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Picture research by Veena Holkar. Audio production by Penelope Reid.
1 Computers today

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---|---
1 Living in a digital age | 2  
2 Computer essentials | 7  
3 Inside the system | 11  
4 Buying a computer | 16

Learning objectives

In this module, you will: 
- talk and write about computer applications in everyday life.
- study the basic structure of a computer system.
- study the differences between certain types of computer.
- learn how to classify computer devices.
- learn about the structure and functions of the CPU.
- learn how to distinguish between RAM and ROM.
- learn about how memory is measured.
- learn and use relative pronouns.
- learn how to enquire about computers in a shop.
- learn how to understand the technical specs of different computers.
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

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 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.

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.

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 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.

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 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. digital (line 25)  
6. built-in (line 21)  
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  
   g. collection of facts or figures  
b. execute, do  
   h. describes information that is recorded or broadcast using computers  
c. monetary  
   i. program used for text manipulation  
d. screen  
   j. copy files from a server to your PC or mobile  
e. integrated  
   f. connected to the Internet

---

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.

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.

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<th>Job</th>
<th>What they use computers for</th>
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B Listen again and write what each speaker uses their computer for.
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 Obeys every impulse as if it were an extension of your hand
   b

2 Displays your ideas with perfect brilliance
   a See the difference – sharp images and a fantastic range of colours
   b

3 It’s quiet and fast
   a ... it’s easy to back up your data before it’s too late
   b

4 Power and speed on the inside
   a Let your computer’s brain do the work
   b

5 ... a big impact on the production of text and graphics
   a
   b Just what you need: a laser powerhouse

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
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.

---

**Input**
Data is collected and entered

**Processing**
Data is manipulated

**Output**
The results are shown on the monitor or in print form

**Expenses**
(e.g. payroll, services, publicity)

**Income**
(e.g. sales, stocks, interest)

**Storage**
Files and programs are held on disk

**Balance**

---

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

1. software
2. peripherals
3. main memory
4. hard drive (also known as hard disk)
5. hardware
6. input
7. ports
8. output
9. central processing unit (CPU)

a. the brain of the computer
b. physical parts that make up a computer system
c. programs which can be used on a particular computer system
d. the information which is presented to the computer
e. results produced by a computer
f. input devices attached to the CPU
g. section that holds programs and data while they are executed or processed
h. magnetic device used to store information
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.

<table>
<thead>
<tr>
<th>laptop</th>
<th>desktop PC</th>
<th>PDA</th>
<th>mainframe</th>
<th>tablet PC</th>
</tr>
</thead>
</table>

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.

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.
Unit 3

Inside the system

1 Technical specifications

A Read the advertisement and translate the technical specifications into your own language.

Dell Inspiron 9200
- Intel Core 2 Duo processor at 2.4GHz
- 2048MB RAM, expandable to 4GB
- 500GB hard drive
- Comes with Windows Vista Home Premium

B In pairs, answer these questions. If necessary, look at the Glossary.
1 What is the main function of a computer’s processor?
2 What unit of frequency is used to measure processor speed?
3 What does RAM stand for?

2 What is inside a PC system?

A Read the text on page 12 and then answer these questions.
1 What are the main parts of the CPU?
2 What does ALU stand for? What does it do?
3 What is the function of the system clock?
4 How much is one gigahertz?
5 What type of memory is temporary?
6 What type of memory is permanent and includes instructions needed by the CPU?
7 How can RAM be increased?
8 What term is used to refer to the main printed circuit board?
9 What is a bus?
10 What is the benefit of having expansion slots?

B Look at these extracts from the text. What do the words in bold refer to?
1 This is built into a single chip. (line 2)
2 … which executes program instructions and coordinates … (line 3)
3 … that is being executed. (line 22)
4 … performance of a computer is partly determined by the speed of its processor. (line 25)
5 … the CPU looks for it on the hard disk … (line 35)
6 … inside the computer to communicate with each other. (line 52)
What is inside a PC system?

Processing

The nerve centre of a PC is the processor, also called the CPU, or central processing unit. This is built into a single chip which executes program instructions and coordinates the activities that take place within the computer system. The chip itself is a small piece of silicon with a complex electrical circuit called an integrated circuit.

The processor consists of three main parts:

- The control unit examines the instructions in the user's program, interprets each instruction and causes the circuits and the rest of the components - monitor, disk drives, etc. - to execute the functions specified.

- The arithmetic logic unit (ALU) performs mathematical calculations (+, -, etc.) and logical operations (AND, OR, NOT).

- The registers are high-speed units of memory used to store and control data. One of the registers (the program counter, or PC) keeps track of the next instruction to be performed in the main memory. The other (the instruction register, or IR) holds the instruction that is being executed (see Fig. 1 on page 13).

The power and performance of a computer is partly determined by the speed of its processor. A system clock sends out signals at fixed intervals to measure and synchronize the flow of data. Clock speed is measured in gigahertz (GHz). For example, a CPU running at 4 GHz (four thousand million hertz, or cycles, per second) will enable your PC to handle the most demanding applications.

RAM and ROM

The programs and data which pass through the processor must be loaded into the main memory in order to be processed. Therefore, when the user runs a program, the CPU looks for it on the hard disk and transfers a copy into the RAM chips. RAM (random access memory) is volatile - that is, its information is lost when the computer is turned off. However, ROM (read only memory) is non-volatile, containing instructions and routines for the basic operations of the CPU. The BIOS (basic input/output system) uses ROM to control communication with peripherals.

RAM capacity can be expanded by adding extra chips, usually contained in small circuit boards called dual in-line memory modules (DIMMs).

Buses and cards

The main circuit board inside your system is called the motherboard and contains the processor, the memory chips, expansions slots, and controllers for peripherals, connected by buses - electrical channels which allow devices inside the computer to communicate with each other. For example, the front side bus carries all data that passes from the CPU to other devices.

The size of a bus, called bus width, determines how much data can be transmitted. It can be compared to the number of lanes on a motorway - the larger the width, the more data can travel along the bus. For example, a 64-bit bus can transmit 64 bits of data.

Expansion slots allow users to install expansion cards, adding features like sound, memory and network capabilities.
Language work: defining relative clauses

Look at the HELP box and then complete the sentences below with suitable relative pronouns. Give alternative options if possible. Put brackets round the relative pronouns you can leave out.

1. That’s the computer _____________________ I’d like to buy.
2. Core 2 Duo is a new Intel processor _____________________ contains about 291 million transistors.
3. A webmaster is a person _____________________ designs, develops and maintains a website.
4. A bus is an electronic pathway _____________________ carries signals between computer devices.
5. Here’s the DVD _____________________ you lent me!
6. Last night I met someone _____________________ works for GM as a software engineer.

HELP box

Defining relative clauses

- We can define people or things with a defining (restrictive) relative clause. We use the relative pronoun who to refer to a person; we can also use that.

  A blogger is a person who/that keeps a web log (blog) or publishes an online diary.

- We use the relative pronoun which (or that) to refer to a thing, not a person.

  This is built into a single chip which/that executes program instructions and coordinates the activities that take place within the computer system.

- Relative pronouns can be left out when they are the object of the relative clause.

  The main circuit board (which/that) you have inside your system is called the motherboard …
4 How memory is measured

A Read the text and then answer these questions.
1 How many digits does a binary system use?
2 What is a bit?
3 What is a collection of eight bits called?
4 What does ASCII stand for?
5 What is the purpose of ASCII?

Bits and bytes

Computers do all calculations using a code made of just two numbers – 0 and 1. This system is called binary code. The electronic circuits in a digital computer detect the difference between two states: ON (the current passes through) or OFF (the current doesn’t pass through) and represent these states as 1 or 0. Each 1 or 0 is called a binary digit, or bit.

Bits are grouped into eight-digit codes that typically represent characters (letters, numbers and symbols). Eight bits together are called a byte. Thus, each character on a keyboard has its own arrangement of eight bits. For example, 01000001 for the letter A, 01000010 for B, and 01000011 for C.

One bit

Example of a byte

<table>
<thead>
<tr>
<th>Unit of memory</th>
<th>Abbreviation</th>
<th>Exact memory amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binary digit</td>
<td>bit, b</td>
<td>1 or 0</td>
</tr>
<tr>
<td>Byte</td>
<td>B</td>
<td>8 bits</td>
</tr>
<tr>
<td>Kilobyte</td>
<td>KB or K</td>
<td>1,024 bytes (2^10)</td>
</tr>
<tr>
<td>Megabyte</td>
<td>MB</td>
<td>1,024 KB, or 1,048,576 bytes (2^20)</td>
</tr>
<tr>
<td>Gigabyte</td>
<td>GB</td>
<td>1,024 MB, or 1,073,741,824 bytes (2^30)</td>
</tr>
<tr>
<td>Terabyte</td>
<td>TB</td>
<td>1,024 GB, or 1,099,511,627,776 bytes (2^40)</td>
</tr>
</tbody>
</table>

B Complete these descriptions with the correct unit of memory.
1 A ___________ is about one trillion bytes – about as much text as the books and magazines in a huge library.
2 A ___________ is about one million bytes – about as much text as a 300-page novel.
3 A ___________ is about one thousand bytes – equivalent to one sheet of A4.
4 A ___________ is about one billion bytes – about as much text as 1,000 books.
5 A ___________ can store a single character, such as the letter h or number 7.
5 A PC system

A Complete this diagram of a PC system. Look at Units 1, 2 and 3 to help you.

B In pairs, compare your answers.

C 📚 Listen to a teacher explaining the diagram to her class and check your answers.

6 Your ideal computer system

A Make notes about the features of the computer that you would most like to have. Think about the features in the box.

<table>
<thead>
<tr>
<th>CPU</th>
<th>Speed</th>
<th>Optical disc drives</th>
<th>Wireless connectivity</th>
<th>Minimum/maximum RAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor</td>
<td>Ports and card memory slots</td>
<td>Hard disk</td>
<td>Software</td>
<td></td>
</tr>
</tbody>
</table>

B 🎈 In pairs, describe your ideal computer system. Give reasons for your choices.

Useful language

It's got...
It's very fast. It runs at...
The standard RAM memory is ... and it's expandable ...
The hard disk can hold ...
I need a large, flat LCD screen because ...
As for the Internet, ...
1 **In a computer shop**

**A** Imagine you are in a computer shop. Choose five things that would improve your digital life. In pairs, compare your choices.

**B** You want to buy a computer. Think of three basic features that will make a big difference to your choice. In pairs, compare your choices.

**C** Listen to two people making enquiries in a computer shop. Do they buy anything?

**D** Listen again and complete the product descriptions.

**iMac**
- Processor speed: 2.33GHz
- RAM: ___________
- Hard drive capacity: ___________
- DVD drive included? Yes
- Operating system: ___________
- Includes internet software
- Price: ___________

**MacBook**
- Processor speed: ___________
- RAM: ___________
- Hard drive capacity: ___________
- DVD drive included? ___________
- Operating system: ___________
- Includes internet software
- Price: £1,029
Listen again and complete the extract from the conversation.

