CLIL Expansion

The History of Computing

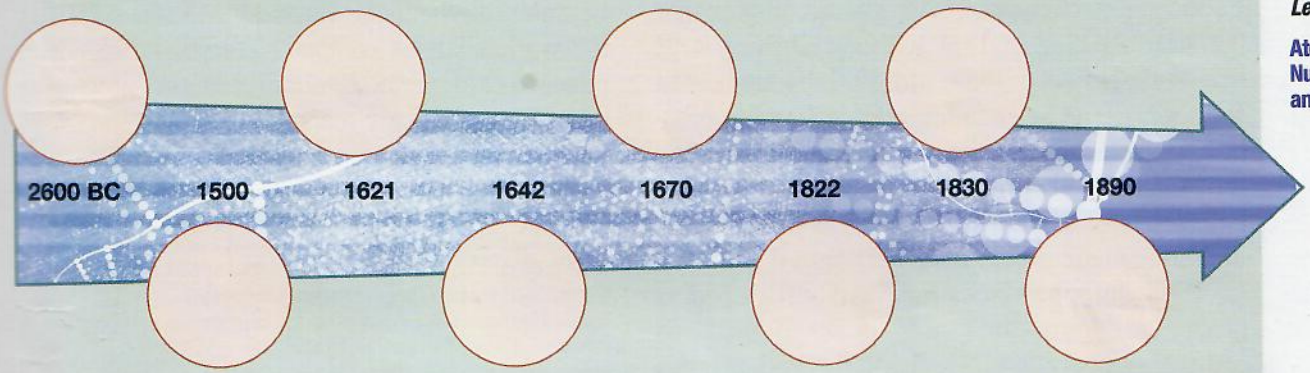
TASK 1

Work in pairs. Read the first text, then explain the importance of the following dates in your own words.

a 2600 BC .....
b 1500 .....
c 1621 .....
d 1642 .....
e 1670 .....
f 1822 .....
g 1830 .....
h 1890 .....

TASK 2

Download the timeline below and make a poster "The Origins of Computing" illustrating each date with a photo of the calculating tool it refers to.



Information needs before computers

Much of the information technology used today has its origins in solutions to yesterday's needs for information.

The need for numbers emerged when people began trading goods.

Paleolithic peoples in central Europe recorded numbers by notching tallies[1] on animal bones, ivory, and stone. As the volume of trade increased, transactions were first recorded on clay tablets (Babylonians), then on papyrus (Egyptians).

The expansion of commerce and the need for accurate recordkeeping led to the evolution of tools for calculations. One of the first to emerge was the abacus, invented in China in 2600 BC.

Later on, in 1500 Leonardo da Vinci conceived a cog-wheeled[2] device that has been interpreted as the first mechanical calculator.

Even before the Industrial Revolution people attempted to mechanize the computations needed for commerce. When the slide rule[3] was invented by William Oughtred in 1621, it remained the mathematician's tool of choice until the electronic calculator took over in the early 1970s.

All the early efforts to juggle numbers had two things in common: they were mechanical and they were on a human scale. They were machines made of parts big enough to assemble by hand.

In 1642 Blaise Pascal invented a mechanical adding machine. The 18-year-old inventor called it "the numerical wheel calculator". The device, which was sold throughout Europe with the name of Pascaline, used a system of gears turned by hand to do addition and subtraction. It also used punched cards to store data, a method that survived well into the 20th century. It was in 1670 that Gottfried Leibniz improved upon Pascaline by adding multiplication, division, and square root capabilities.

In the 1800s Charles Babbage used the mechanical technology of the age to develop his problem-solving tools. Some time prior to 1822, Babbage and his friend John Herschel ran into a problem. While they were checking data calculated manually for the Astronomical Society, the pair found many

Clil in the Lab

Atomic Structure

E-Learning Lesson

Atoms, Nucleons and electrons

errors. Babbage defined his problem: find a way to perform calculations quickly and without error. He then began to work on a solution. The outcome[4] of the scientist's efforts was a blueprint[5] for the Difference Engine. Although his work was funded by grants[6] from the British government, Babbage was never able to complete the Difference Engine. While he was working on that project in 1830, he conceived a new device called Analytical Engine. This machine was different from its predecessors because, based on the results of its own computations, it could make decisions such as sequential control, branching and looping. The "engine" contained a "store" for numeric data which had room for 1,000 variables of 50 digits each. Arithmetic operations were done in the "mill", the arithmetical unit. Programs for the mill were written on punched cards. The "engine" would perform logical operations by ringing a bell when a variable went below zero or above capacity. Babbage's machine, however, was so complex that the scientist died in 1871 without finishing it. It was built between 1989 and 1991 by dedicated members of the Science Museum in London.

In the late 1700s the Industrial Revolution brought more than just mechanization of labour and myriads of new inventions. Many devices operating manually became mechanized.

In 1801 Joseph Marie Jacquard developed a mechanical loom[7] that used punched cards to control its operation. Needles fell through holes in the cards: different combinations of punched holes created different designs and patterns in the woven material.

Punched cards re-emerged in information processing more than 80 years later in the United States.

From 1880 to 1890 the United States population grew from 50 million to 63 million. This generated the need for national census statistics. Using the methods available employees would take more than 10 years to complete the 1890 census. Dr Herman Hollerith developed an electric tabulating system of machines that compiled the census mechanically. Thanks to those machines the count took only six weeks. They operated on the principle of punched cards. Numeric data was punched onto cards. Each number was represented by a hole; combinations of two holes represented the letters of the alphabet. Using punched cards made it possible to record data only once and retain it for future use. The impact of those machines was striking. Hollerith decided he could adapt them for commercial use and founded his own company, the Tabulating Machine Company (1896). In 1924 the company merged into an organization that eventually became International Business Machines (IBM), the world's largest computer company. Hollerith's punched-card methods dominated the processing information for many years.

[1] *tally*: record of the numbers of things that someone has got, achieved, won, etc.
[2] *cog-wheeled*: with a toothed wheel that engages another toothed mechanism in order to change the speed or direction of transmitted motion (con una rueda dentada)
[3] *slide rule*: manual device used for calculation that consists in its simple form of a ruler and a movable middle piece which are graduated with similar logarithmic scales
[4] *outcome*: result
[5] *blueprint*: a model, a prototype
[6] *grant*: sum of money given by an organization for special purposes
[7] *loom*: a machine for making cloth

TASK 3

In pairs provide a definition of the following terms:

a Vacuum tube
b Machine language
c Assembly language
d High-level language

Now compare your definitions with other pairs, then check with your Computer Science teacher.

TASK 4

Read the second text and collect the information about the evolution of computers in the table below.

WHEN	WHO	WHAT
1940s		
1950s		
1970s		

TASK 5

Work in groups of three. Prepare a brief talk on the history of computing. Divide it into three sections:

1 From the pre-historic times to the 19th century (Student A)
2 First-generation computers (Student B)
3 From the transistor to the advent of personal computers (Student C)

Start from your notes taken from the two texts and search for further information on the Internet. Discuss the material collected with the other members of the group and how it can fit into your talk. Agree on a final version of the content of your talk. Act it out in front of the class.

vacuum tube : valvola termoionica

The March of Technology

World War II provided new demands for information processing in the 1940s. As a prelude, Howard G. Aiken of Harvard, working in conjunction with IBM, unveiled an electromechanical calculator in 1944: the MARK I. The machine used mechanical relays stimulated by electricity to perform basic operations. It was 51 feet long and contained 500 miles of wire!

In England the war brought the need to break German military codes faster than could be done manually.

The end of 1943 marked the initial operation of the Colossus, the world's first working electronic computer, which could decode messages 12 times faster than any previous machine. At the same time, the U.S. government signed a contract with the University of Pennsylvania to develop an electronic computer for calculating artillery trajectories: the Electronic Numerical Integrator and Calculator (ENIAC), designed by J. Presper Eckert and John W. Mauchly and completed in 1946. The ENIAC contained 19,000 vacuum tubes, 70,000 resistors, and 5 million soldered joints. It could perform 5,000 additions, 357 multiplications, and 38 divisions in a whole second. This was a thousand times faster than its predecessors.

However, it used so much power that it caused the lights to dim in one section of Philadelphia.

Unlike the Colossus, the MARK I and ENIAC were general-purpose computers because they were able to perform a wide variety of jobs very quickly.

Although Mauchly and Eckert are often given credit for building the first electronic computer, ENIAC was actually based in part on the work of John V. Atanasoff, a professor at Iowa State University. In 1942 he had completed an electronic computer that could solve linear equations. Unfortunately, he lost funding for further research and his work was not recognized until 1973.

The next breakthrough was a general-purpose computer that could easily be programmed. This goal was achieved through the efforts of John von Neumann who joined the Eckert-Mauchly team in the mid-40s.

Von Neumann's design included a memory unit that temporarily stored a program and data. His stored-program principles became the foundation for computer design for the next 30 years.

UNIVAC were the first computers for commercial purposes. UNIVAC I (UNIVersal Automatic Computer) tabulated the 1950 census. The second UNIVAC system was delivered to the General Electric Company in 1952. This launched the use of computers in business.

The computers manufactured until the early 1950s were known as "first generation" computers.

The software that operated them were written in machine language, which required extensive technical knowledge. Programmers found it difficult to use and prone to error.

