

TRƯỜNG ĐẠI HỌC THUÝ LỢI  
KHOA CÔNG NGHỆ THÔNG TIN



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TÀI LIỆU TIẾNG ANH CHUYÊN NGÀNH  
CÔNG NGHỆ THÔNG TIN

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(*Lưu hành nội bộ*)



HÀ NỘI - 2018

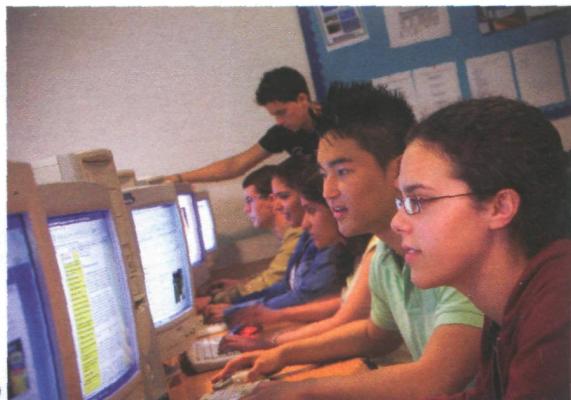
## 1 The digital age

**A** Match the captions (1–4) with the pictures (a–d).

- 1 In education, computers can make all the difference .....
- 2 Using a cashpoint, or ATM .....
- 3 The Internet in your pocket .....
- 4 Controlling air traffic .....



a



b



c



d



**B** How are computers used in the situations above? In pairs, discuss your ideas.



**C** Read the text and check your answers to B.

### The digital age

We are now living in what some people call *the digital age*, meaning that computers have become an essential part of our lives. Young people who have grown up with PCs and mobile phones are often called *the digital generation*. Computers help students to **perform** mathematical **operations** and improve their maths skills. They are used to **access the Internet**, to **do** basic **research** and to

communicate with other students around the world.  
 10 Teachers use projectors and interactive whiteboards to **give presentations** and teach sciences, history or language courses. PCs are also used for administrative purposes – schools use word processors to **write letters**, and databases to **keep records** of students  
 15 and teachers. A school website allows teachers to publish **exercises** for students to **complete** online.

Students can also enrol for courses via the website and parents can download official reports.

20 Mobiles let you **make** voice **calls**, **send texts**, email people and download logos, ringtones or games. With a built-in camera you can send pictures and make video calls in *face-to-face* mode. New smartphones combine a telephone with web access, video, a games console, an MP3 player, a personal digital assistant (PDA) and a GPS navigation system, all in one.

25 In banks, computers **store information** about the money held by each customer and enable staff to **access** large **databases** and to **carry out** financial **transactions** at high speed. They also control the cashpoints, or ATMs (automatic teller machines), which **dispense money** to customers by the use of a PIN-protected card. People use a Chip and PIN

30 card to pay for goods and services. Instead of using a signature to verify payments, customers are asked to **enter a** four-digit **personal identification number (PIN)**, the same number used at cashpoints; this system makes transactions more secure. With online banking, clients can easily **pay bills** and **transfer money** from the comfort of their homes.

35 Airline pilots use computers to help them control the plane. For example, monitors **display data** about fuel consumption and weather conditions. In airport control towers, computers are used to 40 manage radar systems and regulate air traffic. On the ground, airlines are connected to travel agencies by computer. Travel agents use computers to find out about the availability of flights, prices, times, stopovers and many other details.

**D When you read a text, you will often see a new word that you don't recognize. If you can identify what type of word it is (noun, verb, adjective, etc.) it can help you guess the meaning.**

**Find the words (1–10) in the text above. Can you guess the meaning from context? Are they nouns, verbs, adjectives or adverbs? Write *n*, *v*, *adj* or *adv* next to each word.**

- 1 perform (line 6) .....
- 2 word processor (line 13) .....
- 3 online (line 16) .....
- 4 download (line 18) .....
- 5 built-in (line 21) .....

- 5 digital (line 25) .....
- 7 store (line 27) .....
- 8 financial (line 29) .....
- 9 monitor (line 42) .....
- 10 data (line 42) .....

**E Match the words in D (1–10) with the correct meanings (a–j).**

- a keep, save .....
- b execute, do .....
- c monetary .....
- d screen .....
- e integrated .....
- f connected to the Internet .....

- g collection of facts or figures .....
- h describes information that is recorded or broadcast using computers .....
- i program used for text manipulation .....
- j copy files from a server to your PC or mobile .....

**F  In pairs, discuss these questions.**

- 1 How are/were computers used in your school?
- 2 How do you think computers will be used in school in the future?

## 2 Language work: collocations 1

A Look at the HELP box and then match the verbs (1–5) with the nouns (a–e) to make collocations from the text on pages 2–3.

- |            |                 |
|------------|-----------------|
| 1 give     | a money         |
| 2 keep     | b a PIN         |
| 3 access   | c databases     |
| 4 enter    | d presentations |
| 5 transfer | e records       |

B Use collocations from A and the HELP box to complete these sentences.

- 1 Thanks to Wi-Fi, it's now easy to ..... from cafés, hotels, parks and many other public places.
- 2 Online banking lets you ..... between your accounts easily and securely.
- 3 Skype is a technology that enables users to ..... over the Internet for free.
- 4 In many universities, students are encouraged to ..... using PowerPoint in order to make their talks more visually attractive.
- 5 The Web has revolutionized the way people ..... – with sites such as Google and Wikipedia, you can find the information you need in seconds.
- 6 Cookies allow a website to ..... on a user's machine and later retrieve it; when you visit the website again, it remembers your preferences.
- 7 With the latest mobile phones, you can ..... with multimedia attachments – pictures, audio, even video.

### HELP box

#### Collocations 1

Verbs and nouns often go together in English to make set phrases, for example **access the Internet**. These word combinations are called **collocations**, and they are very common. Learning collocations instead of individual words can help you remember which verb to use with which noun. Here are some examples from the text on pages 2–3: **perform operations, do research, make calls, send texts, display data, write letters, store information, complete exercises, carry out transactions.**

## 3 Computers at work

A  Listen to four people talking about how they use computers at work. Write each speaker's job in the table.

	electrical engineer	secretary	librarian	composer
Speaker	Job	What they use computers for		
1				
2				
3				
4				

B  Listen again and write what each speaker uses their computer for.

## 4 The magic of computers

**A You are going to read a text about some of the other things that computers are used for. Five sentences have been removed from the text. Choose which sentence (1–5) fits which gap in the text (a–e).**

- 1 It is a calculating machine that speeds up financial calculations
- 2 we visit shops and offices which have been designed with the help of computers
- 3 you can even use your PC to relax with computer games
- 4 for example calculators, the car's electronic ignition, the timer in the microwave, or the programmer inside the VCR
- 5 as does making a flight reservation or bank transaction

### The magic of computers

Computers and microchips have become part of our everyday lives: (a) \_\_\_\_\_; we pay bills prepared by computers; just picking up a telephone and dialling a number involves the use of a sophisticated computer system, (b) \_\_\_\_\_.

Every day we encounter computers that spring to life the instant they are switched on, (c) \_\_\_\_\_, all of which use chip technology.

What makes your computer such a miraculous device? Each time you turn it on, it is a blank slate (*tabula rasa*) that, with appropriate hardware and software, is capable

of doing anything you ask. (d) \_\_\_\_\_; it is an electronic filing cabinet which manages large collections of data, such as customers' lists, accounts, or inventories; it is a magical typewriter that allows you to type and print any kind of document – letters, memos or legal documents; it is a personal communicator that enables you to interact with other computers and with people around the world; if you like gadgets and electronic entertainment, (e) \_\_\_\_\_.

Nowadays, it is almost impossible to imagine life without the magic of computers.

### B Read the text again and answer these questions.

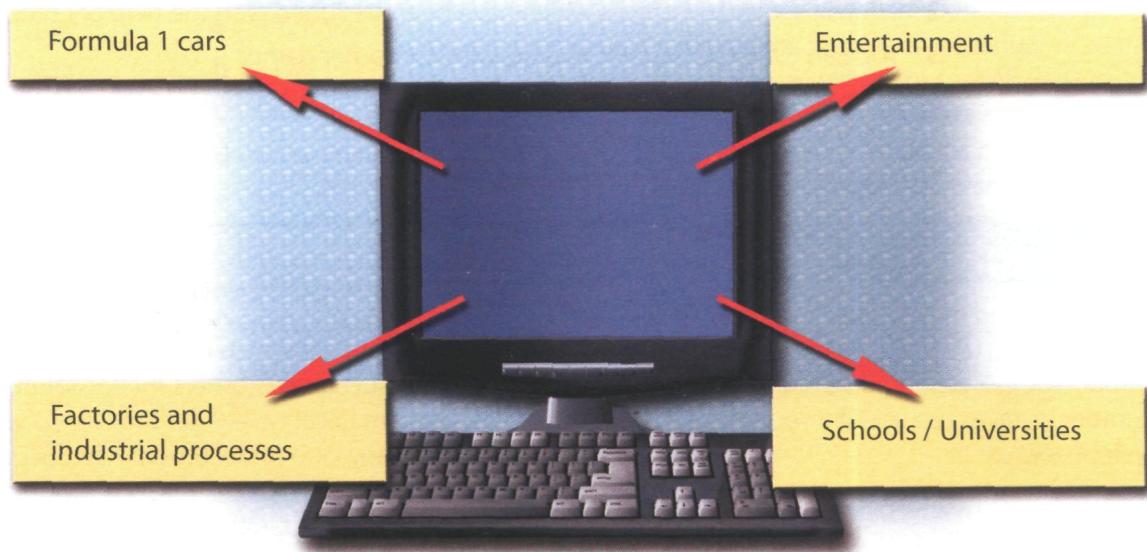
- 1 Apart from computers, what other devices use microchips?
- 2 Which two components allow computer systems to operate?
- 3 What types of document are prepared on computers?
- 4 Why is a computer called a *personal communicator*?



Computers have changed the way we live, work, play and communicate

## 5 Other applications

A  In small groups, choose one of the areas in the diagram below and discuss what you can do with computers in that area. Look at the *Useful language* box below to help you.



### Useful language

**Formula 1 cars:** design and build the car, test virtual models, control electronic components, monitor engine speed, store (vital) information, display data, analyse and communicate data

**Entertainment:** download music, burn CDs, play games, take photos, edit photos, make video clips, watch movies on a DVD player, watch TV on the computer, listen to MP3s, listen to the radio via the Web

**Factories and industrial processes:** design products, do calculations, control industrial robots, control assembly lines, keep record of stocks (materials and equipment)

**School/University:** access the Internet, enrol online, search the Web, prepare exams, write documents, complete exercises online, do research, prepare presentations

Computers are used to ...

A PC can also be used for ...

People use computers to ...

B  Write a short presentation summarizing your discussion. Then ask one person from your group to give a summary of the group's ideas to the rest of the class.

## 1

**Computer hardware****A In pairs, discuss these questions.**

- 1 Have you got a computer at home, school or work? What kind is it?
- 2 How often do you use it? What do you use it for?
- 3 What are the main components and features of your computer system?

**B In pairs, label the elements of this computer system.****C Read these advertising slogans and say which computer element each pair refers to.**

1

Point and click here for power

(a)

2

Displays your ideas with perfect brilliance

(a)

3

It's quiet and fast

(a)

4

Power and speed on the inside

(a)

Obey every impulse as if it were an extension of your hand

(b)

See the difference – sharp images and a fantastic range of colours

(b)

... it's easy to back up your data before it's too late

(b)

Let your computer's brain do the work

5

... a big impact on the production of text and graphics

(a)

Just what you need: a laser powerhouse

(b)

**D Find words in the slogans with the following meanings.**

- 1 to press the mouse button .....
- 2 clear; easy to see .....
- 3 to make an extra copy of something .....
- 4 selection .....
- 5 shows .....

## 2 What is a computer?

A Read the text and then explain Fig. 1 in your own words.

### What is a computer?

A computer is an electronic machine which can accept data in a certain form, process the data, and give the results of the processing in a specified format as information.

First, data is fed into the computer's memory. Then, when the program is run, the computer performs a set of instructions and processes the data. Finally, we can see the results (the output) on the screen or in printed form (see Fig. 1 below).

A computer system consists of two parts: hardware and software. **Hardware** is any electronic or mechanical part you can see or touch. **Software** is a set of instructions, called a program, which tells the computer what to do. There are three basic hardware sections: the **central processing unit (CPU)**, **main memory** and **peripherals**.

Perhaps the most influential component is the central processing unit. Its function is to execute program instructions and coordinate the activities of all the other units. In a way, it is the 'brain' of the computer. The main memory (a collection of RAM chips) holds the instructions and data which are being processed by the CPU. Peripherals are the physical units attached to the computer. They include storage devices and input/output devices.

**Storage devices** (hard drives, DVD drives or flash drives) provide a permanent storage of both data and programs.

**Disk drives** are used to read and write data on disks.

**Input devices** enable data to go into the computer's memory. The most common input devices are the **mouse** and the **keyboard**. **Output devices** enable us to extract the finished product from the system. For example, the computer shows the output on the **monitor** or prints the results onto paper by means of a **printer**.

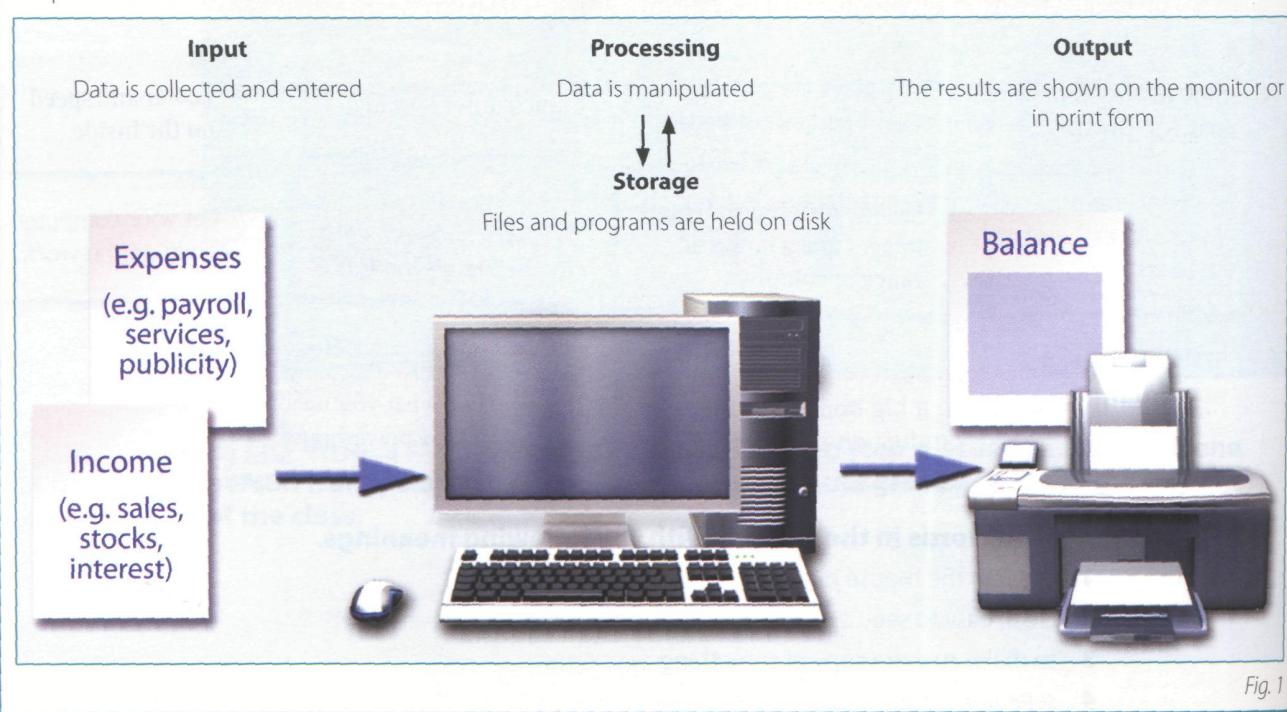
On the rear panel of the computer there are several **ports** into which we can plug a wide range of peripherals – a modem, a digital camera, a scanner, etc. They allow communication between the computer and the devices. Modern desktop PCs have USB ports and memory card readers on the front panel.



A USB port



A USB connector



**B** Match these words from the text (1–9) with the correct meanings (a–i).

- |  |   |
|--|---|
| 1 software                             | a the brain of the computer   |
| 2 peripherals                          | b physical parts that make up a computer system                             |
| 3 main memory                          | c programs which can be used on a particular computer system                |
| 4 hard drive (also known as hard disk) | d the information which is presented to the computer                        |
| 5 hardware                             | e results produced by a computer  |
| 6 input                                | f input devices attached to the CPU   |
| 7 ports                                | g section that holds programs and data while they are executed or processed |
| 8 output                               | h magnetic device used to store information                                 |
| 9 central processing unit (CPU)        | i sockets into which an external device may be connected                    |

## 3 Different types of computer

**A**  Listen to an extract from an ICT class. As you listen, label the pictures (a–e) with words from the box.

laptop	desktop PC	PDA	mainframe	tablet PC
--------	------------	-----	-----------	-----------



a .....



b .....



c .....



d .....



e .....

**B**  Listen again and decide whether these sentences are true or false. Correct the false ones.

- 1 A mainframe computer is less powerful than a PC.
- 2 A mainframe is used by large organizations that need to process enormous amounts of data.
- 3 The most suitable computers for home use are desktop PCs.
- 4 A laptop is not portable.
- 5 Laptops are not as powerful as desktop PCs.
- 6 Using a stylus, you can write directly onto the screen of a tablet PC.
- 7 A Personal Digital Assistant is small enough to fit into the palm of your hand.
- 8 A PDA does not allow you to surf the Web.

## 4 Language work: classifying

A Look at the HELP box and then use suitable classifying expressions to complete these sentences.

- 1 A computer ..... hardware and software.
- 2 Peripherals ..... three types: input, output and storage devices.
- 3 A word processing program ..... software which lets the user create and edit text.
- 4 ..... of network architecture: peer-to-peer, where all computers have the same capabilities, and client-server (e.g. the Internet), where servers store and distribute data, and clients access this data.

B  In pairs, describe this diagram, using classifying expressions from the HELP box. Make reference to your own devices.

### HELP box

#### Classifying

Classifying means putting things into groups or classes. We can classify types of computers, parts of a PC, etc. Some typical expressions for classifying are:

- ... are classified into X types/categories
- ... are classified by ...
- ... can be divided into X types/categories

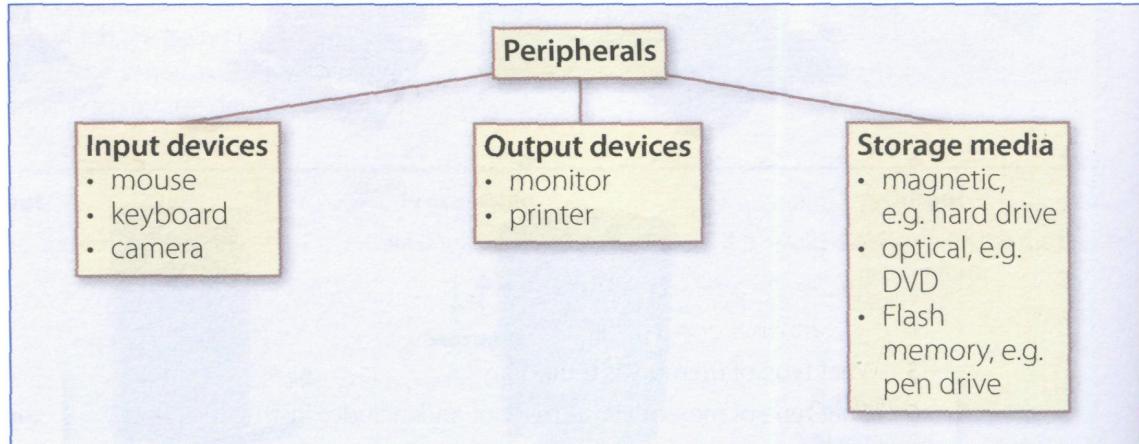
Digital computers can be **divided into** five main **types**: mainframes, desktop PCs, laptops, tablet PCs and handheld PDAs.

- ... include(s) ...
- ... consist(s) of ...

The basic configuration of a mainframe **consists of** a central system which processes immense amounts of data very quickly.

- There are X types/classes of ...
- X is a type of ...

A tablet PC is **a type of** notebook computer.



## 5 Benefits of laptops and tablet PCs

 Your school is considering buying tablet PCs to use in the classroom. Write an email to your teacher explaining the benefits for the students and the school.

or

Your company is considering replacing all of the office PCs with laptops. Write an email to your boss explaining the benefits for the employees and the company.

## 1

### Interacting with your computer

**Read the description of input devices and then label the pictures (1–8) with words from the text.**

**Input devices** are the pieces of hardware which allow us to enter information into the computer. The most common are the **keyboard** and the **mouse**. We can also

interact with a computer by using one of these: a **light pen**, a **scanner**, a **trackball**, a **graphics tablet**, a **game controller** or a **microphone**.



1 .....



2 .....



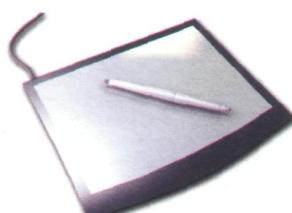
3 .....



4 .....



5 .....



6 .....



7 .....



8 .....

## 2

### Describing input devices

**A** Listen to a computer technician describing three input devices. Write which devices he's talking about.

1 ..... 2 ..... 3 .....

**B** Listen again and complete these extracts.

- 1 This device is ..... enter information into the computer.
- 2 ... it may also ..... function keys and editing keys ..... special purposes.
- 3 This is a device ..... the cursor and selecting items on the screen.
- 4 It usually ..... two buttons and a wheel.
- 5 ... the user ..... activate icons or select items and text.
- 6 It ..... detecting light from the computer screen and is used by pointing it directly at the screen display.
- 7 It ..... the user ..... answer multiple-choice questions and ...

## 3

## Describing functions and features

**A** Look at the HELP box and then use the notes below to write a description of the Sony PlayStation 3 controller.



### Sony PlayStation 3 controller

#### Functions

- control video games
- hold it with both hands, use thumbs to handle directional sticks and face buttons

#### Features

- six-axis sensing system (capable of sensing motion in six directions: up, down, left, right, forwards and backwards)
- wireless controller (Bluetooth)
- USB mini port and cable for wired play and automatic battery charging

### HELP box

#### Describing functions

In the listening, the mouse was described using **for + gerund**:

*This is a device **for controlling** the cursor and selecting items on the screen.*

There are other ways of describing a device's function:

- used + to + infinitive**  
*It's **used to control** ...*
- relative pronoun + verb**  
*This is a device **which controls** ...*
- relative pronoun + used + to + infinitive**  
*This is a device **which/that is used to control** ...*
- work by + gerund**  
*It **works by detecting** light from the computer screen.*

#### Describing features

We can describe features like this:

*An optical mouse **has** an optical sensor instead of a ball underneath.*

*It usually **features** two buttons and a wheel.*

*You **can** connect it to a USB port.*

*A wireless mouse **works/operates** without cables.*

*It **allows** the user **to** answer multiple-choice questions and ...*

**B** In pairs, choose one of these input devices and describe its functions and features. Try to guess which device your partner is describing.



Barcode reader



Touchpad on a portable PC



Webcam



Touch screen

## 4 The keyboard

### A Label the picture of a standard keyboard with the groups of keys (1–5).

- 1 **Cursor control keys** include arrow keys that move the insertion point up, down, right and left, and keys such as *End*, *Home*, *Page Up* and *Page Down*, which are used in word processing to move around a long document.
- 2 **Alphanumeric keys** represent letters and numbers, as arranged on a typewriter.
- 3 **Function keys** appear at the top of the keyboard and can be programmed to do special tasks.
- 4 **Dedicated keys** are used to issue commands or to produce alternative characters, e.g. the *Ctrl* key or the *Alt* key.
- 5 A **numeric keypad** appears to the right of the main keyboard. The *Num Lock* key is used to switch from numbers to editing keys.



A PC-compatible keyboard

### B Match the descriptions (1–8) with the names of the keys (a–h). Then find them on the keyboard.

- 1 A long key at the bottom of the keyboard. Each time it is pressed, it produces a blank space.
- 2 It moves the cursor to the beginning of a new line. It is also used to confirm commands.
- 3 It works in combination with other keys. For example, you press this key and C to copy the selected text.
- 4 It removes the character to the left of the cursor or any selected text.
- 5 It produces UPPER CASE characters.
- 6 It produces UPPER CASE letters, but it does not affect numbers and symbols.
- 7 It moves the cursor horizontally to the right for a fixed number of spaces (in tabulations and data fields).
- 8 They are used to move the cursor, as an alternative to the mouse.

- a arrow keys
- b return/enter
- c Caps Lock
- d shift
- e tab
- f space bar
- g backspace
- h Ctrl

## 5 Mouse actions

Complete this text about the mouse with verbs from the box.

click    double-click    drag    grab    select    move    control

### Mouse actions

A mouse allows you to (1) ..... the cursor and move around the screen very quickly. Making the same movements with the arrow keys on the keyboard would take much longer. As you (2) ..... the mouse on your desk, the pointer on the screen moves in the same direction. The pointer usually looks like an I-bar, an arrow, or a pointing hand, depending on what you are doing.

A mouse has one or more buttons to communicate with the computer. For example, if you want to place the insertion point or choose a menu option, you just (3) ..... (press and release) on the mouse button, and the option is chosen.

The mouse is also used to (4) ..... text and

items on the screen. You can highlight text to be deleted, copied or edited in some way.

The mouse is widely used in graphics and design. When you want to move an image, you position the pointer on the object you want to move, press the mouse button, and (5) ..... the image to a new location on the screen. Similarly, the mouse is used to change the shape of a graphic object. For example, if you want to convert a square into a rectangle, you (6) ..... one corner of the square and stretch it into a rectangle.

The mouse is also used to start a program or open a document: you put the pointer on the file name and (7) ..... on the name – that is, you rapidly press and release the mouse button twice.

GOOD. NOW, BAT THE MOUSE  
OVER THE CAT FOOD DISH ICON  
AND DOUBLE  
CLICK.



[www.CartoonStock.com](http://www.CartoonStock.com)

# 4

# Basic software

Dear Simon,

## Unit

## page

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## Sales presentation

## Learning objectives

### In this module, you will:

- learn about the function of the operating system.
- learn about the features of a graphical user interface, or GUI.
- practise using the correct determiners with countable and uncountable nouns.
- learn how to summarize a written text.
- learn about the basic features and applications of word processors.
- learn how to give and follow instructions.
- study the basic features and applications of spreadsheets and databases.
- practise forming and pronouncing plurals.

## GUI operating systems

- The term **user interface** refers to the standard procedures that the user follows in order to interact with a computer. In the late 1970s and early 80s, the way users accessed computer systems was very complex. They had to memorize and type a lot of commands just to see the contents of a disk, to copy files or to respond to a single prompt. In fact, it was only experts who used computers, so there was no need for a user-friendly interface.
- In 1984, Apple produced the Macintosh, the first computer with a mouse and a **graphical user interface (GUI)**. Macs were designed with one clear aim: to facilitate interaction with the computer. A few years later, Microsoft launched Windows, another operating system based on graphics and intuitive tools. Nowadays, computers are used by all kinds of people, and as a result there is a growing emphasis on accessibility and user-friendly systems.
- A **GUI** makes use of a **WIMP** environment: **windows**, **icons**, **menus** and **pointer**. The background of the screen is called the **desktop**, which contains labelled pictures called **icons**. These icons represent **files** or **folders**. Double-clicking a folder opens a window which contains **programs**, **documents**, or more nested folders. When you are in a folder, you can launch a program or document by double-clicking the icon, or you can drag it to another location. When you run a program, your PC opens a window that lets you work with different tools. All the programs have a high level of consistency, with similar toolbars, menu bars, buttons and dialog boxes. A modern OS also

provides access to networks and allows multitasking, which means you can run several programs – and do various tasks – at the same time.

35 The most popular operating systems are:

- The **Windows** family – designed by Microsoft and used on most PCs. The most recent version is Windows Vista.
- **Mac OS** – created by Apple and used on Macintosh computers.
- **Unix** – a multi-user system, found on mainframes and workstations in corporate installations.
- **Linux** – open-source software developed under the GNU General Public License. This means anybody can copy its source code, change it and distribute it. It is used in computers, appliances and small devices.
- **Windows Mobile** – used on most PDAs and smartphones (PDAs incorporating mobile phones).
- **Palm OS** – used on Palm handheld devices.
- **RIM** – used on BlackBerry communication devices. Developed by Research In Motion.
- The **Symbian OS** – used by some phone makers, including Nokia and Siemens.

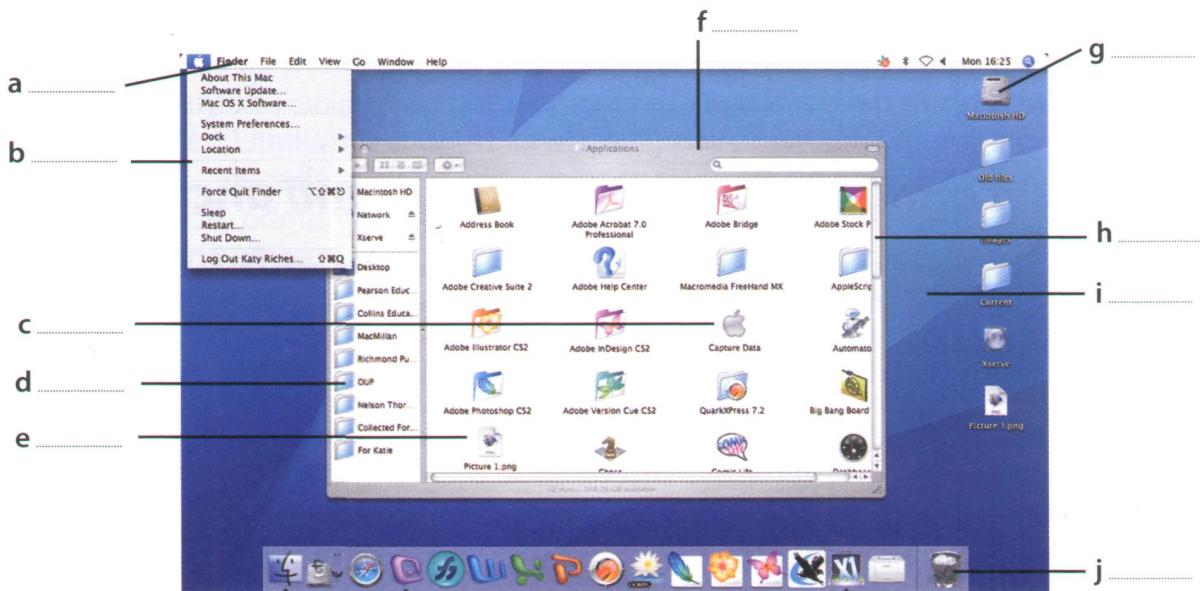
These computer platforms differ in areas such as device installation, network connectivity or compatibility with application software.

### D Translate these terms and expressions into your own language. Use a dictionary or the Internet to help you.

- 1 user interface (line 1) .....
- 2 procedures (line 2) .....
- 3 commands (line 6) .....
- 4 tools (line 16) .....
- 5 desktop (line 21) .....
- 6 nested folders (line 25) .....
- 7 launch a program (line 26) .....
- 8 source code (line 45) .....

**E** Label the interface features (a–j) on the screenshot of Apple's Mac OS X operating system with words in bold from this list.

- **desktop:** the background screen that displays icons and folders
- **window:** a scrollable viewing area on screen; it can contain files or folders
- **icon:** a picture representing an object; for example, a **document, program, folder** or **hard drive icon**
- **folder:** a directory that holds data, programs and other folders
- **menu bar:** a row of words that open up menus when selected
- **drop-down (pull-down) menu:** a list of options that appears below a menu item when selected
- **scroll bar:** a horizontal or vertical bar that is clicked and dragged in the desired direction
- **dock:** set of icons at the bottom of the screen that give you access to the things you use most

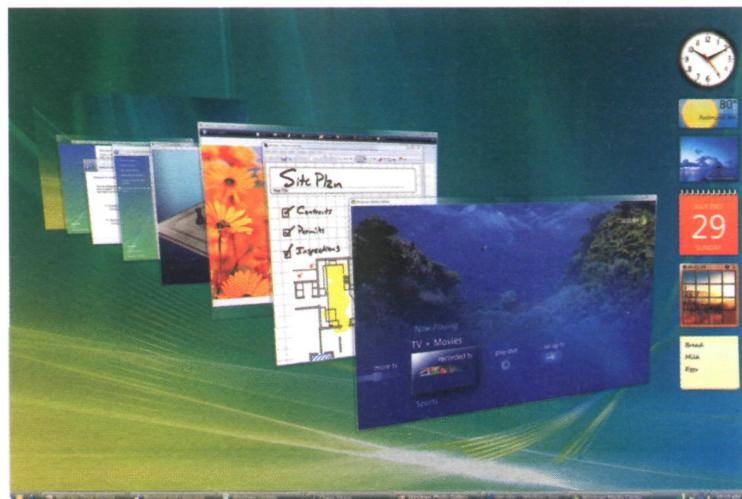


**F** Compare the Mac OS X user interface with a Windows or Linux interface. What are the similarities and differences? Which features do you prefer from each interface?