Assistant: Do you need any (1) _____________?

Paul: Um, yes, we're looking for a Mac computer. Have you got any fairly basic ones?

Assistant: Yes, sure. If you'd like to come over here.

Paul: What different (2) _____________ are there?

Assistant: At the moment we've got these two models: the iMac, which is a desktop computer with an Intel Core 2 Duo processor (3) _____________ at 2.33 gigahertz, and the portable MacBook, which has a processor (4) _____________ at 2.0 gigahertz. Core Duo technology actually means two cores, or processors, built into a single chip, offering up to twice the speed of a traditional chip.

Sue: So they're both very (5) _____________, then. And which one has more memory? I mean, which has more RAM?

Assistant: Well, the iMac has two gigabytes of RAM, which can be (6) _____________ up to three gigabytes, and the MacBook has one gigabyte, expandable to two gigabytes. It all depends on your needs. The iMac is (7) _____________ for home users and small offices. The MacBook is more (8) _____________ if you travel a lot.

Language functions in a computer shop

Look at the language functions in the HELP box and then correct one mistake in each of these sentences. Decide which functions are being expressed in each sentence.

1. The Ulysses SD is a power, expandable computer that offers high-end graphics at a low price.

2. A laptop is likely to be more expensive than the equivalent desktop, but a laptop is less practical if you travel a lot.

3. Where's the storage capacity of the hard drive?

4. I'm looking a desktop PC that has good graphics for games.

5. Do you need the help?

6. And how many does the PDA cost?

7. This workstation is a Pentium processor with dual-core technology, 1,024 gigabytes of RAM, and 1 terabyte of disk space.

HELP box

Language functions useful to a sales assistant

- Greeting and offering help
  * Good morning. Do you need any help?

- Giving technical specifications (specs)
  * The MacBook has a processor running at 2.0 gigahertz.
  * The iMac has two gigabytes of RAM. They feature a camera built into the display.

- Describing
  * Both computers are very fast and reliable.

- Comparing
  * The MacBook is more practical if you travel a lot.
  * PDAs are cheaper than laptops but laptops are more powerful.

Language functions useful to a customer

- Explaining what you are looking for
  * We're looking for a personal computer. Have you got any fairly basic ones?

- Asking for technical specs
  * What's the storage capacity of the hard drive? Do they have a DVD drive?

- Asking the price
  * How much do they cost? How much is it?
3  Role play – buying a computer

Work in pairs. One of you wants to buy a computer, the other is the shop assistant. Use the prompts and product descriptions below to role play the conversation.

**Shop assistant**

Greet the customer and offer help.

Show the customer two possible models.

Give technical specs (describe the processor, RAM and storage capacity). Compare the two different models.

Give the information required. Compare the two models.

Answer, and mention any final details that might persuade the customer to buy the computer.

**Customer**

Explain what you are looking for.

Ask for some technical specs.

Ask about any further technical specs (DVD drive, monitor, communications, etc.).

Ask the price.

Decide which computer to buy or leave the shop.

---

**Toshiba Satellite**

- 2.0GHz Core 2 Duo processor
- 2GB RAM expandable to 4GB
- 160GB hard drive
- Super Multi drive (double layer)
- 15.4" wide XGA display
- Wireless LAN, Wi-Fi compliance

£1,099

**Dell desktop PC**

- AMD Athlon at 2.4GHz
- 1GB RAM expandable to 4GB
- 320GB hard drive
- DVD+/-RW drive
- 17" LCD monitor

£680

**Palm TX handheld**

- Intel 312MHz ARM-based processor
- 128 MB Flash memory (non-volatile)
- Support for memory cards
- 320x480 TFT touch screen
- Wi-Fi and Bluetooth
- Lithium-ion battery

£216

---

4  Choosing the right computer

**A** Listen to four people talking about their computer needs and take notes. In pairs, read the descriptions from the computer shop website and choose the most suitable computer for each person. Give reasons for your choices.

<table>
<thead>
<tr>
<th>Speaker 1</th>
<th>Speaker 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaker 2</td>
<td>Speaker 4</td>
</tr>
</tbody>
</table>

**Sun workstation**

- Two AMD Opteron processors at 3.0GHz
- 4GB RAM; 32GB maximum
- 1 terabyte hard drive and dual DVD drive
- 19" Sun TFT flat-panel LCD
- Supports several graphics formats
- Allows you to handle your toughest technical, scientific, and business-critical applications
- Supports Solaris, Windows and Linux

£3,249
Gateway C-120 convertible notebook
Intel Core 2 Duo ULV processor at 1.06GHz
12.1” WXGA TFT touch screen
Gateway Executive stylus pen
1024MB DDR2 SDRAM
80GB serial ATA hard drive
DVD-ROM drive (optical DVD burner)
Integrated modem and Bluetooth
Windows Vista Home Premium
Thin and lightweight (1.17”, 2.4 kg)
£805

Sony Vaio AR laptop (VGN-AR51E)
Intel Core 2 Duo Processor at 2GHz
2GB DDR2 SDRAM
200GB hard drive
DVD+/-RW optical drive
17” WXGA high-definition LCD screen
Memory Stick slot
Three USB 2.0 ports
Integrated wireless LAN
Built-in ‘Motion Eye’ digital camera
Lithium-ion battery
Windows Vista Ultimate
£899

Dell Inspiron 531 desktop PC
AMD Athlon 64 X2 Dual Core Processor
3072MB DDR2 SDRAM
Dell 22” Wide Flat Panel
256MB NVIDIA GeForce 8600GT video card
1.0TB Hard Drive
16x DVD+/- RW Drive
Integrated 7.1 Channel High Definition Audio
Windows Vista Home Premium
Optional features: Windows Media Center, integrated TV Tuner, and a Blu-ray disc drive for high-definition content
From £849

B  Look at the notes you made about your ideal computer system in Unit 3 task 6 (page 15). What did you want? Look again at the descriptions of the computers above and choose the one that is closest to your ideal. In pairs, discuss your choices.
Designing word trees and spidergrams can help you build up your own mental ‘maps’ of vocabulary areas. Look at the list of terms in the box and put each one in an appropriate place on the word tree below. The first one has been done for you.

<table>
<thead>
<tr>
<th>processor</th>
<th>ROM</th>
<th>expandable memory</th>
<th>ALU</th>
<th>DIMMs</th>
<th>hard drive</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAM</td>
<td>computer brain</td>
<td>byte</td>
<td>DVD</td>
<td>system clock</td>
<td>keyboard</td>
</tr>
<tr>
<td>mouse</td>
<td>gigahertz</td>
<td>printer</td>
<td>megabyte</td>
<td>webcam</td>
<td>registers</td>
</tr>
</tbody>
</table>

6  **Recommending a computer**

A friend has asked you to recommend a computer that suits his needs. He needs to be able to access the Internet, play games and work with graphics, music and video files. Write an email describing its technical features and saying why you recommend it.

Now visit www.cambridge.org/elt/ict for an online task.
# Input/Output devices

<table>
<thead>
<tr>
<th>Unit</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Type, click and talk!</td>
<td>22</td>
</tr>
<tr>
<td>6</td>
<td>Capture your favourite image</td>
<td>27</td>
</tr>
<tr>
<td>7</td>
<td>Display screens and ergonomics</td>
<td>32</td>
</tr>
<tr>
<td>8</td>
<td>Choosing a printer</td>
<td>37</td>
</tr>
<tr>
<td>9</td>
<td>Devices for the disabled</td>
<td>42</td>
</tr>
</tbody>
</table>

---

**Learning objectives**

**In this module, you will:**

- describe input and output devices.
- identify the different keys on a keyboard and explain their functions.
- distinguish between facts and opinions in advertisements.
- learn how to understand the technical specs of digital cameras, printers and display devices.
- learn and use the superlative form of adjectives.
- practise recommending the most suitable display device for particular people.
- learn how to understand and give instructions and advice for the use of computers and monitors.
- compare different types of printer.
- learn and use discourse connectors.
- learn about what sort of input/output devices disabled people can use.
**Unit 5**

**Type, click and talk!**

**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*.

![Input devices images]

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.

Bar code 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.

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 UPPERCASE characters.
   6  It produces UPPERCASE 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.
Speech recognition systems

A  Listen to an interview with Anne Simpson, an expert in voice input technologies and tick (√) the features she mentions.

Speech recognition systems:

□ need a good sound card and a microphone.
□ can take dictation with accuracy.
□ allow you to create and compile a computer program.
□ allow you to execute programs and navigate around menus using voice commands.
□ allow you to surf the Web by speaking.
□ allow you to design graphics.

B  Listen again and answer these questions.
1. What do people usually use to communicate with a computer?
2. How do you get the best results from speech recognition software?
3. What rate of accuracy is possible with the software?
4. How can you train the software to be more accurate?
5. What kinds of words aren't in the software's dictionary?

C  In groups, discuss these questions.
1. What are the benefits of speech recognition software?
2. What kind of tasks would you find speech recognition useful for?
3. Who would benefit most from advances in speech recognition technology?
4. What is the future of this kind of technology? Do you think it will ever be possible to control your computer using only your thoughts?
The eyes of your computer

What does a scanner do?
A scanner ‘sees’ images and converts the printed text or pictures into electronic codes that can be understood by the computer. With a flatbed colour scanner, the paper with the image is placed face down on a glass screen, as with a photocopier. Beneath the glass are the lighting and measurement devices. Once the scanner is activated, it reads the image as a series of dots and then generates the digitized image that is sent to the computer and stored as a file.

The scanner operates by using three rotating lamps, each of which has a different coloured filter: red, green and blue. The resulting three separate images are combined into one by appropriate software.

Photographs are stored in the camera’s memory card before being sent to the computer. Some cameras can also be connected to a printer or a TV set to make viewing images easier. This is usually the case with camera phones – mobile phones with a built-in camera.

What does a camcorder do?
A camcorder, or digital video camera, records moving pictures and converts them into digital data that can be stored and edited by a computer with special video editing software.

Digital video cameras are used by home users to create their own movies, or by professionals in computer art and video conferencing.

They are also used to send live video images via the Internet. In this case they are called web cameras, or webcams.

What does a digital camera do?
A digital camera takes photos electronically and converts them into digital data (binary codes made up of 1s and 0s). It doesn’t use the film found in a traditional camera; instead it has a special light-sensitive silicon chip.
Scanners

Listen to a conversation between Vicky Cameron, an Information Technology (IT) lecturer, and one of her students, and complete the student’s notes.

1. The technology used in scanners is similar to that used in a _____________________________.
2. The scanned image is sent to the ____________, where you can manipulate it.
3. To scan text, you need special software called ________________________________.
4. Flatbed scanners can scan ________________________________.
5. Slide scanners are used to scan ________________________________ or film negatives.
6. Handheld scanners are used for capturing ________________________________.

Facts and opinions

A. What is the difference between facts and opinions? Complete these definitions.
1. ________________ are real, objective information.
2. ________________ usually include emotive words and subjective statements.