Early computers could run one program at a time, used magnetic drums for data storage and relied on vacuum tubes as their primary processing components. Because of the number and size of vacuum tubes, these computers were huge and generated tremendous amounts of heat. They were also expensive to run, and often failed.

The mid-50s brought an invention that would revolutionize not only the world of computers but

also the entire world of electronics: the transistor, for which Bell researchers William Shockley, John Bardeen and Walter Brattain won the 1956 Nobel Prize in Physics. Thanks to transistors, computers decreased in size, increased in dependability, operated more quickly, and cost less to use.

Second-generation computers were programmed with assembly language, which used abbreviations to represent machine language thus bridging the gap between binary coding and instructions that people could read. Transistors, however, had their drawbacks, too. Like other electronic components, they needed to be soldered together. As a result, the more complex the circuits became, the more complicated and numerous the connections between the individual transistors and the likelihood of faulty wiring increased.

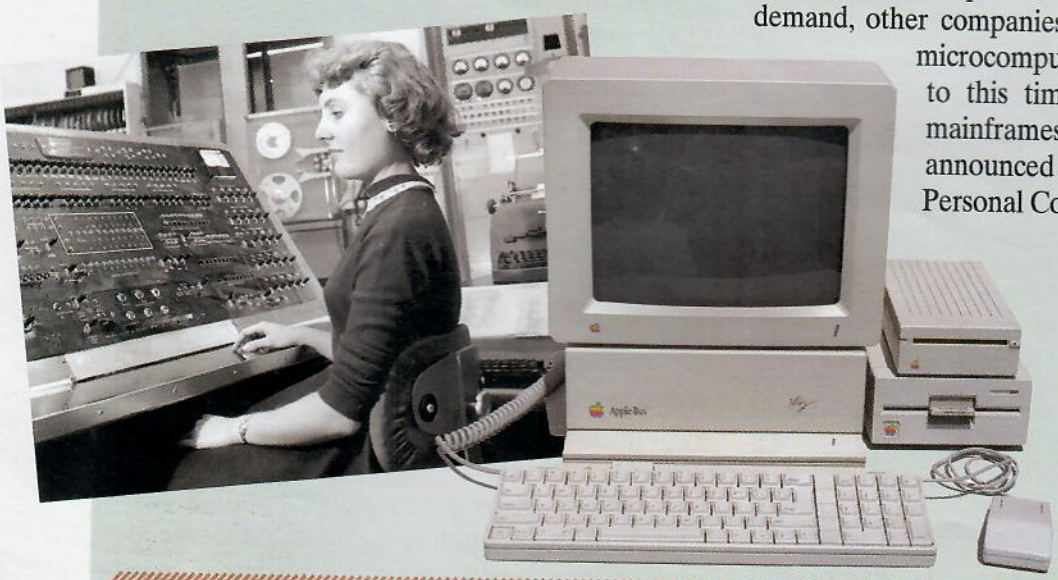
Transistors generated too much heat for use in small or portable equipment.

Once again, technology rose to the challenge. In 1959 Jack Kilby of Texas Instruments successfully tested the first integrated circuit, or IC. He created a solid-state circuit out of a semi-conducting material. By organizing many similar components on tiny silicon wafers Kilby and others of the time produced wafer-sized ICs that held the equivalent of hundreds of transistors and other electronic devices.

Third-generation computers now could be programmed by using high-level languages, which resemble human languages, and sophisticated operating systems.

In 1971 Intel released the first microprocessor, the 4004. This microprocessor was a specialized integrated circuit which was able to process four bits of data at a time. The chip included its own arithmetic logic unit, but a sizable portion of the chip was taken up by the control circuits for organizing the work, which left less room for the data-handling circuitry. By 1974 two companies, Intel and Motorola, were manufacturing microprocessors for build-it-yourself computer kits. Thousands of hobbyists could buy the kits, which came complete with instructions and all the necessary parts, including a microprocessor. Computers built around microprocessors were called "microcomputers". In 1975, the cover of Popular Electronics featured a story on the "world's first computer kit to rival commercial models... Altair 8800". The kit required assembly by the owner and then it was necessary to write software for the machine since none was yet available. The Altair had a 256 byte memory, about the size of a paragraph! It needed to be coded in machine code and the programming was accomplished by manually flipping switches located on the front of the computer. Like other hobbyists in 1976, one teenager purchased a $20 microprocessor and built his own microcomputer from scratch. By today's standards it was somewhat primitive, yet, people were impressed. The teenager, Steve Wozniak, formed a partnership with his friend Steve Jobs to sell their computers at a local store. Jobs sold his Volkswagen Beetle and Wozniak several expensive calculators to raise the money to buy parts. Over the next several months they built and sold hundreds of Apple I computers. Why the name "Apple"? They said because the apple represents the simplicity they were trying to achieve in the design and use of their computer.

Apple II appeared the following year, boasting built-in BASIC. Programs and data could be stored on an everyday audio-cassette recorder. The partnership of Wozniak and Jobs went on to become the Apple Computer Corporation. Meanwhile, in response to the growing computer demand, other companies began to manufacture microcomputers: IBM, which up to this time had been producing mainframes and minicomputers, announced the IBM PC (IBM Personal Computer) in August 1981.



UNIT 10

Networking

Networks

1 **Brainstorming** Can you give a definition of the Internet? Can you explain how it works?

TEXT 1

How networks are laid out – *Part 1*

There are two types of networks: local area network (**LAN**) and wide area network (**WAN**), although a network may be a mixture of both.

A LAN is made up of **nodes**, usually two or more computers located in the same building or group of neighbouring buildings. Whatever the technology, the goal is the same: to transmit data from one place to another.

To become part of a network a PC uses a **network interface card** (NIC), or an RJ-45 connector that is part of the motherboard. For portable computers the interface can be in the form of a PC card or USB adapter.

Communications signals pass from the PC's RAM and through the connection to a LAN's backbone[1], the part of the network that carries most traffic. The backbone and the connection leading to and from it might use **twisted-pair wires**, **fibre optic cables**, radio waves, and phone and power wiring, so files can move among the computers.

The combination of connector, circuitry, wiring and other hardware determines the network's bandwidth.

In a **client/server network**, one computer is the file server, also called a host computer, which contains programs and data files that can be accessed by other computers. In the network servers are often faster and more powerful than the PCs as they run a network operating system (NOS). The NOS manages the movements of files and the network's security by maintaining files of users, their passwords, and the driver and directories for which a user has been given access privileges. Some servers specialize in functions other than passing out files.

A print server allows everyone on the network to share a printer. Other specialised servers provide shared access to the Internet, others are designated for network-wide use, such as an email and database server.

Personal computers attached to a server are the clients. These run the gamut[2] from **fat clients** – computers that run most programs from their own hard drives and use a minimum of network services –, to inexpensive **thin clients** that might have no hard drive at all. They run programs and graphics using their own microprocessors, but depend on a server to access programs and store data. **Dumb terminals** consist of a monitor, a keyboard, and the bare minimum of hardware needed to connect them to the network. They use the server's microprocessor to perform all functions.

In a **peer-to-peer** network there is no central server. Instead, all computers on the network act as servers to every other node. At the same time, all computers on the network act as clients to all the other PCs. This is the simplest network to install.

When components of a network are spread among several buildings, they form a WAN. Chunks[3] of the network in different locations might be connected by dedicated phone lines, T1 or T3 leased (or private) lines, microwaves, or the Internet itself.

[1] *backbone*: dorsale
[2] *gamut*: the complete range of things of a particular type
[3] *chunk*: a large amount of something

TECHNICAL ENGLISH

LAN | **WAN** | **node** nodo | **network interface card** scheda di rete | **twisted-pair wire** doppino | **fibre optic cable** cavo in fibra ottica | **client/server network** rete client/server | **fat client** | **thin client** | **dumb terminal** terminale stupido | **peer-to-peer**

2 **Read the following questions and underline the words and phrases in the text which provide the answers.**

a What is a LAN?
b What is a WAN?
c What is a client/server network?
d What is a peer-to-peer network?
e What is a server?
f What is a client?
g What is a fat client?
h What is a thin client?

3 **Use your answers to compare the pairs of questions on the previous page, using *while* or *whereas*, as in the example provided.**

While *desktop PCs use a NIC or a RJ-45 to connect to a network, portable computers use a PC card or USB adapter.*
Desktop PCs use a NIC or a RJ-45 to connect to a network, **whereas** *portable computers use a PC card or USB adapter.*

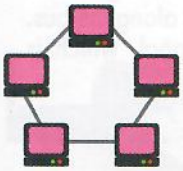
TEXT 2

How networks are laid out – *Part 2*

The way that data moves from one node to others in a network determines its topology, its virtual shape. The basic computer network topologies are: bus, ring, star, and tree.

Bus

In a bus **topology** each node is daisy-chained, i.e. connected one right after the other along the same cable, or backbone. Information sent from a node travels along the backbone until it reaches its destination node. Each end of a bus network must be terminated with a resistor to prevent the signal sent by a node across the network from bouncing back when it reaches the end of the cable. The bus network is inexpensive and easy to set up as it doesn't require much cable. However, a damage or failure in the main cable will cause the whole network to fail or become unusable. If more than a few dozen computers are added to a bus network, the network will become slower because of possible collisions. Finally, as every workstation on the network "sees" all of the data on the network, this is a security risk.