## 3 Windows Vista

**A** Listen to a podcast interview with Bill Thompson, a program developer, and answer these questions.

- 1 Why is Windows so popular?  
Give two reasons.
- 2 Which Windows Vista edition is aimed at high-end PC users, gamers and multimedia professionals?



Windows Vista



## B Listen again and complete this fact file.

Windows Vista editions	Other features	Internet and security	Windows programs
(1) ..... is designed for users with basic needs, such as email and internet access.	The user interface has been redesigned with new icons and a new (4) .....	Internet Explorer is more reliable and secure. The Security Centre includes an (6) ..... program called Windows Defender, and a firewall that protects your computer from (7) .....	The most popular is still (8) ..... , a suite that includes the (9) ..... , Word; an email program; the Excel spreadsheet program; and the (10) ..... program, PowerPoint.
Home Premium is for advanced home computing and (2) .....	It offers support for the latest technologies, from DVD creation to (5) .....		
The Business edition is ideal for (3) .....			
The Ultimate edition is the most complete.			

## 4 Language work: countable and uncountable nouns

A Look at the HELP box and decide if these nouns from the fact file in 3B are countable, uncountable or either, depending on the context. Write C, U, or C and U.

user .....	email .....	computing .....
edition .....	entertainment .....	interface .....
icon .....	technology .....	security .....
		spyware .....

### HELP box

#### Countable and uncountable nouns

- Countable nouns are people or things that we can count. They have a singular and a plural form (e.g. **file**, **program**, **system**, **application**).
- Uncountable nouns are things that we can't count. They have no plural form (e.g. **software**, **music**, **robotics**, **multimedia**, **networking**, **storage**).

*A lot of **software** these days is open-source.*

**Not:** *A lot of **softwares** these days **are** open-source.*

- Some words are countable in many languages but uncountable in English, and are used with a singular verb (e.g. **advice**, **damage**, **equipment**, **furniture**, **research**, **news**, **progress**, **homework**).

*The **advice** he gave me **was** very useful.*

- Countable nouns must have a determiner (**a**, **the**, **my**, **this**, etc.) in the singular, although this is not necessary in the plural.

*I deleted **the file** yesterday.*

*I lost more than 300 **files** when my computer crashed.*

We use **a** before a consonant sound and **an** before a vowel. The definite article **the** means you know which one/ones I mean.

**An icon** is a small graphic.

**The icons** on the toolbar are used to ...

- We don't use **a/an** with uncountable nouns.
- Not:** *a robotics*
- We don't use **the** in generalizations with uncountable nouns or plural countable nouns.
- I like **music**.*
- Not:** *I like **the music**.*
- Computer programs** are expensive.
- Not:** *The computer programs* are expensive.
- Countable and uncountable nouns take different determiners.

**Many, few, a few** only go with countable nouns.

*There are **many versions** of Windows Vista.*

**Much, little, a little, a great deal of** only go with uncountable nouns.

*I have **a little time** free this afternoon if you want to meet.*

**B Complete this text with *a*, *an*, *the* or nothing.**

Linux is (1) ..... operating system and it was initially created as (2) ..... hobby by a young student, Linus Torvalds, at the University of Helsinki in Finland. Version 1.0 of the Linux Kernel\* was released in 1994. (3) ..... Kernel, at the heart of all Linux systems, is developed and released under GNU General Public License, and its source code is freely available to everyone.

Apart from the fact that it's freely distributed, (4) ..... Linux's functionality, adaptability and robustness has made it the main alternative for proprietary Unix and Microsoft operating systems. IBM, Hewlett-Packard and other giants of the computing world have embraced Linux and support its ongoing development. More than (5) ..... decade after its initial release, Linux is being adopted worldwide, primarily as (6) ..... server platform. Its use as a home and office desktop operating system is also on the rise. The operating system can also be incorporated directly into (7) ..... microchips in a process called (8) ..... embedding, and it is increasingly being used this way in appliances and devices.

\*The Kernel provides a way for software and other parts of the OS to communicate with hardware.

## 5 Writing a summary



**Summarize the text on page 64 in 90–100 words. Follow these steps:**

- 1 Read the text again.
- 2 Underline the relevant information in each paragraph.
- 3 Make notes about the main points. Leave out details such as examples.
- 4 Make sentences from the notes and link the sentences with connectors (*and*, *but*, *because*, *therefore*, etc.).
- 5 Write your first draft.
- 6 Improve your first draft by reducing sentences. For example:
  - Cut out unnecessary phrases  
*Macs were designed with one clear aim: to facilitate interaction with the computer.*
  - Omit qualifying words (adjectives or modifying adverbs)  
*very complex*
  - Transform relative clauses into -ing participle clauses  
*Double-clicking a folder opens a window which contains programs, documents or ...*  
*Double-clicking a folder opens a window containing programs, documents or ...*
- 7 Write the final version of your summary. Don't forget to check the spelling and grammar.

# Spreadsheets and databases

## 1 Spreadsheet programs

### A In pairs, discuss these questions.

- 1 What is a spreadsheet?
- 2 What are spreadsheets used for?

### B Look at the worksheet and label a, b and c with column, row and cell.

Then answer these questions.

- 1 What types of data can be keyed into a cell?
- 2 What happens if you change the value of a cell?

c

This worksheet shows the income and expenses of a company. Amounts are given in \$millions.

The terms **worksheet** and **spreadsheet** are often used interchangeably. However, technically, a **worksheet** is a collection of cells grouped on a single layer of the file. A **spreadsheet** refers to both the computer program that displays data in rows and columns, and to the table which displays numbers in rows and columns.

	F4				
	A	B	C	D	E
1		2007	2008		
2 Sales		890	982		
3 Stocks/Shares		487	760		
4 Interest		182	324		
5 Total Revenue	1559	2066			
6					
7 Payroll		894	904		
8 Publicity		399	451		
9 Services		438	372		
10 Total Expenses	1731	1727			
11					
12 TOTAL	-172	339			
13					
Ready					

### C Listen to Lucy Boyd giving a training course on basic Excel and check your answers to A and B.

### D Listen again and decide whether these sentences are true or false. Correct the false ones.

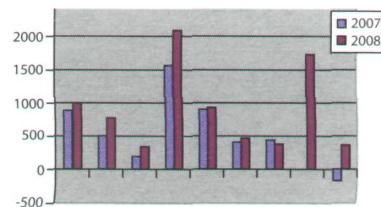
- 1 A spreadsheet displays information in the form of a table with a lot of columns and rows.
- 2 In a spreadsheet you can only enter numbers and formulae.
- 3 You cannot change the width of columns.
- 4 Spreadsheet programs can generate a variety of charts and graphs.
- 5 Spreadsheets cannot be used as databases.

### E Look at the worksheet above and decide whether these sentences are true or false. Correct the false ones.

- 1 The value of the cell C12 is the result of applying the formula C5-C10.
- 2 The value of cell B5 is the result of adding the value in cells B2 and B3.
- 3 If you type the value 800 in C3, the value in cells C5 and C12 will be recalculated.

### F In pairs, discuss the advantages and disadvantages of showing the information above as a graph, rather than as a worksheet.

Graphic representation of the worksheet above



## 2 An invoice, a business letter and a fax

**A Spreadsheets are also used to generate invoices. Complete the invoice below with words from the box. If you have a spreadsheet program, try to produce a similar invoice.**

Quantity	Description	Price	VAT (value added tax)	Product	Grand total	Company
----------	-------------	-------	-----------------------	---------	-------------	---------

Name:	Ruth Atkinson	(1) .....	Media Market			
Address:	38 High Street, Galway		Fax: 1 662 2367			
Telephone:	5 742 9165					
Date:	16 May 2008					
(2) .....	(3) .....	(4) .....	(5) .....			
<b>Ulysses Classic</b>	2GB of RAM, 1TB HD	4	850€	3,400€		
<b>Flat LCD screen</b>	Colour 19"	4	170€	680€		
<b>Portable Ulysses</b>	2GB of RAM, 250GB HD	2	975€	1,950€		
<b>D5 database</b>	DBMS, relational database	1	245€	245€		
<b>Antidote JP</b>	Anti-virus, anti-spyware	6	60€	360€		
<b>Laser printer CQ</b>	2,400 dpi, PostScript	1	230€	230€		
			<b>Sub-total</b>	<b>6,865€</b>		
			(6) .....	(21%)	<b>1,441€</b>	
			(7) .....		<b>8,306€</b>	

**B Look at this letter which accompanies the invoice. Complete the letter with phrases from the box.**

Yours sincerely	I am writing to	Dear Ms Atkinson	We would be grateful if you could
		I am enclosing	Please contact us

16 May 2008

Ruth Atkinson  
38 High Street  
Galway

(1) .....,  
(2) ..... confirm that we have sent you four desktop PCs plus screens, two laptops and a laser printer, along with a D5 database, and an anti-virus program for each of the computers. Please allow two weeks for delivery.

(3) ..... two copies of your invoice.  
(4) ..... make your payment by cheque or directly to our bank account through the Internet.

We are also delighted to inform you that we are offering our clients an online course called *A paperless office*, free of charge. (5) ..... if you require any further information.

(6) .....

Ian Pegg



**C** Imagine you are Ruth Atkinson. When you try to use the laser printer, it gives continuous error messages. You are also having problems installing the database. Write a fax to Media Market to complain. Ask for a new printer and an upgraded version of the database. Look at the *Useful language* box to help you.

### FAX MESSAGE

To: Media Market  
 Fax: 1 662 2367  
 From: Ruth Atkinson  
 Subject: Faulty products  
 Dear Mr Pegg,

---



---



---

Number of pages: 1

Please call if you experience any transmission problems.

### Useful language

I am writing to complain about ...    ... doesn't work    I am unable to ...

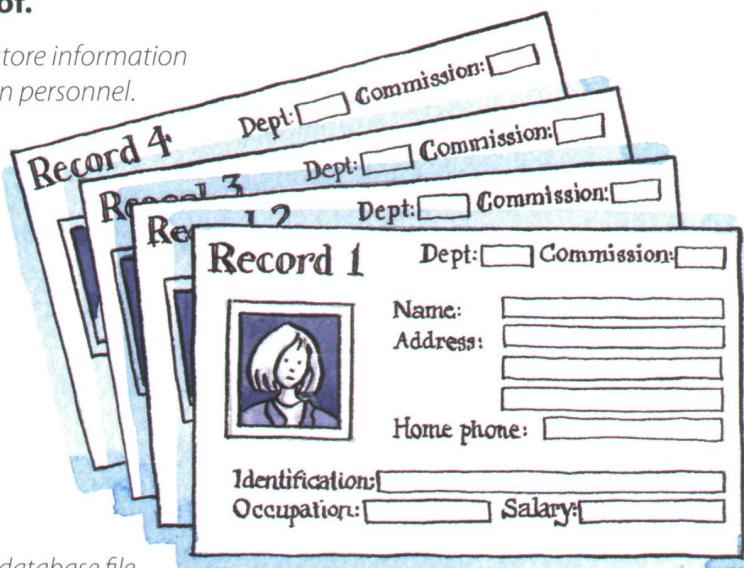
## 3 Databases

**A** In groups, make a list of as many possible applications for databases as you can think of.

Example: Companies use databases to store information about customers, suppliers and their own personnel.

**B** Look at the illustration, which represents a database file. Can you identify a record and a field?

**C** Read the text on page 76 and check your answers to B.



A representation of a database file

## Databases

A **database** is a collection of related data, and the software used in databases to store, organize and retrieve the data is called the **database management system**, or **DBMS**. However, we often use the word *database* to cover both meanings. A database can manage any type of data, including text, numbers, images, sound, video and hyperlinks (links to websites).

Information is entered into the database via **fields**. Each field holds a separate piece of information, and the fields are grouped together in **records**. Therefore, a record about an employee might consist of several fields which give their name, address, phone number, date of birth, salary and length of employment with the company.

Records are grouped together into **files** which hold large amounts of information. Files can easily be **updated** – you can always change fields, add new records or delete old ones. An electronic database is much faster to consult and update than a card index system and occupies a lot less space. With the right software, you can keep track of stock, sales, market trends, orders and other information that can help your company stay successful.

A database program lets you create an **index** – a list of records ordered according to the content of certain fields. This helps you to **search** the database and **sort**

records into numerical or alphabetical order very quickly. Modern databases are **relational** – that is, they are made up of related files: customers and orders, vendors and purchases, students and tutors, etc. Two database files can be related as long as they have a common field. A file of students, for example, could include a field called *Tutor ID* and another file with details of the tutors could include the same field. This key field can be used to relate the two files. Databases like Oracle, DB2 and MySQL can manage these relationships.

A database **query** function allows you to extract information according to certain conditions or criteria. For example, if a managing director wanted to know all the customers that spend more than €8,000 per month, the program would search on the name field and the money field simultaneously.

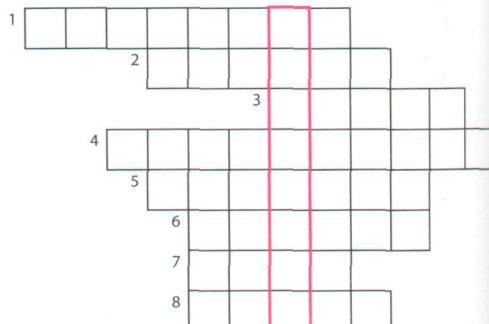
The best database packages also include **network** facilities, which can make businesses more productive. For example, managers of different departments can have direct access to a common database. Most aspects of the program can be protected by user-defined passwords and other **security devices**. For example, if you wanted to share an employee's personal details but not their commission, you could protect the commission field.

### D Complete these statements about databases using information from the text.

- 1 A database management system is used to .....
- 2 Information is entered into a database via .....
- 3 Each field holds .....
- 4 Updating a file means .....
- 5 Some advantages of a database program over a manual filing system are: .....
- 6 Access to a common database over a network can be protected by using .....

### E Solve the clues and complete the puzzle.

- 1 A collection of data stored in a PC in a systematic way.
- 2 A unit of a database file made up of related fields.
- 3 A single piece of information in a record.
- 4 A ..... database maintains separate, related files, but combines data elements from the files for queries and reports.
- 5 Some companies have several computers sharing a database over a .....
- 6 To look for specific information, for example the name of an employee.
- 7 To classify records into numerical or alphabetical order.
- 8 A tool that allows you to extract information that meets certain criteria.



### F In pairs, discuss what fields you would include in a database for your music collection.

## 4 Language work: plurals

**A** Look at the HELP box and then write the plural of these words.

- |                     |                |
|---------------------|----------------|
| 1 client .....      | 5 fax .....    |
| 2 key .....         | 6 salary ..... |
| 3 query .....       | 7 mouse .....  |
| 4 businessman ..... | 8 virus .....  |

### HELP box

#### Plurals

- In most cases, we form the plural in English by adding **-s**.  
*record* → *records*
- If a word ends in **-s**, **-sh**, **-x** or **-ch**, we add **-es**.  
*address* → *addresses*  
*index* → *indexes*
- If a word ends in a consonant + **y**, the **y** becomes **i** and we add **-es**.  
*company* → *companies*  
*facility* → *facilities*
- However, if the **y** follows a vowel, we add only **-s**.  
*birthday* → *birthdays*

- There are several irregular plural forms:

*man/woman* → **men/women**  
*child* → **children**  
*analysis* → **analyses**  
*formula* → **formulae** (or **formulas**)  
*criterion* → **criteria**  
*mouse* → **mice**

- The **-s** is pronounced as:

/s/ after one of these sounds: /p/, /t/, /k/, /f/ or /θ/ (e.g. *amounts*, *hyperlinks*)  
/ɪz/ after one of these sounds: /s/, /z/, /ʃ/, /tʃ/ or /dʒ/ (e.g. *businesses*, *devices*, *images*)  
/z/ in most other cases (e.g. *files*, *fields*, *customers*, *columns*)

**B** Put the plurals into the correct pronunciation column.

databases	passwords
laptops	graphs
orders	switches
taxes	networks
tables	packages
spreadsheets	systems

/s/	/ɪz/	/z/

## 5 Software at home and at work



In pairs, find out as much as you can about the software your partner uses at home or at work. Ask about spreadsheet programs, databases, word processors, videoconferencing, business accounting, email, and web browsers. Look at the **Useful language** box to help you.



Now visit [www.cambridge.org/elt/ict](http://www.cambridge.org/elt/ict) for an online task.

### Useful language

What kind of spreadsheet program do you use?

What do you use it for?

Do you use it at home or at work?

What's your favourite ...?

What features do you like most about it?

How do you ...?

## 1 Internet basics

- A**  In pairs, discuss how you would define *the Internet*.
  - B**  Make a list of all the things you can use the Internet for.
  - C**  Listen to a conversation between a customer buying a PC and a sales assistant. Why do you think the sales assistant has to explain so much about the Internet?
  - D**  Listen again and complete the customer's notes.

To connect to the Internet from home, I need:

(1) a ..... and (2) a .....

Also need an account with an (3) (a company that offers connection for a monthly fee).

If you want to connect lots of computers without using cables, you can use a (4) ..... router.

Wi-Fi uses (5) waves to send data over medium-range distances.

## *Things you can do on the Internet:*

'Web' or 'Internet'? The Web: huge collection of (7) stored on computers all over the world. The Internet: the network which

## **2** *Internet FAQs*

- A** Read Part 1 of the Internet FAQs on page 80 and choose the correct answers.

  - 1 The Internet was
    - a invented in the mid-90s.
    - b popular in the 1960s.
    - c probably created in the USA.
  - 2 Which term describes any fast, high-bandwidth connection?
    - a broadband
    - b dial-up connection
    - c Wi-Fi connection
  - 3 The power-line Internet provides broadband access through
    - a telephone lines.
    - b satellites.
    - c electrical power lines.
  - 4 Which device converts computer data into a form that can be transmitted over phone lines?
    - a ADSL
    - b a mobile phone
    - c a modem
  - 5 The standard protocol that allows computers to communicate over the Internet is called
    - a an IP address.
    - b TCP/IP.
    - c HTTP.
  - 6 The geographical region covered by one or several access points is called a
    - a wireless access point.
    - b hotspot.
    - c wireless network device.

## Internet FAQs: Part 1

### How old is the Internet (the Net)? When was it created?

It's hard to say exactly. The research that led to what we now know as the Internet was begun in the 1960s.

### Who created the Internet?

Again, it's hard to say exactly who created it. The initial research was carried out by the Advanced Research Projects Agency in America, funded by the US government.

### Did the Internet become popular quickly?

It took many years for the Internet to become popular around the world. It's only really since the mid-90s that the Internet has been a part of our daily lives.

### How do you get online?

To get connected, you need a computer, the right connection software and a modem connected to the phone line. You also need an account with an Internet Service Provider (ISP), which acts as a gateway between your PC and the rest of the Net.

### How fast are today's internet connections?

Today, ISPs offer a broadband, high-speed connection. The most common types are cable – offered by local cable TV companies – and ADSL (Asymmetric Digital Subscriber Line), which works through phone lines. They are both faster than the traditional dial-up telephone connection. Broadband access is also offered by some electricity networks. This competing technology, known as power-line Internet, provides low-cost access via the power plug, but is still in development.

### How long has broadband existed?

Since the late 1990s.

### How much does broadband access cost?

It depends on which company you choose. Nowadays, some companies even offer free broadband.

### Why do you need a modem?

A modem (**m**odulator/**d**emodulator) converts digital signals into analogue signals so that data can be transmitted across the phone or cable network.

### What does TCP/IP mean?

The language used for data transfer on the Internet is known as TCP/IP (transmission control protocol/Internet protocol). This is like the internet operating system. Every computer connected to the Net is identified by a unique IP address.

### Are there other ways of accessing the Internet?

Other methods of internet access include Wi-Fi, satellite, mobile phones and TV sets equipped with a modem. Wi-Fi-enabled laptops or PDAs allow you to connect to the Net if you are near a wireless access point, in locations called hotspots (for example, a Wi-Fi café, park or campus). Satellite services are used in places where terrestrial access is not available (for example, on ships at sea). High-end mobile phones provide access through the phone network.



**B** In pairs, discuss which of the internet systems (1–6) you would use to do the tasks (a–f). Then read Part 2 of the FAQs on page 81 and check your answers.

- |               |  |
|---------------|--|
| 1 Email       | a transfer files from the Internet to your hard drive                            |
| 2 The Web     | b send a message to another person via the Internet                              |
| 3 Newsgroups  | c have a live conversation (usually typed) online                                |
| 4 Chat and IM | d connect to a remote computer by entering instructions, and run a program on it |
| 5 FTP         | e take part in public discussion areas devoted to specific topics                |
| 6 Telnet      | f download and view documents published on the Internet                          |

## Internet FAQs: Part 2

## Email

Email lets you exchange messages with people all over the world. Optional attached files can include text, pictures and even audio and animation. A mailing list uses email to communicate messages to all its subscribers – that is, everyone that belongs to the list.

## **Which email program is the best?**

Outlook Express is a popular program, but many users use web-based email accounts such as Hotmail.

## The Web

The Web consists of billions of documents living on web servers that use the HTTP protocol. You navigate through the Web using a program called a web browser, which lets you search, view and print web pages.

### **How often are web pages updated?**

It depends entirely on the page. Some are updated thousands of times a day.

## **Chat and Instant Messaging (IM)**

Chat and Instant Messaging technologies allow you to have real-time conversations online, by typing messages at the keyboard.

FTP

FTP, or file transfer protocol, is used to transfer files over a TCP/IP network. Nowadays, this feature is built into Web browsers. You can download programs, games and music files from a remote computer to your hard drive.

## Telnet

Telnet is a protocol and a program used to log onto remote computer systems. It enables you to enter commands that will be executed as if you were entering them directly on the remote server.

## Newsgroups

Newsgroups are the public discussion areas which make up a system called *Usenet*. The contents are contributed by people who post articles or respond to articles, creating chains of related postings called message threads. You need a newsreader to subscribe to newsgroups and to read and post messages. The newsreader may be a stand-alone program or part of a web browser.

*How many newsgroups are there?*

There are approximately 30,000 active newsgroups.

*Where can you find newsgroups?*

Your newsreader may allow you to download the newsgroup addresses that your ISP has included on its news server. An alternative to using a newsreader is to visit web forums instead, which perform the same function but without the additional software.

**C** Find words and phrases in Part 2 with the following meanings.

- 1 a system used to distribute email to many different subscribers at once (in Email paragraph)
  - 2 a program used for displaying web pages (in The Web paragraph)
  - 3 to connect to a computer by typing your username and password (in Telnet paragraph)
  - 4 a series of interrelated messages on a given topic (in Newsgroups paragraph)
  - 5 a program for reading Usenet newsgroups (in Newsgroups paragraph)

### 3 Language work: questions

A Look at the HELP box and then make a question about Sue Clarke for each of her answers.

1

I'm 23 years old.

2

I'm an online researcher.

3

I use the Internet to find information requested by clients.

4

I've been doing this job for six months.

5

I graduated from university in 2006.



Sue Clarke

#### HELP box

##### Questions

- In questions, we normally place the auxiliary verb before the subject.  
**Are** there other ways of accessing the Internet?
- If there is no other auxiliary, we use **do/does** (present simple) or **did** (past simple).  
**Did** the Internet become popular quickly?
- There are many question words in English which we use to find out more information than just yes or no.  
People  
**Who** created the Internet?  
Things  
**What** does TCP/IP mean?  
**Which** email program is the best?

##### Place

**Where** can you find newsgroups?

##### Time

**When** was it created?

**How often** are web pages updated?

**How long** has broadband existed?

##### Reason

**Why** do you need a modem?

##### Quantity

**How much** does broadband access cost?

**How many** newsgroups are there?

##### Manner

**How** do you get online?

##### Others

**How fast** are today's internet connections?

**How old** is the Internet?

B In pairs, make questions using these prompts. Then practise asking and answering the questions.

Example: When / first / use the Internet      *When did you first use the Internet?*

- 1 What type of internet connection / have at home?
- 2 How fast / your internet connection?
- 3 How much / pay for broadband access?
- 4 How often / access the Internet?
- 5 Which email program / use?
- 6 Who / send email to?
- 7 Do / use your mobile phone to access the Internet?
- 8 Do / use the Internet in public spaces using Wi-Fi?
- 9 Do / play games online?
- 10 How many newsgroups / subscribe to?

## 4 Email features

### A Read the text and find the following.

- 1 the place where your ISP stores your emails
- 2 the type of program used to read and send email from a computer
- 3 the part of an email address that identifies the user of the service
- 4 the line that describes the content of an email
- 5 the computer file which is sent along with an email message
- 6 facial symbols used to indicate an emotion or attitude
- 7 the name given to junk mail

### B Write a reply to Celia's email below.

## Email features

When you set up an account with an Internet Service Provider, you are given an **email address** and a **password**. The mail you receive is stored on the **mail server** of your ISP – in a simulated mailbox – until you next connect and download it to your hard drive.

There are two ways to get email over the Internet. One is by using a **mail program** (known as an **email client**) installed on your computer, for example Eudora or Outlook Express. The other way is to use **web-based email**, accessible from any web browser. Hotmail and Gmail are good examples.

You can make the message more expressive by including **emoticons**, also called **smileys**. For example, ;-) for wink, :-D for happy, :-o for surprised, :-D for laughing, etc. You may also like to add a **signature file**, a pre-written text file appended to the end of the message. The name given to unsolicited email messages is **spam**.

### The anatomy of an email

#### The header

**To:** name and address of the recipient

**From:** name and address of the sender

**Cc:** carbon copy sent to another person

**Bcc:** blind carbon copy

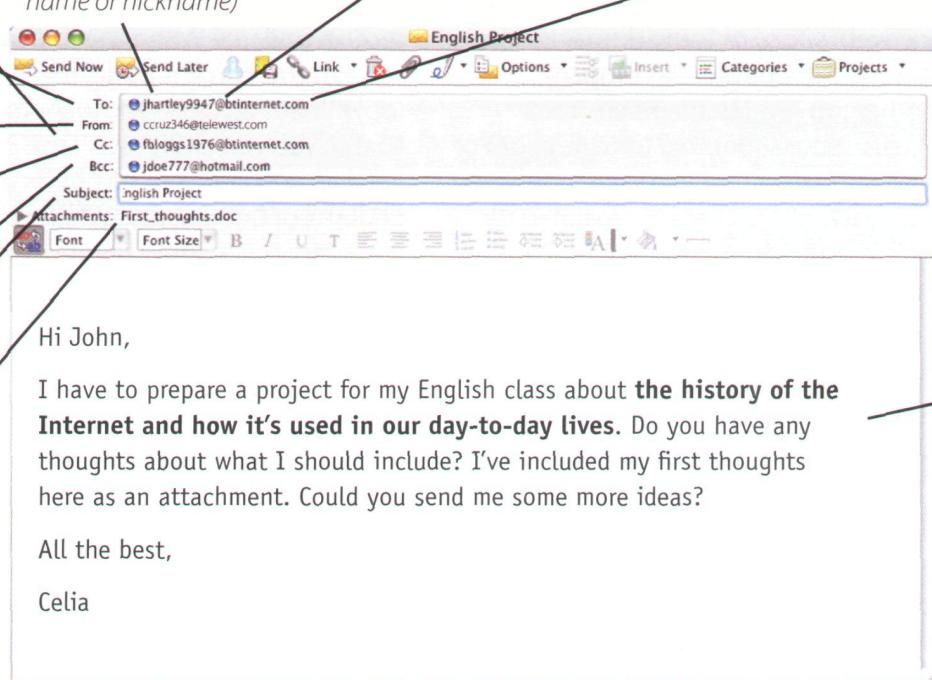
**Subject:** topic of the message

**Attachment:** files added to the message

#### The username (a person's name or nickname)

The @ sign, which means at

The **domain name** or **network address** – that is, the mail server where the account is located. The final part adds information about it, for example **com** = company, **uk** = United Kingdom, **fr** = France, etc.



The **body** contains the message itself

# Unit 17 The Web

You can log on to many networks, each based around a company, region, high school, or other organization.

- \* Share information with people you know.
- \* See what's going on with your friends.
- \* Look up people around you.

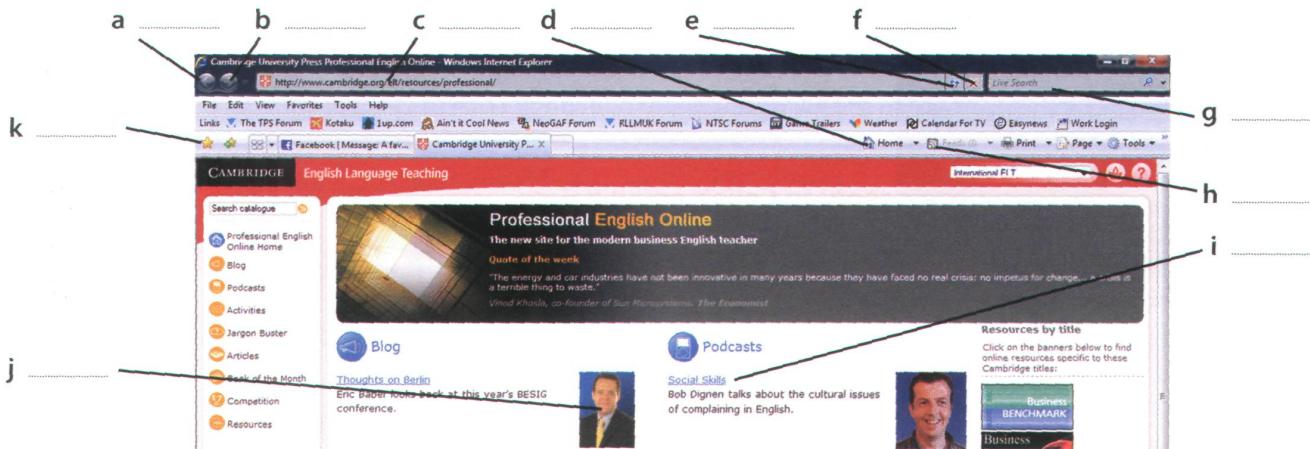
▶ Register  
Everyone can join.

▶ Take the Tour  
Learn about Facebook.

▶ Who's on  
Find friends.

## 1 A typical web page

**A** Look at the screenshot of a typical web page. How many of the features (a–k) can you say in English?



A screenshot from Internet Explorer 7, a leading web browser.

**B** Read the text and label the features on the screenshot with the terms in bold.

### A typical web page

At the top of the page is the **URL address**. URL means **Uniform Resource Locator** – the address of a file on the Internet. A typical URL looks like this:  
<http://www.bbc.co.uk/radio/>.

In this URL, *http://* means **Hypertext Transfer Protocol** and tells the program to look for a web page. *www* means **world wide web**. *bbc.co.uk* is the domain name of the server that hosts the website – a company based in the UK; other top-level domains are *.com* (commercial site), *.edu* (education), *.org* (organization) or *.net* (network); *radio* is the directory path where the web page is located. The parts of the URL are separated by *.* (dot), */* (slash) and *:* (colon). Some sites begin *ftp://*, a **file transfer protocol** used to copy files from one computer to another.

The toolbar shows all the navigation icons, which let you **go back one page** or **go forward one page**. You can

also **go to the home page** or **stop the current transfer** when the circuits are busy.

Tab buttons let you view different sites at the same time, and the built-in **search box** helps you look for information. If the **feed button** lights up, it means the site offers RSS feeds, so you can automatically receive updates. When a web page won't load, you can **refresh the current page**, meaning the page reloads (downloads again). If you want to mark a website address so that you can easily revisit the page at a later time, you can add it to your **favourites** (*favorites* in American English), or bookmark it. When you want to visit it again you simply click **show favourites**.

On the web page itself, most sites feature **clickable image links** and **clickable hypertext links**. Together, these are known as *hyperlinks* and take you to other web pages when clicked.

**C**



Listen to three internet addresses and write them down.

- 1 .....
- 2 .....
- 3 .....

## 2 The collectives of cyberspace

### A Read the article and find websites for the following tasks.

- 1 to search for information on the Web
- 2 to buy books and DVDs
- 3 to participate in political campaigns
- 4 to view and exchange video clips
- 5 to manage and share personal photos using tags
- 6 to buy and sell personal items in online auctions
- 7 to download music and movies, sometimes illegally

### Tour the Collectives of Cyberspace

The Internet isn't just about email or the Web anymore. Increasingly, people online are taking the power of the Internet back into their own hands. They're posting opinions on online journals – weblogs, or blogs; they're organizing political rallies on **MoveOn.org**; they're trading songs on illegal file-sharing networks; they're volunteering articles for the online encyclopedia **Wikipedia**; and they're collaborating with other programmers around the world. It's the emergence of the 'Power of Us'. Thanks to new technologies such as blog software, peer-to-peer networks, open-source software, and wikis, people are getting together to take collective action like never before.