B. Read these advertisements and underline the facts and circle the opinions.

ColourScan XR from Sunrise

The ColourScan XR from Sunrise is a flatbed scanner with 1,200 dots per inch (dpi) of resolution and 9" x 15" of scanning area.

Just think of the possibilities.
You can enter data and graphic images directly into your applications (word processors or databases). You can get crisp, clean scans for colour compositions, video and animation work.

The ColourScan XR comes complete with its own image-capture software, which allows for colour and grey retouching. And it’s easy to use. What more could you want for only £79? It couldn’t be cheaper.

In the field of flatbeds, the ColourScan XR is the clear winner.

ScanPress DF

The ScanPress DF is a self-calibrating flatbed scanner with 2,400 dpi of resolution. You can scan everything from black and white to 24-bit colour.

The package includes a hardware accelerator for JPEG compression and decompression. JPEG technology saves disk space by compressing images by up to 50 to 1.

In creating the ScanPress DF, we have chosen the most advanced technology to give you the best scans with the least effort. It produces images with high colour definition and sharpness. And it comes with OCR software and Adobe Photoshop, so you can manipulate all the images you capture.

The ScanPress DF is a fantastic machine that you will love working with. And at only £309, an excellent investment.
C In small groups, compare your answers and decide about the following.
1 Which text uses more persuasive language?
2 Which text is more factual or objective?

4 Language work: superlatives

A Apart from catchy slogans and other persuasive techniques, advertisements often use the superlative form of adjectives and adverbs. Read the following examples from advertisements for input devices. What can you say from these examples about how superlatives are formed? Look at the HELP box to check your answers.
1 We have chosen the most advanced technology …
2 The fastest personal scanner …
3 The most revolutionary computer peripheral …
4 The best scans with the least effort …

B Complete these sentences with the superlative form of the adjectives in brackets.
1 Always buy the (fast) ________________________ scanner with the (high) ________________________ resolution you can afford.
2 They have created the (revolutionary) ________________________ camera to date.
3 FotoFinish is the (easy) ________________________ photo editing software for your digital camera.
4 This scanner gives you the (good) ________________________ scans with the (little) ________________________ effort.
5 Our university has bought the (modern) ________________________ computer equipment.

HELP box

Superlatives
- We form the superlative of one-syllable and most two-syllable adjectives by adding -est.
  cheap → the cheapest
clever → the cleverest
- Some two-syllable adjectives (including those ending in -ing, -ed, -ful and -less) form the superlative with the most/least.
  advanced → the most advanced
- Adjectives with three or more syllables also take the most/least.
  fantastic → the most fantastic
  powerful → the least powerful
- But two syllable adjectives ending in -y (for example, noisy) take -est and the y changes to i.
  noisy → the noisiest
- Note the irregular forms:
  good → the best
  bad → the worst
  little → the least
  (with amounts, not size)
Language work: suffixes

A Look at the HELP box and then use suitable suffixes to make adjectives or nouns from these words. In some cases, you can make more than one word. Use a dictionary to help you.

1 colour
2 profession
3 photograph
4 wire
5 blur
6 innovate
7 underexpose

B Complete these sentences with the word in brackets and one of these noun suffixes: -tion, -er, -ing, -logy, -ness. Use a dictionary to help you.

1 Kodak is a (manufacture) ________________________________ of photographic and imaging equipment.

2 To avoid red eyes, use the camera’s red eye (reduce) ________________________________ feature.

3 (Crop) ________________________________ a photograph means cutting out the parts of an image you don’t need.

4 The (sharp) ________________________________ of a photograph is a combination of resolution and acutance – the ability to represent clear edges.

5 Digital (techno) ________________________________ is evolving so rapidly that some cameras have a resolution of 12 megapixels – that’s 12 million pixels.
6 Press release: a digital camera

Complete the press release with words from the box.

- colour
- megapixels
- shot
- video
- optical
- brighter
- reduction

Kodak has introduced the EasyShare M753 digital camera, with 7.0 (1) megapixels resolution, a huge 2.5-inch LCD screen, and a professional 3x (2) optical zoom lens. It is the first camera to incorporate proprietary Kodak Perfect Touch Technology. At the touch of a button, this innovative feature creates better, (3) brighter pictures by bringing out detail in shadows without affecting lighter areas. It’s ideal for underexposed pictures caused by shooting beyond the flash range or in adverse lighting conditions.

The M753 uses the exclusive Kodak Colour Science chip for phenomenal image quality with rich (4) optical and accurate skin tones. Seventeen programmed scene modes (e.g. party, fireworks, children) and five colour modes (high, low, natural, sepia, and black and white) help capture the best (5) optical with the least effort.

Other features include cropping, auto picture rotation, digital red-eye (6) reduction, and blurry picture alert. For capturing more than just still pictures, the camera also features high-quality (VGA) (7) reduction capture and playback.

7 Describing a camera

In pairs, describe your digital camera, webcam or video camera. Think about these questions.

- What do you use the device for?
- Why did you buy that particular make/model?
- What are your favourite functions?
- What improvements would you make to the device?
Unit 7
Display screens and ergonomics

1
Your computer screen

☑ In pairs, discuss these questions.

1. What type of display do you have: a cathode ray tube or an LCD flat screen?
2. What size is the screen?
3. How can you change the picture using the controls?
4. Can you watch TV on your PC monitor?

An Apple Mac flat screen monitor

2
How screen displays work

A Complete these definitions with words from the box. Then read the text on page 33 and check your answers.

<table>
<thead>
<tr>
<th>resolution</th>
<th>pixel</th>
<th>aspect ratio</th>
<th>colour depth</th>
<th>video adapter</th>
<th>plasma screen</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2          |       |              |              |               |               |
3          |       |              |              |               |               |
4          |       |              |              |               |               |
5          |       |              |              |               |               |
6          |       |              |              |               |               |

- the smallest unit on a display screen or bitmapped image (usually a coloured dot)
- an expansion card that generates the video signal sent to a computer display
- the width of the screen in proportion to its height
- also called gas discharge display
- the number of pixels contained in a display, horizontally and vertically
- the number of bits used to hold a colour pixel; this determines the maximum number of colours that can be displayed

B Read the text again and answer these questions.

1. What do CRT and LCD stand for?
2. How is the screen size measured?
3. What technology is used by active-matrix LCDs?
4. Which unit of frequency is used to measure the brightness of a display?
5. What substance produces light and colour when hit by electrons in a CRT monitor?
6. What are the three advantages of OLED displays?
How screen displays work

Displays, often called monitors or screens, are the most-used output device on a computer. They provide instant feedback by showing you text and graphic images as you work or play.

Most desktop displays use Liquid Crystal Display (LCD) or Cathode Ray Tube (CRT) technology, while nearly all portable computing devices, such as laptops, incorporate LCDs. Because of their slimmer design and lower energy consumption, LCD monitors (also called flat panel or flat screen displays) are replacing CRTs.

Basic features

Resolution refers to the number of dots of colour, known as pixels (picture elements), contained in a display. It is expressed by identifying the number of pixels on the horizontal and vertical axes. A typical resolution is 1024x768.

Inside the computer there is a video adapter, or graphics card, which processes images and sends signals to the monitor. CRT monitors use a VGA (video graphics adapter) cable, which converts digital signals into analogue signals. LCD monitors use a DVI (digital video interface) connection.

Colour depth refers to the number of colours a monitor can display. This depends on the number of bits used to describe the colour of a single pixel. For example, an old VGA monitor with an 8-bit depth can generate 256 colours and a SuperVGA with a 24-bit depth can generate 16.7 million colours. Monitors with a 32-bit depth are used in digital video, animation and video games to get certain effects.

Display technologies

An LCD is 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, in which each pixel has its own switch. The amount of light the LCD monitor produces is called brightness or luminance, measured in cd/m² (candela per square metre).

A CRT monitor is similar to a traditional TV set. It contains millions of tiny red, green and blue phosphor dots that glow when struck by an electron beam that travels across the screen and create a visible image.

PCs can be connected to video projectors, which project the image onto a large screen. They are used for presentations and home theatre applications.

In a plasma screen, images are created by a plasma discharge which contains noble (non-harmful) gases. Plasma TVs allow for larger screens and wider viewing angles, making them ideal for movies.

Organic Light-Emitting Diodes (OLEDs) are thin-film LED displays that don't require a backlight to function. The material emits light when stimulated by an electrical current, which is known as electroluminescence. They consume less energy, produce brighter colours and are flexible – i.e. they can be bent and rolled up when they're not being used.
Choosing the right display device

A Listen to five customers in a computer shop describing their display device needs. Which device (a–e) would you recommend to each person? In pairs, discuss your choices and give reasons for them.

Speaker 1
Speaker 2
Speaker 3
Speaker 4
Speaker 5

NEC MultiSync LCD Monitor
Screen size: 17"
Resolution: 1280x1024 (SXGA)
Aspect ratio: 5:4
Brightness: 400 cd/m²

Cambridge-Hitachi interactive whiteboard
Allows interaction with a projected computer image
Board size: 78"
Connected to the PC via USB
Pointing device: cordless pen

Dell UltraSharp LCD monitor
Widescreen 24" flat panel
Resolution: 1920x1200
Colour support: 16.7 million
Multiple video inputs, flash-card slots and USB ports

Pioneer 50" Plasma TV
Resolution: 1280x768 (XGA)
Blu-ray Disc recorder
5.1 surround sound system (Five audio channels plus one subwoofer)

Portable projector
DLP (Digital Light Processing) technology
Resolution: 1024x768
Projection screen

B In pairs, discuss which of the display devices you would most like to own. Give reasons for your choice.
4 Ergonomics

A鲜艳 Listen to Tony Clark, an expert in computer ergonomics, talking to some office workers about health and safety. What health problems associated with computer use do the office workers mention?

B鲜艳 Listen again and complete these extracts.
1 Get a good chair, one that .......................................................... your lower back and is .......................................................... .
2 Make sure your feet rest firmly .......................................................... or on a footrest.
3 Position the keyboard .......................................................... your elbows, with your arms .......................................................... the work surface . . .
4 . . . position the monitor at, or just below, .......................................................... .
5 You should sit at .......................................................... from the front of the monitor, about 50 to 70 centimetres away.
6 . . . a kind of stand that lets you move the monitor .......................................................... , so you can use it at the correct angle and height.

C Match the extracts above (1–6) with the correct parts of the diagram (a–f).

Ergonomics – the study of how people interact safely and efficiently with machines and their work conditions
5 Language work: instructions and advice

A Look at the HELP box and then complete these health and safety guidelines with should/shouldn’t.

1 If you type a lot at your computer each day, you __________ buy an ergonomic keyboard; it can help reduce the risk of repetitive strain injury.

2 You __________ place your mouse within easy reach and support your forearm.

3 If you decide to build your own PC, protect yourself from electric shocks. You __________ touch any components unnecessarily.

4 You __________ always use a copyholder if you are working from documents. The best position is between the screen and the keyboard, or at the same height as the screen; this can reduce neck, back and eyestrain.

5 Irresponsible disposal of electronic waste can cause severe environmental and health problems. You __________ just throw your old monitor or video system into the bin.