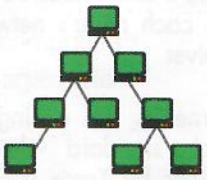


Ring

The ring network has the nodes daisy-chained to a giant ring of cable. Data travel through the ring in the same direction (either "clockwise" or "counter-clockwise") from one node to the next grabbing[1] a **token** of code that endlessly loops through the network. The node replaces the token on the ring with the node's data and the address of the node for which it is intended. The message circles through the ring until another node recognizes that the data is addressed to it. As data flow in one direction, transmission is fast and there is no risk of data collisions. However, if the main cable fails or any device is faulty the whole network will fail.

Star

In the star, several nodes are linked to the centre of the star, where there is a hub, switch, or router.
Each of them has different capabilities.
A **hub** receives incoming data packet[2] from different nodes and temporarily places them in a **memory buffer** if the hub is busy with another packet. The packet received is sent to every other node regardless of the packet's address. Nodes ignore all packets not addressed to them.
A **switch** functions similarly to a hub, but it knows which of its connections lead to specific nodes. Thus information is sent only to the computers which are supposed to receive it. Some packets (for example, one announcing that another computer has come online) arrive addressed for **broadcast**. This means that the sending node wants all other nodes to see the packet, so the switch sends copies of the packet.
Switches can send and receive information simultaneously, which makes them faster than hubs.
Routers are similar to switches, except that they do not accept broadcast packets.
Star networks are reliable because if one cable or device fails then all the others will continue to work. However, they are expensive to install because this type of network uses the most cable (and network cable is expensive). If also new hubs, switches, or routers are required this will lead to extra cost.



Tree (also called **Star bus**)

This topology integrates multiple star topologies onto a bus. Nodes in particular areas are connected to hubs (creating stars), and the hubs are connected together along the network backbone (like a bus network). It is one of the most popular topologies with a good reason. It supports future expandability of the network much better than a bus or star topology, it is fault tolerant and - easy to troubleshoot[3]. The installation of new hardware and additional cable makes it very expensive.

[1] *grabbing*: taking hold of something in a rough or rude way (afferrando)
[2] *packet*: block of information
[3] *troubleshoot*: find and eliminate a problem

TECHNICAL ENGLISH

topology topologia | **token** | **hub** | **memory buffer** memoria intermedia | **switch** | **broadcast** trasmissione | **router**

4 **Read part 2 and then fill in the following table.**

Topology	Advantages	Disadvantages

The Ethernet

TEXT 3

How an Ethernet Works

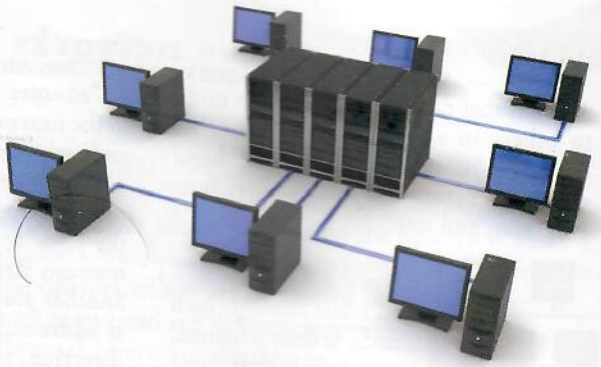
A ...7... If a node detects its own address in a message, instead, it reads the data, checks for errors, and sends an **acknowledgement** to the sender, using the sender's address, which was included as part of the incoming message.

B ...9... The first sender to detect a collision sends a special signal that jams the network so that all nodes will know that the network is blocked. Transmission from all nodes is halted, and each node waits a random length of time before trying to resend its message. The process repeats itself until one of the nodes sends its message without encountering another node message.

C ...3... The card listens to be sure that no other signals are being transmitted along the network. It then sends its message to another node through the network card's **transceiver**. Each node's network connection has its own transceiver.

D ...1... Ethernet is not a single product, but rather a technical standard developed for network communications by Xerox, DEC and Intel, which the rest of the computer community have adopted.

E ...2... All nodes, clients and servers on an Ethernet network are attached to the LAN which branches off a common line as in a bus configuration. Each node has a unique address.
When a node (a PC, file server, a print server) needs to send data to another node, it sends the data, or message, through the network interface card installed in an expansion slot.



F ...6... Each node along the bus network inspects the addressing information contained in the message. Nodes to which the message is not addressed ignore it.

G ...4...The transceiver broadcasts the message in both directions so that it reaches all other nodes on the network. The message includes the addresses of the message destination and source, packets of data to be used for error checking, and the data itself.

H ...5... Switches and routers use the information to determine where to forward the packet. In a network joined by hubs, the hubs themselves check the address to determine which packets to pay attention to and which to ignore.

I ...8... When two nodes send messages simultaneously, the collision of the two messages creates a recognizable electrical interference pattern that travels along the bus. The request results in a "busy line" signal, which is detected by the senders.

TECHNICAL ENGLISH

acknowledgement | **transceiver** ricetrasmettitore

5 **The text above consists of eight paragraphs. Read the text and rearrange them in the correct order. Choose from the paragraphs A-I. There is an extra paragraph that you do not need to use. The first has been done for you.**

Skills and strategies

This type of exercise tests your ability to understand how the text is logically structured.
1 Before you start reading, try to predict what the text may be about. Use your personal knowledge. What do you already know about the topic?
2 Read each paragraph carefully and underline keywords.
3 Look out for words, such as nouns, pronouns, linking words or adjectives that connect the paragraphs.
4 Read the completed text quickly. Does it make sense?

10 **Work in pairs. Read the text again, then decide which layer performs the functions listed below in scrambled order. Two layers are mentioned twice.**

a It is responsible for the splitting of data into segments.
b It ensures that data is transmitted and received without error, in the correct order and in a timely manner.
c It is concerned with the transmission of binary data over the transmission medium.
d It establishes the language in which the message must be sent.
e It provides routing through the network.
f It deals with data transformation, formatting, data encryption and compression.
g It defines how packets must be routed sequentially.
h It is the only part of the process the user sees.
i It deals with synchronization, establishing communication in full duplex or half duplex.

11 **Read Text 5 quickly to find out which of Internet's protocols the text is about.**

FCE
Use of English
Part 2

12 **Read Text 5 more carefully and then think of the word that best fits each gap (1-12). Use only one word in each gap. An example has been provided.**

Then, compare your answers with your partner's.

13 **Speaking** **Work in pairs. Take turns to explain how ICP/IP works.**

Skills and strategies

In this type of text you have 12 gaps.
- Read the text sentence by sentence. Look at the words before and after each gap.
- Think of the part of speech the missing word belongs to. You usually need grammar words: articles, prepositions, auxiliary verbs, pronouns, conjunctions.
- Write in the missing words in pencil.
- When you have finished, go through your text again to check that your answer makes sense.

TEXT 5

Internet's Protocols

The Internet is a packet-switched network, which means that when you send information across the Internet, the data are broken **0** *into* small packets. A series of routers sends each packet across the Net individually. After arriving **1** ..... the receiving computer, the packets are recombined into their original, unified form. That is the job of two protocols on the Internet: the TCP (Transmission Control Protocol) and the IP (Internet Protocol), commonly referred to **2** ..... TCP/IP. For a number of reasons, including hardware limitations, data sent across the Internet must be broken into packets of fewer **3** ..... 1,500 characters each. Each packet is given a header. As TCP creates the individual packets, it also calculates and adds to the header a checksum, **4** ..... is a number that TCP uses on the receiving end to determine whether any errors have been introduced into the packet during transmission.

Each packet is put into separate envelopes which contain addressing information **5** ..... tells the Internet where to send the data. Routers **6** ..... the way examine the IP envelopes and look at their addresses. These routers determine the **7** ..... efficient path for sending each packet to the next router closest to its final destination. After travelling through a series of routers, the packets arrive.

Because the traffic load on the Net changes constantly, the packets might be sent along different routes and arrive **8** ..... of order. On arrival, the TCP calculates a checksum for each packet. It then compares it with the one sent in the packet. **9** ..... the checksums do not match, TCP knows that the data in the packet has been corrupted during transmission. It then discards the packet and asks the original packet to be retransmitted.

If non-corrupt packets are received by the computer to **10** ..... the information is being sent, TCP reassembles them into the original, unified form.

IPv4 uses 32 bits for its addresses, called address space. IP addresses consist of four numbers separated by dots. When Internet was first designed, its creators never imagined that the address space **11** ..... ever fill up, which is why they designed it the way they did. To expand the IP address space, IPv6 is being introduced, which uses 128 bits **12** ..... of 32.

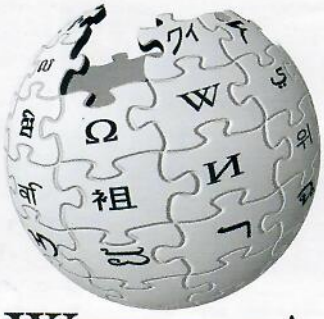
UNIT 12

Using The Web

Finding and Sharing Information

1 **Brainstorming** Label the pictures with the words in the box.

browser	aggregator	online encyclopedia	digital maps	index/directory



WIKIPEDIA
The Free Encyclopedia

1 .....

2 .....

4 .....

YAHOO!

3 .....

