrew becomes human and falls in love with Amanda's granddaughter, Portia. He keeps on trying to become a human by undergoing different operations to have artificial skin, hair and a nervous system. But the final step is still to be done: the World Congress has to recognise him as a human in order to legalise his marriage with Portia. Only after having inserted human blood in his machine system, he begins aging and can thus be declared human, on his death bed, at the age of two-hundred years old. Galatea will then accomplish Portia's wish to put an end to her life in order to die with her husband.



BEFORE VIEWING

1 After reading the plot, answer these questions.

1. What series of robots does Andrew belong to?
2. How old is Andrew when he dies?
3. What is Andrew's desire?
4. What is Portia's final desire?



FILM CLIP

2 Watch the clip and fill each gap with the correct word.

When Andrew is delivered at the Martins' house, the first thing he does, after opening his eyes, is a futuristic holographic show to introduce "the three Laws of Robotics" defined in Isaac Asimov's stories. Andrew follows the three rules till his death, even when becoming a human, though it is no longer necessary.

"First law of 1.:

A robot may not 2. a human being, or, through inaction, cause a 3. to come to harm.

Second 4.:

A robot must obey all human 5., except where those orders come in

6. with the first law.

Third law of robotics:

A robot 7. protect itself, 8. doing so does not conflict with the first two laws."

3 Answer the questions.

1. How would you describe the Martins' reactions when the robot starts speaking?
2. What special effects does Andrew use?
3. Does the soundtrack contribute to the presentation?
4. Why do you think the camera is often located at the eye level of the subjects?
5. Did you like the clip? Why? Why not?

AFTER VIEWING

4 This film provides food for thought. Discuss these ideas.

1. Do you think it possible that robots would become human or are we rather going towards a future in which people will act in a robot-like manner?
2. What is your reaction to the story? Do you think it right to declare Andrew a human being, in spite of the fact that he was not born from a mother?
3. Do you find any similarities with Carlo Collodi's "The adventures of Pinocchio"?

5 Search the Internet to find a definition of biological computer and write it down.

Andrew undergoes a surgical operation to become more human



Bit by Bit

Bit by Bit è un corso di inglese rivolto in particolare agli studenti dei corsi a indirizzo **Informatico** e, in generale, a coloro che hanno l'esigenza di utilizzare la lingua inglese come strumento di studio e/o di lavoro in questo settore.

Il testo si propone di:

- far acquisire le competenze necessarie per comprendere testi che presentano termini, espressioni, strutture sintattiche e modalità discorsive specifiche del linguaggio settoriale;
- migliorare le capacità di ricezione e produzione orale e scritta;
- consolidare abitudini grammaticali corrette e approfondire alcune strutture;
- incoraggiare l'autonomia linguistica e operativa e stimolare la soluzione di problemi.

Contenuti Digitali Integrativi

- Numerosi testi per attività di approfondimento e di recupero
- Tracce audio in formato mp3
- Schemi e mappe che presentano i concetti chiave di ogni Unità
- Esercitazioni *Eucip Core*
- Attività di *Reading Comprehension* tipo *FCE* e *IELTS*

Per l'insegnante e l'uso in classe

Teacher's Book, disponibile sia in formato cartaceo sia digitale. Contiene:

- suggerimenti per la programmazione per competenze e per una didattica inclusiva;
- spunti per progetti di classe e *real-life tasks*;
- test di verifica di tutti i Moduli e le Unità, in formato editabile, anche per BES;
- materiali per la preparazione dell'Esame di Stato;
- soluzioni di tutti gli esercizi e dei test;
- *audioscript* degli esercizi di ascolto.