B In pairs, practise giving advice about how to use a monitor safely using should/shouldn’t or It’s a good/bad idea to. Look at these guidelines for help.

1 Don’t open the monitor. It’s dangerous.

2 Don’t stare at the screen for long periods of time.

3 Position the monitor at eye level or just below.

4 Leave enough space behind the monitor for unobstructed movement.

5 Don’t sit near the sides or back of CRT monitors. Use LCD screens instead – they’re free from radiation.

6 Keep the screen clean to prevent distorting shadows.

6 An ergonomic school or office

You have been asked to write a list of guidelines for making your school or office more ergonomic. Look at the definition of ergonomics at the bottom of page 35 and then write an email to your teacher/manager explaining your guidelines. Consider 1–8 below.

1 Physical layout of the work site: desk areas, computer equipment, filing cabinets, etc.

2 Lighting (overhead lights, desk lamps), glare and ventilation

3 Computer and office furniture: ergonomic chairs and desks

4 User-friendly and ergonomic devices: keyboards, mice, monitors, wrist rests, copyholders, etc.

5 Location and features of telephones

6 Layout of cables and switches for a wired network

7 Wireless internet access and wireless network

8 Maintenance and technical repairs

HELP box

Instructions and advice

• We use the imperative to give instructions.
  • Get an adjustable chair.
  • Don’t put your monitor in front of a window.

• We use should and shouldn’t + infinitive to give advice or to talk about what we think is a good or bad idea.
  • You should look down at the monitor, not up.
  • You shouldn’t use a monitor that’s fuzzy or distorts the image.

• We can also give advice by using set phrases like It’s a good idea to or It’s a bad idea to + infinitive.
  • It’s a good idea to have a monitor with a tilt-and-swivel stand.
Choosing a printer

1 Types of printer

A How many types of printer can you think of? Make a list.

B Read the article on page 38 and then label the types of printer (1–5). Which types of printer aren’t pictured?

The quality (resolution) of the images goes up to 2,400 dots per inch (dpi)

1

Provides high quality output: a resolution of 1,200–2,400 dpi

2

The resolution depends on the number of pins

3

Provides high quality for linework (lines and curves)

4

Provides the highest resolution: more than 3,000 dpi

5

The quality (resolution) of the images goes up to 2,400 dots per inch (dpi)
WHICH TYPE OF PRINTER SHOULD I BUY?

Printing is the final stage in creating a document. Since the results you can obtain with different types of printer will vary substantially, here is a guide to help you decide which one is most suitable for your needs.

To begin with, you should take into account that printers vary in cost, speed, print quality, and other factors such as noise or printing method. Technology is evolving so quickly that there is always a printer for every application or need.

Dot-matrix printers use pins to print the dots required to shape a character. They can print text and graphics; however, they produce relatively low resolution output – 72 to 180 dots per inch (dpi). They are used to print multi-part forms, self-copying paper and continuous-form labels. They are slower than Laser printers (see below) but much cheaper.

Inkjet printers operate by projecting small ink droplets onto paper to form the required image. Colour and hues are created by the precise mixing of cyan, magenta, yellow and black inks. Inkjets are fairly fast, quiet, and not as expensive as laser printers. Nevertheless, you can still expect high quality results because there are some inkjet printers on the market with a resolution of 2,400 dpi.

Laser printers produce output at great speed and with a very high resolution of 1,200–2,400 dpi. They can scan the image with a laser beam and transfer it to paper with a special ink powder called toner. They are constantly being improved. In terms of speed and image quality, laser printers are preferred by experts for various reasons; for instance, they have a wider range of scalable fonts than inkjets, can emulate different language systems, and can produce high-quality graphics; however, they are still expensive for home users.

Thermal transfer printers are used to produce colour images by transferring a wax-based ink onto the paper. They are popular for printing bar codes, labels and medium-resolution graphics.

Imagesetters produce very high-resolution output (up to 3,540 dpi) on paper or on the actual film for making the printing plates. In addition, they are extremely fast. Imagesetters are most often used in desktop publishing (DTP). Although they produce the highest quality output, they have one important disadvantage: they are too expensive for homes or small offices.

In modern lithographic printing, images are created on a DTP computer and then output directly to the printing plates, without requiring film as an intermediate step. This technology is called computer to plate, or CTP, and the machine used is called a platesetter.

Finally, we have plotters. Plotters use ink and fine pens held in a carriage to draw very detailed designs on paper. They are used for construction plans, engineering drawings and other technical illustrations. Nowadays, traditional plotters are being replaced with wide-format inkjets.

Find words in the article with the following meanings.

1. designs and images used in magazines, books, etc. (lines 10–15) __________________
2. output quality, measured in dots per inch (lines 10–15) __________________
3. a particular colour within the colour spectrum (lines 15–20) __________________
4. an ink powder used in laser printers and copiers (lines 25–30) __________________
5. set of characters that can be resized (enlarged or reduced) without introducing distortion (lines 30–35) __________________
6. a rectangular pattern of black lines of magnetic ink printed on an object so that its details can be read by a computer system (lines 35–40) __________________
7. surface that carries a reproduction of the image, from which the pages are printed (lines 45–50) __________________
8. in-between; middle (lines 50–55) __________________
2 Language work: connectors 1

A Look at the HELP box and then put the words in italics from the article on page 38 into the correct column of the table.

<table>
<thead>
<tr>
<th>Giving examples</th>
<th>Listing/Sequencing</th>
<th>Giving reason/cause</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B Try to add some more connectors to each column. How do you say these connectors in your language?

HELP box

Connectors 1

Connectors are linking words and phrases which join ideas and help us organize our writing. Connectors can be used for giving examples, listing or sequencing, and giving reason or cause.

… for instance, they have a wider range of …

To begin with, you should take into account that printers vary in cost …

Some common connectors appear in italics in the article on page 38. For more on other uses of connectors, see Unit 11.

C Write a paragraph describing the printer(s) you use at home or at work. Try to use some connectors. Think about these aspects: type, speed, resolution, print quality, memory, cost, print consumables (ink cartridges etc.).

3 Choosing the right printer

A In pairs, choose the most suitable printer for each of these situations. Give reasons for your choices.

1 You want to print documents, web pages and occasional photographs at home.

2 A small company needs a printer which will be shared by various users on a local area network (LAN).

3 A professional team of architects and engineers need to create accurate representations of objects in technical drawings and CAD.

4 A graphic arts business needs a printer to produce catalogues, brochures and other publications.

B In pairs, describe the features of your ideal printer.
Multi-function printers

A Listen to an extract from a consumer technology podcast about multi-function printers. What two disadvantages of multi-function printers are mentioned?

B Listen again and answer these questions.
1. What is a multi-function printer?
2. Why are multi-function printers so popular?
3. What is the main advantage of PictBridge technology?
4. Apart from sheets of paper, what other things can multi-function printers print?
5. What software do you usually get when you buy a multi-function printer?
6. What advice does Mr Kelly give on ink cartridges?
7. What type of device does he recommend for home users?
8. What type of device does he recommend for businesses?

Language work: comparatives

Look at the HELP box and then complete these sentences using the comparative form of the adjective in brackets.

1. A laser printer is generally (quiet) ___________________________ than a low-cost inkjet printer.
2. Multi-function printers are now only slightly (expensive) ___________________________ than conventional printers, and offer much (great) ___________________________ versatility.
3. The print quality of this network printer is noticeably (good) ___________________________ than any inkjet, and as (good) ___________________________ as similar laser printers.
4. The Agfa platesetter is (reliable) ___________________________ and (easy) ___________________________ to use than most printers of its type.
5. Your printer is only as (good) ___________________________ as the paper you use.
6. The final result is always (accurate) ___________________________ than the original image.
7. An imagesetter is (heavy) ___________________________ than a laser printer.

HELP box

Comparatives

- We form the comparative of one-syllable adjectives by adding -er.
  slow → slower
  Inkjet printers are slower than laser printers, but much cheaper.

- Two-syllable adjectives usually take more/less.
  modern → more modern
  They’re designing a more modern version at the moment.

- Adjectives ending in -y (for example, noisy) take -er and the y changes to i.
  Dot-matrix printers are noisier than inkjets.

- We form the comparative of adjectives with three or more syllables by adding more/less.
  versatile → more versatile
  … they’re cheaper and more versatile than standalone products.

- Note the irregular forms:
  good → better
  bad → worse
  little → less
  If you want better results, you’ll need specialized software.

- Equality is expressed by using as … as. Difference can be shown by using not as … as.
  This is as fast as many other printers in its class.
  Inkjets are not as expensive as laser printers.
Reading quiz – printer adverts

A In pairs, read the adverts and then answer these questions. See who in your class can finish first.

1. How many inkjet printers are advertised?
2. Which printer would you recommend to someone who wants to print advertising graphics?
3. If you have the wide-format printer from Vutec, what kinds of material can you print on?
4. Which technology lets you print directly from your digital camera without needing a computer in between?
5. A page description language, or PDL, describes how to print the text and pictures on the page. Can you find two laser printer languages?
6. What is the resolution of the Brother HL Network Colour Laser Printer?
7. How fast is the Brother HL Network Colour Laser Printer?

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Canon Compact Photo Printer SELPHY CP750

An inkjet photo printer with a 2.4” colour LCD for easy viewing, editing and printing of perfect borderless photos. With PictBridge, you can print directly from digital cameras, memory cards or camera phones (via IrDA or optional Bluetooth unit) without connecting to a PC.

Resolution: 300x300 dpi
Software: Easy-PhotoPrint
Dimensions: 179x127.1x63 mm
Weight: 960g

---

The Vutec UltraVu II S330 provides the ultimate combination of highest print speed and best print quality in a five-metre printer.

- Wide-format professional inkjet printer
- Prints on a wide variety of substrates, including vinyl, and pressure-sensitive paper, mesh and textiles
- VUTEK Low Friction Kit allows for difficult materials to be run more easily
- Prints up to 16.4 feet (5 metres) wide
- Up to 330 dpi resolution produces images that are sharp, crisp and consistent
- Prints up to 2,230 square feet (207 square metres) per hour
- Applications: banners, exhibition graphics, bus shelters, etc.

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Brother HL Network Colour Laser Printer

The HL-4040CN delivers the perfect balance of quality, workgroup, colour A4 laser printing.

It boasts outstanding colour output: 2,400 dpi class colour printing with exceptionally crisp, high-resolution text and graphics driven by Brother's exclusive printing enhancement technologies.

Print Speed: up to 31 ppm (pages per minute) mono, 8 ppm colour (A4)
Compatibility: PCL and PostScript languages
Paper tray capacity: 250 sheets
Memory size: 64MB
High-speed USB

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B A friend has emailed you asking for advice about which printer to buy, the Canon SELPHY CP750 or the Brother HL Network Colour Laser Printer. Write an email to your friend comparing the two printers. Use the HELP box on page 40 to help you.
1 Assistive technology

A In pairs, look at the words in the box and use as many of them as you can to describe the photos. You will not need all the words.