5 .....

2 **Have your say.**

a Without the ability to search the incredibly vast amount of information it contains, the Internet would be of limited use. Discuss this statement in small groups.

b How do you search information on the Internet?

3 **Seven sentences have been removed from Text 1. Read the text, then choose from the sentences (A-H) the one which best fits into each gap. There is one extra sentence that you do not need to use.**

FCE Reading Part 1

A You search through them as you would in a database, by typing keywords that describe the information you want.

B The problem is that doing so is too time-consuming.

C You then get a set of search results – links to documents that match your search.

D It can take a spider from several seconds to many minutes to crawl each site it finds, depending on the size and complexity of the site.

E The difference between browsing and searching is best explained through an analogy to a book.

F These agents are intelligent enough to know how each search engine functions.

G Search engines look through the entire Internet.

H Depending on the size of the index, several layers of subcategories might be available.

TEXT 1

Information at Your Fingertips

Data is only useful if you can find it

The technologies that underpin the World Wide Web, such as HTML, hypertext, and so on, are remarkable things, but the true point of the Web is how those technologies are put to use.

An enormous amount of information is available on the Internet, but there is so little organization on the Internet that it can seem impossible to find the information you want. You can search for it or just wander around the Internet until you find it, or you can be passive about it and let the information come to you. 1 ..... When you leaf through a book you are **browsing**, when you select a topic from the index and open the book to the indicated page, you're searching.

A number of solutions have sprung up to find information on the Net. Two of the most popular approaches are **indexes** and **search engines**.

Indexes (or directories) present a highly structured way to find information. They enable you to browse through information by categories, such as arts, computers, entertainment, sports, and so on. In a web browser, you click a category and you are then presented with a series of subcategories. 2 ..... When you get to the subcategory you are interested in, you are presented with a list of relevant documents.

Yahoo!, the largest and most popular index on the Internet, and other indexes also enable you to search by typing words that describe the information you're looking for. 3 .....

Another popular way of finding information is to use search engines, also called **web crawlers** or "spiders". For most people, Internet searching means only one site, Google. But in fact there are other popular search engines, such as Ask.com.

Search engines operate differently from indexes. They don't present information in a hierarchical fashion. They are essentially massive databases that cover wide swathes of the Internet. 4 ..... Although the specifics of how search sites operate differ somewhat, generally they are all composed of three parts: at least one spider, which crawls across the Internet gathering information, a database, which contains all the information the spiders gather, and a search tool, which people use to search through the database.

Search engines are constantly updated to present the most up-to-date information, but extract and index it differently. For example, some index every word they find in a document, others index only the key 100 words in each document. Some index the size of the documents, some others index the title, headings, subheadings, and so on. 5 .....

Additionally, each search engine returns results in a different way. Some weigh the results to show the relevance of the documents; some show the first few sentences of the document, others show the title of the document, as well as the **URL**.

Each of the many Internet search engines and indexes has their own strengths and weaknesses. To cast the widest possible net when looking for information, you should search as many of them as you can. 6 .....

So a type of software called meta-search software has been developed. With this software, you type a search on your computer. The software sends many "agents" out onto the Internet simultaneously. 7 ..... They submit the search to many Internet search engines, then index and compile the results. You browse through the results in the meta-search software.

TECHNICAL ENGLISH

browse scorrere rapidamente dei contenuti | **index/directory** indice | **search engine** motore di ricerca | **web crawler** | **URL**

4 **Read the restored text again and then answer the following questions.**

a How can the difference between browsing and searching be explained?

b How do indexes enable you to find the information you are looking for?

c How do search engines operate, instead?

d Why has meta-search software been developed?

e What do meta-search agents do?

8 **Read Text 3, then choose the more suitable endings of each sentence.**

a In the early days the primary purpose of the Web was to allow users
- **1** ☐ not only to browse content but also create it themselves
- **2** ☐ to find information and share it with others

b Web 2.0 is
- **1** ☐ user-centred, as it allows an active on-line participation of users
- **2** ☐ a technological advance

c The wiki is the best example of how information
- **1** ☐ can be collected on the Net
- **2** ☐ can be edited and viewed by anyone

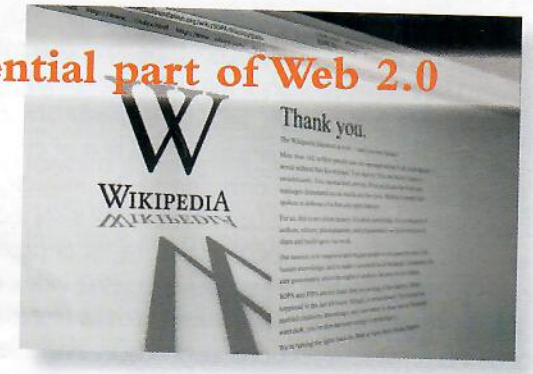
d The term "wiki"
- **1** ☐ is an acronym coined in 1995
- **2** ☐ is a word used for the first time in 1995 to refer to an open source database

e As soon as someone makes a change,
- **1** ☐ it appears immediately online without anybody making sure that no errors are made or introduced into the entry
- **2** ☐ volunteers or people with special interests check the change before it appears online

f Some people are entitled to
- **1** ☐ protect Wikipedia from abuse
- **2** ☐ monitor entries to prevent people from making changes to pages temporarily protected

TEXT 3

WIKIPEDIA: an essential part of Web 2.0



In its first decade, the Web was seen primarily as a tool for finding and sharing information. This gradually changed thanks to the steady evolution of more powerful and accessible web-based tools that allowed every Web user to become an active participant in the online world.

This was something that Berners-Lee, the creator of the Web, had from the beginning designed the Web to be, but that needed to achieve a certain critical mass of accessibility before it could become a reality.

At the Web 2.0 Conference, held in San Francisco in 2004, technologist Tim O'Reilly set out[1] to explore "how the Web has developed into a robust platform for innovation across many media and devices – from mobile to television, telephone to search".

The term Web 2.0 was used to describe both an increasingly active and an increasingly ubiquitous digital culture: a place where the tools for collaborating, socialising, sharing and creating were accessible to all. Today, the world of Web 2.0 revolves around the power to search, create, collate, share and categorize content, and to do it in an increasingly rich online environment.

Perhaps the single most influential example of such participation was launched in 2001: the online encyclopedia Wikipedia, begun with the stated aim of being a universal reference source created and maintained entirely through the efforts of volunteers, and open to anyone who wished to contribute. The idea of a wiki, a website that lets anyone add entries and information to, is fundamentally connected to that of Web 2.0. Derived from the Hawaiian word for "quick", the first one was started in 1995.

In the decade since its founding, Wikipedia has become the emblem of the collaborative potential of the Web, of "harnessing[2] collective intelligence".

Versions of the Wikipedia are available in ten languages – with the English version alone having more than one million entries and constantly growing.

Anyone who wants to edit or add to an entry in the Wikipedia can click the "Edit this page" link at the top of the entry. A page appears that enables the person to make the change. Changes are immediately made alive, without anyone checking them. Every page has a revision "history" link that shows all the changes that have been made to it over time, including the most recent ones.

Volunteers constantly check Wikipedia for errors and people with an interest in a topic are automatically alerted whenever a change is made. When someone wants to be alerted when a page is changed, that page is added to their watch list.

To protect against vandalism and destructive behaviour, such as deleting pages, adding profanity, and so on, some people are granted administrative privileges. This gives them a variety of tools, such as allowing them to override changes that other people make, protecting a page temporarily so that no further changes can be made to it, and banning users from making changes.

How accurate is Wikipedia? Surprisingly so, at least if compared with traditional encyclopedias. Some years ago, the well-respected science magazine *Nature* performed an in-depth analysis of a wide range of scientific articles from the Wikipedia and the Encyclopaedia Britannica, and found that they were about equally accurate. In the 42 entries tested "the average science entry in Wikipedia contained around four inaccuracies, Britannica, about three". That's not to say that the Wikipedia is not prone to abuse, because it is. For this reason, school teachers and university professors often warn their students not to rely solely on the Wikipedia or ban its use outright.

[1] *set out*: begin
[2] *harness*: control and use the natural force or power of something to achieve something.

4 **Read Text 1 quickly. Does the writer's opinion differ from yours?**

5 **Read Text 1 again, and then answer the following questions.**

a Which options are considered indispensable for an email program?
b How is an email sent across the Internet?
c Which Internet protocols are used to send and receive emails, and how do they differ?
d What does the vulnerability of email depend on?
e Which techniques are used to control and filter the enormous flux of emails worldwide?
f What is encryption?

TEXT 1

You've got Email

Email, the sending of text-based messages between computers is one of the first and most fundamental of all digital ideas.

It has been the killer app for the Internet since before the Web, and looks set to stay. Although alternatives such as Facebook and other social online services have taken its place for day-to-day communication with friends and relatives, email is far from dead.

Email remains the preferred and only real option for business communication. Buying products on line and using Web services invariably requires an email address. It is the de facto method of registering for anything, to the point that if you don't have an email address you can't really use the Internet.