**eBay**, for instance, wouldn't exist without the 61 million active members who list, sell, and buy millions of items a week. But less obvious is that the whole marketplace runs on the trust created by eBay's unique feedback system, by which buyers and sellers rate each other on how well they carried out their half of each transaction. Pioneer e-tailer **Amazon** encourages all kinds of customer participation in the site – including the ability to sell items alongside its own books, CDs,

DVDs and electronic goods. **MySpace** and **Facebook** are the latest phenomena in social networking, attracting millions of unique visitors a month. Many are music fans, who can blog, email friends, upload photos, and generally socialize. There's even a 3-D virtual world entirely built and owned by its residents, called **Second Life**, where real companies have opened shops, and pop stars such as U2 have performed concerts.

Some sites are much more specialized, such as the photo-sharing site **Flickr**. There, people not only share photos but also take the time to attach *tags* to their pictures, which help everyone else find photos of, for example, Florence, Italy. Another successful example of a site based on user-generated content is **YouTube**, which allows users to upload, view and share movie clips and music videos, as well as amateur videoblogs. Another example of the collective power of the Internet is the **Google** search engine. Its mathematical formulas surf the combined judgements of millions of people whose websites link to other sites. When you type *Justin Timberlake* into Google's search box and go to the star's official website, the site is listed first because more people are telling you it's the most relevant Justin Timberlake site – which it probably is.

**Skype** on the surface looks like software that lets you make free phone calls over the Internet – which it does. But the way it works is extremely clever. By using Skype, you're automatically contributing some of your PC's computing power and Internet connection to route other people's calls. It's an extension of the peer-to-peer network software such as **BitTorrent** that allow you to swap songs – at your own risk if those songs are under copyright. BitTorrent is a protocol for transferring music, films, games and podcasts. A podcast is an audio recording posted online. Podcasting derives from the words *iPod* and *broadcasting*. You can find podcasts about almost any topic – sports, music, politics, etc. They are distributed through RSS (Really Simple Syndication) feeds which allow you to receive up-to-date information without having to check the site for updates. BitTorrent breaks the files into small pieces, known as chunks, and distributes them among a large number of users; when you download a torrent, you are also uploading it to another user.

Adapted from BusinessWeek online

**B** Read the article again and match the sentence beginnings (1–5) with the correct endings (a–e).

- 1 A weblog , or blog, is an electronic journal
  - 2 A peer-to-peer system allows
  - 3 You can use a search engine to find
  - 4 BitTorrent is a peer-to-peer protocol used
  - 5 RSS keeps you constantly informed
- a web pages on a particular subject.
  - b for downloading files over the Internet.
  - c users to share files on their computers.
  - d about fresh, new content on your favourite websites.
  - e that displays in chronological order the postings of one or more people.

**C** Find words in the article with the following meanings.

- 1 open-source, editable web pages (lines 5–10) .....
- 2 the same as *electronic retailer*, or online store (lines 10–15) .....
- 3 a blog that includes video (lines 25–30) .....
- 4 a program that allows you to make voice and video calls from a computer (lines 30–35) .....
- 5 an audio broadcast distributed over the Internet (lines 35–40) .....

**D**  Write a short article (80–120 words) for your school/university/work newsletter about the latest internet phenomena (MySpace, eBay, etc.). Talk about any other sites you think are important or will be important in the future.

## 3 Language work: collocations 2

**A** Look at the HELP box on page 87 and then match the words on the left (1–6) with the words on the right (a–f) to make collocations. There may be more than one possible answer.

- |            |                |
|------------|----------------|
| 1 online   | a friends      |
| 2 take     | b photos       |
| 3 email    | c action       |
| 4 upload   | d website      |
| 5 portable | e encyclopedia |
| 6 official | f player       |

**B** In pairs, make sentences using the collocations above.

**C** Find the collocations in these sentences and say what type they are.

- 1 Once you are online , you can browse the Web, visit chat rooms or send and receive emails.
- 2 Instant messaging can be a great way to communicate with friends.
- 3 This software may not be fully compatible with older operating systems.
- 4 Most webcams plug into a USB port.
- 5 This highly addictive game will keep you playing for hours.
- 6 Companies are starting to use virtual reality on their websites.

**HELP box****Collocations 2**

A collocation is a pair or group of words that are often used together. For example, we say ***make phone calls***, not ***do phone calls***.

Here are some common types of collocation:

- verb + noun (see Unit 1)

**surf the Web**   **download music**

- verb + particle

**hack into** a computer   **log onto** a bank account

- adverb + adjective

**highly sensitive** information  
**freely available** on the Web

- adjective + noun

**mathematical formulas**   **up-to-date information**

The word **online** often collocates with other words and can function as adjective or adverb.

Adjective: *They post opinions on online journals.*

Adverb: *A podcast is an audio recording posted online.*

## 4 E-commerce and online banking

**A**  Listen to two extracts from a monthly podcast called **Money Matters**. What is each speaker talking about?

Speaker 1

Speaker 2

**B**  Listen again and make notes under these headings.

Speaker 1	Speaker 2
Things people buy online	Things you can do with online banking
Steps for buying online	Biggest issue with online banking
Precautions	Precautions

**C** Complete the extracts with words from the box

authorization   fake   internet auction   shopping cart   browse   log in   steal

- Occasionally I also buy things on ..... sites such as eBay, where people offer and sell things to the highest bidder.
- First you enter a site dedicated to e-commerce and ..... their products.
- Then you put the items you want to buy into a virtual ..... – a program that lets you select the products and buy with a credit card.
- You may have to ..... with a username and a password ...
- ... for some transactions, you will be required to use a TAN, a transaction ..... number.
- Be aware of *phishing* – you may receive ..... emails claiming to be from your bank and asking for personal information or account details in an attempt to ..... your identity.

**D**  Listen again and check your answers.

## 5 Language work: the prefixes e- and cyber-

Look at the HELP box and then complete these sentences.

- 1 A ..... is an employee who uses his company's internet connection during work hours to chat with friends, play games, etc.
- 2 An ..... is a postcard sent via the Internet.
- 3 An ..... is a small magazine or newsletter published online.
- 4 In a ..... you can use computers with internet access for a fee.
- 5 Examples of ..... include internet fraud, digital piracy, theft of confidential information, etc.
- 6 In the future, all elections will be carried out using .....
- 7 You can now sign legal documents online using an .....
- 8 ..... will revolutionise the way we take exams.
- 9 ..... can be used on some websites instead of real money to make purchases. It reduces the risk of fraud.
- 10 An ..... is like the paper version, but in digital form.

### HELP box

#### The prefixes e- and cyber-

- The **e-** prefix means *electronic*, and we add it to activities that take place on computers or online, for example **e-business/e-commerce** – business conducted over the Internet. Other examples include: **e-card, e-learning, e-zine, e-voting, e-signature, e-assessment, e-cash, e-book** and **e-pal**.

There are often spelling variations, with or without a hyphen, so always check your dictionary.

- The **cyber-** prefix comes from *cybernetics*, and we use it to describe things related to computer networks, for example **cybercafé** – an internet café. Other examples include: **cybercrime, cyberculture, cyberslacker** and **cyberspace**.

## 6 What do you use the Web for?



In pairs, discuss these questions. Give reasons for your answers.

- 1 What is your favourite search engine to find information on the Web? Why?
- 2 Do you download music or video clips from the Web? Do you pay for them?
- 3 Do you buy things online? Is it better to buy online or go to a shop?
- 4 Have you ever listened to the radio or watched TV online?
- 5 Do you use the Web to do school/university assignments or projects? How?



## Unit 19

# Internet security

Facebook is made up of many networks, each based around a company, region, high school or group of people around you.  
You can use Facebook to:

- Share information with people you know.
- See what's going on with your friends.
- Look up people around you.

Take the Tour  
Learn about Facebook.

Who's on Face  
Find friends before you join.

## 1 On alert

### A In pairs, discuss these questions.

- 1 What is a hacker?
- 2 How easy do you think it is to infiltrate the Internet and steal sensitive information?
- 3 How can you protect your computer from viruses and spyware?

### B Match the captions (1–4) with the pictures (a–d).

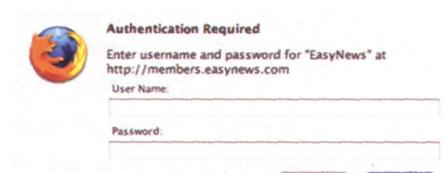
- 1 A secure website can be recognized in two ways: the address bar shows the letters *https* and a closed padlock or key is displayed at the bottom of the screen.
- 2 You have to type your username and password to access a locked computer system.
- 3 This program displays a message when it detects spyware and other unwanted software that may compromise your privacy or damage your computer.
- 4 Private networks use a software and/or hardware mechanism called a firewall to block unauthorized traffic from the Internet.



a



b



c

d



## 2 Security and privacy on the Internet

### A Read the text quickly and see how many of your ideas from 1A Question 3 are mentioned.

### B Read the text more carefully and answer these questions.

- 1 Why is security so important on the Internet?
- 2 What security features are offered by Mozilla Firefox?
- 3 What security protocol is used by banks to make online transactions secure?
- 4 How can we protect our email and keep it private?
- 5 What methods are used by companies to make internal networks secure?
- 6 In what ways can a virus enter a computer system?
- 7 How does a worm spread itself?

# Security and privacy on the Internet

There are many benefits from an open system like the Internet, but one of the risks is that we are often exposed to **hackers**, who break into computer systems just for fun, to steal information, or to spread viruses (see note below). So how do we go about making our online transactions secure?

## Security on the Web

Security is crucial when you send confidential information online. Consider, for example, the process of buying a book on the Web. You have to type your credit card number into an order form which passes from computer to computer on its way to the online bookstore. If one of the intermediary computers is infiltrated by hackers, your data can be copied.

To avoid risks, you should set all security alerts to high on your web browser. Mozilla Firefox displays a lock when the website is secure and allows you to disable or delete **cookies** – small files placed on your hard drive by web servers so that they can recognize your PC when you return to their site.

If you use online banking services, make sure they use **digital certificates** – files that are like digital identification cards and that identify users and web servers. Also be sure to use a browser that is compliant with **SSL** (Secure Sockets Layer), a protocol which provides secure transactions.

## Email privacy

Similarly, as your email travels across the Net, it is copied temporarily onto many computers in between. This means that it can be read by people who illegally enter computer systems.

The only way to protect a message is to put it in a sort of virtual envelope – that is, to encode it with some form of **encryption**. A system designed to send email privately is Pretty Good Privacy, a **freeware** program written by Phil Zimmerman.

## Network security

Private networks can be attacked by intruders who attempt to obtain information such as Social Security numbers, bank accounts or research and business reports. To protect crucial data, companies hire security consultants who analyse the risks and provide solutions. The most common methods of protection are **passwords** for access control, **firewalls**, and **encryption** and **decryption** systems. Encryption changes data into a secret code so that only someone with a key can read it. Decryption converts encrypted data back into its original form.

## Malware protection

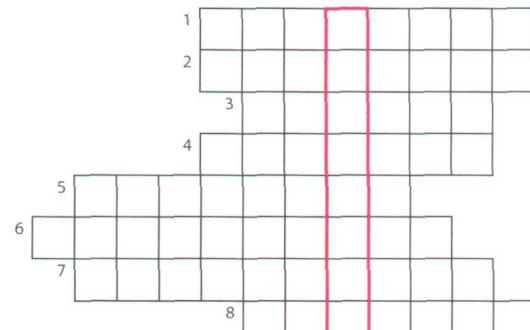
**Malware** (malicious software) are programs designed to infiltrate or damage your computer, for example **viruses**, **worms**, **Trojans** and **spyware**. A virus can enter a PC via a disc drive – if you insert an infected disc – or via the Internet. A worm is a self-copying program that spreads through email attachments; it replicates itself and sends a copy to everyone in an address book. A Trojan horse is disguised as a useful program; it may affect data security. Spyware collects information from your PC without your consent. Most spyware and adware (software that allows pop-ups – that is, advertisements that suddenly appear on your screen) is included with 'free' downloads.

If you want to protect your PC, don't open email attachments from strangers and take care when downloading files from the Web. Remember to update your **anti-virus software** as often as possible, since new viruses are being created all the time.

**Note:** Originally, all computer enthusiasts and skilled programmers were known as **hackers**, but during the 1990s, the term hacker became synonymous with **cracker** – a person who uses technology for criminal aims. Nowadays, people often use the word hacker to mean both things. In the computer industry, hackers are known as *white hats* and crackers are called *black hats* or *darkside hackers*.

## C Solve the clues and complete the puzzle.

- Users have to enter a ..... to gain access to a network.
- A ..... protects a company intranet from outside attacks.
- A ..... is a person who uses their computer skills to enter computers and networks illegally.
- ..... can infect your files and corrupt your hard drive.
- You can download ..... from the Net; this type of software is available free of charge but protected by copyright.
- Encoding data so that unauthorized users can't read it is known as .....
- This company uses ..... techniques to decode (or decipher) secret data.
- Most ..... is designed to obtain personal information without the user's permission.



### 3 Safety online for children



**A** Listen to an interview with Diana Wilson, a member of the Internet Safety Foundation. Which answers (a or b) best describe what she says?

- 1 Parents should make children aware of
  - a the benefits and risks of the Internet.
  - b the risks of the Internet.
- 2 A web filter program can be used to
  - a prevent access to sites with inappropriate content.
  - b rate web content with labels (similar to the way movies are rated).
- 3 If kids spend too much time online or suffer from internet addiction, parents should
  - a stop them using the Internet.
  - b look for help from specialists.



**B** Listen again and complete the interviewer's notes.

#### Risks

Manipulation of children

Invasions of (1) \_\_\_\_\_

Distribution of indecent or  
(2) \_\_\_\_\_ material

Violence and racist (3) \_\_\_\_\_

#### Solutions

There are websites (4) .....  
at children.

Internet (5) ..... programs let  
parents block objectionable websites.

Websites should (6) ..... their  
content with a label, from child-friendly to  
over 18 only.

### 4 The history of hacking

**A** Read Part 1 of the text and answer these questions.

- 1 Which hacking case inspired the film *War Games*?
- 2 When did *Captain Zap* hack into the Pentagon?
- 3 Why was Nicholas Whately arrested in 1988?
- 4 How old was the hacker that broke into the US defence computer in 1989?

#### The history of hacking – Part 1

**1971** – John Draper discovered that a whistle offered in boxes of Cap'n Crunch breakfast cereal perfectly generated the 2,600Hz signal used by the AT&T phone company. He started to make free calls. He was arrested in 1972 but wasn't sent to prison.

**1974** – Kevin Mitnick, a legend among hackers, began hacking into banking networks and altering the credit reports of his enemies. He didn't expect that his most famous exploit – hacking into the North American Defense Command in Colorado Springs – would inspire the film *War Games* in 1983.

**1981** – Ian Murphy, a 23-year-old known as *Captain Zap* on the networks, hacked into the White House and the Pentagon.

**1987** – The IBM international network was paralysed by a hacker's Christmas message.

**1988** – The Union Bank of Switzerland almost lost £32 million to hackers. Nicholas Whately was arrested in connection with virus spreading.

**1989** – A fifteen-year-old hacker cracked the US defence computer.

**1991** – Kevin Poulsen, known as *Dark Dante* on the networks, was accused of stealing military files.

**B**  In pairs, discuss which of the cases in Part 1 you had heard of. Which do you think is the most important?

## 5 Language work: the past simple

**A** Look at the HELP box and then complete Part 2 of the text with the past simple form of the verbs in the box.

show	spread	steal	launch	attempt	overwrite	be	infect	affect
------	--------	-------	--------	---------	-----------	----	--------	--------

### The history of hacking – Part 2

- 1992 – David L Smith (1) ..... prosecuted for writing the Melissa virus, which was passed in Word files sent via email.
- 1997 – The German Chaos Computer Club (2) ..... on TV how to obtain money from bank accounts.
- 2000 – A Russian hacker (3) ..... to extort \$100,000 from online music retailer CD Universe. A Canadian hacker (4) ..... a massive *denial of service* attack against websites like Yahoo! and Amazon. The *ILoveYou* virus, cleverly disguised as a love letter, (5) ..... so quickly that email had to be shut down in many companies. The worm (6) ..... image and sound files with a copy of itself.
- 2001 – The *Code Red* worm (7) ..... tens of thousands of machines.
- 2006 – Hackers (8) ..... the credit card details of almost 20,000 AT&T online customers. However, subscribers to its service (9) (not) .....

### HELP box

#### Past simple

- We use the past simple to talk about a complete action or event which happened at a specific time in the past.

Past \_\_\_\_\_ Now  
He **began** hacking in 1974.

- We form the past simple of regular verbs by adding **-(e)d** to the infinitive.

John Draper **discovered** that a whistle ...

We form questions and negatives using **did/didn't**.

When **did** Captain Zap **hack** into the Pentagon?  
He **didn't expect** that his most famous exploit ...

- There are many verbs which are irregular in the past simple.

*Kevin Mitnick began hacking into ...*

For a list of irregular verbs, see page 166.

We form questions and negatives for irregular verbs in the same way as for regular verbs. The exception is **be** (see below).

*When did Kevin Mitnick begin hacking into ...?*  
*He didn't begin hacking until 1974.*

- We form the past passive with the past simple of **be** + the past participle.

*IBM international was paralysed by hackers.*  
*He wasn't sent to prison.*  
*Why was Nicholas Whately arrested in 1998?*

## B Read these landmarks in the history of the Internet and prepare at least five questions in the past simple.

Example: *What happened in 1969? What did Ray Tomlinson do in 1971?*

- 1969** – The US Defense Department establishes ARPANET, a network connecting research centres.
- 1971** – Ray Tomlinson of BBN invents an email program to send messages across a network. The @ sign is chosen for its *at* meaning.
- 1981** – IBM sells the first IBM PC. BITNET provides email and file transfers to universities.
- 1982** – TCP/IP is adopted as the standard language of the Internet.
- 1988** – Jarkko Oikarinen develops the system known as Internet Relay Chat (IRC).
- 1991** – CERN (*Conseil Européen pour la Recherche Nucléaire*) creates the World Wide Web.
- 1998** – The Internet 2 network is born. It can handle data and video at high speed but is not a public network.
- 1999** – Online banking, e-commerce and MP3 music become popular.
- 2001** – Napster, whose software allows users to share downloaded music, maintains that it does not perpetrate or encourage music piracy. However, a judge rules that Napster's technology is an infringement of music copyright.
- 2004** – Network Solutions begins offering 100-year domain registration.
- 2006** – Americans spend over \$100 billion shopping online.

## C In pairs, ask and answer your questions.

## 6 Internet issues

### A In small groups, look at the list of cybercrimes and discuss these questions.

- 1 Which crimes are the most dangerous?
- 2 Is it fair or unfair to pay for the songs, videos, books or articles that you download? Should copyright infringement be allowed online?
- 3 What measures can be taken by governments to stop cybercrime?
- 4 Do you think governments have the right to censor material on the Internet?
- 5 Personal information such as our address, salary, and civil and criminal records is held in databases by marketing companies. Is our privacy in danger?

#### Cybercrimes

- **Piracy** – the illegal copy and distribution of copyrighted software, games or music files
- **Plagiarism and theft of intellectual property** – pretending that someone else's work is your own
- **Spreading of malicious software**
- **Phishing (password harvesting fishing)** – getting passwords for online bank accounts or credit card numbers by using emails that look like they are from real organizations, but are in fact fake; people believe the message is from their bank and send their security details
- **IP spoofing** – making one computer look like another in order to gain unauthorized access
- **Cyberstalking** – online harassment or abuse, mainly in chat rooms or newsgroups
- **Distribution of indecent or offensive material**

### B Write a summary of your discussion on PowerPoint and present it to the rest of the class.



Now visit [www.cambridge.org/elt/ict](http://www.cambridge.org/elt/ict) for an online task.

# Unit 20 Graphics and design

## 1 Computer graphics

A  In pairs, look at the computer graphics (a–d) and discuss these questions.

- 1 Which of these computer graphics are three-dimensional (3-D)?
- 2 What are the advantages of creating 3-D images?
- 3 Which types of professional might use the computer graphics (a–d)?
- 4 Who else uses computer graphics in their job? How do they use them?



a



b



c



d

B Read the text on page 101 and check your answers to 3 and 4 in A.

C Read the text again and answer these questions.

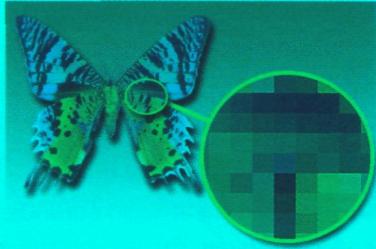
- 1 What are the differences between *raster* graphics and *vector* graphics?
- 2 Which graphics file formats are mentioned?
- 3 What is *compositing*?
- 4 What does CAD stand for?
- 5 What are the benefits of using graphics in the car industry?
- 6 What type of graphics software is used to make maps or 3-D models of the Earth?
- 7 Who uses computer animation? How?

## Computer graphics

Computer graphics are pictures and drawings produced by computer. There are two main categories:

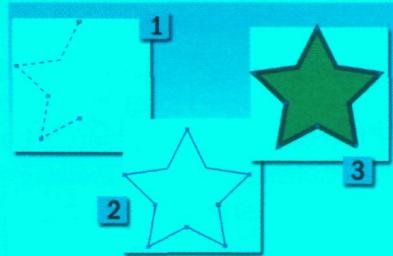
**Raster graphics**, or **bitmaps**, are stored as a collection of pixels. The sharpness of an image depends on the density of pixels, or **resolution**. For example, text or pictures that are scaled up – that is, made bigger – may show **jagged** edges. Paint and photo-editing programs like Adobe Photoshop focus on the manipulation of bitmaps. Popular raster formats are **JPEG**, **GIF** and **TIFF**.

**Vector graphics** represent images through the use of geometric objects, such as lines, curves and polygons, based on mathematical equations. They can be changed or scaled without losing quality. Vector data can be handled by drawing programs like Adobe Illustrator, Corel Draw or Macromedia Freehand. **EPS** is the most popular file format for exchanging vector drawings.



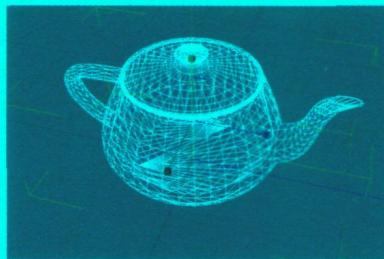
► *Bitmap graphics are composed of pixels, each of which contains specific colour information*

► *Vector graphics consist of points, lines and curves which, when combined, can form complex objects*



Almost all computer users use some form of graphics. Home users and professional artists use image-editing programs to manipulate images. For example, you can add **filters** (special effects) to your favourite photos, or you can **composite** images. Compositing is combining parts of different images to create a single image. Graphic artists and designers use drawing programs to create freehand drawings and illustrations for books or for the Web. Businesspeople use presentation graphics to make information more interesting visually – graphs and diagrams can be more effective ways of communicating with clients than lists of figures. Electrical engineers use graphics to design circuits in order to present data in a more understandable form. Mechanical engineers use **CAD** (Computer Aided Design) software to develop, model and test car designs before the actual parts are made. This can save a lot of time and money.

CAD is also used in the aerospace, architecture and industrial sectors to design everything from aeroplanes and buildings to consumer products. Designers start a project by making a **wireframe**, a representation showing the outlines of all edges in a transparent drawing. They then specify and fill the surfaces to give the appearance of a 3-D solid object with volume. This is known as **solid modelling**. Next, they add paint, colour and filters to achieve the desired 'look and feel': this is called **texturing** the object. Finally, they **render** the object to make it look real. Rendering includes lighting and shading as well as effects that simulate shadows and reflections.



► *A wireframe model of a teapot*

► *Smooth shading – part of the rendering process*



**Computer art**, or **digital art**, is used in adverts and TV programmes. Artists and scientists use special graphic applets to create amazing **fractals**. Fractals are geometrical patterns that are repeated at small scales to generate irregular shapes, some of which describe objects from nature. Government agencies use **GIS** (**Geographic Information Systems**) to understand geographic data and then plan the use of land or predict natural disasters. Cartographers use GIS to make detailed maps. Animators use **computer animation** software to create animated cartoons or add effects in movies and video games.

► *A fractal*



#### D Match the words (1–6) with the definitions (a–f).

- |              |  |
|--------------|--|
| 1 resolution | a special effects that can be applied to pictures                          |
| 2 jagged     | b a technique that generates realistic reflections, shadows and highlights |
| 3 filters    | c geometrical figures with special properties                              |
| 4 wireframe  | d irregular or uneven  |
| 5 rendering  | e the number of pixels in an image   |
| 6 fractals   | f the drawing of a model by using features like edges or contour lines     |

E  In pairs, discuss which application of computer graphics you think is the most important or useful. Give reasons for your answers.

## 2 Language work: the -ing form

A Look at the HELP box and decide if the *-ing* forms in these sentences are gerunds, present participles or adjectives. Write *g*, *pp* or *a*.

- 1 PCs generate graphics by performing mathematical calculations on data.  
.....
- 2 Businesspeople use graphics to make information more interesting visually.  
.....
- 3 Graphs and diagrams can be more effective ways of communicating with clients than lists of figures.  
.....
- 4 She is designing a logo for the company.  
.....
- 5 If you need to make a presentation, I suggest using PowerPoint.  
.....
- 6 The Internet is a network linking other networks.  
.....

B Correct the mistakes in these sentences. There are seven mistakes in total.

- 1 Computer animation is the process of create objects which move across the screen.
- 2 Texturing involves add paint, colour and filters to drawings and designs.
- 3 You can open the colour palette by click on the corresponding icon.
- 4 CAD programs are very fast at to perform drawing functions.
- 5 A lot of time and money is saved by test a car design before to make the product.
- 6 To render refers to the techniques used to make realistic images.

#### HELP box

##### The -ing form

We use the *-ing* form in three ways:

- 1 *Rendering* includes *lighting* and *shading*.
- 2 We are *designing* a new car on computer.
- 3 They use special applets to create *amazing* fractals.
- In 1, **rendering** is a gerund (see below), acting as the subject. **Lighting** and **shading** are also gerunds, acting as the objects. A gerund refers to an activity or process.
- In 2, **designing** is a present participle. This is used in continuous tenses (in the above example, the present continuous) and reduced relative clauses.  
*... a representation showing the outlines of all edges.*  
(= which shows the outlines ...)
- In 3, **amazing** is an adjective.

We use gerunds in the following ways:

- As the subject of a verb  
*Compositing* is combining parts of different images to create a single image.
- As the complement of the subject  
*Compositing* is combining parts of different images ...
- As the object of a verb  
*I enjoy editing* pictures.
- After a preposition  
*Designers start a project by making* a wireframe.
- As the complement of a verb  
*This course involves painting and drawing* in various media.
- Some verbs are followed by the gerund, not by the infinitive (e.g. **avoid**, **fancy**, **finish**, **give up**, **hate**, **imagine**, **involve**, **keep**, **look forward to**, **mind**, **suggest**, **enjoy**)

### 3 The toolbox

#### A Listen to an extract from an online tutorial about graphics programs and answer these questions.

- 1 What is a *toolbox* in graphics software?
- 2 What are *graphics primitives*?
- 3 What sort of *attributes*, or characteristics, can be used in graphical objects?
- 4 What does *translation* mean?

#### B Listen again and complete this extract from the web version of the tutorial.

Graphics programs usually have a *toolbox* – a collection of drawing and (1) ..... tools that enable you to type, (2) ..... , draw, paint, edit, move, and view images on the computer.

The basic shapes which are used to (3) ..... graphical objects are called *primitives*. These are usually geometric, such as lines between two points, arcs, circles, polygons, ellipses and even text. Furthermore, you can specify the *attributes* of each primitive, such as its colour, line type, fill area, interior style and so on.

The various tools in a toolbox usually appear together as pop-up icons in a menu or palette. To use one, you

activate it by (4) ..... on it. For example, if you want to (5) ..... a rectangle, you activate the rectangle tool, and the pop-up options give you the possibility of (6) ..... rectangles with square or rounded corners.

You can transform an object by translating, (7) ..... or scaling it. *Translation* means moving an object to a different location. *Rotation* is (8) ..... the object around an axis. For example, you may need to rotate an object 90 or 180 degrees to fit the drawing. (9) ..... is making the object larger or smaller.

#### C Match the tools from the Photoshop toolbox (1–10) with the functions (a–j).

- 1  Marquee select tools
- 2  Move tool
- 3  Crop tool
- 4  Paintbrush, pencil
- 5  Eraser
- 6  Paint bucket
- 7  Type tool
- 8  Colour picker (Eyedropper)
- 9  Zoom
- 10  Colour tools and palette

- a cut down the dimensions of a picture
- b select a particular part of an image (you can choose different shapes for selection)
- c fill in an area with a colour
- d control the foreground and background colour
- e select a specific colour in a photo
- f magnify areas of an image when you are doing close, detailed work
- g delete the part of the picture you drag it over
- h insert text into your document
- i draw and paint in different shapes and patterns
- j move a selection or entire layer by dragging it with your mouse

## 4 Choosing graphics software

 **Work in pairs.** Student A chooses a task from the list (1–6) and describes it. Student B chooses the most appropriate graphics software for the task (a–f) and gives reasons for his or her choice. Swap roles. Look at the text on page 101 and the *Useful language* box to help you.

- 1 to edit and retouch photos
  - 2 to create illustrations and drawings for a magazine
  - 3 to prepare slideshows for training sessions or conferences
  - 4 to make mechanical designs and architectural plans
  - 5 to create dynamic simulations and special effects for films, TV, advertisements and games
  - 6 to analyse geographic data and make maps
- 
- a Computer animation software, for example 3-D Studio Max
  - b GIS software, for example ArcView
  - c Presentation software, for example PowerPoint
  - d A CAD package, for example AutoCAD
  - e Vector graphics software, for example Freehand
  - f A paint and image-editing program, for example Photoshop

### Useful language

*If I need to ..., what software would you recommend?*

*For that kind of task, the best thing would be ...*

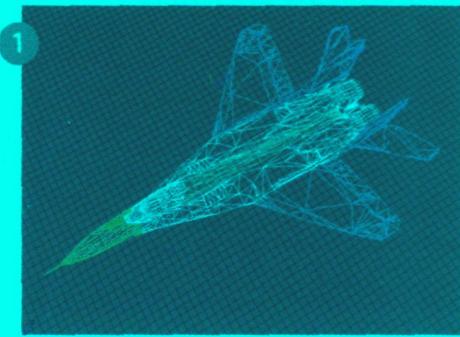
*It allows you to ... and ...*

*I wouldn't recommend ... because ...*

*A good program of this type is ...*

## 5 Describing graphics

 **Look at the images (1–4), which show the stages involved in drawing a plane using computer software. Write a short description of stages 2, 3 and 4. Look at the text on page 101 and the *Useful language* box to help you.**



Wireframe

This first image shows a wireframe model, probably made using CAD software. A wireframe is a drawing with edges and contour lines. The parts of the plane are shown in different colours (violet, green, blue, etc.).

### Useful language

*This picture shows ...*

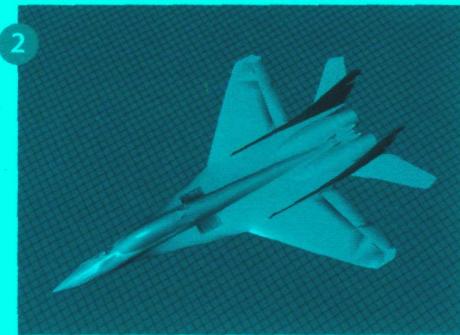
*In this (next) stage ...*

*The designer has used ...*

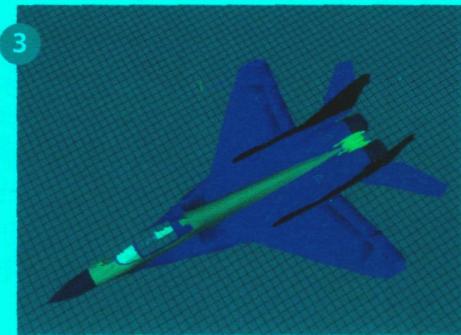
*This stage is called ...*

*Rendering techniques include ...*

*As a finishing touch, ...*



Solid modelling



Texturing the model



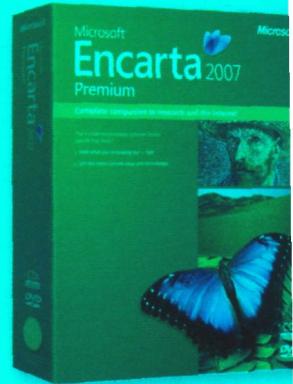
Rendering

## 1 Multiple forms of media



In pairs, discuss these questions.

- 1 What different types of content are combined in multimedia applications?
- 2 How many products can you think of that incorporate multimedia? Make a list.