- blind person
- motor-impaired person
- screen magnifier
- Braille printer
- adaptive switch
- touch screen
- adapted keyboard
- on-screen keyboard
- voice recognition system
- screen-pointing device
- screen reader
- pneumatic switch (sip and puff)
B 🌟 In pairs, discuss these questions.
1 What sort of difficulties do you think are experienced by computer users with limitations of vision or mobility?
2 What types of device could be helpful to blind users?
3 How can a person with mobility limitations communicate with a computer?

2 Computers for the disabled

A Read the text and find the following.
1 the laws which ensure equal opportunities for people with disabilities in the USA and the UK
2 how the blind student in the photo interacts with the machine
3 the systems which type on the screen what is being said in meetings
4 the type of software which reads printed material, recognizes the text and then sends it to the PC
5 the system which is activated by the user's eye movements
6 the switch which can be used by someone with quadriplegia
7 the function of voice recognition devices

Computers for the disabled

Computers have taken a dominant role in our society, meaning most jobs now require access to computers and the Internet. But what happens if a person is blind, deaf or motor-disabled? They needn't worry. The latest assistive technology is designed to help them use computers and do their jobs in the office, learn at school, or interact with their families at home. In addition, new laws oblige companies to adapt the workplace to accommodate disabled people. For example, the Americans with Disabilities Act (ADA) and the UK's Disability Discrimination Act make it illegal for employers to discriminate against people with disabilities.

To work effectively, most blind users need to have their computers adapted with technologies such as Braille, screen magnifiers, speech synthesis and Optical Character Recognition (OCR).

Braille keyboards have Braille lettering on keyboard overlays, allowing the blind user to easily identify each key. For output, there are printers, called Braille embossers, that produce tactile Braille symbols on both sides of a page at high speed.

For someone with limited but usable vision, a screen magnifier may be appropriate. This type of software can enlarge text and images appearing on the screen by up to 16 times.

A Braille embosser prints a hard copy of a text document in Braille

A speech synthesis system is used to read aloud the work on the computer. It has a speech synthesizer, which produces the audio output, and a screen reader – the program which reads aloud text and menus from word processors, databases and the Web.

OCR uses a flatbed scanner and specialized OCR software to read printed material and send the text to the computer. The PC can then produce a copy of the text in Braille, a magnified copy, or a version that can be read aloud by a speech synthesis system.
Deaf computer users can overcome many communication difficulties with the aid of visual alerts, electronic notetakers and textphones. Visual alerts are indicators that alert the deaf user when they receive new mail or when there is a system error. So instead of hearing a sound, the user is alerted by a blinking menu bar or by a message on the screen. Electronic notetakers use software that types a summary of what is said in meetings onto the computer screen.

Textphones allow the deaf to type and read phone conversations. They are also called TDDs (Telephone Devices for the Deaf) or TTYs (TeleTypewriters). They can be used in combination with relay services, where an operator says what the text user types, and types what a voice phone user says. Deaf people can also communicate via SMS and instant messaging.

Motor-impaired workers unable to type on a standard keyboard can employ expanded or ergonomic keyboards, on-screen keyboards, adaptive switches and voice recognition systems.

On-screen keyboards are software images of a keyboard that appear on the screen and may be activated with a trackball, touch screen, screen-pointing device, or eye movements. In an eyegaze system, the keys on the virtual keyboard are activated by the user's eyes when they pause on a key for two or three seconds.

Eyegaze technology consists of a video camera and image processing software, which determines the eye's gazepoint on the screen.

Switches come in many shapes and sizes. They are operated by muscle movements or breath control. For example, a pneumatic switch — known as a sip and puff — allows someone with quadriplegia to control the computer by puffing and sipping air through a pneumatic tube. People with quadriplegia can also use sip and puff joysticks.

Finally, there's voice recognition, which allows the computer to interpret human speech, transforming the words into digitized text or instructions.
B Complete the crossword with words from the text on pages 43–44.

ACROSS
2 An ___________ keyboard presents a graphic representation of a keyboard on the desktop screen and allows people with mobility impairments to type data using a joystick or a pointing device.
4 Visual ___________ allow deaf users to be notified of incoming mail or error messages without hearing a tone.
6 A screen ___________ makes the computer screen more readable for users with poor vision.
7 A system of reading and writing using raised dots, which enables blind people to read by touch.

DOWN
1 Unlike a standard telephone, a ___________ has a small screen and a keyboard that transcribes a spoken voice as text. It is used for text communication via a telephone line, ideal for people who have hearing or speech difficulties.
3 A Braille ___________ is an impact printer that prints text as Braille, by punching dots onto paper.
5 A speech synthesizer is used in conjunction with a screen ___________ to convert screen contents into spoken words.

HELP box

Noun phrases
A noun phrase is a phrase that has a noun as its head. This noun can be accompanied by a modifier that gives information about the head.

modifier head
speech recognition computer

A noun phrase can function as the subject or object of a verb. It can contain the following range of modifiers:
- adjectives
  * I have a portable computer.
  * = a computer which is portable
- present participles
  * I use this drawing program.
  * = a program that draws
- 's genitive
  * The files are on the director's computer.
  * = the computer which belongs to the director
- nouns
  * I need to buy a colour scanner.
  * = a scanner which uses colour

3 Language work: noun phrases

A Look at the HELP box and then the noun phrases 1–6. Decide what type of modifier (a–d) is placed before the 'head' in each case.
1 disabled worker
2 rehabilitation engineer
3 employee's abilities
4 adapted keyboard
5 voice-activated computer
6 pointing device

B Explain the noun phrases in A.
Example:
disabled worker = a worker who is disabled
4 Assistive technologies for the blind

A Listen to an interview with Mike Hartley, the director of the Assistive Technology Project for the Blind in Washington DC. Make notes about these topics.

1. The work that Mike is currently involved in:

2. Assistive technologies for blind users:

3. The difference between voice recognition and speech synthesis:

4. The goal of the Web Accessibility Initiative:

5. Companies developing assistive technology products:

B In pairs, help each other to improve your notes and then listen again to make sure you have included all of the important information.

5 Investing in assistive technologies

Your school/company has decided to invest some of its annual IT budget in assistive technology. Write an email to your director of studies / manager, summarizing the different technologies available and the kind of people they can help. If possible, use the Internet to find suppliers of these technologies in your country.

Now visit www.cambridge.org/elt/ict for an online task.
3 Storage devices

<table>
<thead>
<tr>
<th>Unit</th>
<th>page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Magnetic storage</td>
<td>48</td>
</tr>
<tr>
<td>11 Optical storage</td>
<td>52</td>
</tr>
<tr>
<td>12 Flash memory</td>
<td>57</td>
</tr>
</tbody>
</table>

Learning objectives

In this module, you will:

- learn about different types of magnetic drive and disk.
- give instructions and advice on how to protect data.
- use technical vocabulary associated with optical storage devices and media.
- learn and use more discourse connectors.
- learn about the technical details of flash memory and its uses.
- learn different ways of making new words: affixation, conversion and compounding.
- describe flash-based devices.
Unit 10

Magnetic storage

1 Types of magnetic drive

A Look at the pictures and descriptions below and find the following.
1 the name of the hard drive on a PC platform
2 the type of hard drive that plugs into a socket at the back of a computer
3 the system that works in sequential format
4 the size and storage capacity of a floppy disk

A 3.5" floppy drive and diskette
A floppy disk drive uses 3.5" disks, which can store 1.44MB of data; it is usually assigned to the A: drive. Floppy drives are becoming increasingly rare.

The inside of a hard drive
Most PCs have one internal hard drive, usually called C: drive. It is used to store the operating system, the programs and the user's files in a convenient way. A hard drive can hold hundreds of gigabytes of data.

A portable external hard drive
External hard drives are connected to the USB or FireWire port of the computer. They can be as small as a wallet but can have as much capacity as internal drives; they are typically used for backup or as secondary storage.

Magnetic tapes and drive
A tape drive reads and writes data on tapes. It is sequential-access - i.e. to get to a particular point on the tape, it must go through all the preceding points. Tapes can hold hundreds of gigabytes of data and are used for data collection, backup and archiving.

B Complete these sentences with words from the box.

capacity storage archiving hold secondary

1 There are basically three types of magnetic __________ device available to the computer user - hard drives, diskettes and tapes.
2 The __________ of a 3.5" floppy disk is only 1.44MB.
3 Hard drives can __________ hundreds of times more data than floppy disks.
4 A portable hard drive is a good choice for __________ storage.
5 Magnetic tapes are used for __________ information that you no longer need to use regularly.

2 Buying a portable hard drive

A Sue (see Unit 4) wants to buy a new drive. Listen to her conversation with the sales assistant. Does she buy anything?

B Listen again and answer these questions.
1 What is the storage capacity of the Iomega eGo portable hard drive?
2 How much information can be stored on the Edge DiskGo model?
3 Which hard drive is good for mobile professionals?
4 How much does the Iomega eGo drive cost?
5 How much does the Edge DiskGo cost?
Magnetic storage

A Read the text and then identify a sector and a track in Fig. 1.
B Read the text again and decide whether these sentences are true or false. Correct the false ones.
1. A hard drive spins at the same speed as a floppy disk drive.
2. If you format a hard drive that has files on it, the files will be deleted.
3. Hard drives cannot be partitioned to run separate operating systems on the same disk.
4. Seek time and transfer rate mean the same thing.
5. Disk drives are not shock resistant, especially in operating mode.

Magnetic storage

Magnetic storage devices store data by magnetizing particles on a disk or tape.

A floppy disk is so called because it consists of a flexible sheet of plastic, coated with iron oxide—a magnetizable material. A floppy disk drive spins at 360 revolutions per minute (rpm), so it’s relatively slow. However, a hard drive spins at over 7,200 rpm and stores data on a stack of metal rotating disks called platters. This means you can store much more data and retrieve information much faster.

New disks need to be formatted before you can use them, unless they come preformatted from the manufacturer. When the disk is formatted, the operating system (OS) organizes the disk surface into circular tracks and divides each track into sectors. The OS creates a directory which will record the specific location of files. When you save a file, the OS moves the read/write head of the drive towards empty sectors, records the data and writes an entry for the directory. Later on, when you open that file, the OS looks for its entry in the directory, moves the read/write heads to the correct sector, and reads the file in the RAM area. However, formatting erases any existing files on a disk, so do not format disks on which data that you don’t want to lose is stored.

The OS allows you to create one or more partitions on your hard drive, in effect dividing it into several logical parts. Partitions let you install more than one operating system (e.g., Windows and Linux) on your computer. You may also decide to split your hard drive because you want to store the OS and programs on one partition and your data files on another; this allows you to reinstall the OS when a problem occurs, without affecting the data partition.

The average time required for the read/write heads to move and find data is called seek time (or access time) and it is measured in milliseconds (ms); most hard drives have a seek time of 7 to 14 ms. Don’t confuse this with transfer rate—the average speed required to transmit data from the disk to the CPU, measured in megabytes per second.