A host of options are now considered essential for any email program. Top of many lists is the ability to send and receive files – documents, photographs, databases, and so on – as **attachments** to an email. **Address Book** functions for managing contact details are also almost universal, as is the ability to send a carbon copy (cc) or blind copy (bcc) of a message to other recipients, and to forward (fw) messages on to others. Many people also use email signatures, automatically putting their business or personal details at the bottom of each email. A **mailing list** is one of the most intriguing uses of email. It is a way for groups of people to have public text-based discussions on a regular basis about their shared interests, hobbies, professions. **Tagging** and **filing** systems for keeping track of past emails are increasingly important given the many thousands of messages an average user can expect to build up over their lifetime.

When an email is sent, it arrives not at an individual's computer, but at an online mail server providing your particular email service. If you are using a piece of software that can process emails, such as Microsoft's Outlook, this software will log into the email server via the Internet to look for new messages, downloading a copy of any new messages to your computer.

Many people now use webmail rather than a software client on their computers, meaning that they access their mail server through a web browser. (Google's Gmail, Yahoo's Mail, etc.)

In both cases, there are two dominant modern protocols for getting messages off a mail server: POP3 (Post Office Protocol) and IMAP (Internet Message Access protocol). POP3 is a simpler system, treating the server like a post office: it connects to a server, checks for and downloads new messages, deletes old messages, then disconnects. IMAP offers a more sophisticated process. As it leaves all of messages on the central mail server, IMAP makes it easier to view mail from home, work and other locations.

The problems with **spam email** have existed as long as the system itself: its simplicity is both a blessing and a curse. Because it's so cheap and easy to send messages, it's cheap and easy to send things people don't want. Filtering spam email is an ongoing battle. Technically speaking, spam is possible because email is "decentralised", i.e. there is no overall authority that checks senders' identities.

Popular techniques for managing and filtering the sheer amount of messages sent and received around the world range from spam filters or spam blockers to "inbox zero" (no messages allowed to linger in the inbox), to "batching" (setting aside for dealing with large amounts of email in one intense session).

Another problem with email is that it is insecure and prone to hackers and snoopers. To make sure that no one except the sender and the intended recipient can read it as it is sent across the Internet, **encryption** can be used: software that scrambles the email so only those with the proper encryption keys can read it.

Despite its shortcomings and vulnerabilities, email is still the unparalleled communication method online, at the same time simple and ever-shifting art, and is not going to disappear soon.

TECHNICAL ENGLISH

attachment allegato | **Address Book** indirizzario | **mailing list** | **tagging** marcatura, etichettatura | **filing** archiviazione | **spam email** posta indesiderata | **encryption** codifica, cifratura

Blogging

TEXT 2

Building a Blog: a great way to share news and opinions online

Where the Internet is about availability of information, blogging is about making information creation available to anyone. (George Siemens, 2002)

In the early days of the Web, online publication was something achieved by specially selected writers and the building of a website, a skill possessed by a minority of users. The culture of the blog – the word is a contraction of "weblog" – changed all this, putting into the hands of every Web user a simple way of publishing their own words and ideas online. For the first time in history, everyone was an author.

Personal diary-style blogs, as well as political, cultural, gossip, technology and special interest blogs are proliferating on the Net. Well over a hundred million blogs are now active across the world in the English language alone. One thing is certain: the Internet is like a soapbox[1] and many millions of people have stepped up[2] to have their say.

In most cases, this means making use of a ready-made blogging service that enables users to start posting articles more or less immediately. However, while these services are quick to set up and simple to use, they can also be restrictive when it comes to customization[3]. For example, the selection of designs on offer may be limited and the web address for the blog may be something unwieldy[4].

One way to overcome such restrictions is to build a **self-hosted** blog. This means buying a website address (the domain name), paying for some storage space on the Web and then using the combination to create a blog in your own mould[5].

There are two elements that must be in place before a self-hosted blog can be built. The first is to register the domain name, and the second is to arrange the **hosting**, i.e. the rented storage space on a computer server that remains permanently connected to the Web so your blog will always be accessible. Though not a requirement, it makes sense to purchase both from the same company. Besides, many web-hosting firms include a web domain with the hosting package.

Though there are countless companies offering domain name registration and hosting services, there isn't a whole lot to distinguish different providers. However, there are a few things worth checking before signing up with one. How long, for example, is the contract period? Web-domain registrations usually need to be renewed every two years, but some companies offer discounts on longer durations. Make a note in your diary as a reminder of when the renewal is due. The company with which the domain was registered (known as the **registrar**) should send a reminder, but missing the date can be a complicated and expensive mistake – and could even result in the permanent loss of your domain name.

The website hosting is where things get a little more complicated. That's because there are many different options. Many hosts offer a few gigabytes of storage space which should be plenty for most purposes, unless you intend to post lots of pictures or videos. Some web-hosting companies even provide an automated installation service for blogging software, such as Wordpress.

Wordpress is the most popular blogging software for self-hosted blogs and, for the day-to-day running of your website, nothing else will be required. However, for building the blog, a couple of other tools will come in handy.

First, you'll need a way of **uploading** files to the hosting company's server. This is achieved using something known as the **File Transfer Protocol**, or FTP. There is some basic FTP support built into Windows but we strongly recommend downloading one of the many dedicated FTP tools that are available for free, as it'll make the job easier.

A good text-editing tool is also essential. The files that make up Wordpress are written in plain text and installing a text editor that uses colour coding to make editing easier will be helpful.

Adding photos and videos to posts is simple. For example, it is possible to upload videos to the hosted web space but in almost all cases, it is simpler and cheaper (because you won't be paying for the storage) to upload the footage to a video-sharing site such as YouTube and use an 'embedding' code to add the clip to your blog.

[1] *soapbox*: a temporary platform that somebody stands on to make a speech, usually outdoors
[2] *step up*: come forward
[3] *customization*: the act of making or changing something according to the buyer's or user's needs (personalizzazione)
[4] *unwieldy*: difficult to control or manage because too complicated
[5] *mould*: style

Skype works as a piece of software running on a computer, and requires **5** ..... the software be downloaded from the Skype site and installed. The software itself is free, **6** ..... are the calls made from a PC running Skype to another PC running Skype.

Skype also allows you to make calls **7** ..... your computer to landline phones or mobile phones. When you make calls this **8** ..... , your call initially travels over the Internet, and only at "the last mile" – the closest location **9** ..... the person being called – does the call go over the normal telephone network or mobile network. Calls are not free **10** ..... they are extremely cheap, especially if compared to international phone rates. Skype has now made it **11** ..... easier to keep in touch with friends and family. And you can also connect with your Facebook friends **12** ..... it.

10 **Do you use video conferencing and/or Skype in your school? If so, which activities are carried out using these services? If not, in what ways could they be used for class activities?**

Social Networks

TEXT 4

Chat in the Dock

1 Rarely has a web-site had such an apt name as Twitter. This micro-blogging site is all about chatter and allows users to create and read text messages of no more than 140 characters.

Twitter first appeared in 2006 as a way to communicate with a group of people using a single SMS text message. Within a year there was considerable enthusiasm for Twitter among technology and media types. This early popularity encouraged others to join but also left many people with the impression that Twitter was an 'in-club' for media professionals and celebrities. Even if this was true in its early days, Twitter has now entered the mainstream[1].

2 Twitter is far simpler than other social networks and also remarkably open. While users must sign up via Twitter website, they needn't use the service from there afterwards. It has encouraged third-party software developers and provides a 'back-end' through which software programs can access the service. As a result, it's possible to choose from many free Twitter applications, which between them support most computers and mobile devices. Many are free of advertising, too. Once signed up to Twitter, there's little more to do than reading and creating messages. If a user tweets "Hello world" the message will be publicly visible on their profile and will automatically appear in the **timeline**, (i.e. the collected stream of tweets), of anyone who follow them.

3 Users can address public tweets to limited users by adding @username (another Twitter account-holder's user name) – the recipient's software will typically alert him/her and sort the message into a special location. Beginning a message with D username creates a private direct message that can be seen only by the addressee. There are some other special characters, too, like the # (hash) character, used for creating a **hashtag** to categorise the content of a tweet (e.g. #joke). The hashtag can be clicked to display a list of tweets from others with the same tag. By using hashtags and addressing messages to relevant people with @, Twitter users can help their messages stand out among the constant stream of conversations.

4 The reality is that it's not possible to read all tweets. Using filters can hide tweets on dull subjects.

Just because there's a mix of interesting people on Twitter, it doesn't necessarily follow that their tweets will be of interest. It may be disappointing for those following updates from a favourite actor, musician or comedian, to discover that they're distinctly less fascinating than expected. While many users find some celebrities worth following, it's all too easy to come across inane or tedious, bland or trivial updates.

5 Most major news outlets now use Twitter feeds to distribute headlines, but Twitter's accessibility means that smaller news outlets and even individuals can use it to circulate information. However, without conventional journalism's

hierarchy of writers and editors, the news broken on Twitter by independent sources may lack the verification, evidence and accuracy usually associated with major news outlets.

A juicy-sounding tweet can be widely retweeted (i.e. re-posted) even if it's wrong. Facing competition from Twitter when it comes to breaking news, conventional news outlets sometimes turn to it as a source – occasionally leading to embarrassing mistakes.

6 There are many fake or parody 'celebrity' accounts on Twitter, some of which can be amusing while others are scathingly critical or offensive. Many people tweet contemporary news in the style of famous people from history, while others tweet jokes or phrases attributed to someone famous (either dead people or living celebrities). It's often clear when a Twitter feed doesn't belong to a real person, and many celebrities or businesses greet parody with good humour. However, cases of mischievous third parties imitating a brand or famous person have prompted Twitter to introduce a verification scheme. Names that appear with a white tick in a blue circle next to them are the official accounts that you would expect them to be. If there's no tick, they may not be genuine.