## 2 Components and system requirements

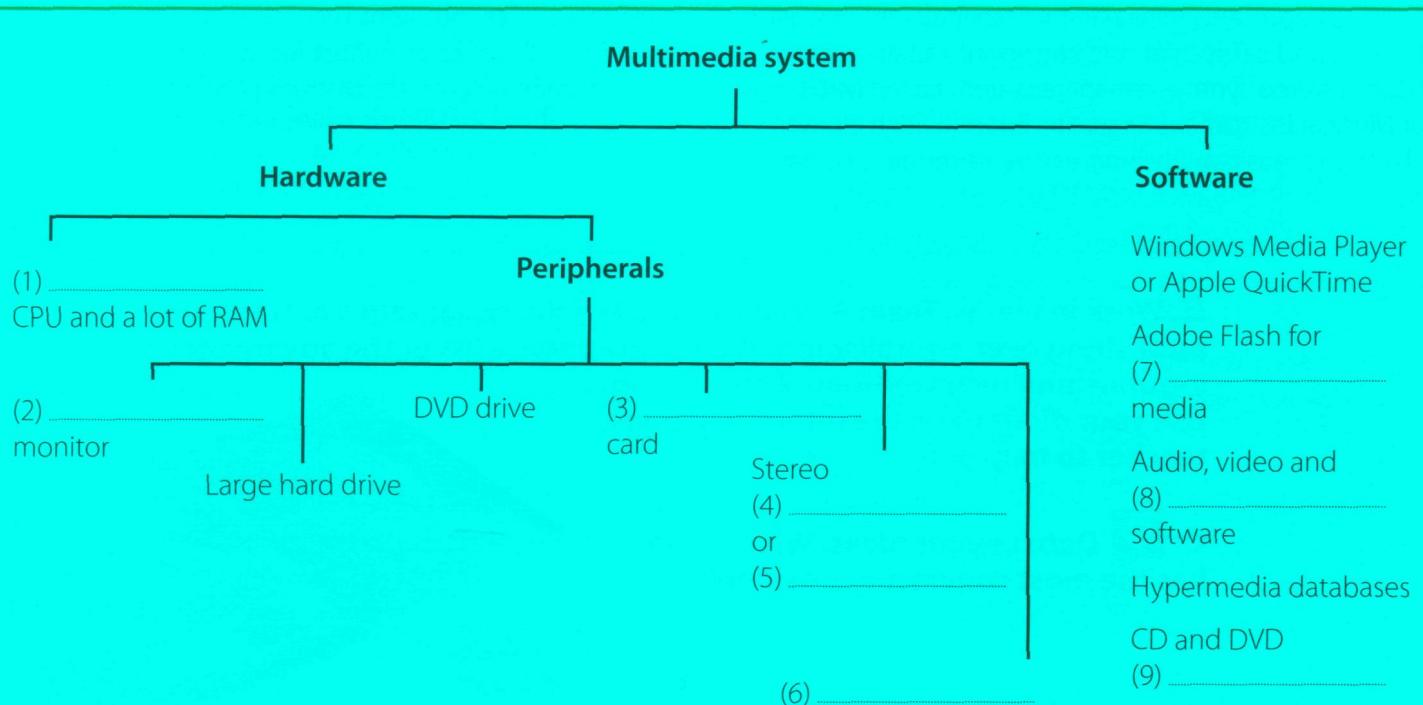


A Listen to a sales assistant in a computer shop explaining to a customer the system requirements needed to run multimedia software. Which answers (a or b) best describe what she says?

- 1 Multimedia is defined as
  - a the integration of video and telecommunications with traditional computing.
  - b the integration of text, graphics, audio, video and animation in a single application.
- 2 With multimedia encyclopedias,
  - a you have more fun but you learn more slowly.
  - b you get much more involved than with print encyclopedias.
- 3 Interactive games
  - a use multimedia and virtual reality features.
  - b do not require much RAM memory.



B Listen again and complete this diagram of a multimedia system.



### 3 Multimedia magic!

**A** Read the text and match the headings (1–4) with the gaps at the start of each paragraph (a–d).

- 1 Sound, Music, MIDI
- 2 Products full of pictures, action and sound
- 3 Creating and editing movies
- 4 The potential of multimedia

#### Multimedia magic!

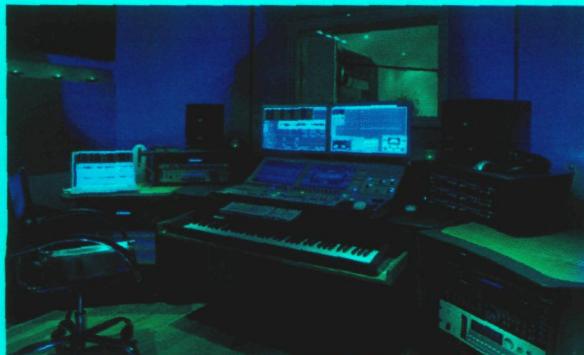
**a** \_\_\_\_\_

Multimedia applications are used in all sorts of fields. For example, museums, banks and estate agents often have information kiosks that use multimedia; companies produce training programs on optical discs; businesspeople use Microsoft PowerPoint to create slideshows; and teachers use multimedia to make video projects or to teach subjects like art and music. They have all found that moving images and sound can involve viewers emotionally as well as inform them, helping make their message more memorable.

The power of multimedia software resides in **hypertext**, **hypermedia** and **interactivity** (meaning the user is involved in the programme). If you click on a hypertext link, you can jump to another screen with more information about a particular subject. Hypermedia is similar, but also uses graphics, audio and video as hypertext elements.

**b** \_\_\_\_\_

As long as your computer has a **sound card**, you can use it to capture sounds in digital format and play them back. Sound cards offer two important capabilities: a built-in stereo synthesizer and a system called **MIDI**, or **Musical Instrument Digital Interface**, which allows electronic musical instruments to communicate with computers. A **Digital Audio Workstation (DAW)** lets you mix and record several tracks of digital audio.



MIDI allows your computer to communicate with electronic keyboards and other devices

You can also listen to music on your PC, or transfer it to a portable **MP3** player. MP3 is short for **MPEG audio layer 3**, a standard format that compresses audio files. If you want to create your own MP3 files from CDs, you must have a **CD ripper**, a program that extracts music tracks and saves them on disk as MP3s.

Audio is becoming a key element of the Web. Many radio stations broadcast live over the Internet using **streaming audio technology**, which lets you listen to audio in a continuous stream while it is being transmitted. The broadcast of an event over the Web, for example a concert, is called a **webcast**. Be aware that you won't be able to play audio and video on the Web unless you have a **plug-in** like RealPlayer or QuickTime.

**c** \_\_\_\_\_

Video is another important part of multimedia. **Video computing** refers to recording, manipulating and storing video in **digital format**. If you wanted to make a movie on your computer, first you would need to capture images with a **digital video camera** and then transfer them to your computer. Next, you would need a **video editing** program like iMovie to cut your favourite segments, re-sequence the clips and add transitions and other effects. Finally, you could save your movie on a DVD or post it on websites like YouTube and Google Video.

**d** \_\_\_\_\_

Multimedia is used to produce dictionaries and encyclopedias. They often come on DVDs, but some are also available on the Web. A good example is the Grolier Online Encyclopedia, which contains thousands of articles, animations, sounds, dynamic maps and hyperlinks. Similarly, the Encyclopedia Britannica is now available online, and a concise version is available for iPods, PDAs and mobile phones. Educational courses on history, science and foreign languages are also available on DVD. Finally, if you like entertainment, you'll love the latest multimedia video games with surround sound, music soundtracks, and even film extracts.

## B Correct the technical mistakes in these sentences.

- 1 Multimedia training software is distributed on magnetic disks.
- 2 You need to have MIDI on your computer to hear speech and music.
- 3 A stereo synthesizer allows your computer to communicate with electronic musical instruments.
- 4 A CD ripper converts CDs to live streams.
- 5 The Encyclopedia Britannica is only available on DVD.

## C Match the words (1–5) with the definitions (a–e).

- |   |               |   |  |
|---|---------------|---|--|
| 1 | hypertext     | a | the process of manipulating video images   |
| 2 | hypermedia    | b | text with links which take you to other pages  |
| 3 | streaming     | c | a technique for playing sound and video files while they're downloading                                    |
| 4 | webcast       | d | a live event broadcast over the Internet   |
| 5 | video editing | e | a form of enriched multimedia which allows an interactive and dynamic linking of visual and audio elements |

# 4 Language work: conditional sentences

## A Look at the HELP box and then complete these sentences with the correct form of the verbs in brackets.

- 1 If you (bring) ..... your digital video camera, we can make a movie on my PC.
- 2 You won't be able to play those video files if you (not have) ..... the correct plug-in.
- 3 If the marketing manager (have) ..... PowerPoint, she could make more effective presentations.
- 4 If I could afford it, I (buy) ..... a new game console.
- 5 If I had the money, I (invest) ..... in some new multimedia software.

### HELP box

#### Conditional sentences

We use conditional sentences to express that the action in the main clause can only take place if a certain condition is fulfilled (see below for examples). They are introduced by **if**, **unless** and **as long as**. **Unless** means *if not* and **as long as** means *provided/providing (that)*.

*You won't be able to play audio and video on the Web unless you have a plug-in like RealPlayer or QuickTime.* (= if you don't have a plug-in ...)

There are two types of conditional sentence.

- The first conditional (for real or possible situations).

If A happens      B will happen  
(present simple)    (**will** in positive or negative + verb)

*If you like entertainment, you will love the latest multimedia video games.*

In the main clause, we can also have a modal (for example, **can** or **must**) or an imperative.

*If you want to create your own MP3 files from your CDs, you must have a CD ripper.*

- The second conditional (for more hypothetical situations).

If A happened    B would happen  
(past simple)     (**would** in positive or negative + verb)

*If you wanted to make a movie on your computer, first you would / you'd need to ...*

In the main clause, we can also use other modals (e.g. **could**, **should**, **might**), depending on the meaning.

If the verb **be** appears in the **if** clause, we often use **were** instead of **was**, even if the pronoun is **I**, **he**, **she** or **it**.

*If I were you, I'd get a new MP3 player.*

**B**  In pairs, discuss these questions. Use the second conditional.

What would you do if ...

- 1 you had a digital video camera?  
*If I had a digital video camera, I'd ...*
- 2 you had a home recording studio?
- 3 you couldn't afford an iPod but you wanted an MP3 player?
- 4 you won the lottery?
- 5 someone stole your laptop?

## 5 Applications of multimedia

**A** Match the descriptions (1–5) with the pictures (a–e).

- 1 Virtual reality
- 2 Distance learning
- 3 A business presentation
- 4 A touch screen information kiosk
- 5 An MMS mobile phone



c \_\_\_\_\_



a \_\_\_\_\_



d \_\_\_\_\_



b \_\_\_\_\_



e \_\_\_\_\_

**B**  In pairs, discuss how multimedia is used in the situations above and then present your ideas to the rest of the class. Look at the Useful language box to help you.

### Useful language

*In distance learning, multimedia is used to ...*

*Information kiosks take advantage of multimedia in order to ...*

*In virtual reality, the use of multimedia allows you to ...*

*With 3G mobile phones, you can ...*

*Slide presentations integrate a wide range of media, such as ...*

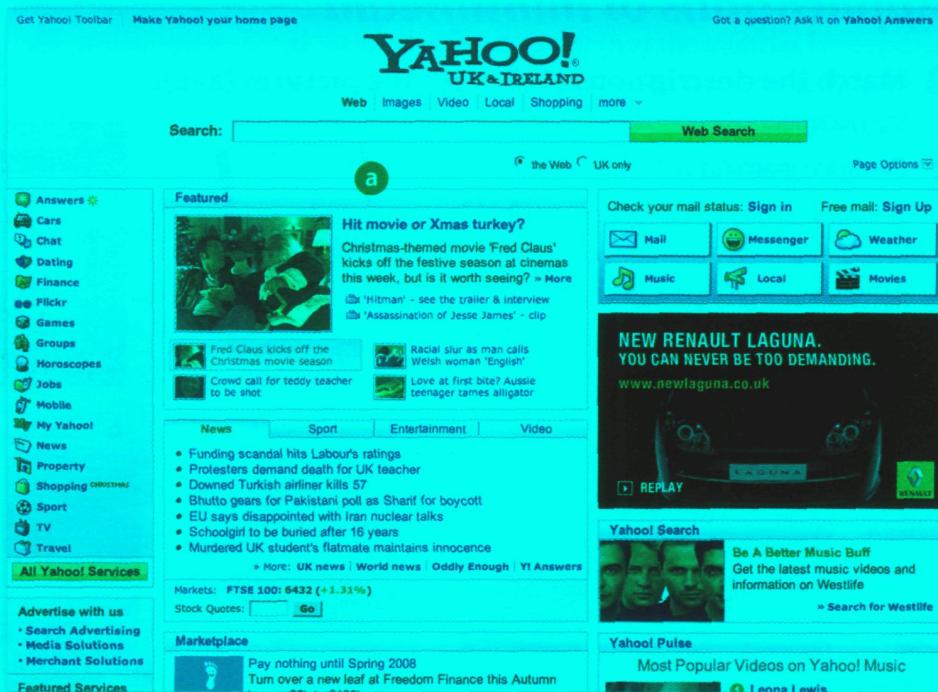
**C**  A friend who writes a blog has asked you to contribute a post about the use of multimedia now and in the future. Write a post (80–120 words) summarizing what multimedia is, what it can do, and your predictions for what it might be able to do in the future. Try to use at least two conditional sentences.

# Unit 23 Web design

## 1 A typical home page

 In pairs, discuss these questions.

- 1 Why do companies have websites?
- 2 What is the difference between a website and a web page?
- 3 What is a home page?
- 4 Do you have a blog or personal website? Describe the home page to your partner.



The Yahoo! home page

## 2 Web page design

**A Read the text on page 115 and find the following.**

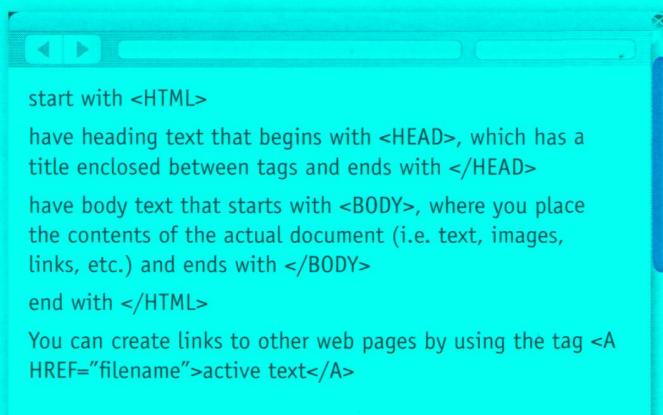
- 1 the language used to create web documents
- 2 the type of software that lets you design web pages without writing HTML codes
- 3 the format invented by Adobe to distribute text files over the Internet
- 4 a method of displaying multiple HTML documents in the same browser window
- 5 three common graphics formats used on websites
- 6 three popular formats used to store and play back video

# Web page design

## HTML and web editors

The code behind most web pages is **HTML** (**hypertext markup language**), which consists of commands called **tags**. Tags are placed around pieces of text to tell the web browser how to display text or pictures. You can view the source HTML code of a web page by choosing the *Page Source* option in your web browser. But you needn't learn HTML in order to build your own website. Instead, you can use a word processor with web design capabilities or a dedicated **web editor** like Macromedia Dreamweaver or Microsoft FrontPage. Web editors are user-friendly and **WYSIWYG** (*What You See Is What You Get*). Different buttons and menu items let you design a page without writing HTML.

HTML files have this basic structure:



## Some basic HTML source code

**Marina's web page**

Hill I live in Madrid, but I was born in Zaragoza

**My Hobbies ...**  
I like music and computers. I can play the Spanish guitar and I love Latin dancing. I have a mountain bike but my favourite sport is football.

**My studies ...**  
I study at Politécnica University, Madrid. My favourite subjects are Maths, Physics, Aeronautics and English. I have studied English for ten years. In the future I would like to be an engineer.

**My favourite city ...**  
Zaragoza is a multicultural modern and ancient city, with 700.000 inhabitants and over 2000 years of history. Muslims, Christians and Jews lived together in peace for many centuries. It is famous for its 'mudejar' style, the Pilar Basilica, and the charming character of its people.

HTML file displayed as a web page

## Web page elements

There are a number of different elements that you can use on a web page:

- **Text** – displayed in a variety of fonts and sizes. Most text files are available in two formats: HTML or **PDF** (the portable document format that can be viewed with Acrobat Reader).

- **Background** – the underlying colours and patterns of a web page

- **Tables** – with columns and rows, used to position images and text on a page

- **Frames** – rectangular areas that allow the display of different pages in the same browser window

- **Cascading Style Sheets (CSS)** – a mechanism for adding styles to web documents. You could use HTML code to specify the font, text styles and background colour. Nowadays, however, it is more common to use CSS. This makes it easy to apply presentation changes across a website.

- **Graphics, clip art, icons, background templates, wallpaper, and transparent images** – common formats are **.jpg** (joint photographic experts group), ideal for pictures with many colours, **.gif** (graphics interchange format), ideal for pictures with fewer colours, and **.png** (portable network graphics), which supports 16 million colours.

- **Hyperlinks** – highlighted text or pictures (buttons, image maps, etc.) that act as links to other pages. If you want to share information with people, you can use **RSS feeds** and provide readers with a link to the feed. RSS allows subscribers to receive updates of blogs, news, podcasts, etc. Before **going live**, you should check that all the links work.

## Audio, video and animation

Many websites now incorporate audio files, and if you're designing a site, you may like to insert songs, podcasts, etc. The most common audio formats are: **.wav** (Windows wave audio format), **.ra** (RealAudio file) and **.mp3** (MPEG-1 Audio Layer-3).

**Full-motion video** is stored in these formats: **.avi** (audio video interleave), **.mov** (QuickTime movie) and **.mpg** (moving picture experts group).

If you want to inject something special into your web pages, you can use Adobe Flash to include **interactive animations** and **streaming audio**. Additionally, you can insert Java applets – small programs that enable the creation of interactive files. Animations are made up of a series of independent pictures put together in sequence to look like moving pictures. To see or hear all these files, you must have the right **plug-in**, an auxiliary program that expands the capabilities of your web browser.

**B** Read the text again and then match the sentence beginnings (1–6) with the correct endings (a–f).

- 1 Instructions in HTML
  - 2 Cascading Style Sheets are the way
  - 3 A hyperlink is any clickable text,
  - 4 A plug-in is a small program
  - 5 Java applets are used to provide
  - 6 RSS feeds are summaries of web content
- 
- a image or button that takes you to another place on the Web.
  - b used for handling audio, video and animation files.
  - c are called *tags*.
  - d interactive features to web applications.
  - e to define the presentation of web pages, from fonts and colours to page layout.
  - f published in the Really Simple Syndication format for download.

### 3 Language work: modal verbs

**A** Underline all the modal verbs in the text on page 115 and then look at the HELP box. Which modal verb from the HELP box does not appear in the text? Can you think of any other modal verbs?

#### HELP box

##### Modal verbs

We use modal verbs to add extra meaning to the main verb. They are followed by infinitive without *to*. Modal verbs are used in the following ways:

- To express a possibility

*You can/could use Adobe Flash to include interactive animations.*

*You may like to insert songs, podcasts, etc.*

*The price of Dreamweaver might go down next month.*

**Can** and **could** are often interchangeable when talking about possibility. **May** and **might** are used to express weaker possibilities and often come before the verb **like** to mean *It is possible you will like*.

- To ask for permission

**Can/Could/May I use your mobile phone?**

**May** is more formal than **can** or **could**.

- To talk about ability

*They are looking for artists who can draw and design web pages.*

**Could** is the past tense of **can** and is used to talk about ability in the past.

- To talk about obligation or necessity

*To see or hear all these files, you must have the right plug-in.*

*... you needn't learn HTML in order to build your own website.*

**Needn't** means *don't need to* or *don't have to* and is used to express a lack of obligation.

- To give advice (see Unit 7)

*Before going live, you should check that all the links work.*

**B Complete these sentences with suitable modal verbs from the HELP box. There may be more than one possible answer.**

- 1 With Java, I ..... include some attractive banners on my website.
- 2 With a web editor, you ..... create a web document easily.
- 3 These days, you ..... learn how to use complicated HTML codes. Modern web design software is user-friendly and converts a visual layout into HTML code.
- 4 Once live, you ..... update your website regularly.
- 5 To view a PDF file, you ..... have Adobe Acrobat Reader.
- 6 Websites with graphics are more inviting than those written in plain text, so you ..... like to insert some graphics into your documents.
- 7 ..... I use your laptop? I need to print out this report.

**C**  **In pairs, discuss at least two things**

- 1 you can now do more easily because of the Internet.
- 2 you could do better if you had a faster internet connection.
- 3 that may/might happen to the Internet in the next ten years.
- 4 you must consider when designing a website.
- 5 you should take into account when choosing which PC to buy.

## 4 Designing a website

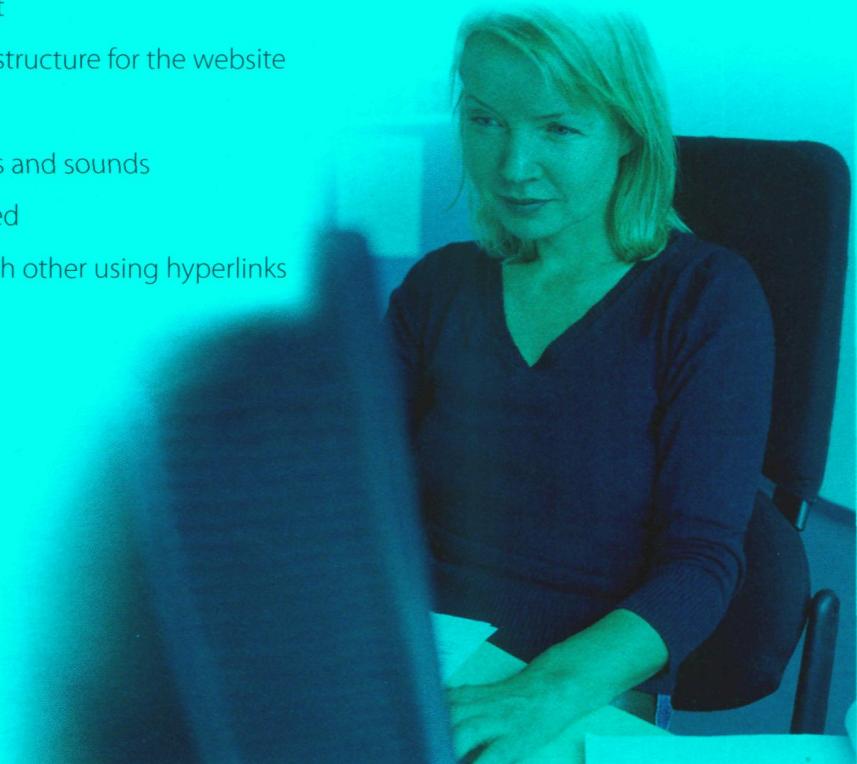
**A**  **In pairs, think about your favourite websites and discuss these questions.**

- 1 Do you like the way they are designed? Give reasons for your answer.
- 2 What elements do you think a good website should have? Make a list.

**B**  **Listen to an interview with a web designer describing how to design a website and put these steps into the correct order.**

- Write and format the text
- Decide the content and structure for the website
- Publish the website
- Insert computer graphics and sounds
- Keep the website updated
- Link related pages to each other using hyperlinks

*A web designer at work*





**C** Listen again and decide whether these design guidelines are right or wrong. Tick the correct box.

- 1 Plan your website carefully.
- 2 Use a web editor. It will make it easier to create your pages.
- 3 Insert photos or animations just to make the pages look attractive.
- 4 Place a large number of graphics on your pages.
- 5 Use very bright colours.
- 6 Put a lot of links on one page.
- 7 Check that all the links on your web pages are correct.
- 8 Once they are published, update your pages regularly.

Right      Wrong



**D** In small groups, collect information about your college or company and design a home page for it. Follow the instructions from the interview with the web designer.

## 5 Blogs



**A** In pairs, discuss these questions.

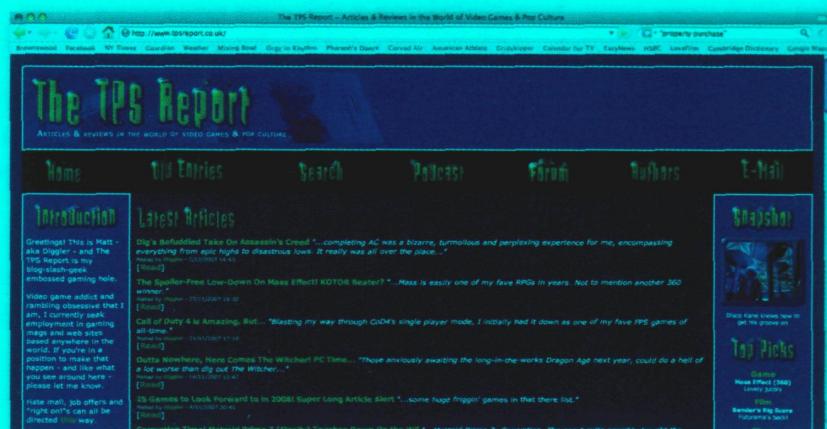
- 1 What is a blog?
- 2 Which blogs do you read regularly?

**B** Look at the screenshot from [tpsreport.co.uk](http://www.tpsreport.co.uk), a popular gaming blog. Can you see any design differences between blogs and normal websites?



**C** Imagine you wanted to start your own blog. In pairs, discuss these questions.

- 1 Why would you start your own blog – to write a diary of your thoughts or to share your expertise on a particular topic?
- 2 What types of media would you include – text, photos, video, audio (including podcasts)?
- 3 Would you insert links to other blogs? Which ones?
- 4 Would you focus on a particular subject or have a mix of several topics?
- 5 Which site would you use to host your blog?



A screenshot from [www.tpsreport.co.uk](http://www.tpsreport.co.uk)



**D** Write an entry for the blog you've described in C (80–100 words). Introduce the blog to the world and talk about why you've started it.



Now visit [www.cambridge.org/elt/ict](http://www.cambridge.org/elt/ict) for an online task.

## 1 Programming

**A**  In pairs, discuss what you think **programming** is.

**B** Look at the definition of **programming** in the Glossary. Is it similar to yours?

```
#include <stdio.h>
main( )
{
    printf("good morning\n");
}
```

## 2 Steps in programming

**A** Match the words (1–5) with the definitions (a–e).

- 1 flowchart
- 2 source code
- 3 compiler
- 4 machine code
- 5 debugging

- a Program instructions written in a particular computer language
- b The techniques of detecting and correcting errors (or bugs) which may occur in programs
- c A diagram representing the successive logical steps of the program
- d A special program which converts the source program into machine code – the only language understood by the processor
- e The basic instructions understood by computers; it consists of 1s and 0s (binary code)

This C program tells the computer to print the message 'good morning'

**B**  Listen to Andrea Finch, a software developer, talking to a group of students on a training course about how a program is written and check your answers to A.

**C**  Listen again and put these steps into the correct order.

- Write instructions in a programming language
- Prepare documentation
- Understand the problem and plan a solution
- Make a flowchart of the program
- Compile the program (to turn it into machine code)
- Test and debug the program

**D**  Listen again and make detailed notes. In pairs, use your notes to write a short explanation of what each step in C means.

### 3 Computer languages

**A** Read the text. How many high-level computer languages are mentioned?

#### Computer languages

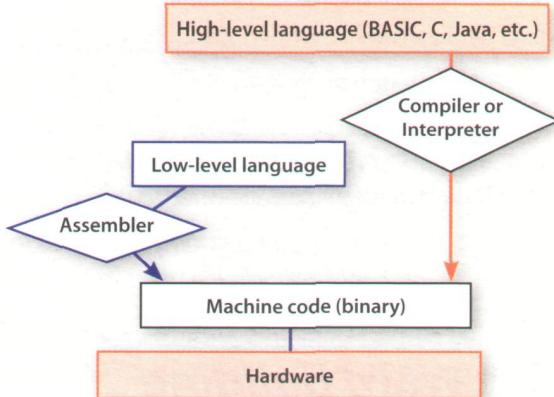
Unfortunately for us, computers can't understand spoken English or any other natural language. The only language they can understand directly is **machine code**, which consists of 1s and 0s (binary code).

Machine code is too difficult to write. For this reason, we use symbolic languages to communicate instructions to the computer. For example, **assembly languages** use abbreviations such as ADD, SUB, MPY to represent instructions. The program is then translated into machine code by a piece of software called an **assembler**. Machine code and assembly languages are called **low-level languages** because they are closer to the hardware. They are quite complex and restricted to particular machines. To make the programs easier to write, and to overcome the problem of intercommunication between different types of computer, software developers designed **high-level languages**, which are closer to the English language.

Here are some examples:

- **FORTRAN** was developed by IBM in 1954 and is still used for scientific and engineering applications.
- **COBOL (Common Business Oriented Language)** was developed in 1959 and is mainly used for business applications.
- **BASIC** was developed in the 1960s and was widely used in microcomputer programming because it was easy to learn. **Visual BASIC** is a modern version of the old BASIC language, used to build graphical elements such as buttons and windows in Windows programs.
- **PASCAL** was created in 1971. It is used in universities to teach the fundamentals of programming.
- **C** was developed in the 1980s at AT&T. It is used to write system software, graphics and commercial applications. **C++** is a version of C which incorporates object-oriented programming: the programmer concentrates on particular things (a piece of text, a graphic or a table, etc.) and gives each object functions which can be altered without changing the entire program. For example, to add a new graphics format, the programmer needs to rework just the graphics object. This makes programs easier to modify.
- **Java** was designed by Sun in 1995 to run on the Web. Java applets provide animation and interactive features on web pages. (See Unit 25)

Programs written in high-level languages must be translated into machine code by a **compiler** or an **interpreter**. A compiler translates the source code into **object code** – that is, it converts the entire program into machine code in one go. On the other hand, an interpreter translates the source code line by line as the program is running.



It is important not to confuse **programming languages** with **markup languages**, used to create web documents. Markup languages use instructions, known as **markup tags**, to format and link text files. Some examples include:

- **HTML**, which allows us to describe how information will be displayed on web pages.
- **XML**, which stands for **EXtensible Markup Language**. While HTML uses pre-defined tags, XML enables us to define our own tags; it is not limited by a fixed set of tags.
- **VoiceXML**, which makes Web content accessible via voice and phone. VoiceXML is used to create voice applications that run on the phone, whereas HTML is used to create visual applications (for example, web pages).

```

<xml>
< name> Andrea Finch </name>
< homework> Write a paragraph describing
the C language </homework>
</xml>
  
```

In this XML example we have created two new tags: <name> and <homework>

### B Read the text again and answer these questions.

- 1 Do computers understand human languages? Why? / Why not?
- 2 What is the function of an *assembler*?
- 3 Why did software developers design high-level languages?
- 4 Which language is used to teach programming techniques?
- 5 What is the difference between a *compiler* and an *interpreter*?
- 6 Why are HTML and VoiceXML called *markup* languages?

### C Complete these sentences with a computer language from the text.

- 1 ..... allows us to create our own *tags* to describe our data better. We aren't constrained by a pre-defined set of tags the way we are with HTML.
- 2 IBM developed ..... in the 1950s. It was the first high-level language in data processing.
- 3 ..... applets are small programs that run automatically on web pages and let you watch animated characters, play games, etc.
- 4 ..... is the HTML of the voice web. Instead of using a web browser and a keyboard, you interact with a voice browser by listening to pre-recorded audio output and sending audio input through a telephone.
- 5 This language is widely used in the business community. For example, the statement ADD VAT to NET-PRICE could be used in a ..... program.

## 4 Word building

Look at the words in the boxes. Are they nouns, verbs or adjectives? Write *n*, *v* or *adj* next to each word. There may be more than one possible answer. Complete the sentences with words from the boxes.

program ..... programmers ..... programming ..... programmable .....

- 1 ..... is the process of writing a program using a computer language.
- 2 A computer ..... is a set of instructions that tells the computer how to do a specific task.
- 3 Most computer ..... make a plan of the program before they write it.
- 4 A ..... keyboard allows the user to configure the layout and meaning of the keys.

compile ..... compiler ..... compilation .....

- 5 Programs written in a high-level language require ..... – that is, translation into machine code, the language understood by the processor.
- 6 A source program is converted into machine code by software called a .....
- 7 Programmers usually ..... their programs to generate an object program and diagnose possible errors.

bug ..... debug ..... debugger ..... debugging .....

- 8 Any error or malfunction of a computer program is known as a .....
- 9 A ..... is a program used to test and ..... other programs.
- 10 The process of going through the code to identify the cause of errors and fixing them is called .....