How to protect your hard drive

- Don’t hit or move the computer while the hard drive is spinning. Hard drives are very sensitive to vibration and shocks, especially when they are operating; when the read/write head touches the rotating disk, it can scratch and damage the disk surface. This is known as head crash.
- You shouldn’t turn your computer off and on quickly. Wait at least ten seconds to ensure that the drive has stopped spinning.
- Check your hard drive regularly for logical and physical errors. To check and repair a drive, you can use a disk diagnosis utility like Windows ScanDisk.
- To minimize the risk of data loss or corruption, you should install an up-to-date virus scanner. You should also back up your hard drive regularly.
C Match these words (1–5) with the definitions (a–e).
1 formatted
2 directory
3 read/write head
4 head crash
5 back up

a a file system that defines the structure for keeping track of the files
b the part of a drive that reads and records data on a disk
c to make a copy of data or software in case the original disk is damaged
d initialized; when the tracks and sectors on magnetic disks are set
e a serious disk malfunction; when the read/write head touches the rotating disk

4 Language work: precautions

A Look at the HELP box and then match the instructions (1–6) with the pictures (a–f).
1 Do not expose discs to heat or direct sunlight.
2 Check for viruses before opening files you receive from the Web or via email.
3 Make backup copies of your files.
4 Don't shake or move the computer violently while the hard drive is spinning.
5 Keep your discs away from water and humidity.
6 Hold discs by the edges, or by one edge and the centre hole.

HELP box

**Precautions**
- We use the imperative to give precautions and warnings.
  
  **Check** your hard drive regularly for logical and physical errors.
  
  … formatting erases any existing files on a disk, so **do not format** disks on which data that you don't want to lose is stored.
  
- We use **should** + infinitive without to to give advice or to talk about what we think is right.
  
  … you **should** install an up-to-date virus scanner.
  
- We use **shouldn't** + infinitive without to to give advice or to talk about what we think is wrong.
  
  You **shouldn't** turn your computer off and on quickly.
B In pairs, discuss what you should or shouldn’t do to protect your data. Use the suggestions below.

Example: discs on top of each other (stack)
You shouldn’t stack discs on top of each other. / Don’t stack discs on top of each other.
1 your anti-virus program regularly, since new viruses are created everyday (update)
2 discs in a protective case (store)
3 passwords and security devices to protect confidential information (use)
4 on discs with permanent marker pens (write)
5 the disc into the disc drive carefully (insert)
6 floppies or hard drives near magnets; they can damage the data stored on them (leave)
Note: disc (optical media); disk (magnetic storage media)

5 Word building

Look at the words in the boxes. Are they nouns, verbs, adjectives or adverbs? Write n, v, adj or adv next to each word and then complete the sentences below. For more about word building, see Unit 12.

<table>
<thead>
<tr>
<th>magnet</th>
<th>magnetic</th>
<th>magnetically</th>
</tr>
</thead>
<tbody>
<tr>
<td>magnetism</td>
<td>magnetize</td>
<td>magnetized</td>
</tr>
</tbody>
</table>

1 ___________ is the science of magnetic phenomena and properties.
2 Floppy disks and hard drives are ___________ storage devices.
3 Data is recorded on a disk in the form of ___________ spots called bits.

<table>
<thead>
<tr>
<th>fragment</th>
<th>fragmentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>defragmenter</td>
<td>fragmented</td>
</tr>
</tbody>
</table>

4 After you create, delete and modify a lot of files, the hard drive becomes ___________ , with bits and pieces spread all over the disk.
5 ___________ slows down the speed at which data is accessed because the disk drive has to work harder to find the parts of a file stored in many different locations.
6 To reorganize your hard drive, you can use a disk optimizer or ___________ ; this will reorder your files into continuous clusters.

6 Explaining hard drive precautions

A friend has sent you an email explaining that she has just lost all of the information on her PC because of a head crash. Write a reply explaining the following.

- Why the head crash happened
- What precautions she should take with her new PC to avoid similar problems in the future
- What steps she could take to back up her files
Unit 11  Optical storage

1  CDs and DVDs

A  In pairs, discuss these questions.
   1  What do CD and DVD stand for?
   2  What is the main advantage of using DVDs instead of CDs?

B  How do you say these expressions in your language?
   1  optical disc
   2  laser beam
   3  backward-compatible

C  Paul (see Unit 4) wants to buy some blank discs. Listen to his conversation with the sales assistant and check your answers to A.

D  Listen again and decide whether these sentences are true or false. Correct the false ones.
   1  A DVD is an optical digital disc that can be used for video, audio and data storage.
   2  The dimensions of a CD and a DVD are the same: 1.3 mm thick and 13 cm in diameter.
   3  The data on a DVD is read with a laser beam.
   4  A basic DVD can hold 3.7 gigabytes.
   5  You need a hard drive to read DVDs.
   6  DVD-Video discs can hold full-length movies.
   7  A DVD Writer is not compatible with old CD-ROMs.

Note: disc (optical media); disk (magnetic storage media)

2  Optical discs and drives

A  Read the text on page 53 and find the following.
   1  the advantages and disadvantages of optical discs over magnetic disks
   2  the storage capacity of a double-sided, dual layer DVD
   3  the difference between a DVD burner and a DVD recorder
   4  the feature of a portable DVD player which allows the user to play different formats
   5  two possible successors to DVDs
   6  where the Blu-ray format gets its name from
Optical discs and drives

Optical discs can store data at much higher densities than magnetic disks. They are therefore ideal for multimedia applications where images, animation and sound occupy a lot of disc space. Furthermore, optical discs are not affected by magnetic fields, meaning that they are secure and stable, and can be transported through airport metal detectors without damaging the data. However, optical drives are slower than hard drives.

CDs and DVDs

At first sight, a DVD is similar to a CD. Both discs are 120 mm in diameter and 1.2 mm thick. They also both use a laser beam to read data. However, they are very different in internal structure and data capacity. In a DVD, the tracks are very close together, thus allowing more tracks. The pits in which data is stored are also smaller, so there are more pits per track. As a result, a CD can hold 650-700MB, whereas a basic DVD can hold 4.7GB. In addition, a DVD can be double-sided and dual layer, with a capacity of 17GB.

CDs come in three different formats:
- CD-ROMs (read-only memory) are read-only units, meaning you cannot change the data stored on them (for example, a dictionary or a game).
- CD-R (recordable) discs are write-once devices which let you duplicate music CDs and other data CDs.
- CD-RW (rewritable) discs enable you to write onto them many times, just like a hard disk.

DVDs also come in several formats:
- DVD-ROMs are used in DVD computer drives. They allow for data archiving as well as interactive content (for example, an encyclopedia or a movie).
- DVD-R or DVD+R can only be recorded on once.
- DVD-RW or DVD+RW discs can be erased and reused many times. They are used to back up data files and to record audio and video.

The DVD drive used in computers is also called a DVD burner because it records information by burning via a laser to a blank DVD disc. However, a DVD recorder typically refers to a standalone unit which resembles a video cassette recorder. New DVD recorders can play all CD and DVD formats. There are also portable DVD players – handheld devices which let you watch movies or TV, play games and listen to music, wherever you are. They come with a built-in DVD drive and widescreen (rectangular 16:9 format) LCD display. They usually support multi-format playback – that is, they can play many file formats, including DVD-video, DivX, CD audio discs, MP3 music and JPEG images.

HD-DVD and Blu-ray discs

These two competing formats are expected to replace current DVD as the standard for watching movies at home. On one side are Toshiba, Microsoft and the DVD Forum, who support the High Definition-DVD (HD-DVD). Sony, Panasonic, Samsung, JVC and many movie studios are behind the Blu-ray format.

A Blu-ray disc has a capacity of 25GB (single layer), 50GB (dual layer) and 100GB (four layer). Unlike DVDs, which use a red laser to read and write data, Blu-ray uses a blue-violet laser, hence its name. Blu-ray discs can record and play back high-definition television and digital audio, as well as computer data.
B  Read the text again and make notes about the features of CDs, DVDs and Blu-ray discs.

<table>
<thead>
<tr>
<th>Capacity and formats</th>
<th>Possible uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD</td>
<td></td>
</tr>
<tr>
<td>DVD</td>
<td></td>
</tr>
<tr>
<td>Blu-ray</td>
<td></td>
</tr>
</tbody>
</table>

3 Language work: connectors 2

A  Look at these extracts from the text and put the words in italics into the correct column of the table.

1  They are therefore ideal for multimedia applications …
2  Furthermore, optical discs are not affected by magnetic fields.
3  However, they are very different in internal structure and data capacity.
4  As a result, a CD can hold 650–700MB, whereas a basic DVD can hold 4.7GB.
5  In addition, a DVD can be double-sided and dual layer …

<table>
<thead>
<tr>
<th>Indicating addition</th>
<th>Making contrasts</th>
<th>Explaining the results or effects of something</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B  Look at the HELP box and check your answers. How do you say these connectors in your language?

C  Choose the correct word in brackets to complete these sentences.

1  (Although/Consequently) CDs and DVDs are similar in size and shape, their data structure is very different.
2  DVDs hold more data than CDs. The pits burnt into the disc are smaller than on a CD, and the tracks are closer together. (On the other hand / As a result), DVDs can have up to four recording layers.
3  A Blu-ray disc drive costs a lot of money (but/so) you should use it carefully.
4  Blu-ray is expected to replace DVD over the coming years (because/besides) it offers much greater storage capacity.
5  Both Blu-ray (and / in addition) HD-DVD devices are backward-compatible with current CDs and DVDs, meaning you can play your old discs on the new players.
6  Sony has invested millions of dollars in the development of Blu-ray technology. The success of Blu-ray is (whereas/therefore) vital for the company’s future.
Choosing storage devices

In pairs, look at the products in the computer catalogue and choose the most suitable device for the purposes (1–6). Give reasons for your choices. Try to use some connectors from the HELP box on page 54.

1 to keep the operating system and the programs on a home computer
2 to watch a movie on a plane or in the back seat of a car
3 to hold your favourite photos and music
4 to make backup copies and to transport files between computers in a big company
5 to hold historical records in the National Library
6 to read, write and re-write high-definition video and TV

Seagate hard drive
Superfast 8ms hard drive. Capacity ranges from 80GB to 1TB.

Iomega portable hard drive
160GB, 2.5" external hard drive. An affordable way to back up all your data, from business documents to emails.

LaCie DVD drive
16x DVD writer with free Nero DVD burning software. Can play and record both DVD+R and DVD-R discs, plus their rewritable counterparts, as well as all types of CD.

Panasonic portable DVD player
8" portable LCD DVD Player with Car Kit. Compatible with DVD-Video, CD, JPEG image CD and MP3-formatted audio CD.

Sony Blu-ray disc drive
Sony's Vaio AR laptop is the first portable Blu-ray studio, which includes a Blu-ray disc drive and a TV tuner, alongside a 17" widescreen display and a 2GHz Intel Core Duo processor.

Toshiba USB flash drive
High-speed 16GB pen drive with a built-in MP3 player. Plugs directly into any USB connection.

Useful language

For this use, the ... is the most appropriate because ...

The ... has ... so I'd choose it for ...

However, ... is good for ... because ...