7 With patience and some selective listening, it's possible to focus only on the best bits, which can be illuminating, educational or just entertaining. Perhaps most importantly, you needn't sign up if you just want to see what the fuss is about, so there's little to lose in taking a closer look. You may find Twitter a pointless distraction, but you may find it a source of ideas and news, or an exciting outlet for your own thoughts and opinions. Just remember that Twitter is a conversation in a public place; if you wouldn't say something loud on a busy train, don't tweet it!

[1] *mainstream*: considered ordinary and accepted by many people

TECHNICAL ENGLISH

timeline | **hashtag**

11 Read Text 4 quickly, and then choose the most suitable heading from the list (A-H) for each part (1-7). There is one extra heading that you do not need to use.

A True or false facts? .....
B Just kidding! .....
C To tweet or not to tweet .....
D Easy access .....
E How to get the best from Twitter .....
F What is Twitter? .....
G Stay private on Twitter .....
H What's in a tweet? .....

12 Read Text 4 again carefully, and then answer the following questions.

a What does the writer think about the name given to the social network?
b What does Twitter allow its members to do?
c When was it launched?
d How can a user send tweets to a limited number of users?
e What is the # sign used for?
f Are tweets always interesting, according to the writer?
g Do Twitter feeds always have a reliable source?
h How has Twitter sorted out the problem of "parody"?
i How can a user select hashtags that he finds most interesting?
j What advice does the writer give to the reader about using Twitter safely?

13 **Work in pairs. Before you read Text 5, think of people's main concerns about Facebook and social networks in general. Jot down your ideas.**

14 **Work in pairs. Read Text 5 and then answer the following questions.**

a Do you think it is a great idea for anyone to view information about where you are, where you live and how to reach you on the phone? Why, or why not?

b Why do you think a stranger might want to be your friend unexpectedly?

c The article contains some pieces of advice on how to stay safe on Facebook. Which ones? Draw up a list.

d Can you think of other precautions that users should take to protect their privacy?

TEXT 5

Stay private in public

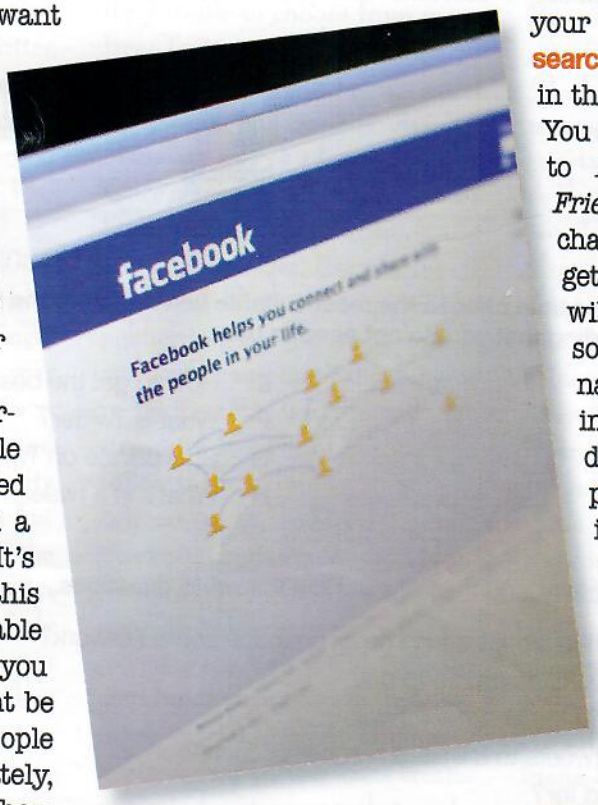
Free, fun and a great way to keep in touch, it's no wonder Facebook is proving a big hit with users all over the world, and the number of people using it is growing by the day.

Naturally, its owners want the site to grow, and the best way to do this is to make its users interact with each other more by sharing information. While this is great for Facebook, it also means you have to keep an eye on your privacy settings.

It's important to understand how your profile and the information stored within it is set up from a privacy point of view. It's all too easy to assume this information is only available to trusted friends but if you are not careful you might be offering it up to more people than you realise. Ultimately, it's up to you to decide how much to share.

Control your public profile

In Facebook's privacy settings, the site splits people into three groups: *Friends* (people who you have accepted into your friends list), *Friends of Friends* (people who are friends with one or more of your friends, but not directly with you) and *Everyone* (all Facebook users).



Most privacy settings let you specify one of these groups for each privacy setting; occasionally there are other options, such as *Only me* (completely private) or the ability to block or allow access to specific friends. Previewing your public profile is a good way to check your privacy settings. The first option, *Search for you on Facebook*, is set to everyone by default[1], which means anyone can tap your name into Facebook's **search box** and see you listed in the results.

You can change this setting to *Friends of Friends* or *Friends Only* but the chances of people you know getting in touch with you will be reduced. In reality, someone seeing your name and profile picture in a Facebook search doesn't present a big privacy concern. What is an issue, though, is whether strangers will be able to find out other information about you. For this reason, we would recommend that you set the last four options to *Friends Only*. Those options are: *See your friend list*, *See your education and work*, *See your current city and hometown* and *See your likes...* . This way, only those people who you have accepted a friend request from will be able to

see the information. Hiding information from your public profile only takes a few clicks.

Protecting your privacy

To stay in complete control of your information on Facebook you will need to click on the *Customize Settings* link. The *Customize settings* screen is split into three sections, with the first being *Things I share*. This section lets you specify how the data you enter will be shared among the Facebook community, including who can see your relationship information as well as your birthday and **wall** posts. Ensuring these are set to *Friends Only* is a good way to protect your privacy.

If you would like to be more selective, click the *Customize* option. Using the **drop-down menu** you can create settings for specific people, so your photos could be shared with a named list of people; alternatively you can nominate a list of people who are not allowed to see certain types of information.

Controlling your friends

While you have the overall say on how the information within your Facebook account is shared, you won't enjoy the same level of control when it comes to your friends' accounts. If you comment on a photo of theirs or post something on a friend's wall, for example, their privacy settings apply to the information, not yours, that will define who sees what you have written. However, there are some useful settings within the *Things others share* section of the *Customize Settings* window. For instance, many people have concerns about their friends uploading unflattering photos of them, particularly when the photo is then tagged to indicate they are in it. Once a photo of you is tagged, all your friends will see it in their news feeds. If you would rather not have tagged photos of you publicised in this way, you can remove tags of yourself within them. To do this, click on the photo in question, locate your name in the tags underneath it and click on *Remove* link. The photo will disappear from your friends' news feeds. Depending on the privacy settings of the person who uploaded it, your friends may still be able to view it within their photo album, but they won't be alerted to it.

Another important tool within the *Things others share* section is the *Friends can check me into places* setting. This lets your friends mark you as being in a certain geographical location, such as a café or library. Although it can be useful, you may not want everyone knowing where you are and when you are not at home. To prevent friends from checking you in to locations, click the *Edit Settings* button and choose *Disabled* from the drop-down menu.

Spam

Privacy concerns relating to apps hit the headlines when Facebook revealed it was going to allow third-party app developers to ask for access to users' home addresses and mobile phone numbers.

Many users are concerned that rogue apps might be developed to obtain this information for spam purposes. Facebook has put some safeguards in place, though, and any third-party application that wants to access your address and mobile phone number is required to seek your permission first. This permission request comes in the form of a **pop-up window**, along with two buttons: *Allow* and *Don't Allow*.

The problem is it's easy to quickly click *Allow* without fully understanding the consequences. The best way to ensure you are unaffected by this is to not enter your address and mobile phone number into Facebook.

[1] *by default*: predefinito

TECHNICAL ENGLISH

search box casella di ricerca | **wall** bacheca | **drop-down menu** menu a tendina | **pop-up window** finestra pop-up

UNIT 14

Multimedia and Entertainment on the Net

Media and Web Usage

1 **Brainstorming** **Have your say.**

a Do you have a huge library of MP3s, or do you prefer streaming music from the Internet?
b How do you share your music with your friends?
c Do you think that there is still a need to own a copy of any music or video if these can be easily streamed to a computer or portable device?

TEXT 1

STREAMING MEDIA

Sharing and downloading files is a powerful **0** *.....way.....* of distributing content digitally, but it is something that **1** ..... considerable time and space. This is where streaming comes in: the ability to listen to or watch media online **2** ..... having to wait for the entire file to download.

Music was the first medium to demonstrate the potential of streaming services, **3** ..... to the relatively small size of music files compared to other media content, and the **4** ..... of the compact MP3 music file format from 1993 onwards. All streaming services are essentially **5** ..... .

A user **6** ..... on a link in their web browser: instead of starting the download of a complete media file, the browser contacts a web server and downloads a metafile. This small file **7** ..... instructions to the browser to launch the media player service required to play the file, as well as information about the online location of the file that is going to be streamed. The browser then begins the **8** ..... of buffering – i.e. sending packets of data to be stored in a certain amount of memory set aside for receiving media content. This takes a small amount of time, **9** ..... on the speed of the Internet connection. However, it **10** ..... that play is not continually interrupted by the need to download data: it has been "buffered" **11** ..... this happening by the download of part of the file in advance.