# 5 Language work: the infinitive

## A Look at the HELP box and then make sentences using these prompts.

- 1 not easy / write instructions in COBOL  
*It's not easy to write instructions in COBOL.*
- 2 expensive / set up a data-processing area
- 3 advisable / test the programs under different conditions
- 4 unusual / write a program that works correctly the first time it's tested
- 5 important / use a good debugger to fix errors
- 6 easy / learn Visual BASIC

## B Choose the correct words (a–c) to complete these sentences.

- 1 We use high-level languages because machine code is too difficult ..... understand and debug.  
**a** read   **b** reading   **c** to read
- 2 I went on the course ..... how to be a better programmer.  
**a** learn   **b** to learn   **c** for to learn
- 3 I'm not interested in ..... that computer language.  
**a** learn   **b** learning   **c** to learn
- 4 He refuses ..... the project with me.  
**a** do   **b** doing   **c** to do
- 5 The engineers warned the employees not ..... the cables.  
**a** touch   **b** touching   **c** to touch
- 6 They may not ..... to the conference.  
**a** come   **b** coming   **c** to come
- 7 Spyware can make your PC ..... more slowly.  
**a** perform   **b** performing   **c** to perform
- 8 This program is too slow ..... the simulation.  
**a** do   **b** to do   **c** for doing

## HELP box

### The infinitive

The infinitive with *to* is used in the following ways:

- To express purpose

*We use symbolic languages **to communicate** instructions to the computer.  
(=in order to communicate ...)*

**Not:** ... **for** to communicate

- After adjectives

*BASIC was widely used in the past because it was **easy to learn**.*

*Machine code is too **difficult to write**.  
(=not easy enough to write)*

- After certain verbs (e.g. **afford, demand, plan, agree, expect, promise, appear, hope, refuse, arrange, learn, try, decide, manage**)

*A lot of companies are now **trying to develop** voice applications for web access.*

- After the object of certain verbs (e.g. **advise, encourage, allow, expect, tell, ask, invite, want, enable, order, warn**)

*HTML **allows us to describe** how information will be displayed on web pages.*

The bare infinitive (without *to*) is used in the following ways:

- After modal verbs (e.g. **can, could, may, might, will, would, must, should**)

*Unfortunately, computers **can't understand** spoken English.*

*High-level languages **must be** translated into machine code.*

- After the object with the verbs **make** and **let**

*Programs **make computers perform** specific tasks.*

**C**  **In pairs, discuss something**

- 1 you can't afford to buy at the moment.
- 2 you've arranged to do this weekend.
- 3 you've learnt to do in the last year.
- 4 you'd advise someone to do before buying a new PC.
- 5 you'd expect to be included with an anti-virus package.
- 6 you can do with Java applets.

## 6 Visual BASIC and VoiceXML

**A Work in pairs. Student A reads about Visual BASIC, Student B reads about VoiceXML. Try not to look at your partner's text. Complete your part of the table.**

**Student A**

**Visual BASIC** was developed by Microsoft in 1990. The name **BASIC** stands for Beginner's All-purpose Symbolic Instruction Code. The adjective **Visual** refers to the technique used to create a graphical user interface. Instead of writing a lot of instructions to describe interface elements, you just add pre-defined objects such as buttons, icons and dialog boxes. It enables programmers to create a variety of Windows applications.

**Student B**

**VoiceXML** (EXtensible Markup Language) was created in 2000 to make web content accessible via the telephone. For input, it uses voice recognition. For output, it uses pre-recorded audio content and text-to-speech. Applications:

- voice portals, where you can hear information about sports, news, traffic, etc.
- voice-enabled intranets (private networks)
- voice e-commerce
- home appliances controlled by voice

	<b>Visual BASIC</b>	<b>VoiceXML</b>
What does Visual BASIC / VoiceXML stand for?		
When was it developed?		
What are its main features?		
What is it used for?		

**B**  **Ask your partner about the other language and complete the table.**

## 1 *IT professionals*

**A Complete these definitions with jobs from the box.**

software engineer	computer security specialist	blog administrator	help desk technician
DTP operator	hardware engineer	network administrator	webmaster

- 1 A ..... designs and develops IT devices.
- 2 A ..... writes computer programs.
- 3 A ..... edits and deletes posts made by contributors to a blog.
- 4 A ..... uses page layout software to prepare electronic files for publication.
- 5 A ..... manages the hardware and software that comprise a network.
- 6 A ..... designs and maintains websites.
- 7 A ..... works with companies to build secure computer systems.
- 8 A ..... helps end-users with their computer problems in person, by email or over the phone.

**B**  Listen to four people on a training course introducing themselves and talking about their jobs. Which job in A does each person do?

Speaker 1 ..... Speaker 3 .....

Speaker 2 ..... Speaker 4 .....

## 2 *Job advertisements*

**A**  In pairs, read the two job advertisements on page 130 and tick (✓) the most important qualities and abilities (1–10) for each job. Add more to the list if you can. Which three things do you think are most important for each job?

Senior programmer      DTP operator

- |                           |                          |                          |
|---------------------------|--------------------------|--------------------------|
| 1 logical reasoning       | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 patience and tenacity   | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 being good with figures | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 imagination             | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 self-discipline         | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 accuracy                | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 leadership skills       | <input type="checkbox"/> | <input type="checkbox"/> |
| 8 efficiency              | <input type="checkbox"/> | <input type="checkbox"/> |
| 9 creativity              | <input type="checkbox"/> | <input type="checkbox"/> |
| 10 drawing skills         | <input type="checkbox"/> | <input type="checkbox"/> |

**B**  Discuss if you would like to apply for one of the jobs. Give reasons for your answers.

## DIGITUM-UK

**SENIOR PROGRAMMER** required by DIGITUM-UK, a leading supplier of business systems to the insurance industry.

You will be able to work on the full range of software development activities – analysis, design, coding, testing, debugging and implementation. At least two years' experience of COBOL or C++ is necessary.

As we are active in Europe, fluency in French, Italian or another European language is desirable.

Don't miss this opportunity to learn new skills and develop your career.

Send your CV to CHRIS SCOTT, PERSONNEL MANAGER, DIGITUM-UK, 75 PARKSHILL STREET, LONDON SW14 3DE

**You can visit our website at [www.digitum-uk.com](http://www.digitum-uk.com)**

## DTP operator

**required for a leading financial magazine.**

We are looking for a bright, competent QuarkXPress operator with at least three years' experience in design and layout. Skills in Photoshop, Freehand or Illustrator an advantage.

Ability to work in a team and to tight deadlines is vital.

Please apply in writing, with CV and samples of your work, to Tom Parker, Production Manager, Financial Monthly, Stockton Street, London EC1A 4WW  
Or apply online:

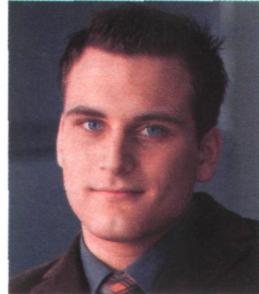
**Apply now**

**C Look at the online profile for Charles Graham. Which of the jobs above is most appropriate for him?**

**Charles Graham** 22 years old

### Professional summary

I graduated in 2004 with A levels in English, Art and Maths, and went on to do a course in graphic design and page layout at Highland Art School. Since 2006 I've been a graphic designer for PromoPrint, a company specializing in publishing catalogues and promotional material, and have used Adobe InDesign and other DTP software.



## 3 A letter of application

**A Read the letter of application on page 131 and answer these questions.**

- 1 Which job is Sarah Brown applying for?
- 2 Where did she see the advertisement?
- 3 How long has she been working as a software engineer?
- 4 What type of programs has she written?
- 5 When did she spend three months in Spain?

Dear Mr Scott,

I am writing to apply for the position of Senior Programmer which was advertised on 28th March in *The Times*.

I graduated in May 2002 and did a work placement with British Gas as part of my degree. Before taking my present job I worked for a year with NCR. I stayed in this job (1) ..... March 2004.

(2) ..... the last three years I have been working as a software engineer for Intelligent Software. I have designed four programs in COBOL for commercial use, and (3) ..... January I have been writing programs in C for use in large retail chains. These have been very successful and we have won several new contracts in the UK and Europe on the strength of my team's success.

Two years (4) ..... I spent three months in Spain testing our programs and also made several visits to Italy, so I have a basic knowledge of Spanish and Italian. I now feel ready for more responsibility and more challenging work, and would welcome the opportunity to learn about a new industry.

I enclose my curriculum vitae. I will be available for an interview at any time.

I look forward to hearing from you.

Yours sincerely,

Sarah Brown

Sarah Brown

### HELP box

#### *for, since, ago, until*

- We use **for** to refer to a period of time.  
*I've lived in Liverpool for five years.*
- We use **since** to refer to a point in time.  
*I've been unemployed since May 2005.*
- We use **ago** with the past simple to say when something happened. We put **ago** after the time period.  
*I got married five years ago.*
- We use **until** to mean up to a certain time.  
*I stayed at high school until I was 18.*

**B** Look at the HELP box and then complete the letter with **for, since, ago or until**.

## 4 A job interview



Chris Scott, the Personnel Manager at Digitum-UK, is interviewing Sarah Brown. Listen to part of the interview and complete his notes.

Name: Sarah Brown

Qualifications:

Degree in (1) .....

(Aston University)

Languages: Basic Spanish and Italian

Work experience:

NCR: (2) ..... (one year)

Software for:

(3) .....

Programs for:

(4) .....

Database knowledge:

(5) .....

Present job: Works for Intelligent Software writing programs in COBOL and C.

Reasons for applying:

(6) .....

## 5 Language work: the present perfect

**A** Look at the HELP box and then choose the correct words in brackets to complete these sentences.

- 1 He ('s never liked / 's never been liking) Maths.
- 2 They ('ve worked / 've been working) on the project all day.
- 3 John ('s used / 's been using) the computer for hours – he looks really tired.
- 4 How many emails (have you written / have you been writing) today?
- 5 She ('s written / 's been writing) this essay since 9 o'clock.
- 6 They ('ve interviewed / 've been interviewing) five candidates today.

### HELP box

#### Present perfect simple

We form the present perfect simple with **have/has** + past participle.

**I've used** Microsoft Access for many years.  
**I haven't used** Microsoft Access for years.

We use this tense to talk about:

- States that started in the past and continue to the present.  
*Since 2006, I've been* a computer operator for PromoPrint.
- Past actions that continue to the present, where we put an emphasis on quantity (*how many*).  
*I have designed* four programs in COBOL.
- Personal experiences, especially with **ever** and **never**.

**Have you ever worked** with databases?  
**I've never worked** with databases.

#### Present perfect continuous

We form the present perfect continuous with **have/has been** + present participle.

*Since January I've been writing* programs in C.

We use this tense to talk about:

- Actions which started in the past and are still happening.  
*For the last three years I've been working* as a software engineer for Intelligent Software.
- Past actions that continue to the present, where we put an emphasis on duration (*how long*).  
*She's been working* all morning.

#### Contrast with the past simple

We use the past simple to talk about events that happened at a specific time in the past that are now finished.

*I graduated* in May 2003.

**Not:** *I have graduated* in ...

*I stayed* in this job until March 2004.

Two years ago, *I spent* three months in Spain.

#### B Put the verbs in brackets into the present perfect simple or past simple.

- 1 She (be) ..... a software engineer since 2004.
- 2 After graduation I (work) ..... for a year with NCR.
- 3 (you ever work) ..... as an IT consultant?
- 4 I (lose) ..... my PDA.
- 5 I (send) ..... my CV last Monday. Have you received it yet?



**C** Make questions using these prompts. In pairs, ask and answer the questions.

- 1 ever / live or work in another country?
- 2 ever / have a bad job interview?
- 3 ever / do a job you hated?
- 4 how long / study English?
- 5 how long / use computers?
- 6 how many emails / receive today?
- 7 how many jobs / apply for this year?

## 6 Applying for a job

**A** Look at the job advertisement for a webmaster at eJupiter. María Quintana is interested in applying. Use her curriculum vitae on page 155 to write a letter of application. Follow these steps:

**Paragraph one:** reason for writing  
*I am writing to apply for the position of ...*

**Paragraph two:** education and training

*I graduated in (date) ...  
I completed a course in ...*

**Paragraph three:** work experience  
*For the past X years I have been ...  
Since X I have been ...*

**Paragraph four:** personal skills

*I spent X months in (country) ... , so I have knowledge of (foreign languages).  
I can ...*

**Paragraph five:** reasons why you are applying for this job

*I now feel ready to ... and would welcome the opportunity to ...*

**Paragraph six:** closing / availability for interview

*I enclose ... I look forward to ... I will be available for an interview ...*

**B** Write your own CV in English, using María's CV as a guide.

**C** Think of your ideal job and write a letter of application for it. If you prefer, look on the Internet for real jobs and practise applying for those.



Now visit [www.cambridge.org/elt/ict](http://www.cambridge.org/elt/ict) for an online task.

### Vacancies at eJupiter.co.uk

#### Webmaster

We are seeking a Webmaster for eJupiter.co.uk, a company dedicated to e-commerce.

The successful candidate will manage our website. You will be responsible for making sure the web server runs properly, monitoring the traffic through the site, and designing and updating our web pages.

Experience of using HTML and Java is essential. Experience of Adobe PDF and Photoshop is an advantage. The successful candidate will also have knowledge of web editors – MS FrontPage or equivalent.

*Send your CV and a covering letter to James Taylor,  
eJupiter Computers, 37 Oak Street, London SW10 6XY*

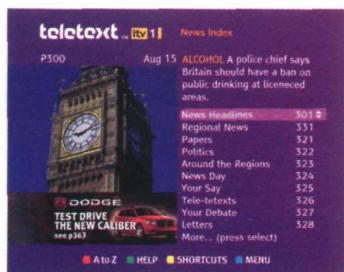
**1****Information and communications technologies (ICT)**

**A**  In pairs, discuss these questions.

- 1 What is an ICT system?
- 2 How many types of ICT system can you think of? Make a list.
- 3 How can a PC be connected to another computer?

**B** Label the pictures (1–7) with the ICT systems and services in the box.

Fax	GPS	Call centre	Digital radio	Teletext	Wearable computer	Digital TV
-----	-----	-------------	---------------	----------	-------------------	------------



1 .....



2 .....



3 .....



4 .....



5 .....



6 .....



7 .....

**C** Complete these sentences with words and phrases from B and then read the text on page 136 to check your answers.

- 1 Digital Audio Broadcasting, or DAB, is the technology behind ..... DAB is intended to replace FM in the near future.
- 2 ..... are designed to be worn on the body or integrated into the user's clothing.
- 3 Most existing TV sets can be upgraded to ..... by connecting a digital decoder.
- 4 My grandfather is 75 and he still watches ..... on TV to find out share prices, weather forecasts and sports results.
- 5 I work in a ..... . I receive incoming calls with information inquiries. I also make outgoing calls for telemarketing.
- 6 Please complete this form and send it by ..... or normal mail.
- 7 I have a ..... navigation system in my car but I don't use it very often. My town is small and I know it well.

# Channels of communication

## What are telecommunications?

**Telecommunications** refers to the transmission of signals over a distance for the purpose of communication. Information is transmitted by devices such as the telephone, radio, television, satellite, or computer networks. Examples could be two people speaking on their **mobile phone**, a sales department sending a **fax** to a client, or even someone reading the **teletext** pages on TV. But in the modern world, telecommunications mainly means transferring information across the **Internet**, via modem, phone lines or wireless networks.

Because of telecommunications, people can now work at home and communicate with their office by computer and telephone. This is called **teleworking**. It has been predicted that about one third of all work could eventually be performed outside the workplace. In **call centres**, assistance or support is given to customers using the telephone, email or online chats. They are also used for **telemarketing**, the process of selling goods and services over the phone.

## Digital TV and radio

In recent years, TV and radio broadcasting has been revolutionized by developments in satellite and digital transmission. **Digital TV** is a way of transmitting pictures by means of digital signals, in contrast to the analogue signals used by traditional TV. Digital TV offers interactive services and **pay multimedia** – that is, it can transmit movies and shows to TV sets or PCs on a pay-per-view basis. It is also **widescreen**, meaning programmes are broadcast in a native 16:9 format instead of the old 4:3

format. Digital TV provides a better quality of picture and sound and allows broadcasters to deliver more channels.

Digital Terrestrial TV is received via a **set-top box**, a device that decodes the signal received through the aerial. New technologies are being devised to allow you to watch TV on your mobile. For example, **DMB** (**Digital Multimedia Broadcasting**) and **DVB-H** (**Digital Video Broadcast-Handheld**) can send multimedia (radio, TV and data) to mobile devices.

Audio programs (music, news, sports, etc.) are also transmitted in a digital radio format called **DAB** (**Digital Audio Broadcasting**).

## Mobile communications

Thanks to wireless connectivity, mobile phones and **BlackBerrys** now let you check your email, browse the Web and connect with home or company intranets, all without wires.

The use of **GPS** in cars and PDAs is widespread, so you can easily navigate in a foreign city or find the nearest petrol station. In the next few years, GPS chips will be incorporated into most mobile phones.

Another trend is **wearable computers**. Can you imagine wearing a PC on your belt and getting email on your sunglasses? Some devices are equipped with a wireless modem, a keypad and a small screen; others are activated by voice. The users of wearable technology are sometimes even called *cyborgs*! The term was invented by Manfred Clynes and Nathan Kline in 1960 to describe cybernetic organisms – beings that are part robot, part human.

### D Read the text again and find the following.

- 1 the device that allows PCs to communicate over telephone lines
- 2 the practice of working at home and communicating with the office by phone and computer
- 3 the term that refers to the transmission of audio signals (radio) or audiovisual signals (television)
- 4 five advantages of digital TV over traditional analogue TV
- 5 two systems that let you receive multimedia on your mobile phone
- 6 the term that means *without wires*
- 7 devices that deliver email and phone services to users on the move
- 8 the meaning of the term *cyborg*

## 2 Language work: the passive

**A** Look at the HELP box. How do you make the passive in your language? How different is it to English?

### HELP box

#### The passive

We form the passive with the verb **be** + the past participle of the main verb. When we mention the agent, we use **by**.

The passive is often used in technical writing to give an objective tone.

- Present simple passive

*Information **is transmitted by** devices such as the telephone, radio, TV or ...*

- Present continuous passive

*New technologies **are being devised** to allow you to watch TV on your mobile.*

- Past simple passive

*The term **cyborg was invented by** M Clynes and N Kline in 1960.*

- Past continuous passive

*My TV **was being repaired**, so I couldn't watch the match.*

- Present perfect passive

*It **has been predicted** that about one third of all work could eventually be performed outside the workplace.*

- Past perfect passive

*The system **had been infected** by a virus.*

- Future simple passive

*In the next few years, GPS chips **will also be incorporated** into most mobile phones.*

- Modal verbs in the passive

*It has been predicted that about one-third of all work **could** eventually **be performed** outside the workplace.*

**B** Read the article and underline all the examples of the passive. What tenses are they?

A HACKER has been sent to jail for fraudulent use of credit card numbers. Nicholas Cook, 26, was arrested by police officers near a bank cashpoint last month.

Eight months earlier, he had been caught copying hundreds of computer

programs illegally. After an official inquiry, he was accused of software piracy and fined £5,000.

It is reported that in the last few years Cook has been sending malware (malicious software) to phone operators and attacking mobile phones to steal business and personal

information. Cook has now been sentenced to three years in prison for stealing passwords and obtaining money by credit card fraud.

Government officials say that new anti-hacking legislation will be introduced in the EU next year.

**C** Complete these sentences with the passive form of the verbs in brackets.

- 1 Microprocessors (make) ..... of silicon.
- 2 Call centres (use) ..... to deal with telephone enquiries.
- 3 In recent years, most mobile phones (equip) ..... with Bluetooth.
- 4 GPS (develop) ..... in the 1970s as a military navigation system.
- 5 Sorry about the mess – the computers (replace) ..... at the moment.
- 6 In the near future, the Internet (access) ..... more frequently from PDAs and mobile phones than from desktop computers.
- 7 Networks (can connect) ..... via satellite.
- 8 I had to use my laptop this morning while my PC (fix) .....

### 3 VoIP technology

**A**  Listen to an interview with Sue Reid, a specialist in telecommunications. What is her prediction about the future of VoIP?

**B**  Listen again and answer these questions.

- 1 What exactly is VoIP?
- 2 Does the recipient need any special equipment?
- 3 What is an ATA? What is its function?
- 4 What is the advantage of Wi-Fi phones over mobile phones?
- 5 Do you need to have a VoIP service provider?
- 6 What is spit?



A wireless VoIP phone

**C**  Using the diagram, explain VoIP technology in your own words.



## 4 Mobile phones

**A Label the mobile phone with features from the box.**

LCD screen   Brand   Built-in camera  
Changeable faceplate  
SIM card (Subscriber Identity Module)  
Wireless support   Keypad   Ringtone



**B** In pairs, describe your mobile phone.  
Use A and the *Useful language* box to help you.

### Useful language

My phone is a ... It's got a ... With the ..., I can ...  
The best feature is ... I never use the ... I mostly use it for ...

**C** In pairs, discuss these questions.

- 1 How much money do you spend on your mobile?
- 2 Can you send MMS (multimedia messages) from your mobile?
- 3 Do you access the Internet from your mobile? Which sites do you visit?
- 4 Can you listen to music and watch TV on your mobile?
- 5 Do you use your mobile phone for business? Do you think it is secure to carry out financial transactions via mobile phones?
- 6 Do you ever use your phone while driving?
- 7 Have you ever had to use your phone in an emergency?
- 8 Do you think that prolonged use of mobile phones can affect our health (for example cause fatigue and headaches, emit radiation, excite brain cells, etc.)?



An Apple iPhone combines three products – a mobile phone, an iPod, and an internet device with email, web browsing, maps and searching

**D** Write a summary of the discussion in C as if you were posting it on a blog. Show your summary to other members of your class so that they can add comments.

## 1 Future trends

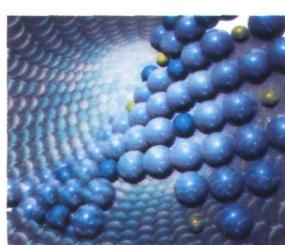
**A**  In pairs, discuss these questions.

- 1 What do you think a *trend* is?
- 2 What trends in ICT do you think will affect our lives in the future? Make a list.

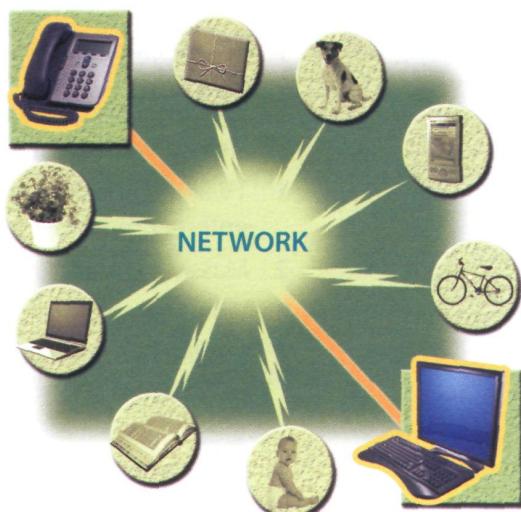
**B** Match the texts (1–5) with the pictures (a–e). Which trends from your list in A are mentioned?



a .....



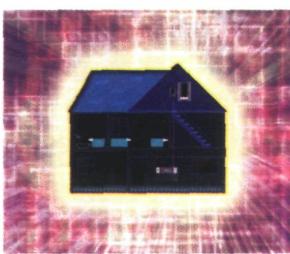
b .....



e .....



c .....



d .....

1

By all accounts, **nanotechnology** – the science of making devices from single atoms and molecules – is going to have a huge impact on both business and our daily lives. Nano devices are measured in **nanometres** (one billionth of a metre) and are expected to be used in the following areas.

- **Nanocomputers:** Chip makers will make tiny microprocessors with **nanotransistors**, ranging from 60 to 5 nanometres in size.

- **Nanomedicine:** By 2020, scientists believe that nano-sized robots, or **nanobots**, will be injected into the body's bloodstream to treat diseases at the cellular level.

- **Nanomaterials:** New materials will be made from carbon atoms in the form of **nanotubes**, which are more flexible, resistant and durable than steel or aluminium. They will be incorporated into all kinds of products, for example stain-resistant coatings for clothes and scratch-resistant paints for cars.

2

**Artificial Intelligence (AI)** is the science of making intelligent machines and programs. The term originated in the 1940s, when Alan Turing said: 'A machine has artificial intelligence when there is no discernible difference between the conversation generated by the machine and that of an intelligent person.' A typical AI application is **robotics**. One example is ASIMO, Honda's

intelligent humanoid robot. Soon, engineers will have built different types of **android**, with the form and capabilities of humans. Another AI application is **expert systems** – programs containing everything that an 'expert' knows about a subject. In a few years, doctors will be using expert systems to diagnose illnesses.

3

Imagine you are about to take a holiday in Europe. You walk out to the garage and talk to your car. Recognizing your voice, the car's doors unlock. On the way to the airport, you stop at an ATM. A camera mounted on the bank machine looks you in the eye, recognizes the pattern of your iris and allows you to withdraw cash from your account.

When you enter the airport, a hidden camera compares the digitized image of your face to that of suspected

criminals. At the immigration checkpoint, you swipe a card and place your hand on a small metal surface. The geometry of your hand matches the code on the card, and the gate opens. You're on your way.

Does it sound futuristic? Well, the future is here.

**Biometrics** uses computer technology to identify people based on physical characteristics such as fingerprints, facial features, voice, iris and retina patterns.

Adapted from the *Richmond Times-Dispatch*

4

**Ubiquitous computing**, also known as **pervasive computing**, is a new approach in which computer functions are integrated into everyday life, often in an invisible way. **Ubiquitous devices** can be anything from smartphones to tiny sensors in homes, offices and cars, connected to networks, which allow information

to be accessed anytime and anywhere – in other words, ubiquitously. In the future people will interact naturally with hundreds of these **smart devices** (objects containing a microchip and memory) every day, each invisibly **embedded** in our environment and communicating with each other without cables.

5

In the ideal **smart home**, **appliances** and electronic devices work in sync to keep the house secure. For example, when a regular alarm system senses that someone is breaking into the house, it usually alerts the alarm company and then the police. A smart home system would go further, turning on the lights in the home and then sending a text message to the owner's phone. Motorola *Homesight* even sends images captured by wireless cameras to phones and PCs.

Smart homes can remember your living patterns, so if you like to listen to some classical music when you come home from work, your house can do that for you automatically. They will also know when the house is empty and make sure all appliances are turned off. All home devices will be interconnected over a home area network where phones, cable services, home cinemas, touch screens, smart mirrors and even the refrigerator will cooperate to make our lives more comfortable.

Adapted from [www.businessweek.com](http://www.businessweek.com)

### C Read the texts again and answer these questions.

- 1 Which unit of measurement is used in nanotechnology?
- 2 What are the advantages of nanotubes over regular materials?
- 3 What will doctors use *expert systems* for?
- 4 What features are analysed by biometrics?
- 5 Which trend refers to computers embedded in everyday devices, communicating with each other over wireless networks?
- 6 What will the alarm system do if someone breaks into a smart home?
- 7 How will devices be interconnected inside the smart home?

### D Find words in the texts with the following meanings.

- 1 a microscopic robot, built with nanotechnology (text 1) .....
- 2 a robot that resembles a human (text 2) .....
- 3 biological identification of a person (text 3) .....
- 4 integrated; inserted into (text 4) .....
- 5 electrical devices, or machines, used in the home (text 5) .....

### E Write a suitable caption for each picture on page 150.

## 2 RFID tags

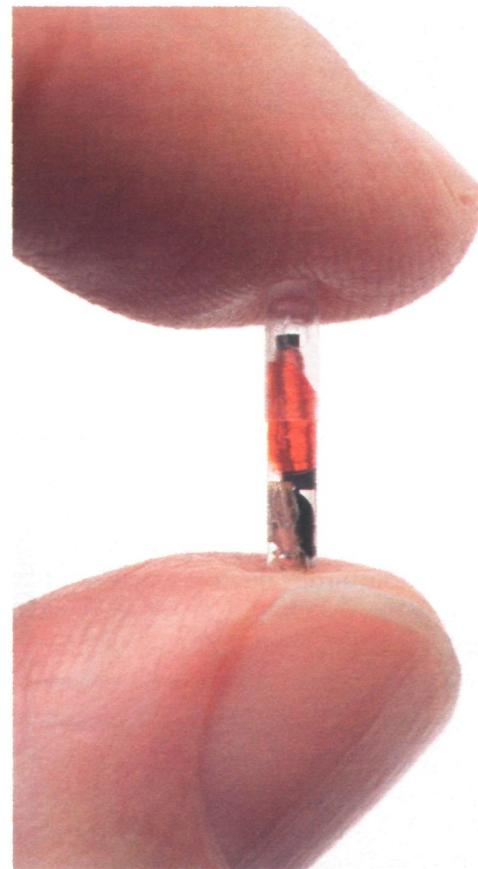
**A**  Listen to Sarah Wood, an ICT teacher, giving a class about RFID tags. Which definition (a–c) best describes RFID?

- a** a smart technology worn on the user's body so that they can email and access the Web
- b** a technology that uses radio waves and chip-equipped tags to automatically identify people or things
- c** a technology that uses microchips and bar codes to track people or things at a distance

**B**  Listen again and decide which answers (a or b) are correct.

- 1 RFID stands for
  - a** Radio Frequency Identification.
  - b** Radio Frequency Identification Download.
- 2 Radio tags
  - a** can only be attached to or embedded into products.
  - b** can be attached to or embedded into products, animals and humans.
- 3 Active RFID tags
  - a** have a communication range of several hundred metres.
  - b** have a communication range of five metres.
- 4 RFID chips
  - a** will help us track ordinary objects like car keys or books.
  - b** won't be able to locate objects when they are lost or stolen.
- 5 Radio tags may be implanted under the skin
  - a** to confirm a patient's identity and cure illnesses.
  - b** to give doctors instant access to a patient's medical history.
- 6 According to consumer organizations, RFID tags
  - a** could be used to track consumers or to steal a person's identity.
  - b** are secure and private; there is no need for concern.

**C**  In pairs, discuss how secure you think RFID is. Do you agree with the consumer organizations or the manufacturers? Give reasons for your answers.



An RFID micro chip

### 3 Language work: future forms

#### A Look at the HELP box and then choose the correct words in brackets to complete these sentences.

- 1 In the future, I hope we ('ll have /'re going to have) robots in the home to help us with the housework.
- 2 Hey, Nick, be careful, you ('re going to spill /'ll spill) that coffee on the computer!
- 3 It's John's birthday next week. We ('ll give /'re going to give) him a mobile phone.
- 4 – My laptop has crashed!  
– Don't worry. I ('ll lend /'m going to lend) you mine.
- 5 The Internet (will probably change / is probably going to change) the publishing industry in the way that TV changed the movie industry.
- 6 Futurists predict that smart technology (will be / is going to be) incorporated into fabrics, so you'll be able to email from your coat!

#### HELP box

##### Future forms

We use the future simple (**will/won't** + verb) in the following ways:

- To make predictions when you don't have present evidence that something will happen  
*Nanobots **will be injected** into the body's bloodstream to treat diseases.*
- To talk about hopes and promises, especially with the words **expect, think, hope** and **probably**  
*They **hope** that people **will interact** naturally with hundreds of smart devices at a time.*
- To describe an instant decision, often when we make an offer  
*Sure, **I'll help** you with your homework.*
- To talk about facts that will inevitably happen  
***She'll be** 21 in May.*

We use **be going to** + verb in the following ways:

- To describe future intentions  
*She's **going to write** a book about ubiquitous computing.*
- To make predictions when you have present evidence that something is going to happen  
*By all accounts, nanotechnology **is going to have** a huge impact on business and our daily lives.*

We use the future continuous (**will be** + -ing form of the verb) to talk about actions in progress at a specific time in the future.

*In a few years, doctors **will be using** expert systems to diagnose illnesses.*

We use the future perfect (**will have** + past participle) to talk about actions finished at a specific time in the future.

*Soon, engineers **will have built** different types of android.*

#### B Complete these sentences with the correct future form of the verb in brackets. Use the future continuous or future perfect.

- 1 Thanks to ICT, by the year 2030 we (find) ..... cures for the major diseases of our time.
- 2 In twenty years' time, some people (live) ..... in space, perhaps inside a computerized colony.
- 3 By this time next week, I (work) ..... for IBM.
- 4 By this time next month, I (buy) ..... that BlackBerry that I've been wanting to buy for months.
- 5 Scientists predict that in twenty years' time nearly everyone (live) ..... in smart houses.

**C** In pairs, discuss these predictions. Do you agree or disagree? Give reasons for your answers. Look at the *Useful language* box to help you.

- 1 Some day, we'll be talking to computers naturally, like friends.
- 2 Microchips implanted in our arms will serve as ID cards and contain our medical records.
- 3 Robots will learn to build themselves, without human help.
- 4 Smart homes will be voice-activated.
- 5 Computers will be ubiquitous and almost invisible, embedded into our homes and integrated into our lives.