In a big company, it would be a good idea to ...

Well, that depends on ...

I agree / I disagree.
5 Format wars

Read these posts from a forum about the topic of ‘Blu-ray versus HD-DVD’ and then add your response, giving your opinion on the topic.

HD-DVD and Blu-ray formats display movies in full high-definition resolution, but they are incompatible; HD-DVD cannot play the Blu-ray discs, and vice versa. People say that Blu-ray discs can hold more data and video, but that they are more expensive and complex. Who will be the winner in this format battle?

Consumers ezine, March 10th at 5:40 pm

Samsung and Toshiba are selling hybrid players that can play both formats. Sony and NEC are also releasing dual-format players. This may be the end of the format war. Will both sides produce a unified standard?

News.net, March 15th at 12:30 am

I hate format wars. This situation reminds me of the Beta versus VHS war in the early days of the video market, and more recently DVD-R versus DVD+R. I don’t want to invest money in equipment that quickly becomes obsolete or incompatible. Why can’t someone create a universal player that plays all formats, from CDs to high-definition video discs?

Posted by Adam, March 15th at 4:15 pm

Name:

Submit comment
1 **Flash-based gadgets**

Flash memory is used in many handheld devices. Match the descriptions (1–6) with the pictures (a–f).

1 This handheld console lets you play games stored on ROM game cards, which have a small amount of flash memory to save user data, for example high scores.
2 This flash memory card is used as 'digital film' to store images on a digital camera.
3 This wireless LAN card allows laptop and PDA users to access the Internet from any Wi-Fi access point.
4 This USB flash pen drive is the latest mobile drive for your computer.
5 It looks like an ordinary watch, but this USB drive from Edge Tech can store up to 1GB of flash memory. It will let you save and transfer your photos, songs and data files easily.
6 This flash-based player provides everything you need to play music and store data on the go. It also comes with a built-in FM radio and voice recorder.

2 **Memory in a flash!**

A Look at the title of the text on page 58. Why is it a suitable title for an article about flash memory? Read the first paragraph of the text to find out.

B Read the whole text and answer these questions.

1 What is flash memory?
2 What are the differences between RAM memory and flash memory?
3 What can devices which use multi-level cell technology do?
4 What are the differences between flash drives and external hard drives?
5 What is the advantage of using U3 technology in flash drives?
6 How much data can a flash memory card hold?
7 What is the name of the flash card created by Sony for its digital cameras?
Memory in a flash!

Flash memory is a type of non-volatile memory that can be electronically erased and reprogrammed. Its name was invented by Toshiba to express how much faster it could be erased — 'in a flash', which means very quickly.

Unlike RAM, which is volatile, flash memory retains the information stored in the chip when the power is turned off. This makes it ideal for use in digital cameras, laptops, network switches, video game cards, mobile phones and portable multimedia players. In addition, it offers fast read access times (although not as fast as RAM), with transfer rates of 12MB per second. Unlike ROM chips, flash memory chips are re-writable, so you can update programs via software.

Inside the chip, data is stored in several floating gate transistors, called cells. Each cell traditionally stores one bit of data (1 = erased and 0 = programmed). New devices have a multi-level cell structure so they can store more than one bit per cell. The chips are constructed with either NOR or NAND gates. NOR chips function like a computer's main memory, while NAND works like a hard drive. For example, in a camera, NOR flash contains the camera's internal software, while NAND flash is used to store the images.

Flash memory is used in several ways:

- Many PCs have their BIOS (basic input/output system) stored on a flash memory chip so it can be updated if necessary.
- Modems use flash memory because it allows the manufacturer to support new protocols.
- USB flash drives are used to save and move MP3s and other data files between computers. They are more easily transported than external hard drives because they use solid-state technology, meaning that they don't have fragile moving parts that can break if dropped. However, USB flash drives have less storage capacity than hard drives.
- New U3 smart drives allow users to store both applications and data. They have two drive partitions and can carry applications that run on the host computer without requiring installation.
- Flash memory cards are used to store images on cameras, to back up data on PDAs, to transfer games in video consoles, to record voice and music on MP3 players or to store movies on MP4 players. They are as small as a stamp, and capacity can range from 8MB to several gigabytes. The only limitation is that flash cards are often not interchangeable between devices. Some formats include: CompactFlash, Secure Digital, MultiMedia Card, miniSD card, and xD-Picture Card. Sony has its own product called the Memory Stick, used in its digital still cameras, video camcorders and the PlayStation Portable. The photos stored in a digital camera can be offloaded to a computer via cable or wirelessly. Another option is to have a flash card reader permanently connected to your PC; you simply eject the card from the camera and put it into the reader instead of having to plug the camera in.

The future of hard drives may be hybrid hard drives. Hybrid hard drives combine a magnetic hard disk and flash memory into one device. This allows computers to boot, or start, more quickly, and also reduces power consumption.

C Find words or phrases in the text with the following meanings.

1 permanent; able to hold data without power (lines 1–5)
2 able to be rewritten many times (lines 10–15)
3 different sections of a disk drive or storage area (lines 40–45)
4 to make a copy of a file so that the original is not lost (lines 45–50)
5 transferred to another device (lines 60–65)
6 a peripheral device that reads and writes flash memory cards (lines 60–65)
7 a product that integrates two different technologies (lines 65–70)
3 Language work: word building

A Look at the HELP box and then, using affixation, conversion and compounding, try to make as many words as you can from blog, mail and print. Use a dictionary and the Internet to help you.

<table>
<thead>
<tr>
<th>blog</th>
<th>mail</th>
<th>print</th>
</tr>
</thead>
<tbody>
<tr>
<td>blogger (a person who writes a blog)</td>
<td>to mail (the verb form)</td>
<td>printout (the pages produced by the printer)</td>
</tr>
</tbody>
</table>

B Choose the correct word in brackets to complete this description of a digital voice recorder. Use a dictionary to help you.

Olympus WS-320M digital voice recorder
Slim, attractive, and highly functional, the Olympus WS-320M digital voice recorder packs 1GB of internal flash memory into its 1 (lighted/lightweight/lighten) housing, letting you record up to 277 hours of high-quality audio in WMA format. It's ideal for 2 (record/recordable/recording) notes or long lectures, interviewing people, or capturing song ideas before they disappear. As an added bonus, the WS-320M can store up to 266 WMA or MP3 songs for high-quality stereo 3 (player/playback/playoff).

The WS-320M features five separate file 4 (folds/folding/folders), capable of holding 199 files each, so you can organize nearly 1,000 files by subject, theme or other category. Users also have the choice of four recording modes: HQ for high-quality audio, LP and SP for extended recording times, and ST HQ for stereo recording. And thanks to the voice 5 (activation/activate/active) option, users don't need to press a single button to start recording — the WS-320M will record as soon as the built-in microphone picks up sound.

Perhaps the most convenient feature, however, is the built-in USB 6 (connector/connect/connect), which eliminates the need for a USB cable. Once this is connected, you can 7 (downloadable/download/upload) music files, images or documents from your PC, in effect turning the recorder into a small hard drive. You can even transfer voice recordings to your computer for 8 (store/storage/storeroom) or multimedia use.

HELP box

Word building
We can create new words from existing words in three main ways:

- Affixation (adding a prefix or suffix)
  Adding a prefix:
  volatile —— non-volatile
date —— update
Adding a suffix:
erase —— erasable
install —— installation

- Conversion (turning a noun into a verb, or a verb into a noun, etc.)
network (noun) —— to network (verb)
We networked all the PCs in the office.
We created a network of all the PCs in the office.

- Compounding (putting two or more words together)
  hand + held —— handheld
I bought a new handheld last week.

Compounds can be written as two separate words (flash card), as two words joined with a hyphen (solid-state), or as one word (handheld). Unfortunately, there are no rules, and some compounds even change spelling over time. For example, website began as two words, then became hyphenated (web-site) and is now written as one word — website. Always check your dictionary or Google if you are not sure.

In pronunciation, compounds normally have the main stress on the first part, and the secondary stress on the second part, for example 'video, game.'
4 Describing flash drives

A Listen to a salesperson at his stand at a consumer electronics show describing two flash products to a potential customer. Which product (a or b) is the visitor most interested in?

a. The Dragon flash drive
b. The Dragon MP4 player

B Listen again and tick (✓) which features the salesperson mentions for each device.

<table>
<thead>
<tr>
<th>Features</th>
<th>Dragon flash drive</th>
<th>Dragon MP4 player</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back up computer data</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Transport files between PCs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audio and video playback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM radio tuner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voice recorder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Games</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C Listen again and answer these questions.

1. What is the storage capacity of the Dragon flash drive?
2. How do you connect it to the computer?
3. According to the salesperson, what are the advantages of a USB flash drive over a DVD or an external hard drive?
4. Some portable media players are also known as MP4 players. Why?
5. What is the screen size of the Dragon MP4 player?
6. How long does the battery last?
D In pairs, choose a flash-based device that you own and describe it. Use the Useful language box and the features and questions from the listening text to help you.

E You have received a text from a friend at a computer show. Write a short reply.

Hi. At the computer show in town. Need a new media player. What’s the difference between MP3 & MP4 players? What features should I look for? Thanks!

5 Vocabulary revision

Solve the clues and complete the puzzle. Look at Units 10–12 to help you.

Across
4 Thousandth of a second, abbreviated to ms, used to measure the access time of hard drives.
6 Floating gate transistors are called ____________ in flash memory technology.
7 Prefix meaning very large or one thousand million.
11 Acronym for light amplification by stimulated emission of radiation.
12 Capable of being deleted.

Down
1 Concentric ring on the surface of a disc when the disc is formatted.
2 ____________ memory retains its data when the power is switched off.
3 CD-RW means Compact Disc ____________ .
5 Abbreviation of digital versatile disc.
8 To write information on a disk or storage area.
9 Type of external bus or connector that plugs into the computer.
10 The physical mechanism that accepts, reads and writes data on a disk.

Now visit www.cambridge.org/elt/ict for an online task.
# Basic software

<table>
<thead>
<tr>
<th>Unit</th>
<th>page</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>The operating system (OS)</td>
</tr>
<tr>
<td>14</td>
<td>Word processing (WP)</td>
</tr>
<tr>
<td>15</td>
<td>Spreadsheets and databases</td>
</tr>
</tbody>
</table>

## 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.
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.

The most popular operating systems are:

- **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.

---

**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 [Image] 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 [Image] 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?
Listen again and complete this fact file.

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

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.
1 Word processing features

A In pairs, discuss these questions.
1 What is a word processor?
2 What kind of tasks do people use word processors for?
3 How many different word processing programs can you name? Which do you think is the most popular?

B Look at this screenshot from Microsoft Word and translate the labelled features and functions into your own language.