The most watched forms of streamed media on the modern Internet come via video sites like *YouTube*. Clips on *YouTube* can be watched on the main site itself or can be "embedded" into a blog or other websites and watched there without having to **12** ..... *YouTube* itself.

2 **For questions 1-12 read the text above and decide which answer (A, B, C, or D) best fits each space. One example has been provided.**

FCE
Use of English
Part 1

0	**A** technique	**B** means	**C** way	**D** process
1	**A** takes up	**B** takes	**C** takes off	**D** takes away
2	**A** before	**B** without	**C** instead of	**D** despite
3	**A** despite	**B** according	**C** thanks	**D** contrary
4	**A** diffusion	**B** spread	**C** distribution	**D** demand
5	**A** like	**B** same	**C** alike	**D** close
6	**A** presses	**B** types	**C** keys	**D** clicks
7	**A** contains	**B** collects	**C** shows	**D** concerns
8	**A** act	**B** action	**C** process	**D** procedure
9	**A** due	**B** because	**C** in addition	**D** depending
10	**A** ensures	**B** allows	**C** enables	**D** assures
11	**A** for	**B** against	**C** in case of	**D** from
12	**A** surf	**B** connect	**C** link	**D** visit

Music on the Net

TEXT 3

MP3: the most popular music format on the Net

One of the most popular ways to distribute music on the Internet is through the use of **MP3** music files.

MP3, which stands for MPEG Audio Layer 3, is the audio file format that has been the de facto standard for online digital music. The ability to carry around several thousand music tracks on a device that fits into your pocket would once have been dismissed as outrageous. But with the invention of the MP3 audio file format in the mid-1990s, this fantasy became a reality. The key to the success of MP3 is that it allows a complete audio CD, which normally takes up around 600MB of hard disk space, to be squeezed into 50MB or less.

MP3 files work with virtually every brand of portable digital music player, which is why the term "MP3 player" is often used to describe these devices. The mix of small size and high quality is what sets the MP3 standard apart from other Internet music formats.

In order to get the most out of this ubiquitous format, it's important to understand what an MP3 file is, and what it does to your music.

Before MP3 files can be posted on the Internet the music has to be recorded, no differently from any other kind of music and then put on a CD. The music from the CD has then to be converted to the MP3 format using a **ripper**, a **shareware** program. The software uses special algorithms that shrink the size of the sound data of files by a factor of 12 while retaining almost CD-like quality.

MP3 compresses the original sound by filtering out differences in the sound signal, a technique which is called perceptual noise shaping. MP3 compression format creates files that don't sound exactly like the original recording – it's a lossy format. In order to decrease the size of the file significantly, the MP3 **codec** shrinks the source file by removing portions of the original signal considered to be essentially inaudible. You can choose how much information an MP3 file will retain or lose during the **encoding** and **compression** process. It's possible to create two different MP3 files with different sound quality and file sizes from the same source of data. The key is the **bit rate** – or average amount of data required per second of music, which determines the audio resolution of an MP3. The higher the number of kilobytes per second (kbps), the closer in sound quality the MP3 is to the original source – and the larger the file size; the more the sound is compressed, the worse the audio quality gets. Listen to an older MP3 file then the CD copy and the difference should be obvious.

Inside an MP3 file, music is stored as long strings of binary numbers (zeros and ones) in a series of chunks called "frames". Each frame starts with a short header (a kind of table of contents), followed by the music data itself. At the start of an MP3 file there is a kind of "index card" that stores details of the track name, artist, genre, and so on. This information is called metadata and each part of it (artist, track, and so on) is stored in what's called an "**ID3 tag**" (identify an MP3). Many MP3 programs have an option that lets you "edit the ID3 tags".

After the file has been converted to an MP3 format, it is posted to a site on the Internet where people can download it. Once downloaded, it can be played with a special piece of software called an MP3 player. Technologies have been developed that enable MP3 files to be streamed so that you can listen to them as they are being downloaded.

Downloading songs from a site like iTunes or Amazon MP3 is perfectly legal. These companies have bought the rights to sell downloadable songs. However, if you are downloading them for free from a **peer-to-peer** site it is probably illegal.

TECHNICAL ENGLISH

MP3 | **ripper** | **shareware** software in prova gratuita | **codec**

encoding codifica | **compression** compressione | **bit rate** frequenza di cifra, bit rate

ID3 tag etichetta per MP3 | **peer-to-peer**

7 **Here are a number of FAQs about MP3. Find the answers in the text.**

a How is the sound quality of the downloaded material?
b How do I make an MP3 from a CD?
c What is MP3?
d What are MP3 ID tags?
e What does MP3 stand for?
f Is downloading MP3 files legal or illegal?
g What is bit rate?
h What is a ripper?

8 **Work in pairs.**

a Think of three more questions about MP3 that you would like to ask.

1 .....

2 .....

3 .....

b Your questions are likely to be FAQs. Surf the Internet to find the answers.

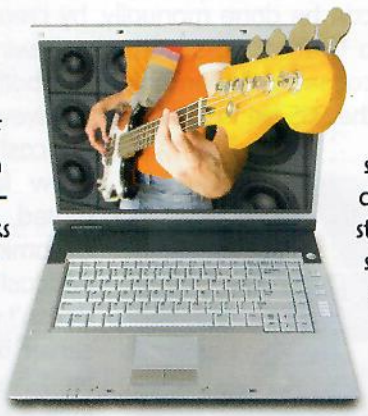
TEXT 4

Rock around the Clock: Music on the Internet

Music downloads have become big business, with a plethora of sites and services offering songs and albums. From paid-for music downloads to free music on demand, the choices for getting music online can be a bit confusing, especially when you stumble upon one of the many illegal websites.

Thankfully, there are several legal and legitimate services available online, offering both free and paid-for music.

Two music services dominate the market at present: *iTunes* and *Spotify*. *iTunes*, owned by Apple, charges you to download and keep songs and albums, while *Spotify* offers a wide choice of songs and albums you can listen to on demand.



The second type of service is called a streaming service, because the music tracks are sent to your PC in a continuous stream, so you can listen to them as the file is downloading. Some streaming services, such as *Spotify*, are free to the consumer and paid for by advertising. The music service pays a licence fee to the music industry in exchange for the right to offer the work of bands and artists. Apple's *iTunes* and other download services, instead, typically pay a fee to copyright holders per purchase.

The advantage of *iTunes* over *Spotify* is that once a song has been downloaded, it is yours to keep. It can then be added to a portable media player and can also be listened to on your PC even when you are not online. *Spotify*'s benefit is that you can enjoy a huge amount of music (about 15 million tracks are available) for no cost, if you are prepared to put up with the adverts. However, *Spotify* also offers a monthly subscription with all adverts removed.

Both music services provide a means to organize music using **playlists** – a way to group tracks together to form a compilation – and by sorting tracks according to their genre, such as rock, classical or folk.

If you like listening to music on the radio but get annoyed by adverts and irritating DJs, then *Spotify* and *Last.fm* are great options. Both offer a 'radio' function that continually plays music based on your tastes. On *Spotify* you can select from different decades and musical styles such as jazz, soul, blues, pop and many others besides. There is still the occasional advert but you can skip tracks you don't like and find out more about artists and other tracks and albums.

Last.fm has a more comprehensive radio tool based on your own personal tastes. To use it, you need to sign up for a free account. You search for a favourite artist or song, or select from a list of musical genres, and *Last.fm* will then open a special 'radio' stream featuring songs it identifies as suitable. The more you listen to music on *Last.fm* the better it gets at working out what you like. There are no adverts and songs that you don't like can be skipped. It also recommends similar artists and playlists, so there are plenty of options to choose from. What's good about *Last.fm* is that it introduces you to lots of new music and if you like it, you will hear more of it as the service tracks your listening habits.

The social aspect of listening to and enjoying music is a strong feature for many online services. *Spotify* allows playlists to be shared among anyone. To share your own playlists, just create and name a playlist, **drag and drop** songs into it and then you can either share a special *Spotify* link or post it to social-networking sites such as *Facebook* or *Twitter* for friends to enjoy.

Listening to music online needn't be reserved for your home PC. There are loads of ways to enjoy music on a range of devices both at home and on the go. The influence of *iTunes* as a method of enjoying music on the go is unavoidable. The software links well with iPads, iPhones and iPods, which makes it the logical choice for those who own such devices. With *iTunes* making playlists to add to devices is simple and quick. The Genius function makes recommendations on what to buy and creates custom playlists, while the Genius Mixes option creates a continuous playlist of music based on your musical tastes.

iTunes Match lets you store your entire collection in iCloud. When it is in iCloud, it is available on all your devices. So you can enjoy all your music anywhere, anytime. Thanks to the Internet, there are now more ways than ever to both listen to music and share your favourite songs and artists with the world without breaking the law.

2 Have your say

a In your opinion, what are the advantages and disadvantages of conventional shopping and online shopping?

b Do you, or your family, ever shop on the Internet? If so, what items do you buy and where do you buy them?