### Useful language

I think that ...

What do you think about number ... ?

I'm not sure that ... will ...

I completely agree/disagree with ...

## 4 Making predictions

**A** Write your own predictions about these topics.

• Work/Jobs

Example: *By the year 2030, human labour in industry will have been replaced by robots.*

Your prediction:

• Money

Example: *Cash will be replaced by electronic money.*

Your prediction:

• Education

Example: *By the end of this century, every student in every school will have a PC.*

Your prediction:

• The Internet

Example: *People in every country will have high-speed access to the Internet within five years.*

Your prediction:

**B** In pairs, compare your predictions. Find out more about your partner's predictions.



Now visit [www.cambridge.org/elt/ict](http://www.cambridge.org/elt/ict) for an online task.



BROWER

# Appendix: a model CV

## Curriculum vitae

### Personal information

**Name:** María Quintana

**Address:** Avda Séneca, 5, Madrid 28040

**Telephone:** 00 34 91 5435201

**Email:** mquintana0782@telefonica.net

**Date of birth:** 28/07/82

### Education and Training

2006	Online diploma in web-based technology for business, <a href="http://www.elearnbusiness.com">www.elearnbusiness.com</a>
2005	Course in web design at the Cybernetics College, London: HTML, Java and Macromedia Dreamweaver
2004	Course in computer hardware and networking at the Cybernetics College, London
1999–2004	Degree in Computer Science and Engineering, University of Madrid

### Work experience

January 2006 – present	Part-time Webmaster at <a href="http://www.keo.es">www.keo.es</a> ; responsible for updating the site and using Adobe Flash to create animations
May 2005 – December 2006	IT consultant at Media Market, specializing in e-commerce and IT strategies

### IT skills

Knowledge of multiple computer platforms (Windows, Mac and Linux); strong database skills (including the popular open source MySQL database); complete understanding of graphics formats and Cascading Style Sheets

### Personal skills

Social and organizational skills

Good communication skills

### Languages

Spanish mother tongue; English (Cambridge CAE); Arabic (fluent)

### Hobbies and Interests

Web surfing, listening to music and travelling

### References

Miguel Santana, Manager, keo.es

Sam Jakes, Lecturer, Cybernetics College

# Glossary

## A

**@** /ət/ The '@' sign that separates the recipient's name from the domain name in an email address.

**Acrobat Reader** /'æktrəbæt 'ri:də/ *n* Adobe's free software for displaying and printing PDF files.

**ADSL** /eɪdʒi:es'el/ *n* Asymmetric Digital Subscriber Line. A broadband communication technology designed for use on telephone lines; it allows a single phone connection to be used for both internet service and voice calls at the same time.

**.ADSL.modem** /eɪdʒi:es'el 'mədəm/ *n* A device used to connect one or more computers to an ADSL phone line.

**adware** /'ædweər/ *n* Software devised to display advertisements; some may include spyware.

**alphanumeric keys** /ælfənju:mətrɪk 'ki:z/ *n* Keys that represent letters and numbers, arranged as on a typewriter.

**Amazon.com** /'æməzən ,dot ,kɒm/ *n* A popular online shopping site.

**android** /'ændrɔɪd/ *n* A robot that resembles a human.

**animations** /æn'teɪmeʃənz/ *n* Images made up of a series of independent pictures put together in sequence to look like moving pictures.

**applet** /'æplət/ *n* A small Java application, usually designed to run automatically within a web page.

**application software** /æpli'keɪʃən ,sɒfweə/ *n* Programs that let you do specific tasks, such as word processing, database management or financial planning.

**arcade game** /ɑ:k'eɪd ,geɪm/ *n* A game played in a coin-operated machine, typically installed in pubs, restaurants and amusement arcades.

**arithmetic logic unit (ALU)** /ə,rɪθmətɪk 'lɒgɪk ju:nɪt/ *n* A component of the CPU which performs the actual arithmetic and logical operations asked for by a program.

**ARPANet** /'a:pənet/ *n* Advanced Research Projects Agency Network. Developed in the early 70s by the US Department of Defence. This was the precursor to the Internet.

**Artificial Intelligence** /a:tɪ,fɪ:səl ɪn'telɪdʒəns/ *n* The study of methods by which a computer can simulate aspects of human intelligence.

**ASCII code** /'æski: ,kɔ:d/ *n* A standard system for the binary representation of characters. ASCII, which stands for American Standard Code for Information Interchange, permits computers from different manufacturers to exchange data.

**aspect ratio** /'æspekt ,reɪʃɪəʊ/ *n* The width of the screen divided by its height, e.g. 4:3 (standard PC monitor or TV set) and 16:9 (high-definition TV).

**assembler** /'ə'sembələ/ *n* A special program that converts a program written in a low-level language into machine code.

**assembly language** /'ə'sembli ,laengwidʒ/ *n* A low-level language that uses abbreviations, such as ADD, SUB and MPY, to represent instructions.

**ATA adaptor** /'eɪti:er ə,dæptə/ *n* An analogue telephone adaptor, which converts the analogue signals of your traditional phone into digital signals.

**Athlon** /'æθlɒn/ *n* A processor manufactured by AMD.

**attachment** /ə'tætʃmənt/ *n* A file that has been included as part of an email message.

**attributes** /'ætrɪbju:tɪs/ *n* Characteristics that affect the visual representation of lines and polygons, e.g. line styles, rectangle colour, etc.

**authentication** /ə:tʃentɪ'keɪʃən/ *n* Verifying the identity of a user logging onto a network; ways of authentication include passwords, digital certificates and biometrics.

**avatar** /'ævətə:/ *n* An object which represents a participant in a 3-D chat room

## B

**back up** /bæk 'ʌp/ *v* To copy files from one disk to another.

**backbone** /bækbaʊn/ *n* High-speed lines or connections that form the major access pathways within the Internet.

**backup** /bæk'ʌp/ *n* A copy of data or software, usually kept in case the original disk is damaged.

**bandwidth** /bændwɪtθ/ *n* The quantity of data that can be transmitted through a network, measured in bits per second (bps).

**bar code reader** /'bɑ:kɔ:d ,ri:də/ *n* A specialized scanner used to read price labels in shops.

**BASIC** /'beɪsɪk/ *n* A high-level programming language developed in the 1960s, widely used in programming because it was interactive and easy to use. Short for *Beginner's All-purpose Symbolic Instruction Code*.

**binary code** /'bainərɪ ,kɔ:d/ *n* A code made of just two numbers (0 and 1).

**binary digit** /'bainərɪ ,dɪdʒɪt/ *n* The smallest unit of information in the binary system, 0 or 1. Also called a *bit*.

**binary system** /'bainərɪ ,sɪstəm/ *n* A notation system in which numbers are represented by the two digits: 0 and 1. Thus the binary number 10 represents 2 in the decimal system, while 100 represents 4.

**biometrics** /baɪəʊ'metriks/ *n* The science that uses computer technology to identify people based on physical features, such as fingerprints or voice scans. From the ancient Greek: bios = life, metron = measure.

**bit** /bɪt/ *n* See **binary digit**.

**bit-mapped graphics** /,bitmæpt 'græfɪks/ *n* See **raster graphics**.

**BitTorrent** /'bit 'tɔ:rənt/ *n* A protocol for transferring music, films, games and podcasts. It breaks files into chunks and distributes them among a large number of users; when you download a torrent, you are also uploading it to another user.

**BlackBerry** /'blækberi/ *n* A wireless handheld device, developed by Research in Motion, which provides email, phone, text messaging, web browsing, an organizer, as well as instant messaging and corporate data access.

**blind carbon copy (Bcc)** /,blaɪnd ,kɔ:bən 'kɔ:pi/ *n* Addresses in the Bcc: line of an email program will receive a copy of the message, but the identity of the recipients will be kept secret.

**blog** /bɒgl/ *1 n* A user-generated website where people express their opinions. The entries are displayed in a reverse chronological order. The term comes from *web log*, coined by Jorn Barge in 1997 to refer to an online diary. *2 v* To write entries in a blog.

**blog administrator** /,bɒgl əd'mi:nɪstreɪtə/ *n* Someone who edits and deletes posts or comments made by contributors to a blog.

**logger** /'blɒgə/ *n* A person who writes on a blog.

**blogging** /'blɒgɪŋ/ *n* Writing web logs. See **blog**.

**blogosphere** /'blɒgəʊsfɪə/ *n* The collective term including all blogs as a community.

**Bluetooth** /'blu:tʊ:θ/ *n* A wireless technology that allows handhelds, mobile phones and other peripheral devices to communicate over short distances.

**Blu-ray disc** /'blu:reɪ ,disk/ *n* A new optical disc, created by Sony, which can record and play back high-definition TV and computer data. Unlike current DVDs, which use a red laser to read and write data, Blu-ray uses a blue-violet laser, hence its name.

**bookmark** /'bʊkmɑ:k/ *n* A saved link that takes users directly to a web address. Bookmarks are also called *favourites*.

**Braille** /breɪl/ *n* A system of writing devised by Louis Braille for blind people, in which combinations of raised dots representing letters and numbers can be identified by touch.

**Braille embosser** /'breɪl ɪm,bɔ:sə/ *n* An impact printer that produces tactile Braille symbols.

**brightness** /'braɪntnəs/ *n* The amount of light produced by an LCD monitor, measured in cd/m<sup>2</sup>.

**broadband** /'brɔ:dbænd/ *n* High-speed transmission, usually referring to internet access via cable and ADSL; about 400 times faster than dial-up access.

**browser** /'braʊzə/ *n* A program designed to fetch and display web pages on the Internet.

**buddy list** /'bʌdi ,lɪst/ *n* A list of people that you may want to communicate with via instant messaging.

**bug** /bʌg/ *n* An error in a computer program.

**built-in** /'bɪlt in/ *adj* Integrated; constructed as part of a larger unit.

**bulletin board system (BBS)** /,bulətɪn ,bɔ:d 'sɪstəm/ *n* A system that enables its users, usually members of a particular interest group, to share information and programs.

**burn** /bɜ:n/ *v* To write data to a CD or DVD.

**bus** /bʌs/ *n* An electrical channel, or highway, which carries signals between units inside the computer.

**bus topology** /,bʌs tɔ:pɒlədʒɪ/ *n* One of the three principal topologies for a LAN, in which all computer devices are connected to a main cable, or bus.

**bus width** /bʌs ,wɪdθ/ *n* The size of a bus, which determines how much data can be transmitted; for example, a 64-bit bus can transmit 64 bits of data.

**byte** /baɪt/ *n* A unit of computer information, consisting of a group of eight bits. See also **kilobyte**, **megabyte**, **gigabyte**, **terabyte**.

## C

**C** /sɪ:/ *n* A high-level programming language developed in 1972 at AT&T Bell Labs. It is used to write system software, graphics and commercial applications.

**C#** /sī: 'ʃɔ:p/ *n* A simplified version of C and C++, developed by Microsoft for applications on the Web.

**C++** /sī: 'plas 'plas/ *n* An object-oriented version of C, widely used to develop enterprise and commercial applications. The programmer gives each object (e.g. a piece of text, a graphic or a table) functions which can be altered without changing the entire program.

**cable modem** /'keɪbəl ,məʊdəm/ *n* A modem designed to operate through a cable TV line.

**call centre** /'kɔ:l ,sə:tə/ *n* A large office in which a company's employees provide information to its customers, or sell or advertise its goods or services by telephone.

**carbon copy (Cc)** /'ka:bən ,kɔ:pɪ/ *n* Addresses on the Cc: line of an email program will receive the same message, and the recipients will be able to see the identity of the other recipients.

**Cascading Style Sheets (CSS)** /kæs'keɪdrɪŋ ,stailz/ *n* A mechanism for adding style (e.g. fonts, colours, spacing) to web documents.

**cathode ray tube (CRT)**

/'kæθədəʊd ,reɪtju:b/ *n* The picture tube of old PC monitors, made of glass and containing a vacuum. In a colour monitor, the screen surface is coated with triads of red, green and blue phosphor. Three electron beams energize the phosphor dots, causing them to emit coloured light from which the picture is formed.

**CD ripper** /,sī:di: 'rɪpə/ *n* A program that extracts music tracks and saves them on disk.

**CD-R** /,sī:di: 'a:/ *n* A write-once CD which lets you duplicate music and data CDs. Short for *compact disc recordable*.

**CD-ROM** /,sī:di: 'rom/ *n* A 'read-only' CD, meaning you cannot change data stored on it. Short for *compact disc read-only memory*.

**CD-RW** /,sī:di: 'a: 'dæbəlju:/ *n* A CD that allows audio or data to be written, read, erased, and rewritten. Short for *compact disc re-writable*.

**cell** /sel/ *n* An intersection of a column and a row in a spreadsheet.

**cell phone** /'sel ,fəʊn/ *n* American term for *mobile phone*. The term cell comes from the fact that the phone calls are made through base stations (antennae) which divide the coverage area into cells. As you move from cell to cell, the calls are transferred to different base stations; this is called *roaming*.

**central processing unit (CPU)** /,sentrəl 'prəʊsesɪŋ ,ju:nɪt/ *n* The processor chip that performs the basic operations of a computer; like the 'brain' of the computer. Its basic components are the control unit, the arithmetic logic unit and the registers.

**character** /'kærəktə/ *n* A symbol available on the keyboard (letter, number or blank space).

**chat** /tʃæt/ *n* A real-time interactive conversation on the Internet.

**chat room** /'tʃæt ,ru:m/ *n* A channel where users can communicate with each other in real time.

**chip** /tʃɪp/ *n* A tiny piece of silicon containing complex electronic circuits. Chips are used to make the hardware components of a computer.

**Chip and Pin** /,tʃɪp ,ænd 'pɪn/ *n* A secure method of paying with credit cards. Instead of using a signature to verify payments, customers are asked to enter a four-digit PIN (personal identification number).

**click** /klɪk/ *v* To press and release the left button on a mouse.

**client program** /'klaɪənt ,prə'græm/ *n* Software running on your PC, used to connect and obtain data from a server.

**client-server** /'klaɪənt,sɜ:və/ *n* A network architecture in which various client programs all connect to a central server to obtain information or to communicate.

**clip art** /'klɪp ,a:t/ *n* Ready-made pictures.

**clipboard** /'klɪpbɔ:d/ *n* A holding place for text or graphics that you have just cut or copied.

**COBOL** /'kəʊbəl/ *n* A high-level programming language developed in 1959 and mainly used for business applications. Short for *Common Business-Oriented Language*.

**coding** /'kəudɪŋ/ *n* The process of writing instructions for a computer.

**colour depth** /'kʌlə ,depθ/ *n* The number of bits used to hold a colour pixel; this determines the number of colours that a monitor can display.

**colour palette** /'kʌlə ,paɪət/ *n* The collection of colours available in a system.

**colour picker** /'kʌlə ,pɪkə/ *n* A tool used to select a specific colour in a photo; also called an *eyedropper*.

**column** /'kʌləm/ *n* A vertical line of boxes labelled with a letter in a spreadsheet program.

**command** /kə'ma:nd/ *n* An instruction for a computer.

**compact disc (CD)** /kəm,pæk't disk/ *n* A storage device which uses optical laser technology. Its storage capacity is from 650MB to 700MB.

**compatible** /kəm'pætɪbəl/ *adj* The ability of a device or program to work with another device or program. Two PCs are compatible if they can run the same software. Programs are compatible if they use the same data formats.

**compiler** /kəm'paɪələ/ *n* A special program that converts a source program (written in a high-level language) into object code (machine code) in one go.

**compositing** /kəm'pozɪtɪŋ/ *n* Combining parts of different images to create a single image.

**compression** /kəm'prɛʃən/ *n* The process which makes computer data smaller so the information takes up less space and may be transmitted in less time. Compressed files have extensions like .zip, .arj, and .sit.

**computer security specialist** /kəm,pjū:tə sɪ:kjʊrəti ,speʃəlist/ *n* Someone who works with companies to build secure computer systems.

**computer-aided design (CAD)**

/kəm,pjū:tə ,eɪdɪd di'zain/ *n* Software, and sometimes special-purpose hardware, used by engineers and architects to design everything from cars and planes to buildings and furniture.

**computer-to-plate (CTP)** /kəm,pjū:tə tə'pleɪt/ *n* An imaging technology used in modern commercial printing, in which DTP files are output directly to the printing plates without using film as an intermediate step.

**configuration** /kən,fɪgə'reɪʃən/ *n* The components of a computer system.

**configure** /kən'fɪgə/ *v* To set up a computer, device or a program to be used in a particular way.

**console game** /'kɒnsəl ,geɪm/ *n* A game played on a video game console, such as PlayStation or Xbox 360, and displayed on a television or similar audio-video system.

**control unit (CU)** /kən'trəol ,ju:nɪt/ *n* A component of the CPU which coordinates all the other parts of the computer system. This unit is also responsible for fetching instructions from the main memory and determining their type.

**cookies** /'kukɪz/ *n* Small files used by web servers to know if you have visited their site before. Cookies can store user information but do not read your hard disk.

**cracker** /'krækə/ *n* An intruder who breaks into computer systems for fun, to steal information, or to propagate viruses. Compare with **hacker**.

**crash** /kræʃ/ *1 n* A serious failure which usually requires operator attention before the computer system can be restarted. *2 v* When a hard disk fails, it is said to have crashed.

**crop** /krɒp/ *v* To cut down the dimensions of a picture.

**cursor control keys** /,kɜ:sə kən'trəol ,ki:z/ *n* They include arrow keys that move the insertion point up, down, right and left, and keys such as *End*, *Home*, *Page Up* and *Page Down*, used within a word processor to move around a long document.

**CU-SeeMe** /,sī: ,ju: ,sī: 'mi:/ *n* A video-conferencing program from Cornell university.

**cybercafé** /'saɪbə,kæfə/ *n* A place where you can use computers with internet access for a fee; also called an *internet café*.

**cybercrime** /'saɪbə,kraɪm/ *n* Crimes perpetrated over the Net.

**cyberculture** /'saɪbə,kʌltʃə/ *n* Culture emerging from the use of ICT systems.

**cyberslacker** /'saɪbə,slækə/ *n* An employee who uses his company's internet connection during working hours to chat with friends, play games, etc.

**cyberspace** /'saɪbə,spɛs/ *n* A term originated by William Gibson in his novel *Neuromancer*, now used to refer to the virtual world of computers and the Internet.

**cyberstalking** /'saɪbə,stɔ:kɪŋ/ *n* Online harassment or abuse, mainly in chat rooms and forums.

**cyborg** /'saɪbə:g/ *n* A term invented by M. Clynes and N. Kline in 1960 to describe a cybernetic organism, a being that is part robot, part human.

## D

**data** /'deɪtə/ *n* Information in an electronic form that can be stored and processed by a computer.

**data processing** /'deɪtə ,prəʊsesɪŋ/ *n* The performing of operations on data to obtain information or solutions to a problem.

**data transfer rate** /,deɪtə 'trænsfr: ,reɪt/ *n* The average speed at which data can be transmitted from one device to another, often measured in megabytes per second.

**database** /'deɪtabeɪs/ *n* A file of structured data.

**database program** /'deɪtabeɪs ,prəʊgræm/ *n* An applications program used to store, organize

and retrieve a large collection of data. Among other facilities, data can be searched, sorted and updated.

**debug** /dɪ:bæg/ *v* To correct program errors, or bugs.

**debugger** /dɪ:bægə/ *n* A program used to test and debug other programs.

**debugging** /dɪ:bægɪŋ/ *n* The techniques of detecting and correcting errors (or bugs) which may occur in programs.

**decryption** /dɪ:kriptʃən/ *n* The process of decoding (deciphering) secret data.

**dedicated keys** /'dedɪkeɪtɪd ,ki:z/ *n* Special keys used to issue commands or to produce alternative characters, e.g. the *Ctrl* key or the *Alt* key.

**desk accessory** /desk ək'sesəri/ *n* A mini application available on the Apple Menu, e.g. a calculator. In Palm OS, it is a program that you can launch from any program without having to exit the running program.

**desktop PC** /'deskətɒp pi:si:/ *n* A computer designed to be placed on a desk, used as a home computer or as a workstation for group work.

**desktop publishing (DTP)** /'deskətɒp

'pʌblɪʃɪŋ/ *n* The use of a computer system for all steps of document production, including typing, editing, graphics and printing.

**device driver** /dɪ'veɪəs ,draɪəvə/ *n* A program that allows a hardware device, such as a printer, to communicate with a computer.

**dial-up connection** /'daɪələp kə,nækʃən/ *n* A form of internet access through which the client uses a modem connected to a computer and a telephone line to dial into an Internet Service Provider. A dial-up connection is slower than a broadband connection like ADSL.

**dialog box** /'daɪəlɒg ,bɒks/ *n* A message box requiring information from the user.

**digital** /'dɪdʒɪtəl/ *adj* Describes a system that performs operations by means of digits, represented as binary numbers (1s and 0s). The opposite of digital is *analogue*.

**digital camera** /'dɪdʒɪtəl 'kæmərə/ *n* A still camera that records images in digital form. Instead of using the film found in a traditional camera, it uses a flash memory card.

**digital certificate** /'dɪdʒɪtəl sə'tifikət/ *n* A file that identifies a user or a web server; like a digital identification card.

**digital radio** /'dɪdʒɪtəl 'reidiəʊ/ *n* Radio technologies which carry information as digital signals; also known as *digital audio broadcasting* (DAB).

**digital TV** /'dɪdʒɪtəl ti:vɪ:/ *n* A way of transmitting pictures by means of digital signals, in contrast to the analogue signals used by traditional TV.

**digital video camera** /'dɪdʒɪtəl 'vɪdiəʊ ,kæmərə/ *n* A camera that records moving images and converts them into digital data; also called a *camcorder*.

**digitize** /'dɪdʒɪtaɪz/ *v* To translate into digital form, i.e. convert information into binary codes (1s and 0s) so that it can be processed by a computer. It is possible to digitize images, sound and video.

**directory** /dɪ'rektəri/ *n* An alphabetical or chronological list of files on a disk. Also known as *catalogue*.

**disk drive** /'dɪsk ,drəɪv/ *n* A device that reads and writes data on disks. Magnetic drives read

magnetic disks (e.g. hard disks), and optical drives use a laser beam to read optical discs (e.g. CDs and DVDs).

**disk partitioning** /'dɪsk pə:tɪʃənɪŋ/ *n* The process of dividing a hard disk into isolated sections. In Windows, each partition will behave like a separate disk drive. This is particularly useful if you want to install more than one operating system (e.g. you can have one partition for Windows and another for Linux).

**display** /dɪ'splaɪ/ **1** *n* A screen or monitor. **2** *v* To show text and graphics on a screen.

**DivX** /'dɪvɛks/ *n* A format used to compress and distribute movies on DVD or over the Net.

**Dock** /dɒk/ *n* A set of icons at the bottom of the Macintosh screen that give you instant access to the things you use most.

**domain name** /də'meɪn ,neɪm/ *n* A name that identifies internet sites, consisting of two or more parts separated by dots. For example, in the web address <http://www.ibm.com>, the part on the left (.ibm) is the most specific (a subdomain); the part on the right (.com) is the most general (a primary domain); this can be a country (e.g. .fr for France, .uk for United Kingdom, .es for Spain), or the type of organization (e.g. .com for commercial, .org for organization, .edu for educational, .net for network, or .gov for government). An IP address (e.g. 194.179.73.2) is translated into a domain name by a Domain Name System.

**dot-matrix** /dɒt 'meɪtrɪks/ *n* A regular pattern of dots.

**dot-matrix printer** /dɒt ,meɪtrɪks 'prɪntə/ *n* A printer that uses pins to print an array of dots; used to print multi-part forms, self-copying paper and continuous-form labels.

**double click** /'dʌbəl ,klɪk/ *v* To press and release the left button on a mouse twice, in rapid succession.

**download** /'daʊn'ləʊd/ *v* To copy files from a host computer to your own computer; compare with **upload**.

**drag** /dræg/ *v* To select a block of text or an object with the mouse button and then move the mouse while keeping the button pressed down.

**Dreamweaver** /'dri:m'wi:və/ *n* A program from Adobe (originally created by Macromedia), used for building websites.

**drop-down menu** /'drɒp ,daɒn 'menju:/ *n* A list of options that appears below a menu item when selected; also called a *pull-down menu*.

**DTP operator** /dɪrti:pɪ: ,ɒpə'reɪtə/ *n* Someone who uses page-layout software to prepare electronic files for publication.

**dual-core processor** /dju:əl ,kɔ: 'prəʊsesə/ *n* A CPU that combines two execution cores (processors) onto a single chip

**DVD** /'dɪvd/ *n* A Digital Versatile (or Video) Disc that uses optical technology to store large amounts of audio-visual material. Whereas CDs use only one side, DVDs can be recorded on both sides as well as in dual layers. A basic DVD can hold 4.7GB, and a dual layer DVD can hold 17GB.

**DVD burner** /'dɪvdɜ:nə/ *n* A DVD drive that records information by burning via a laser to a blank DVD disc.

**DVD-R** /'dɪ:vɪ:dɪ: 'ɑ:/ *n* A recordable (write-once) DVD, for both movies and data.

**DVD-ROM** /'dɪ:vɪ:dɪ: 'rɒm/ *n* A read-only DVD disc used in DVD computer drives for data

archival as well as interactive content (e.g. an encyclopedia, a movie, etc.).

**DVD-RW** /'dɪvdɪ:di: ,ɑ: 'dɒdblju:/ *n* A re-writable (write-many) DVD, for movies and data.

## E

**eBay** /'i:beɪ/ *n* An online auction and shopping website where you can buy and sell things.

**e-book** /'i:bʊk/ *n* The electronic counterpart of a printed book.

**e-card** /'i:kɑ:d/ *n* A digital greeting card.

**e-cash** /'i:kæʃ/ *n* Money available as an electronic account, used in internet commerce.

**e-commerce** /,i:kɒmɜ:s/ *n* The buying and selling of products on the Internet

**edit** /'edɪt/ *v* To make changes and corrections to text and graphics. Well-known editing techniques are: select, undo, copy, cut, and paste.

**e-learning** /,i:lɜ:nɪŋ/ *n* Instruction via computers.

**email** /'i:meɪl/ **1** *n* A facility which allows users to exchange messages electronically; short for *electronic mail*. **2** *v* To send a message by email.

**email address** /'i:meɪl ə,dres/ *n* A unique address used to receive and send email. This is a typical format: jmartin1984@telefonica.net, where 'jmartin1984' is the user name, '@' means 'at', 'telefonica' is the Internet Service Provider, and 'net' means the server is a network provider.

**email client** /'i:meɪl ,klaɪənt/ *n* A program used to read and send email from a computer.

**embedded** /'ɪm'bɛdɪd/ *adj* Inserted into; fixed into the surface of something.

**emoticon** /'ɪməʊtɪkɒn/ *n* See **smiley**.

**encrypt** /ɪn'kri:p/ *v* To encode data so that unauthorized users can't read it.

**encryption** /ɪn'kri:pʃən/ *n* The process of saving and transmitting data in encoded form. Data encryption and passwords are important for network security, particularly when sending confidential information such as credit card numbers.

**e-pal** /'i:pæl/ *n* A friend you write email to.

**eraser** /'reɪzə/ *n* A tool used to delete the part of the picture you drag it over.

**ergonomics** /,ɜ:gə'nɒmɪks/ *n* The study of how people interact safely and efficiently with machines and their work conditions.

**e-signature** /,i:sɪgnətʃə/ *n* The electronic equivalent of a hand-written signature.

**e-tailer** /'i:teɪlə/ *n* An electronic retailer, or online store.

**Ethernet** /'i:θənet/ *n* A method of connecting computers in a LAN. Fast Ethernet can send data at 100 megabits per second. Most computers come with Ethernet ports that connect internally to circuits on the motherboard.

**Excel** /'kɛxl/ *n* A spreadsheet program from Microsoft.

**execute** /'eksɪkju:t/ *v* To perform an action, as in executing a program or a command; the same as *run*.

**expandable** /'ɪk'spændəbəl/ *adj* Upgradeable; able to increase in size. For example, RAM is expandable in most computers, which means you can add extra chips, usually contained in small circuit boards called *dual in-line memory modules*, or *DIMMs*.

**expansion card** /'ɪk'spænʃən ,ka:d/ *n* Printed circuit board that can be inserted into an expansion slot to add features like sound,

memory, and network capabilities; the same as **expansion board**.

#### **expansion slots** /ɪk'spænʃən ,sləts/ n

The connectors that allow the user to install expansion cards to improve the computer's performance.

#### **eyegaze system** /'aɪgeɪz ,sɪstəm/ n A system activated by the user's eye movements.

**e-zine** /'i:zi:n/ n An electronic magazine.

## F

**FAQ** /'efə:kju:/ n Frequently Asked Questions, a file or web page containing answers to questions asked by internet users or visitors to a website.

**fax** /fæks/ n A facsimile machine that operates by scanning a paper document so that the image is sent to a receiving machine which produces a copy of the original.

**fibre optic communication** /,faɪbə ,ɒptɪk kə,mju:nɪ'keɪfən/ n A way of transmitting information at high-speed by sending light through an optical fibre (made of glass or plastic). Fibre optic cables are used to transmit internet, cable TV and phone signals.

**field** /fi:ld/ n A unit of information in a record. In a database, information is entered via fields.

**file** /faɪl/ n 1 A collection of records in a database. 2 A section of information stored on disk – a document or a program.

**file server** /'faɪl ,sɜ:və/ n A fast computer that stores the programs and data files shared by users in a network.

**File Transfer Protocol (FTP)** /'faɪl ,trænsfɜ:/ 'prəʊtəkəl/ n A standard for transferring files from one computer to another over a network.

**filter** /'filtə/ n A special effect that can be applied to pictures.

**filtering program** /'filtərɪŋ ,prəʊgræm/ n Software designed to restrict the access to specific aspects of the Web.

**Find and Replace** /,faɪnd ənd rɪ'pleɪs/ n A command that lets you find a word or phrase in a document and change it to new text.

**Firefox** /'faɪəfəks/ n A web browser, part of the open-source Mozilla project.

**firewall** /'faɪəwɔ:l/ n A software and/or hardware device that allows limited access to an internal network from the Net. This prevents intruders from stealing or destroying confidential data.

**firmware** /'fɜ:mweə/ n Permanent software instructions contained in the ROM.

**flame** /fleɪm/ n An angry or insulting comment on a discussion group.

**Flash** /flæʃ/ n 1 The Adobe Flash Player. 2 The Adobe Flash Professional multimedia authoring program, used to create animations and advertisements. It supports a scripting language called ActionScript, and the streaming of audio and video.

**flash card reader** /'flæʃ ,ku:d ,ri:də/ n A device that reads and writes a flash memory card.

**flash drive** /'flæʃ ,drəv/ n A USB storage device, small enough to fit on a key ring, used to store and transport computer data.

**flash memory** /'flæʃ 'meməri/ n A type of non-volatile memory that can be erased and reprogrammed.

**flatbed scanner** /'flætbed ,skænə/ n A scanner with a glass scanning surface on which objects are placed; similar to a photocopier.

**flat-rate internet** /,flætretɪt 'ɪntənet/ n Access to the Internet at any time of the day, at a fixed and cheap tariff.

**Flickr** /'flɪkə/ n A website where users can share photos.

**floppy disk** /'flopi ,dɪsk/ n A disk made of a flexible plastic material upon which data is stored on magnetic tracks. Also known as a *diskette*. A floppy disk drive uses 3.5" disks.

**flowchart** /'fləʊtʃɑ:t/ n A diagram which shows the logical steps of a computer program.

**folder** /'fəʊldə/ n A directory that holds programs, data files and other folders.

**font** /fɒnt/ n The shape, style and size of a particular typeface, e.g. **Times Bold at 10pt**.

**footer** /'fʊtə/ n Customized text printed in the bottom margin of a document.

**format** /'fɔ:mæt/ 1 n The layout of a document, including page numbers, line spaces, margins, paragraph alignment, headers and footers, etc. 2

**format a disk** v To prepare a disk for use. When a disk is initialized, the operating system marks tracks and sectors on its surface.

**formatting toolbar** /'fɔ:mætɪŋ ,tu:lbə:/ n A toolbar with icons that allow you to edit and style your text. For example, you can change font, align text, increase or decrease indentation, etc.

**formula** /'fɔ:mjələ/ n A mathematical equation that helps you calculate and analyse data.

**FORTRAN** /'fɔ:træn/ n The first high-level programming language and compiler, developed in 1954 by IBM. Today, it is still used in mathematics, science, and engineering. Short for *FOR*mul $\alpha$  *TR*ANslation.

**fractals** /'fræktləz/ n Geometrical patterns that are repeated at small scales to generate irregular shapes, some of which describe objects from nature.

**fragmentation** /,frægmən'teɪʃən/ n The condition of a hard disk in which files are divided into pieces scattered around the disk. This occurs naturally after creating, deleting and modifying many files. When the operating system cannot find enough contiguous space to store a complete file, the file is divided into several separated fragments. As disk fragmentation increases, disk efficiency starts decreasing.

**frames** /freɪms/ n 1 Rectangular areas that allow the display of different pages in the same browser window. 2 Single pictures in films.

**Freehand** /'fri:hænd/ n A Macromedia program for creating vector graphics, which use geometrical primitives such as points, lines, curves and polygons to represent images.

**freeware** /'fri:weə/ n Software that is available free of charge, but protected by copyright.

**FrontPage** /,frʌnt'peɪdʒ/ n A web editor from Microsoft, used for designing web pages.

**function** /'fʌŋkʃən/ n A ready-to-use formula that helps you perform a specialized calculation, e.g. SUM, AVERAGE, etc.

**function keys** /'fʌŋkʃən ,ki:z/ n Keys that appear at the top of the keyboard and can be programmed to do special tasks.

## G

**gadget** /'gædʒɪt/ n A small hardware device. Synonymous with *gizmo* (slang).

**game controller** /'geɪm kən,trəʊlə/ n A device used to control video games.

**game genre** /,geɪm 'ʒə:nrə/ n A specific type or category of game. For example, a game in which the player solves puzzles would fall into the Puzzle game genre. Other genres are: Action, Adventure, Fighting, First-person shooter, Role-playing, Simulation, Sports, Strategy, etc.

**game platform** /,geɪm 'plætform/ n An electronic device on which video games are played. Examples are personal computers and game consoles.

#### **Geographic Information System (GIS)**

/dʒi:ə,græfɪk ɪnfə'meɪʃən ,sɪstəm/ n A type of graphics software that allows us to analyse geographic data and then make maps, plan the use of land, predict natural disasters, etc.

**gigabyte** /'gɪgəbɔ:t/ n 1,024 megabytes.

**gigahertz** /'gɪgəhɜ:ts/ n A unit of one thousand million hertz, or cycles per second, used to measure processor speed.

#### **Global Positioning System (GPS)**

/,gleubəl pə'zɪʃənɪŋ ,sɪstəm/ n A navigation system formed by various satellites orbiting the earth and their corresponding receivers on the earth. It allows GPS receivers to determine their location, speed and direction.

**Google** /'gu:gəl/ 1 n A popular search engine on the Web. 2 v To search the Web for something.

**grammar checker** /'græmə ,tʃekə/ n A software utility that analyses the grammar of a written text.

**graphical user interface (GUI)** /,græfɪkəl 'ju:zə ,ɪntəfeis/ n A user-friendly interface based on graphics. A GUI uses a WIMP environment: windows, icons, menus and pointer. Typical examples are the Mac OS and Microsoft Windows.

**graphics tablet** /'græfɪks ,tæblət/ n An input device which allows the user to enter drawings and sketches into a computer

## H

**hacker** /'hækə/ n Someone who invades a network's privacy. Originally, all skilled programmers were known as hackers, but in the 1990s, the term became synonymous with *cracker*, a person who breaks security on computers. Today, the general public uses hacker for both. In the computer industry, hackers are known as *white hats* and crackers as *black hats* or *darkside* hackers.

**handheld game** /'hændheld ,geɪm/ n A game played on portable gaming devices, such as the Sony PSP and the Nintendo DS.

**handheld scanner** /'hændheld ,skænə/ n A scanner that is moved by hand, ideal for capturing small pictures, logos and bar codes.

**hard disk** /'ha:d ,disk/ n See **hard drive**.

**hard drive** /'ha:d ,draɪv/ n A magnetic storage device that reads and writes data on metal disks (called platters) inside a sealed case. A hard drive is commonly known as a hard disk. Strictly speaking, drive refers to the entire unit, containing multiple platters, a read/write head and a motor, while hard disk refers to the storage medium itself.

**hardware** /'ha:dweə/ n The physical units which make up a computer system. See **software**.

**hardware engineer** /'ha:dweə endʒɪnɪə/ n Someone who designs and develops IT devices.

**header** /'heds/ n Customized text printed in the top margin of a document.

## **help desk technician** /'help ,desk/

**tek,niʃən/** *n* Someone who helps end users with their computer problems in person, by email or over the phone.

**hertz** /hɜ:tɪs/ *n* A unit of frequency equal to one cycle per second, named after Heinrich Hertz.

**high-level language** /,haɪ ,levl 'læŋgwɪdʒ/ *n* A language in which each statement represents several machine code instructions, e.g. COBOL, Pascal or C.

**home cinema** /,həʊm 'sɪnəmə/ *n* A system that tries to reproduce the cinema experience in the home. It is also called *home theatre* and typically includes a large-screen TV, a hi-fi system with speakers for surround sound, and a DVD recorder.

**home page** /'həʊm ,peɪdʒ/ *n* **1** The first page on a website, that usually contains links to other pages. **2** The default start-up page on which a web browser starts.

**host** /həʊst/ *n* A computer containing data or programs that other computers can access via a network or modem.

**hotspot** /'hotspot/ *n* The geographic boundary covered by a Wi-Fi wireless access point.

**HTML** /,eɪtʃt̬:em'el/ *n* The language used to create hypertext documents (e.g. web pages); short for *Hypertext Markup Language*.

**HTML tags** /,eɪtʃt̬:emel 'tægz/ *n* The codes used to define text fonts, format paragraphs, add links, etc. HTML tags are surrounded by the angle brackets < and >.

**HTTP** /,eɪtʃti:t̬i:'pi:/ *n* The method by which web pages are transferred from a website to your PC; http appears at the beginning of web addresses and means *hypertext transfer protocol*.

**hybrid hard disk** /,haɪbrɪd 'ha:d ,disk/ *n* A hard disk with integrated flash memory, intended for new laptops and mobile PCs.

**hyperlink** /haɪpərlink/ *n* A text, image or button that, when clicked, takes you to other destinations on the Web.

**hypermedia** /haɪpə'mēdiə/ *n* A form of enriched multimedia which supports linking graphics, sound, and video elements in addition to text elements.

**hypertext** /haɪpətekst/ *n* Text that contains links to other documents.

## I

**icon** /'aɪkɒn/ *n* A picture representing an object, such as a document, program, folder or hard disk.

**ICT system** /,aɪsɪ:t̬i: 'sɪstəm/ *n* A system that uses information and communications technologies.

**IM server** /,aɪem 'sɜ:və/ *n* A central system that provides presence information about online users, and passes instant messages between them.

**iMac** /'aɪmæk/ *n* A desktop computer from Apple, intended for home, school, and small offices.

**imagesetter** /'ɪmɪdʒ,seɪtə/ *n* A professional printer that generates high-resolution output on paper or microfilm.

**inch** /ɪnʃ/ *n* The equivalent of 2.54 cm, or 72.27 points. It is represented by the symbol ".

**indentation** /,inden'teʃən/ *n* The space between the page margins and where the text aligns.

**InDesign** /'ɪndɪzæɪn/ *n* A desktop publishing program created by Adobe Systems.

**ink cartridge** /'ɪnk ,ka:tɪdʒ/ *n* A replaceable container that holds the ink of an inkjet printer.

**inkjet printer** /'ɪŋkdʒet ,prɪntə/ *n* A printer that generates an image by spraying tiny drops of ink at the paper. By heating the ink within the print head, individual drops are expelled to make a matrix of dots on the paper.

**input** /'ɪnpʊt/ **1** *n* The process of transferring information into the memory from a peripheral unit. **2** *v* To transfer data, or program instructions, into the computer.

**input devices** /'ɪnpʊt dɪ'veɪsɪz/ *n* Units of hardware which allow the user to enter information into the computer, e.g. the keyboard, mouse, voice recognition devices, etc.

**Instant Messaging (IM)** /,ɪnstənt 'mesɪdʒɪŋ/ *n* Exchanging text messages in real-time between two or more people logged into IM services such as AIM, Windows Live Messenger and Yahoo! Messenger. Modern IM services also have audio and video capabilities.

**Intel** /'ɪntɛl/ *n* The company that designs and produces the processors used in most PCs.

**Intel Core 2 Duo** /,ɪntɛl ,kɔ: ,tu:/

'dju:əu/ *n* Technology that includes two cores, or processors, into a single chip, offering twice the speed of a traditional chip.

**interactive whiteboard** /ɪntə,æktɪv 'waɪtbɔ:d/ *n* A touch-sensitive projection screen that allows the user to control a computer directly, by touching the board instead of using a keyboard. Used in presentation situations such as teaching.

**interface** /'ɪntəfeɪs/ *n* Channels and control circuits which provide a connection between the CPU and the peripherals. See also **user interface**.

**Internet** /'ɪntənet/ *n* A global network of computer networks which offers services such as email, file transfer, online chats, newsgroups, and information retrieval on the Web. It evolved from the Arpanet of the 70s and uses the TCP/IP protocol.

**internet auction** /,ɪntənet 'ɔ:kʃən/ *n* A website on which bids are received and transmitted electronically.

**Internet Explorer** /,ɪntənet ɪk'splɔ:ə/ *n* A popular web browser from Microsoft.

**Internet Service Provider (ISP)** /,ɪntənet 'sɜ:pərɪəfəd/ *n* The company which gives you access to the Internet.

**internet telephony** /,ɪntənet trɪ'lefəni/ *n* See **VoIP**.

**internet TV** /,ɪntənet ti:'vi:/ *n* A TV set used as an internet device.

**interpreter** /'ɪnt̬:prɪtə/ *n* A special program that translates the source code line by line, as the program is running.

**Intranet** /'ɪntrənet/ *n* A company network that uses public internet software but makes the website only accessible to employees and authorized users.

**invoice** /'ɪnvəɪs/ *n* A document showing the items purchased, quantities, prices, etc., and requesting payment for a credit order.

**IP address** /aɪ'pi: ə,dres/ *n* A number which identifies a computer on the Internet. Every computer on the Net has a unique IP address, e.g. 194.179.73.2.

**IP spoofing** /aɪ'pi: 'spu:fɪŋ/ *n* Making one computer look like another to gain unauthorized access.

**iPhone** /'aɪfəʊn/ *n* A device from Apple that combines three products in one: an iPod, a mobile phone and an internet communicator.

**iPod** /'aɪpɒd/ *n* A family of portable media players from Apple. Popular models include the iPod Nano, the iPod Shuffle and the full-sized iPod that can also be used as a portable hard disk.

**iTunes** /'aɪtju:nz/ *n* A program from Apple that lets you play and organize music and video files, on computer or on an iPod. With an internet connection, iTunes can also connect to the iTunes Store in order to download purchased music, videos and podcasts.

## J

**Java** /'dʒɑ:və/ *n* The programming language from Sun Microsystems for building internet applications. Java programs (called applets) let you watch animated characters and moving text, play music, etc.

**Java ME** /,dʒɑ:və e'mi:/ *n* The Java platform, Micro Edition, used to create applications that run on mobile phones, PDAs, TV set-top boxes, and printers. For example, many phones are configured to use Java games.

**joystick** /'dʒo:stɪk/ *n* An input device with a vertical lever, used in computer games.

**JPEG** /'dʒeɪpeɪg/ *n* A standard for compressing and decompressing image files; developed by the Joint Photographic Experts Group. A .jpg extension is added to many image files on the Web.

## K

**kerning** /'kɜ:nɪŋ/ *n* The process of adjusting the spaces between letters to achieve even, consistent letter spacing.

**keyboard** /'ki:bɔ:d/ *n* A set of keys on a terminal or computer, including the standard typewriter keys (for letters and numbers), function keys and several special keys.

**kilobit** /'kiləbit/ *n* One thousand bits.

**kilobyte** /'kiləbaɪt/ *n* A unit for measuring the memory or disk space in thousands of bytes. Also called **k**. Equals 1,024 bytes.

## L

**laptop** /'læptɒp/ *n* A small type of portable computer.

**laser printer** /'leɪzə ,prɪntə/ *n* A printer that uses a laser beam to fix the ink (toner) to the paper.

**lightpen** /'laɪtpen/ *n* A highly sensitive photoelectric device which uses the screen as the positioning reference. The user can pass the pen over the surface of the screen to draw or modify images displayed on the screen.

**link** /lɪŋk/ *n* See **hyperlink**.

**link up** /,lɪŋk 'ʌp/ *v* To form a connection in order to operate together.

**Linux** /'lɪnəks/ *n* Open-source software developed under the GNU General Public License. This means anybody can copy its source code, change it and distribute it.

**liquid crystal display** /,lɪkwɪd/  
'krɪstəl di,spley/ *n* A flat-screen display made of two glass plates with a liquid crystal material between them. The crystals block the light in different quantities to create the image. Active-matrix LCDs use TFT (thin film transistor) technology, producing very sharp images.

**lithium-ion battery** /'lɪθiəm ,aɪən 'bætəri/ *n* A type of a battery composed of Lithium, a metallic chemical element, used in PDAs, cameras and mobile phones.

**load** /ləud/ *v* To read program instructions into the main memory.

**Local area network (LAN)** /'ləʊkəl ,eəriə 'netwɔ:k/ *n* A group of computer devices interconnected within a small physical area, like a home or office building.

**log in/on** /lɒg 'ɪn/ /lɒg 'ɒn/ *v* To gain access to a computer system or network.

**log out/off** /lɒg 'aut/ /lɒg 'ɒf/ *v* To sign off; to end a computer session. The opposite of *log in/on*.

**login/logon** /'lɒgɪn/ /'lɒgɒn/ *n* The process of identifying yourself when entering a computer system or network. You usually type your user name and password.

**low-level language** /,ləʊ ,levl 'læŋgwɪdʒ/ *n* A programming language that is very close to machine language. See **assembly language**.

## M

**Mac OS** /,mæk əʊ'ses/ *n* An operating system created by Apple and used on Macintosh computers.

**MacBook** /'mæk'buk/ *n* A Macintosh notebook computer.

**machine code** /mə'ʃi:n ,kəd/ *n* Binary code numbers; the only language that computers can understand directly.

**magnetic storage devices** /mæg,netɪk 'stɔ: rɪdʒ dɪ,væsɪz/ *n* devices that store data by magnetizing particles on a disk or tape (e.g. hard drive, tape drive).

**magnetic tape** /mæg,netɪk 'teɪp/ *n* A sequential storage device used for data collection, backup and archiving. A tape consists of a magnetic coating on a thin plastic strip.

**mail merging** /'meɪl ,mɜ:dʒɪŋ/ *n* The process of combining a database file with a word processor to personalize a standard letter.

**mail server** /'meɪl ,sɜ:və/ *n* The computer where your Internet Service Provider stores your emails.

**mailbox** /'meɪlboks/ *n* The place where your email program stores new email for you.

**mailing list** /'meɪlɪŋ ,list/ *n* A system used to distribute email to many different subscribers at once.

**main memory** /,meɪn 'meməri/ *n* The section which holds the instructions and data currently being processed; also referred to as the *immediate access store* or *internal memory*. PCs make use of two types of main memory: RAM and ROM.

**Macintosh** /'mækintɒʃ/ *n* A popular computer from Apple, introduced in 1984; the first computer with a graphical user interface.

**mainframe** /'meɪnfreɪm/ *n* The largest and most powerful type of computer. Mainframes process enormous amounts of data and are used in large installations.

**malware** /'mælwɛə/ *n* Malicious software, created to damage computer data. It includes viruses, worms, Trojan horses and spyware.

**markup language** /'ma:kap ,læŋgwɪdʒ/ *n* A computer language that uses instructions, called markup tags, to format and link web documents.

**marquee select tools** /ma:kwi: sɪ'lekt ,tu:lz/ *n* Tools used to select a particular part of an image.

**master page** /'mɑ:stə ,peɪdʒ/ *n* A page you design which can be applied to any document page. You can place text and picture boxes, headers and footers, and page rules, etc. on a master page, which ensures a consistent look on all pages.

**media player** /'mi:diə ,pleɪə/ *n* Software that plays audio, video or animation files.

**megabit** /'megəbit/ *n* A million binary digits (1,024 kilobits).

**megabyte** /'megəbaɪt/ *n* 1,024 kilobytes.

**megahertz** /'megəhɜ:ts/ *n* A unit of a million cycles per second, used to measure processor speed.

**megapixel** /'megəpɪksəl/ *n* One million pixels.

**memory card** /'meməri ,ka:d/ *n* A removable module used to store images in digital cameras, to record voice and music on MP3 players, or to back up data on PDAs. They are made up of flash memory chips (e.g. CompactFlash, Secure Digital). See **flash memory**.

**menu bar** /'menju: ,ba:/ *n* A row of words at the top of the screen that open up menus when selected.

**message threads** /'mesɪdʒ ,θredz/ *n* A series of interrelated messages on a given topic.

**microchip** /'maɪkrəfɪp/ *n* See **chip**.

**Microsoft Access** /,maɪkrəsɒft 'ækses/ *n* A relational database management system.

**Microsoft Office** /,maɪkrəsɒft 'ɒfɪs/ *n*

An integrated package that includes some combination of Word, Excel, PowerPoint, Access and Outlook, along with various internet and other utilities.

**MIDI** /'mɪdi/ *n* A standard for connecting computers and musical instruments. MIDI files contain the .midi extension, short for *Musical Instrument Digital Interface*.

**millisecond** /'mili,sekənd/ *n* One thousandth of a second.

**mobile (phone)** /'məʊbəl/ *n* (US: **cell phone**) A phone connected to the telephone system by radio, rather than by a wire.

**modem** /'məʊdem/ *n* A device that converts the digital signals used by computers into the analogue signals used by the telephone lines, thus allowing access to the Internet. Short for *MODulator/DEModulator*.

**modem-router** /'məʊdem ,ru:tə/ *n* A device that connects various computers (e.g. a home LAN) to the Internet.

**monitor** /'mɒnɪtə/ *n* An output device with a screen on which words or pictures can be shown. Also called a *display screen*.

**motherboard** /'mʌðəbɔ:d/ *n* The main circuit board of a computer, which contains the processor, memory chips, expansion slots and controllers for peripherals, connected by buses.

**mouse** /maʊs/ *n* A small input device used to specify the position of the cursor or to make choices from menus. A *mechanical mouse* has a rubber or metal ball underneath that is rolled by the user. An *optical mouse* uses light (a laser) to detect the mouse's movement, and can be wired or wireless.

**MP3** /'empi:θri:/ *n* 1 A standard format that compresses music files, enabling them to be transmitted over the Net more easily. 2 A file containing a song or other audio data that is encoded using the MP3 standard.

**MP3 player** /'empi:θri: ,pleɪə/ *n* A digital music player that supports the MP3 format.

**MP4 player** /'empi:'fɔ:r ,pleɪə/ *n* A portable media player that plays video in the MPEG-4 format; it is like an MP3 player that can play video files.

**MPEG** /'empeg/ *n* A standard for compressing and decompressing video files; developed by the Moving Pictures Experts Group.

**multi-format playback** /mʌlti,fɔ:mat̩ 'pleɪbæk/ *n* The feature of a media player that makes it compatible with many file formats, including DVD-video, DivX, MP3 music or JPEG images.

**multi-function printer** /mʌlti,fʌŋkʃən 'printə/ *n* An 'all-in-one' device that can work as a printer, a scanner, a fax and a photocopier.

**multimedia** /,mʌlti'mi:diə/ *n* The integration of text, graphics, audio, video and animation in a single application.

**multitasking** /'mʌlti,tɑ:skɪŋ/ *n* The execution of several tasks at the same time.

**multi-threaded** /'mʌlti,θreɪdɪd/ *adj* Refers to a computer program that has multiple threads (parts), i.e. many different things processing independently and continuously. This enables the program to make the best use of available CPU power.

**MySpace** /'maɪspɛ:s/ *n* A social networking site that allows users to share messages, interests, blogs, photos, music and videos with friends.

## N

**nanobot** /'nænəʊbɒt/ *n* A microscopic robot, built by means of nanotechnology.

**nanocomputer** /,nænəʊkəm'pjū:tə/ *n* A molecule-sized computer, the size of a grain of sand, e.g. a quantum computer, a DNA computer, etc.

**nanotechnology** /,nænəʊtek'nɒlədʒi/ *n* The science of making small devices from single atoms and molecules.

**nanotube** /'nænəʊ,tju:b/ *n* Extremely small tube made from pure carbon. Nanotubes are expected to be used in the development of materials for buildings, cars, airplanes, clothes, etc.

**netiquette** /'netɪket/ *n* 'Net etiquette'; good manners when communicating online.

**NetMeeting** /'net,mi:tɪŋ/ *n* A VoIP and video-conferencing program from Microsoft.

**Netscape Navigator** /,netskeɪp 'nævɪgətə/ *n* A web browser developed by Netscape Communications.

**network** /'netwɔ:k/ *n* A system of computer devices or 'nodes' (e.g. PCs and printers), interconnected so that information and resources can be shared by a large number of users.

**network administrator** /,netwɔ:k əd'mɪnɪstreɪtə/ *n* Someone who manages the hardware and software that comprise a network.

**newsgroups** /'nju:z,gru:ps/ *n* The public discussion areas which make up Usenet. The contents are contributed by people who send articles (messages) or respond to articles.

**newsreader** /'nju:z,rɪ:də/ *n* A program that reads and sends articles to newsgroups.

**nickname** /'nɪkneɪm/ *n* A name used by a participant on mailing lists or chat sessions instead of the real name.

**node** /nəud/ *n* Any computer device in a network.

**non-volatile memory** /nɒn,vɒlətælɪ 'meməri/ *n* Permanent memory, able to hold data without power. ROM and Flash memory are examples of non-volatile memory.

**notebook computer** /nəʊtbuk kəm'pjū:tə/ *n* A light, portable computer that is generally thinner than a laptop.

**numeric keypad** /nju:t,merɪk 'ki:pæd/ *n* A small key section that appears to the right of the main keyboard and contains numeric and editing keys.

## O

**object-oriented programming** /,ɒbjekٹɪd 'prəʊgræmɪŋ/ *n* A technique that allows the creation of objects that interact with each other and can be used as the foundation of others. Used to develop graphical user interfaces.

**offline** /,o:f'lain/ *adj or adv* Not connected to the Internet.

**online** /'o:nlain/ *adj or adv* Connected to the Internet.

**online banking** /,o:nlain 'bæŋkɪŋ/ *n* Performing transactions and payments through a bank's website. Also known as *internet banking*.

**onscreen keyboard** /,o:n,skrɪn 'ki:bɔ:d/ *n* A graphic representation of a keyboard on the computer screen, allowing people with mobility problems to type data using a joystick or pointing device.

**open-source** /'əpən ,sɔ:s/ *adj* Refers to the source code (of software) that is free and available to anyone who would like to use it or modify it.

**operating system** /'opəreɪtɪŋ ,sistəm/ *n* A set of programs that control the hardware and software of a computer system. Typical functions include handling input/output operations, running programs and organizing files on disks.

**optical character recognition** /,ɒptɪkəl 'kærəktə rekəg,nɪʃən/ *n* Technology that allows computers to recognize text input into a system with a scanner. After a page has been scanned, an OCR program identifies fonts, styles and graphic areas.

**optical disc** /,ɒptɪkəl 'disk/ *n* A storage device in which data is recorded as microscopic 'pits' by a laser beam. The data is read by photoelectric sensors which do not make active contact with the storage medium.

**output** /'autput/ **1** *n* The results produced by a computer. **2** *v* To transfer information from a CPU to an output device.

**output devices** /'autput di,vaiszɪz/ *n* The units of hardware which display the results produced by the computer (e.g. plotters, printers, monitors).

## P

**.pdf** /,pi:di:'ef/ *n* A portable document format from Adobe, commonly used to distribute text files over the Internet, and read with Acrobat Reader.

**page description language** /,peɪdʒ dɪ'skrɪpʃən ,læŋgwɪdʒ/ *n* A computer language that describes how to print the text and images on each page of the document.

**Page-layout program** /,peɪdʒ 'leɪaʊt ,prægræm/ *n* Application software used to import texts and illustrations, and to combine and arrange them all on a page; e.g. Adobe InDesign or QuarkXPress.

**paint bucket** /'peɪnt ,bʌkɪt/ *n* A tool used to fill in an area with a colour.

**Palm OS** /,pæ:m əʊ'ses/ *n* An operating system used on Palm hand-held devices.

**palmtop** /'pa:mtp/ *n* A hand-held personal computer.

**Pascal** /pæ'skæl/ *n* A high-level language created in 1971, named after the mathematician Blaise Pascal. Its highly structured design facilitates the rapid location and correction of coding errors. Today, it's used in universities to teach the fundamentals of programming.

**password** /'pa:swɔ:d/ *n* A secret word which must be entered before access is given to a computer system or website.

**paste** /peɪst/ *v* To insert a copy of text or graphics, held in the computer's memory, at a chosen position of a document.

**PC** /,pi:si:/ *n* A personal computer, which carries out processing on a single chip. PCs are often classified by size and portability: desktop PCs, laptops, tablet PCs and PDAs.

**PC game** /,pi:si: 'geɪm/ *n* A game played on a personal computer.

**peer-to-peer** /,pi:r tə 'pi:r/ *n* A network architecture in which all the computers have the same capabilities, i.e. share files and peripherals, without requiring a separate server computer.

**peer-to-peer file-sharing** /,pi:r tə ,pi:r 'fai:l,ʃərɪŋ/ *n* A form of P2P networking which eliminates the need for central servers, allowing all computers to communicate and share resources (music files, videos, etc.) as equals.

**pen drive** /'pen ,draɪv/ *n* See **flash drive**.

**peripherals** /pə'rɪfərlz/ *n* The units attached to the computer, classified into three types: input devices, output devices and storage devices.

**Personal Digital Assistant (PDA)**

/,pɜ:sənəl ,dɪ:dʒɪtəl ə'sistənt/ *n* A tiny computer which can be held in one hand. The term PDA refers to a variety of hand-held devices, palmtops and pocket PCs. For input, you type at a small keyboard or use a stylus. It can be used as a personal organizer, a mobile phone or an internet device.

**phishing** /'fi:ʃɪŋ/ *n* Getting passwords of online bank accounts or credit card numbers by using emails that look like real organizations, but are in fact fake; short for *password harvesting fishing*.

**phosphor** /'fəfsfə/ *n* The material or substance of the CRT screen that lights up when struck by an electron beam.

**Photoshop** /'fəutəʊʃəp/ *n* An image manipulation program developed by Adobe Systems.

**PictBridge** /'pɪkbrɪdʒ/ *n* A technology developed by Canon that lets you print images from a memory card in a digital camera or a camera phone directly to the printer (no computer is necessary).

**piracy** /'paɪrəsi/ *n* The illegal copying and distribution of copyrighted programs and files.

**pixel** /'pɪksəl/ *n* The smallest unit on a display screen or bitmapped image (usually a coloured dot).

**plasma screen** /'plæzmə ,skrɪ:n/ *n* A display that generates images by a plasma discharge, which contains noble, non-harmful gases. It allows for larger screens and wide viewing angles.

**platesetter** /'pleɪtsɛtə/ *n* A machine that creates the printing plates.

**platform-independent** /,plætfɔ:m

ɪndɪ'pendənt/ *adj* Refers to software that can run on any computer system.

**platter** /'plætə/ *n* A magnetic plate, or disk, that constitutes part of a hard disk drive. There may be only one or several platters in a drive.

**PlayStation** /'pleɪ,steɪʃən/ *n* A video game console from Sony.

**plotter** /'plɔ:tə/ *n* A graphics output device which is used to make various types of engineering drawings.

**plug-ins** /'plʌgnz/ *n* Special programs which extend the capabilities of a web browser so that it can handle audio, video, 3D and animation elements.

**podcast** /'pɒdkɑ:st/ *n* An audio recording that is distributed by subscription (paid or unpaid) over the Internet using RSS feeds, for playback on mobile devices and PCs; coined from *iPOD* and *broadCAST*.

**point** /'poɪnt/ *n* A unit used to measure font types and the distance between baselines. A point is a subdivision of a pica: there are 12 points in a pica and 72.27 points in an inch.

**pointer** /'poɪntə/ **1** *n* A small picture that follows the mouse movements. **2** The cursor which locates the insertion point on the screen, i.e. indicates where the next character will be displayed.

**port** /'pɔ:t/ *n* A socket or channel in the rear panel of the computer into which you can plug a wide range of peripherals: modems, scanners, digital cameras, etc. See **USB port**.

**portable DVD player** /,pɔ:təbəl di:vɪ:di: ,pleɪə/ *n* A handheld device with a built-in DVD drive and a screen.

**portable hard drive** /,pɔ:təbəl 'ha:d ,drayv/ *n* An external hard drive that is connected to the USB or FireWire port of the computer.

**portable media player** /,pɔ:təbəl 'mi:dia ,pleɪə/ *n* A handheld device that plays audio and video files.

**PostScript** /'pəʊs̩kript/ *n* A page description or graphics language developed by Adobe Systems. A PostScript font is any font defined in this language, e.g. Times or Helvetica.

**power-line internet** /,paʊərlain 'intənet/ *n* A technology that provides low-cost internet access via the power plug.

**PowerPoint** /'paʊərpɔɪnt/ *n* A presentation graphics program from Microsoft.

**Pretty Good Privacy (PGP)** /,pri:tɪ ,gud'pi:ri/ *n* A freeware program, written by Phil Zimmerman, designed to send email privately.

**primary colours** /,praɪməri 'kʌləz/ *n* These are red, green and blue (RGB) in computers. Compare with the colours considered basic in inks (magenta, yellow and cyan).

**primitives** /'prɪmitɪvz/ *n* The basic shapes used to construct graphical objects: lines, polygons, etc.

**print preview** /'print 'pri:vju:/ *n* A function that shows how pages will look when printed.

**printer** /'prɪntə/ *n* An output device which converts data into printed form. The output from a printer is referred to as a *print-out* or *hard copy*.

**printer driver** /'prɪntə ,drɪvə/ *n* A program installed to control a particular type of printer.

**printing plate** /,prɪntɪn 'pleɪt/ *n* A metal surface that carries the image to be printed.

**processor** /'præsəsə/ *n* The chip that processes the instructions provided by the software. See **central processing unit (CPU)**.

**program** /'prəʊgræm/ *n* A set of instructions that tells the computer how to do a specific task. The task can be anything from the solution to a Maths problem to the production of a graphics package.

**programmer** /'prəʊgræmə/ *n* Someone who writes computer programs.

**programming** /'prəʊgræmɪŋ/ *n* The process of writing a program using a computer language.

**protocol** /'prəʊtəkɒl/ *n* A set of rules which determine the formats by which information may be exchanged between different systems.

**proxy** /'prəksɪ/ *n* A computer server which controls the traffic between the Internet and a private network.

## Q

**QuarkXpress** /'kwa:k ɪk'spres/ *n* A page layout application produced by Quark.

**query** /'kwɪəri/ *n* A request for data; in a database, a function that allows you to extract data according to certain conditions or criteria.

**QuickTime** /'kwɪktaim/ *n* Software from Apple that enables users to play, edit, and manipulate multimedia files.

## R

**radio tags** /'reɪdiəʊ ,tægz/ *n* Microchips attached to, or embedded into, products, animals or people, for the purpose of identification.

**radio-frequency identification (RFID)** /,reɪdiəʊ ,fri:kwənsi aɪdɛntɪfɪ'keɪʃən/ *n* Technology that uses radio waves and chip-equipped tags (called RFID tags) to automatically identify people or things.

### random access memory (RAM)

/,rændəm 'ækses ,meməri/ *n* The part of the main memory which stores information temporarily while you are working. RAM requires a continuous power supply to retain information. Compare with **ROM**.

**raster graphics** /'ra:stə ,græfɪks/ *n* Images stored and displayed as pixels, which can become distorted when manipulated. Also called *bit-mapped graphics*.

**read-only memory (ROM)** /,ri:i:d'əʊnli ,meməri/ *n* Chips of memory containing information which is present and permanent. Also known as *firmware*.

**read/write head** /,ri:i:d ,rait 'hed/ *n* The part of a disk drive that reads and writes data on a magnetic disk.

**RealPlayer** /'ri:əplərə/ *n* A media player, created by RealNetworks, that plays a variety of audio and video formats.

**real-time** /'ri:əltaim/ *adj* Refers to something live, simultaneous (without delay), e.g. real-time chat.

**reboot** /ri:'bu:t/ *v* To restart the computer.

**record** /'rekɔ:d/ *n* A unit of a file consisting of a number of interrelated data elements (fields).

**register** /'redʒɪstə/ *n* The component in the processor or other chip which holds the instruction from the memory while it is being executed.

**relational database** /ri'læfʃənəl ,deɪtəbæs/ *n* A database system that maintains separate, related files (tables), but combines data elements from the files for queries and reports.

**rendering** /'rendərɪŋ/ *n* A technique that generates realistic reflections, shadows and highlights.

**resolution** /,rezəl'u:ʃən/ *n* The maximum number of pixels in the horizontal and vertical directions of the screen; also refers to the number of pixels per inch.

**rewritable** /ri:'ræɪtəbl/ *adj* Able to be rewritten many times.

**right click** /,rait 'klɪk/ *v* To press and release the right button on a mouse; this action displays a list of commands.