3 Read Text 1, then answer the following questions.

a How do online transactions mirror physical transactions?

b What makes e-commerce more complex than it actually seems?

c In what ways have Amazon and eBay contributed to changing the way people use the Internet?

d Which fundamental characteristics of e-commerce are embodied in these two shopping sites?

e What is PayPal?

f How important has it proved for the expansion of e-commerce?

g Why have major retailers moved parts of their operations online?

h What is e-commerce being influenced by now?

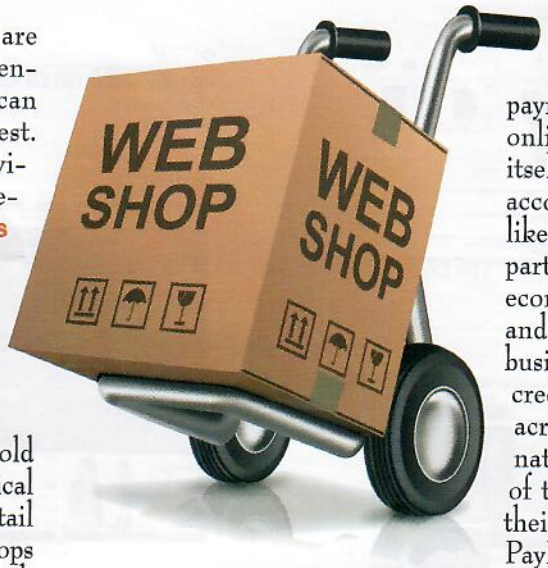
TEXT 1

The Web is the world's biggest shop window

Commercial transactions are one of the most fundamental uses of the Internet and can seem like one of the simplest. Some of the major activities often associated with e-commerce are **B2B (Business to Business)**, the commerce transactions between businesses, and **B2C (Business to Consumer)**, the transactions conducted between a business and a consumer.

Services are bought and sold on a similar basis to physical transactions. And with retail goods, much as in many shops or catalogues, items are selected, paid for, and then delivery is arranged either by post, in the case of physical goods, or via download. Behind **e-commerce**, however, lies a network of operations of immense complexity, above all when it comes to processing financial transactions and ensuring data security.

Although Amazon and eBay, both launched in 1995, weren't the very first online shopping sites, they were the first to have a profound market impact and to begin accustoming the world to the idea that items could be bought as well as merely viewed online.



Between them, the sites also embody the two core types of business that the Internet excels at delivering: selling a greater range of new goods than can be fitted into any physical store, and offering a bigger consolidated marketplace for second-hand **auctions** and re-sales than any physical location. The overwhelming success of these companies is also a telling indicator of the dominance of e-commerce by large brands.

eBay was launched online in the same year as Amazon, but it's best acquisition came in 2002, when it became the sole owner of the e-commerce business PayPal, a company allowing people to purchase goods and services online and make and receive payments and transfers of money online via an account with PayPal itself rather than a business bank account or credit card. Services like PayPal have proved a central part of the growing online economy for both customers and businesses. For many online businesses, in fact, processing credit card transactions securely across a spectrum of different national banking systems is one of the most expensive aspects of their entire business.

PayPal accounts also allow small businesses and individuals to make and receive payments securely when they would often be ineligible or unable to set up a payment system through conventional banking. The service operates today in over 190 markets, as well as via a text-message-based system on mobile phones, making steady headway in being accepted alongside credit card payments as a truly mainstream way of paying for goods and services.

In parallel to these two giant booming Internet-based businesses, almost every major retailer in the world now has a substantial online presence, with an increasing sophistication of

goods and services available. Supermarkets have expanded heavily into online shopping and home deliveries, while many bricks-and-mortar[1] stores, in particular those selling media such as books, CDs and DVDs, have found their business shrinking or have been compelled to adapt to more of a "destination" experience to differentiate physical shopping from online shopping, not to be left behind. Accompanying this, too, has been a steady increase in the sophistication of delivery and logistics services – something exemplified by Amazon, whose strategically located distribution centres can each be larger than ten football pitches!

Like everything else online, the new stage of e-commerce is being influenced by social media. Leading multinationals have begun to experiment with selling brands directly through Facebook, with the sales platform powered by Amazon. And the online culture of recommendations and reviews, which Amazon and others did so much to fuel, is becoming more and more sophisticated.

[1] *bricks-and-mortar*: a traditional store that does not operate on the Internet

TECHNICAL ENGLISH

B2B Business to Business da azienda a azienda | **B2C Business to Consumer** da azienda a consumatore

e-commerce commercio elettronico | **auction** asta

4 **Speaking** **Work in pairs. You would like to buy a hifi system online but are worried about doing things wrong. You phone a friend of yours, who is very good at picking up bargains on the Net, and ask for advice. Act out your conversation following the hints given. Then exchange roles.**

YOU	YOUR FRIEND
Greet	
	Answer greetings
Say the reason for calling	
	Offer help
Say you have visited some sites and found one with good offers. You do not know if you can trust it	
	Suggest sticking with well-known websites. Add you usually shop on Amazon.
Say that site had better offers than Amazon	
	Suggest checking out user reviews
Say you did. Say there were many positive reviews	
	Ask about means of order
Answer you can either order by phone or fill in a form. Ask about payment	
	Answer you always pay by credit card as transactions are usually covered by the supplier's insurance scheme
Say you are worried about using your credit card as your data might be stolen	
	Suggest making sure that the website address starts with https:// instead of http://
Ask about the difference between them	
	Explain that https:// means the page is encrypted. Add it is much safer than handing a credit card to someone in a shop or restaurant
Ask whether there are other things to take into account	
	Suggest making sure the site does not have complicated or long winded replacement or refund procedures
Say you are still undecided	
	Encourage your friend to buy online. List the advantages

7 **Work in pairs. Before you read Text 3 answer the following questions.**

a Do you think that traditional books will soon be a thing of the past, or will there still be a place for both ebooks and traditional books in the market?

b Do you think that the digital version can grant ownership of books in the same way as the physical version does? Why, or why not?

8 **Read this article to find out what the writer thinks about ebooks. Answer the following questions.**

a Which advantages does he mention? Draw up a list.

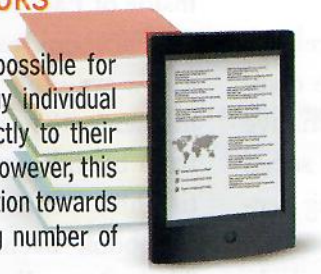
b Are there any limitations?

c What can affect the price of ebooks?

d What does he say about the problem of ownership?

TEXT 3

Ebooks versus Paper books



The growth of iTunes has made it possible for users to pay a small amount to buy individual songs online and download them directly to their computers and portable MP3 players. However, this has been just one part of a global transition towards the digital distribution of an increasing number of products.

Digital books or **ebooks** are perhaps the simplest example of this.

Supplied as a digital download, they don't consume the planet's forests, needn't be carried to shops by sea, air or road, and are more flexible than their printed equivalents, as you can choose how they are displayed.

Ken Follett's[1] latest hardback has 864 pages, Penguin's latest translation of *War and Peace* runs to more than 1,300 pages. Neither of them can be easily carried around for any length of time, unless you buy them as ebooks. Download them to Amazon's Kindle **ereader** and it still won't weigh more than 247 grams – roughly the same as a single slim paperback – and there will be room inside for hundreds more books besides.

Amazon also makes Kindle software for iPhone and Android smartphones, as well as Windows and Mac computers and iPad tablets. Likewise, Apple's iBooks app is available on the iPad, iPhone and iPod Touch music player.

They all synchronise online, so if you buy a book on one it can be downloaded in seconds onto any other device you own.

Digital portability only stretches so far, though, as all the major e-book services' platforms are incompatible with one another. The only real exception is that, at the moment, you can buy a book on the Kindle and read it using the Kindle app on an iPad.

Whichever method you use to buy your books, they are delivered in seconds – no more waiting for deliveries or heading out to the shops in your lunch hour.

Amazon carries more than one million titles in its Kindle store, while Apple's iBookstore stocks 180,000 from 2,500 publishers. Both stores let you download a sample of each volume to try before you buy, and the Kindle can even read many books aloud if you wish.

Many ebooks are cheaper than their printed cousins. You will make your biggest savings on the classics on which copyright has now expired, as these cost a few pounds in print but nothing at all to download. Amazon and Apple maintain lists of free books, and repositories such as Project Gutenberg offer a veritable trove of free downloads. However, there are occasions when you will see electronic books selling for more than their printed siblings.

Given that they don't require paper, printing or transportation, this seems daft[2] – so what's going on? The answer is usually simple: tax. The supply of text by electronic transmission, via the Internet, or similar means, does not qualify as a book, and as such attracts VAT[3] at the standard rate. This means that ebook download services are taxed according to the country from which ebooks are sold.

Ebooks are virtual but this doesn't mean they lack the permanence and ownership of a printed book. All the major services allow you to back up your purchases, and Amazon stores a copy of your library online: buy a book once and you can download it as many times as you need over its Whispernet service.

You can also download it to multiple devices, so if you lose your Kindle and replace it, you can retrieve all your purchases. If you accidentally delete a book, you can download it again free of cost.

The iPad backs up books on your computer and catalogues them inside Apple's iTunes software, where the covers are lined up on virtual shelves. From this point on, it's up to you to perform your own backups to keep them safe.

[1] *Ken Follett*: Welsh author of thrillers and historical novels.
[2] *daft*: silly, often in a way it is amusing
[3] *VAT* (Valued Added Tax): IVA