**RIM** /rɪm/ *n* An operating system used on BlackBerry communication devices, developed by Research In Motion.

**ring topology** /,rɪŋ tə'pɒlədʒi/ *n* One of the three principal topologies for a LAN, in which all devices are interconnected in a continuous loop, or ring.

**ringtone** /'rɪŋtən/ *n* A digital sound file played by a telephone to announce an incoming call.

**ripping** /'rɪpɪŋ/ *n* Converting music tracks from a CD to the MP3 format.

**rotation** /rə'teɪʃən/ *n* Turning an object around its axis.

**router** /'ru:tə/ *n* A device used to transmit data between two computers or networks. See also **modem-router** and **wireless router**.

**routine** /ru:tɪ:n/ *n* A piece of code which performs a specific task in the operation of a program or system.

**row** /rəʊ/ *n* A horizontal line of boxes, labelled with a number, in a spreadsheet program.

**RSS feed** /'rɛ:s'es ,fi:d/ *n* A web feed format that allows subscribers to receive updates of blogs, news, podcasts, etc.

**run a program** /,rʌn ə 'prəʊgræm/ *v* To execute a specific program; to use a program.

## S

**save** /seɪv/ *v* To copy information from the RAM to a storage device.

**scale** /skel/ *v* 1 To magnify or shrink a particular font. 2 To make an object larger or smaller in any direction.

**scan** /skæn/ *v* To digitize an image by passing it through a scanner.

**scanner** /'skænə/ *n* An input device that scans (reads) the image as a series of dots and introduces the information into the computer's memory

**screen magnifier** /'skri:n ,mægnɪfɪə/ *n* Software that enlarges text and images on the screen, making the content more readable for users with low vision.

**screen reader** /'skri:n ,ri:də/ *n* Software for the blind that converts screen contents into spoken words.

**screensaver** /'skri:n,seɪvə/ *n* A program that darkens the screen after you have not worked for several minutes. Designed to protect an unchanging image from burning into the screen.

**screen size** /'skri:n ,saɪz/ *n* The viewing area of a monitor; measured diagonally, in inches.

**scroll** /skrəʊl/ *v* To move a document in its window by using scroll bars so that text in another part of the document is visible.

**scroll bar** /'skrəʊl ,ba:/ *n* A horizontal or vertical bar containing a box that is clicked and dragged to the desired direction.

**search** /sɜ:tʃ/ *v* To look for specific information.

**search engine** /'sɜ:tʃ ,endʒɪn/ *n* A program that allows users to search a large database of web addresses and internet resources. Examples are Google and Yahoo!

**Second Life** /,sekənd 'laɪf/ *n* A 3-D virtual world on the Internet, entirely built and owned by its residents.

**sector** /'sektə/ *n* A part of a track on a magnetic disk.

**seek time** /'si:k ,taɪm/ *n* The average time required for the read/write head of a disk drive to move and access data, measured in milliseconds. Also called *access time*.

**set up** /,set 'ʌp/ *v* To install and configure hardware or software.

**set-top box** /,set ,tɒp 'bɒks/ *n* A device that connects to a TV and to an external source of signal (e.g. a satellite dish or cable TV) and converts the signal into content then displayed on the TV screen.

**setup** /'set ʌp/ *n* The way in which a program or device is configured.

**shareware** /'ʃeəweə/ *n* Software distributed similarly to freeware, but requiring payment after a trial period. Also known as 'try before you buy' software.

**shopping cart** /'ʃɒpɪŋ ,ka:t/ *n* Software that lets you choose products from a website and processes the order through the payment gateway.

**sign up** /,saɪn 'ʌp/ *v* To register in a service.

**signature** /'sɪgnətʃə/ *n* A file with personal information that is automatically attached at the end of an email message.

**silicon chip** /'sɪlɪkən ,tʃɪp/ *n* A device made up of a semi-conducting material (silicon), which contains a set of integrated circuits.

**simulation** /,sɪmju:l'eɪʃən/ *n* Using computer models (programs) to imitate real life or make predictions.

**sip-and-puff** /,sɪp ,ænd 'pʌf/ *n* A technology that allows someone with quadriplegia to control the computer by sipping and puffing air through a mouth-controlled tube or joystick.

**site** /saɪt/ *n* See **website**.

**Skype** /skape/ *n* A program that allows you to make voice and video calls from a computer.

**slide scanner** /'slaɪd ,skænə/ *n* A device used to scan 35mm slides or film negatives; also called a *film scanner*.

**smart device** /'smɑ:t dɪ'veɪs/ *n* An object containing a microchip and memory.

**smart home** /'smɑ:t ,haʊm/ *n* A home where all the systems (security, lights, appliances, sensors, audio-video devices, etc.) are interconnected to allow the automatic and remote control of the home.

**smart phone** /'smɑ:t ,feən/ *n* A mobile phone with advanced functions, providing voice service as well as any combination of email, text messaging, web access, voice recorder, camera, MP3, TV or video player and organizer.

**smileys** /'smaili:z/ *n* Faces made from punctuation characters to express emotions in email messages, e.g. :-) for happy, :-o for surprised, etc. Also called *emoticons*.

**software** /'sɒfweə/ *n* The set of program instructions that tell the computer what to do. See **hardware**.

**software engineer** /'sɒfweə endʒɪn/ *n* Someone who writes computer programs; also known as *programmer* or *programmer analyst*.

**Solaris** /sə'lə:ris/ *n* A Unix-based operating system, developed by Sun Microsystems, which runs on SPARC computers and other workstations.

**solid modeling** /'sɒlɪd 'mɒdəlɪŋ/ *n* A technique for representing solid objects; this includes specifying and filling the surfaces to give the appearance of a 3-D solid object with volume.

**sort** /sɔ:t/ *v* To classify; to reorder data into a new sequence.

**sound card** /'saʊnd ,ku:d/ *n* An expansion card that processes audio signals; also called a *sound board*.

**source code** /'sɔ:s ,kəud/ *n* 1 Computer instructions written in a high-level language like C or Pascal. 2 The HTML codes of a web page.

**spam** /spæm/ *n* Unsolicited, junk email.

**spamming** /'spæmɪŋ/ *n* Posting unsolicited advertising messages.

**speaker** /'spi:kə/ *n* A device that provides sound output; also called a *loudspeaker*. A pair of speakers usually plug into the computer's sound card.

**speech-synthesizer** /'spi:tʃ 'sɪnθəsaɪzə/ *n* A device that produces audio output.

**spell checker** /'spel ,tʃekə/ *n* A utility to correct typing mistakes.

**spit** /spit/ *n* Spam (unwanted messages) over internet telephony.

**spooler** /'spu:lə/ *n* A utility which makes it possible to send one document to the printer (by creating a temporary file for it) so that the user can work on another.

**spreadsheet** /'spredʃɪ:t/ *n* A program for financial planning which allows the user to analyse information presented in tabular form, by manipulating rows and columns.

**spyware** /'sparweə/ *n* A type of software that collects information from your computer without your consent.

**standard toolbar** /'stændəd ,tu:lbə:/ *n* A row of icons that, when clicked, activate certain commands of a program. For example, in a word processor, it allows you to save or print a document, include a hyperlink, check the spelling, etc.

**star topology** /'sta: tɔ:pɒlədʒi/ *n* One of the three principal topologies for a LAN, in which all data flows through a central hub, a common connection point for the devices on the network.

**storage device** /'stɔ:rɪdʒ dɪ,væts/ *n* A hardware device used to record and store data, e.g. a hard disk, DVD or flash memory card.

**store** /stɔ:/ *v* To copy data from the computer's internal memory to a storage device, such as a disk, tape or flash memory card.

**streaming** /'stri:mɪŋ/ *n* A technique for transmitting sound and video so that it can be processed as a continuous stream. The files are played while they are downloading.

**stylus** /'stɪləs/ *n* A pen-shaped tool that is used to draw images or point to menus on pressure-sensitive screens (e.g. on PDAs).

**subject** /'sʌbdʒɪkt/ *n* The line that describes the content of an email.

**subroutine** /'sʌbru:t,ti:n/ *n* A set of instructions which performs a specific function of the program.

**surf** /sɜ:f/ *v* To navigate and search for information on the Web.

**Symbian OS** /'sɪmbi:jən əʊ'es/ *n* An operating system used by some phone makers, including Nokia and Siemens.

**system clock** /'sistəm ,klɒk/ *n* A clock that measures and synchronizes the flow of data.

**system software** /'sistəm ,sɒfweə/ *n* The programs that control the basic functions of a computer, e.g. operating systems, programming software, device drivers and utilities.

## T

**tablet PC** /,tæblət pi:'si:/ *n* A type of notebook computer that has an LCD screen on which you can write with a stylus or digital pen. The screen can be easily folded or rotated.

**telecommunications** /,telɪkə,mju:nɪ'rkeɪfənz/ *n* The transmission of signals over a distance for the purpose of communication.

**telegraph** /'telɪgra:f/ *n* A communications system that transmits and receives simple electromagnetic impulses. A message transmitted by telegraph is a *telegram*.

**telemarketing** /'telɪ,ma:kɪtɪŋ/ *n* The process of selling goods and services over the telephone.

**teletext** /'telɪtekst/ *n* A method of communicating information by using TV signals. An extra signal is broadcast with the TV picture and translated into text on the screen by a decoder.

**teleworking** /'telɪ,wɜ:kɪŋ/ *n* The practice of working at home and communicating with the office by phone and computer. Also called *telecommuting*.

**Telnet** /'telnet/ *n* A protocol and a program which is used to log directly into remote computer systems. This enables you to run programs kept on them and edit files directly.

**terabyte** /'terəbaɪt/ *n* 1,024 gigabytes.

**terminal** /'tɜ:minəl/ *n* A hardware device, often equipped with a keyboard and a video screen, through which data can be entered or displayed.

**text flow** /'tekst ,fləʊ/ *n* A feature that enables you to wrap text around images on the page.

**textphone** /'tekstfəʊn/ *n* A phone with a small screen and a keyboard that transcribes spoken voice as text; it is used by people with hearing or speech difficulties.

**texturing** /'tekstʃərɪŋ/ *n* Adding paint, colour and filters to an object in order to achieve a given look and feel.

**thermal transfer printer** /,θɜ:mal 'trænsfɜ: ,prɪntə/ *n* A printer that produces colour images by adhering wax-based ink onto paper.

**thesaurus** /θ'ærəsəs/ *n* A utility for searching synonyms and antonyms.

**three-dimensional (3-D)** /,θri:drɪ'menʃənəl/ *adj* Having three dimensions e.g. width, length, and depth. 3-D drawings represent objects more accurately.

**tilt-and-swivel stand** /,tɪlt ,ænd ,swɪvəl 'stænd/ *n* A kind of stand that lets you move the monitor up or around, so you can use it at the right angle and height.

**toner** /'təʊnə/ *n* A special ink powder used in copy machines and laser printers.

**toolbar** /'tu:lbə:/ *n* A row of icons on a computer screen that, when clicked, activate certain functions of a program. Toolbars are used in programs like MS Word or as add-ons for web browsers (e.g. the Google toolbar).

**toolbox** /'tu:lbɒks/ *n* A collection of drawing and painting tools.

**topology** /tɒ:pɒlədʒi/ *n* The layout or shape of a network. See **bus**, **star** and **ring topologies**.

**touch screen** /'tʌtʃ ,skrɪ:n/ *n* A display screen that is sensitive to the touch of a finger or stylus. Used in PDAs, portable game consoles, and many types of information kiosks.

**touchpad** /'tʌtʃ,pæd/ *n* A pointing device consisting of a soft pad which is sensitive to finger movement or pressure. Used on portable PCs.

**track** /træk/ *n* An area marked on the surface of a disk. When a disk is initialized, the operating system divides its surface into circular tracks, each one containing several sectors. Tracks and sectors are used to organize the information stored on disk.

**trackball** /'trækbɒ:l/ *n* A stationary device that works like a mouse turned upside down. The ball spins freely to control the movement of the cursor on the screen. Used in laptops and CAD workstations.

**translation** /trænз'leɪʃən/ *n* Moving an object to a different location.

**Trojan horse** /,trəʊdʒən 'hɔ:s/ *n* Malicious software disguised as a useful program.

**two-dimensional (2-D)** /,tu:drɪ'menʃənəl/ *adj* Having only two dimensions, length and width. 2-D drawings look flat.

**type style** /'taɪp ,staɪl/ *n* A visual characteristic of a typeface, e.g. plain text, *italic*, **bold**, etc.

**typeface** /'taɪp,feɪs/ *n* The design of a set of printed characters, such as Arial and Courier. The words *typeface* and *font* are used interchangeably, but the *typeface* is the primary design, while the *font* is the particular use of a typeface, such as the size (e.g. 12 points) and style (e.g. normal, *italic*, **bold**).

## U

**Undo** /ʌn'du:/ *n* A command that reverses or erases the last editing change done to the document.

**Uniform Resource Locator (URL)** /,ju:nɪfɔ:m rɪ'zɔ:s ləʊ,kərə/ *n* The address of a file on the Internet, e.g. <http://www.bbc.co.uk/radio>.

**UNIX** /'ju:xɪks/ *n* An operating system, designed by Bell Laboratories in the USA, found on mainframes and workstations in corporate installations.

**update** /ʌp'deɪt/ *v* To make something more modern or suitable for use now by adding information or changing its design.

**upgradable** /ʌp'greɪdəbl/ *adj* Can be upgraded or expanded.

**upgrade** /ʌp'greɪd/ *v* To add or replace hardware or software in order to expand the computer's power.

**upload** /ʌp'ləud/ *v* To send files to a central, often remote computer. Compare with **download**.

**USB** /,ju:es'bɪ:/ *n* A Universal Serial Bus, a hardware interface that allows peripheral devices (disc drives, modems, cameras, etc.) to be easily connected to a computer.

**USB port** /ju:es'bɪ: ,pɔ:t/ *n* A USB socket on a computer device into which you can plug a USB cable.

**Usenet** /'ju:znet/ *n* A large collection of discussion areas (called newsgroups) on the Internet.

**user interface** /,ju:zə 'ɪntəfɪs/ *n* The standard procedures for interaction with specific computers.

**user-friendly** /,ju:zə 'frendli/ *adj* A system that is easy to learn and easy to use

**username** /'ju:zənɛɪm/ *n* 1 the part of an email address that identifies the user of the service. 2 The name you use to identify yourself when you log onto a computer system or network; also called *user ID*.

**utility** /ju:'tɪləti/ *n* A small program designed to improve the performance of the system. *System utility* refers to a diverse field covering anything from software designed to help you back up your hard disk or locate files, to anti-virus programs or routines used by the system.

**V**

**vector graphics** /'vektə ,græfɪks/ *n* Images represented through the use of geometric objects such as lines, curves and polygons, based on mathematical equations. They can be changed or scaled without losing quality.

**video adapter** /'vɪdiəʊ ə,dæptə/ *n* A expansion card that processes images and sends the video signals to the monitor; also called *video graphics board*.

**video editing** /'vɪdiəʊ ,edɪtɪŋ/ *n* The process of manipulating video images.

**video projector** /'vɪdiəʊ prə,dʒektor/ *n* A device that projects images on a large screen using a lens system.

**videoblog** /'vɪdiəʊbɒgl̩/ *n* A blog that includes video.

**videoconferencing** /'vɪdiəʊ,kɒnfərəntsɪŋ/ *n* A technology that allows organizations to create virtual meetings with participants in multiple locations, enabling them to talk to and see each other.

**virtual interface** /,vɜ:tʃuəl 'ɪntəfɪs/ *n* A type of interface based on virtual reality techniques. The user puts on a head-mounted display, and uses data gloves and other devices which make you feel as if you are in a 3-D world.

**virtual reality** /,vɜ:tʃuəl rɪ'æləti/ *n* A computer-generated space in which the user interacts with artificial objects through 3-D computer simulation. This is done by using sensory peripherals, such as data gloves and head-mounted displays, to give the feeling of being immersed into an illusionary, yet sensate, world.

**virus** /'vaɪrəs/ *n* A piece of software which attaches itself to a file. Once you run an infected program, the virus quickly spreads to the system files and other software. Some viruses can destroy the contents of hard disks.

**VisualBASIC** /,vɪzjʊəl 'beɪsɪk/ *n* A high-level programming language, developed by Microsoft in 1990, used to create graphical user interfaces in Windows applications.

**VoIP** /vɔɪp/ *n* Voice over Internet Protocol, which allows you to make phone calls using the Internet instead of the regular phone lines.

**voice recognition** /,voɪs rekəg'nɪʃən/ *n* A technology that allows computers to interpret human speech, converting spoken words into digitized text or instructions.

**VoiceXML** /,voɪs eksem'el/ *n* A markup language which makes web content accessible via voice and phone. Short for *Voice Extensible Markup Language*.

**volatile memory** /,vɒlətəl 'meməri/ *n* Temporary memory (e.g. RAM); it doesn't hold its contents without power.

**W**

**wearable computer** /,weərəbəl kəm'pjū:tə/ *n* A computer that is worn on the body, or integrated into the user's clothing.

**Web** /web/ *n* A network of documents that works in a hypertext environment, i.e. using text that contains links to other documents. It's also

known as the *World Wide Web*, WWW or W3. By using a special program known as a browser, you can find information on nearly any topic you can imagine.

**Web Accessibility Initiative (WAI)** /,web əksesa'biliti ɪ,nɪʃətɪv/ *n* A project that tries to make the Web accessible to people with disabilities.

**web editor** /'web ,edɪtə/ *n* Software that lets you design web pages without writing HTML codes.

**web page** /'web ,pɜ:dʒ/ *n* An individual document on the Web, identified by its own unique URL. Web pages contain different elements, such as text, pictures, video, links, etc.

**webcam** /'webkæm/ *n* A web camera used to send live video images via the Internet.

**webcasting** /'webkæ:stɪŋ/ *n* Sending audio and video live over the Internet.

**webmaster** /'web,mæ:stə/ *n* Someone responsible for designing, developing, marketing or maintaining websites.

**website** /'websaɪt/ *n* A collection of web pages (usually including a homepage), set up by an organization or an individual, which are usually stored on the same server. The pages are all linked together; you can move from one page to another by clicking on words or pictures called *hyperlinks*.

**wide area network (WAN)** /,waɪd ,eəriə 'netwɜ:k/ *n* A network that extends outside a building or small area. For long distance communications, LANs are usually connected into a WAN. The largest WAN is the Internet.

**Wi-Fi** /'wɪ:fɪ/ *n* A term from the Wi-Fi Alliance, which certifies that network devices comply with the IEEE 802.11 wireless specifications. A typical Wi-Fi setup contains one or more wireless access points (base stations) and various computer devices acting as clients.

**Wi-Fi phone** /,wɪ:fɪ 'fəʊn/ *n* A mobile phone that can switch from the cellular network to a wireless VoIP network and vice versa.

**Wii** /wi:/ *n* A video game console from Nintendo, introduced in 2006.

**wiki** /'wɪki:/ *n* A collaborative website whose content can be edited by anyone who has access to it, e.g. WikiWikiWeb, Wikipedia, etc.

**WiMAX** /'waimæks/ *n* A technology that enables the delivery of wireless broadband access as an alternative to cable and ADSL; short for *Worldwide Interoperability for Microwave Access*.

**window** /'wɪndəʊ/ *n* A scrollable viewing area on screen, which can contain files or folders.

**Windows** /'wɪndəuz/ *n* The operating system from Microsoft that runs on most PCs. The most recent versions are Windows 2000, Windows XP and Windows Vista.

**Windows Mobile** /,wɪndəuz 'məʊbaɪl/ *n* An operating system used on many PDAs and smartphones.

**Windows Vista** /,windəuz 'vɪstə/ *n* The new Windows, released in 2007. It includes security improvements, a new graphical user interface, and new ways of searching information

**wired** /'waɪəd/ *adj* Equipped with a system of wires (cables).

**wireframe** /,waɪə'freɪm/ *n* The drawing of a model by tracing features like edges or contour lines.

**wireless** /'waɪələs/ *adj* Having no wires; without the use of cables.

**Wireless access point (WAP)** /,waɪələs 'ækses ,pɔɪnt/ *n* A device that connects wireless communication devices together to form a wireless network.

**wireless adapter** /,waɪələs ə'dæptə/ *n* A device that adds wireless connectivity to a computer or PDA. It is attached via a PC card or a USB port. There are three main types of wireless adapters: Bluetooth, cellular (for mobiles) and Wi-Fi (for laptops and desktop PCs).

**wireless LAN** /,waɪələs 'læn/ *n* A wireless local area network, linking two or more computers without cables.

**wireless network** /,waɪələs 'netwɜ:k/ *n* Any type of network that uses electromagnetic waves, such as radio waves, to transmit data. These are the main types: satellites for long distances, WiMAX for connecting Wi-Fi hotspots, Wi-Fi for medium-range distances, Bluetooth for short distances, and GSM for mobile phones.

**wireless router** /,waɪələs 'ru:tə/ *n* A device which allows computers to communicate via radio waves. Also called *wireless access point* or *base station*.

**Word** /wɜ:d/ *n* A word processor from Microsoft.

**word processor** /'wɜ:d ,prəsesə/ *n* An application that manipulates text and produces documents suitable for printing.

**word wrap** /'wɜ:d ,ræp/ *n* An editing facility which automatically moves a word to the next line if there is not enough space for the complete word on the current line.

**workstation** /'wɜ:k,steɪʃən/ *n* **1** A high-performance computer, typically used for graphics, CAD, software development and scientific applications. **2** Any computer connected to a network.

**World Wide Web** /,wɜ:ld ,waɪd 'web/ *n* See *Web*.

**worm** /'wɜ:m/ *n* A self-copying program that spreads through email attachments; it replicates itself and sends a copy to everyone in a contact list.

**X**

**Xbox 360** /,eksbɒks ,θri: 'sɪkstɪ/ *n* A video game console from Microsoft.

**XML** /,eksem'el/ *n* Extensible Markup Language. While HTML uses pre-defined tags, XML allows us to create our own tags to better describe data.

**Y**

**Yahoo!** /'ja:hu:/ *n* A leading web portal, with a mix of news, entertainment and online shopping, as well as search engine, internet directory, email and IM services.

**YouTube** /'ju:tju:b/ *n* A popular website which lets users upload, view, and share video clips.

**Z**

**.zip** /zɪp/ *n* An extension that identifies compressed files. To decompress them you need a shareware program like WinZip.

**zoom** /zu:m/ *n* A tool used to magnify areas of an image when you are doing close, detailed work.

# Irregular verbs

These are the most important irregular verbs. They can be divided into the following groups (A–E):

## A All three forms the same

Base	Past simple	Past participle	Translation
bet	bet	bet	.....
cost	cost	cost	.....
cut	cut	cut	.....
hit	hit	hit	.....
hurt	hurt	hurt	.....
set	set	set	.....
let	let	let	.....
put	put	put	.....
shut	shut	shut	.....
spread	spread	spread	.....
read	read /red/	read /red/	.....

## C Past simple = Past participle cont.

Base	Past simple	Past participle	Translation
hear	heard	heard	.....
hold	held	held	.....
keep	kept	kept	.....
lay	laid	laid	.....
lead	led	led	.....
learn	learnt	learnt	.....
leave	left	left	.....
lend	lent	lent	.....
light	lit	lit	.....
lose	lost	lost	.....
make	made	made	.....
mean	meant	meant	.....
meet	met	met	.....

## B Base = Past simple

Base	Past simple	Past participle	Translation
beat	beat	beaten	.....

## C Past simple = Past participle

Base	Past simple	Past participle	Translation
bend	bent	bent	.....
bleed	bled	bled	.....
bring	brought	brought	.....
build	built	built	.....
buy	bought	bought	.....
catch	caught	caught	.....
deal	dealt	dealt	.....
feed	fed	fed	.....
feel	felt	felt	.....
fight	fought	fought	.....
find	found	found	.....
get	got	got	.....
hang	hung	hung	.....
have	had	had	.....

## D Past simple ≠ Past participle

Base	Past simple	Past participle	Translation
pay	paid	paid	.....
say	said	said	.....
sell	sold	sold	.....
send	sent	sent	.....
shine	shone	shone	.....
shoot	shot	shot	.....
sit	sat	sat	.....
sleep	slept	slept	.....
spend	spent	spent	.....
stand	stood	stood	.....
stick	stuck	stuck	.....
strike	struck	struck	.....
sweep	swept	swept	.....
teach	taught	taught	.....
tell	told	told	.....
think	thought	thought	.....
understand	understood	understood	.....
win	won	won	.....

## D Base = Past participle

Base	Past simple	Past participle	Translation
become	became	become	.....
come	came	come	.....
run	ran	run	.....

## E All three forms different cont.

Base	Past simple	Past participle	Translation
give	gave	given	.....
go	went	gone	.....
grow	grew	grown	.....
hide	hid	hidden	.....
know	knew	known	.....
lie	lay	lain	.....
overwrite	overwrote	overwritten	.....
ride	rode	ridden	.....
ring	rang	rung	.....
rise	rose	risen	.....
see	saw	seen	.....
shake	shook	shaken	.....
show	showed	shown	.....
shrink	shrank	shrunk	.....
sing	sang	sung	.....
sink	sank	sunk	.....
speak	spoke	spoken	.....
steal	stole	stolen	.....
swear	swore	sworn	.....
swim	swam	swum	.....
take	took	taken	.....
tear	tore	torn	.....
throw	threw	thrown	.....
wake	woke	woken	.....
wear	wore	worn	.....
withdraw	withdrew	withdrawn	.....
write	wrote	written	.....

## E All three forms different

Base	Past simple	Past participle	Translation
arise	arose	arisen	.....
awake	awoke	awoken	.....
be	was/were	been	.....
begin	began	begun	.....
bite	bit	bitten	.....
blow	blew	blown	.....
break	broke	broken	.....
choose	chose	chosen	.....
do	did	done	.....
draw	drew	drawn	.....
drink	drank	drunk	.....
drive	drove	driven	.....
eat	ate	eaten	.....
fall	fell	fallen	.....
fly	flew	flown	.....
forbid	forbade	forbidden	.....
forget	forgot	forgotten	.....
forgive	forgave	forgiven	.....
freeze	froze	frozen	.....

# Acronyms and abbreviations

**ADSL** Asymmetric Digital Subscriber Line  
**AI** Artificial Intelligence  
**AIM** AOL Instant Messenger  
**ALU** Arithmetic Logic Unit  
**AMD** Advanced Micro Devices  
**ASCII** American Standard Code for Information Interchange  
**AT&T** American Telephone & Telegraph company  
**ATA** Analogue Telephone Adaptor  
**ATM** Automated Teller Machine  
**AVI** Audio Video Interface

**BASIC** Beginner's All-purpose Symbolic Instruction Code  
**BBS** Bulletin Board System  
**Bcc:** Blind carbon (or courtesy) copy  
**BIOS** Basic Input/Output System  
**bit** binary digit  
**bps** bits per second

**CAD** Computer-Aided Design  
**Cc:** Carbon (or courtesy) copy  
**CCD** Charge-Coupled Devices  
**CD** Compact Disc  
**cd/m<sup>2</sup>** Candela per square metre  
**CD-R** Compact Disc-Recordable  
**CD-ROM** Compact Disc-Read Only Memory  
**CD-RW** Compact Disc-Rewritable  
**CERN** Conseil Européen pour la Recherche Nucléaire  
**COBOL** Common Business-Oriented Language  
**CPU** Central Processing Unit  
**CRT** Cathode Ray Tube  
**CSS** Cascading Style Sheets  
**CTP** Computer To Plate  
**CU** Control Unit

**DAB** Digital Audio Broadcasting  
**DAW** Digital Audio Workstation  
**DBMS** Database Management System  
**DDR** Double Data Rate (RAM)  
**DIMM** Dual In-line Memory Module  
**DLP** Digital-Light processing  
**DMB** Digital Multimedia Broadcasting  
**DNS** Domain Name System  
**dpi** dots per inch  
**DTP** Desktop Publishing  
**DTTV** Digital Terrestrial television  
**DVB-H** Digital Video Broadcast-Handheld

**DVD-/+RW** Digital Versatile Disc-Rewritable  
**DVD** Digital Versatile Disc or Digital Video Disc  
**DVD-R** Digital Versatile Disc-Recordable  
**DVD-ROM** Digital Versatile Disc-Read Only Memory  
**DVI** Digital Video Interface

**EEPROM** Electrically Erasable Programmable ROM  
**EPS** Encapsulated PostScript

**FAQ** Frequently Asked Questions  
**FORTRAN** FORmula TRANslation  
**FTP** File Transfer Protocol

**GB** Gigabyte (1,024 megabytes)  
**GHz** Gigahertz  
**GIF** Graphic Interchange Format  
**GIS** Geographic Information System  
**GNU** Gnu's Not UNIX  
**GPS** Global Positioning System  
**GSM** Global System for Mobile communication  
**GUI** Graphical User Interface

**HDD** Hard Disk Drive  
**HD-DVD** High Definition-Digital Versatile Disk  
**HDTV** High-definition Television  
**HP** Hewlett-Packard  
**HTML** Hypertext Markup Language  
**HTTP** Hypertext Transfer Protocol  
**Hz** Hertz

**I/O** Input/Output  
**IBM** International Business Machines  
**ICQ** I Seek You  
**ICT** Information and Communications Technologies  
**IM** Instant Messaging  
**IP** Internet Protocol  
**IR** Instruction Register  
**IrDA** Infrared Data Association  
**ISP** Internet Service Provider  
**IT** Information technology

**JPG** (or JPEG) Joint Photographic Experts Group

**k** 1 kilo, used to denote a thousand;  
2,1024 bytes

**KB** kilobyte (1,024 bytes)

**LAN** Local Area Network  
**Laser** Light Amplification by Stimulated Emission of Radiation  
**LCD** Liquid-Crystal Display  
**LISP** LISt Processing

**.mov** QuickTime movie  
**Mac** Macintosh computer  
**MAN** Metropolitan Area Network  
**MB** Megabyte (1,024 kilobytes)  
**MHz** Megahertz  
**MIDI** Musical Instrument Digital Interface  
**MIPS** Million Instructions Per Second  
**MMS** Multimedia messages  
**Modem** MOdulator/DEModulator  
**MP3** MPEG-1 Layer-3 Audio  
**MPEG** Moving Pictures Experts Group  
**ms** millisecond

**NIC** Network Interface Card  
**NUI** Network User Identifier

**OCR** Optical Character Recognition  
**OLE** Microsoft's Object Linking and Embedding standard  
**OLED** Organic Light-Emitting Diodes (display)  
**OOP** Object Oriented Programming  
**OS** Operating System

**.pdf** portable document format  
**PAN** Personal Area Network  
**PC** 1Personal Computer; 2 Program Counter  
**PCL** Printer Control Language  
**PDA** Personal Digital Assistant  
**PDL** Page Description Language  
**PGP** Pretty Good Privacy  
**PIN** Personal Identification Number  
**pixel** picture element  
**png** portable network graphic  
**ppm** pages per minute  
**PPP** Point to Point Protocol

**.ra** RealAudio file  
**RAM** Random Access Memory  
**RGB** Red, Green, Blue  
**RFID** Radio-Frequency identification  
**RIM** Research In Motion  
**RIP** Raster Image Processor  
**RISC** Reduced Instruction Set Computer  
**ROM** Read Only Memory  
**rpm** revolutions per minute

**RSI** repetitive strain injury  
**RSS** Really Simple Syndication  
**SDRAM** Synchronous Dynamic Random Access Memory  
**SIM (card)** Subscriber Identity Module  
**SMS** Short Message Service  
**SMTP** Simple Mail Transfer Protocol  
**SQL** Structured Query Language  
**SSL** Secure Sockets Layer  
**SXGA** Super XGA (Extended Graphics Array)

**TAN** Transaction Authorization Number  
**TB** Terabyte (1,024 gigabyte)  
**TCP/IP** Transmission Control Protocol / Internet Protocol  
**TFT** Thin Film Transistor (display)  
**TIFF** Tagged Image File Format

**UMTS** Universal Mobile Telecommunications System  
**URL** Uniform Resource Locator  
**USB** Universal Serial Bus

**VAT** Value Added Tax  
**VCR** Videocassette Recorder  
**VDU** Visual Display Unit  
**VGA** Video Graphics Adapter  
**VoiceXML** Voice Extensible Language  
**VoIP** Voice over Internet Protocol  
**VRML** Virtual Reality Modeling Language

**.wav** Windows wave audio file  
**W3** See **Web** in Glossary  
**WAI** Web Accessibility Initiative  
**WAN** Wide Area Network  
**WAP** 1 wireless access point  
2 Wireless Application Protocol  
**Wi-Fi** Wireless Fidelity  
**WiMAX** Worldwide Interoperability for Microwave Access  
**WIMP** Window, Icon, Menu (mouse) and Pointer  
**WP** Word Processing  
**WWW** World Wide Web  
**WYSIWYG** What You See Is What You Get

**XGA** Extended Graphics Array  
**XML** Extensible Markup Language  
**WXGA** Wide XGA (Extended Graphics Array)