C Complete these sentences with the correct features and functions above.
1 The Standard __________ lists the icons to save or print a document, spell check, etc. The __________ Toolbar is the area for changing font, alignment, indentation, etc.
2 A font consists of three elements: __________ , type style and type size. For example, Palatino bold at 10 points.
3 Type style refers to a visual characteristic of a typeface, for example B for _________, I for _________ and U for underlined.
4 If you need to change indentation – the space between the page margin and where the text aligns – you can click the Increase or Decrease _________ buttons.
5 The _________ and _________ commands allow you to specify customized texts at the top and bottom of every page.
## Word Sudoku

**In pairs, read the instructions and complete the puzzle.**

**Instructions**

This Word Sudoku is a variation on the normal Sudoku. Instead of using the numbers 1 to 9, we are using words and icons. There are nine WP functions and their equivalent icons, so we are playing with nine pairs. In order to complete the grid, you can use each function or the equivalent icon only once in each row, each column, and in each of the 3x3 boxes. The icons can only be used in the coloured boxes.

**Word processing functions and icons**

- Align Left
- Insert Hyperlink
- Print Preview
- Columns
- Insert Table
- Undo
- Drawing
- Open
- Bullets

<table>
<thead>
<tr>
<th>Drawing</th>
<th>Columns</th>
<th>Bullets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Align Left</td>
<td>Insert Table</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Undo</td>
<td>Print Preview</td>
</tr>
<tr>
<td>Print Preview</td>
<td>Insert Hyperlink</td>
<td>Columns</td>
</tr>
<tr>
<td>Undo</td>
<td>Insert Hyperlink</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>Open</td>
<td>Bullets</td>
</tr>
<tr>
<td></td>
<td>Columns</td>
<td>Insert Hyperlink</td>
</tr>
</tbody>
</table>
The Cut and Paste technique

A Listen to two friends, Anna and Ben, talking about how to move text in Word. How many steps are involved in carrying out the Cut and Paste task?

B Listen again and complete the dialogue.

Anna: Ben, do you know how I can move this paragraph? I want to put it at the end of this page.
Ben: Er ... I think so. (1) , use the mouse to select the text you want to move. (2) choose the Cut command from the Edit menu.
Anna: (3) ?
Ben: Yes. The selected text disappears and goes onto the clipboard.
(4) you find where you want the text to appear and you click to position the insertion point there.
Anna: Mm, OK. Is that (5) ?
Ben: Yes, if that's where you want it. (6) , choose Paste from the Edit menu, or hold down Ctrl and press V. (7) , check that the text has appeared in the right place.
Anna: OK, I've (8) . Is that (9) ?
Ben: Yes, that's it. If you make a mistake, you can choose Undo from the Edit menu, which will reverse your last editing command.
Anna: Brilliant! Thanks a lot.
Ben: That's OK, it's my pleasure.

Moving text is a process of cutting and pasting, as if you were using scissors and glue.
4  Language work: giving and following instructions

A  Look at the HELP box and then correct six mistakes in this dialogue.
A: I need a photo for my curriculum vitae. How do I insert one into this Word document?
B: Well, now choose Insert on the Menu bar.
A: As this?
B: Yes, From the Insert menu, select Picture. As you can see, this displays a drop-down menu with different options: Clip Art, From File, From Scanner, Chart, etc. Select From File and you’ll get a dialog box.
A: OK. I’ve done that now. What last?
B: OK. Now I navigate your hard drive’s contents and find the picture that you want to insert.
A: Right. I’d like to include this one.
B: OK, good. Now click Insert and the photograph will be inserted into your document.
A: Here it is. Is that write?
B: Yes, First, right-click with the mouse and select Format Picture to adjust the size and other properties.
A: Brilliant, thanks!

HELP box

Giving instructions
• To give instructions, we use the imperative form of the verb and sequence words such as first, next, then, after that, finally, etc.

First, use the mouse to select the text.
Then choose the Cut command from the Edit menu.
Next, choose Paste from the Edit menu.
Finally, check that the text has appeared in the right place.

We can also use the present simple with you.
Now you find where you want the text to appear and you click to position the insertion point.

Following instructions
• If you want to check that you have understood instructions, you can use expressions like:
  Like this?
  Is that right?

• If you want to signal that you are ready to move on to the next step, you can use expressions like:
  OK, I’ve done that now.
  What next?

• If you want to ask if the process is completed, you can use expressions like:
  Is that everything?
  Anything else?

B  Complete these instructions for how to Copy and Paste in Word with verbs from the box.

click (x2)  select  position  right-click  drag

1 First, __________ the text you wish to copy. To select text, __________ the mouse over the portion of the text that you want to copy. This part should then be highlighted.

2 Then __________ on the Copy icon on the Standard Toolbar. This copies the selected text to an invisible clipboard.

3 Next, __________ the cursor where you want the text to appear.

4 Finally, __________ the Paste icon. This inserts the content of the clipboard at the insertion point. As well as the icons on the toolbar, you can use the keys Ctrl+C for Copy, and Ctrl+V for Paste. These options also come up if you __________ the selected text.
Write instructions for using *Find and Replace* based on this dialog box.

Work in pairs. Student A: Give your partner instructions on *Creating a document and saving it on disk*. Student B: Give your partner instructions on *How to insert a picture from the Web into a Word document*. Use words and expressions from the HELP box on page 71.

**5 WP tools**

**A** Scan the descriptions of three WP tools (1–3) – a spell checker, an online thesaurus and a grammar checker – and match them with the dialog boxes (a–c).

1. Spell checkers can be used to compare words in the program's dictionary to those used in the user's document. The spell checker points out any words it cannot match, notifies the user, and allows them to make any changes; it even suggests possible correct spellings. Like a conventional thesaurus, this database of words contains definitions and suggestions of words with similar and opposite meanings. A word may be spelled correctly but still be wrong (*too* instead of *two*, for instance). This is a good first step at proofing a document because it can find many common errors, but users will still need to proofread documents to ensure complete accuracy.

2. Many word processors include an online thesaurus with which users can look up different words to use in similar instances. Their power comes not from knowing every grammatical rule, but from questioning the writer about certain parts of the text. Some even include information about pronunciation and the history of a word.

3. Grammar checkers are applications that attempt to check more than just spelling. They count words in sentences to flag possible run-on sentences. They look for words that show possible conflicts between verbs and subjects, and they offer advice about corrections. Grammar checkers are a step beyond spell checkers, but they are still not a substitute for a human editor. However, this does not mean that all the words in the document are spelled correctly. They give the writer another chance to think about what he or she has written. The computer can alert writers to problems that wouldn't be obvious to them otherwise.

**B** Read the descriptions more carefully. Find three sentences that have been printed in the wrong text and decide where they should go.

**C** Correct the three mistakes in this sentence and decide if they would be found by the spell checker or the grammar checker.

*Mail merge* combine a form letter with a database file to create customized copies of the letter.
Unit 15  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?

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.

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.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
<th>Price</th>
<th>VAT (value added tax)</th>
<th>Product</th>
<th>Grand total</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ulysses Classic</td>
<td>2GB of RAM, 1TB HD</td>
<td>4</td>
<td>850€</td>
<td>Media Market</td>
<td>3,400€</td>
<td></td>
</tr>
<tr>
<td>Flat LCD screen</td>
<td>Colour 19&quot;</td>
<td>4</td>
<td>170€</td>
<td>Fax: 1 662 2367</td>
<td>680€</td>
<td></td>
</tr>
<tr>
<td>Portable Ulysses</td>
<td>2GB of RAM, 250GB HD</td>
<td>2</td>
<td>975€</td>
<td></td>
<td>1,950€</td>
<td></td>
</tr>
<tr>
<td>D5 database</td>
<td>DBMS, relational database</td>
<td>1</td>
<td>245€</td>
<td></td>
<td>245€</td>
<td></td>
</tr>
<tr>
<td>Antidote JP</td>
<td>Anti-virus, anti-spyware</td>
<td>6</td>
<td>60€</td>
<td></td>
<td>360€</td>
<td></td>
</tr>
<tr>
<td>Laser printer CQ</td>
<td>2,400 dpi, PostScript</td>
<td>1</td>
<td>230€</td>
<td></td>
<td>230€</td>
<td></td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td></td>
<td></td>
<td><strong>6,865€</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(6)</td>
<td>(21%)</td>
<td></td>
<td><strong>1,441€</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(7)</td>
<td></td>
<td></td>
<td><strong>8,306€</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
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 £6,000 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  
2 key  
3 query  
4 businessman  
5 fax  
6 salary  
7 mouse  
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 /v/ (e.g. amounts, hyperlinks)
  /z/ after one of these sounds: /s/, /z/, /j/, /x/ or /dʒ/ (e.g. businesses, devices, images)
  /ズ/ in most other cases (e.g. files, fields, customers, columns)

B Put the plurals into the correct pronunciation column.

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

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.

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 …?  

Now visit www.cambridge.org/elt/ict for an online task.
Learning objectives

In this module, you will:

- study vocabulary related to the Internet and email.
- learn how to form different types of question.
- learn about the basic features of the Web.
- learn and use collocations related to the Internet.
- learn and use vocabulary related to the Web, e-commerce, online banking, online chatting and videoconferencing.
- learn and use abbreviations in online chats.
- learn about the basic ideas related to security and privacy on the Internet.
- discuss controversial issues related to the Internet.
## Unit 16 The Internet and email

### 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:

(6) ____________________________________________

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

### 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 (modulator/demodulator) 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
2 The Web
3 Newsgroups
4 Chat and IM
5 FTP
6 Telnet

a transfer files from the Internet to your hard drive
b send a message to another person via the Internet
c have a live conversation (usually typed) online
d connect to a remote computer by entering instructions, and run a program on it
e take part in public discussion areas devoted to specific topics
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.

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, :-( for sad, :-( for surprised, :-( 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 @ sign, which means at

The username (a person’s name or nickname)

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

Hi John,

I have to prepare a project for my English class about the history of the Internet and how it’s used in our day-to-day lives. Do you have any thoughts about what I should include? I’ve included my first thoughts here as an attachment. Could you send me some more ideas?

All the best,
Celia
Unit 17  The Web

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 **hypertext links** and take you to other web pages when clicked.

C  Listen to three internet addresses and write them down.

1  
2  
3  
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
2 take
3 email
4 upload
5 portable
6 official

a friends
b photos
c action
d website
e encyclopedia
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.
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.

<table>
<thead>
<tr>
<th>Speaker 1</th>
<th>Speaker 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Things people buy online</td>
<td>Things you can do with online banking</td>
</tr>
<tr>
<td>Steps for buying online</td>
<td>Biggest issue with online banking</td>
</tr>
<tr>
<td>Precautions</td>
<td>Precautions</td>
</tr>
</tbody>
</table>

C Complete the extracts with words from the box

| authorization | fake | internet auction | shopping cart | browse | log in | steal |

1 Occasionally I also buy things on __________________________ sites such as eBay, where people offer and sell things to the highest bidder.

2 First you enter a site dedicated to e-commerce and __________________________ their products.

3 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.

4 You may have to __________________________ with a username and a password …

5 … for some transactions, you will be required to use a TAN, a transaction __________________________ number.

6 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 18 Chat and conferencing

1 Online chatting

In pairs, discuss these questions.

1 What is your favourite way to chat on the Internet?
2 How much time do you spend chatting?
3 Do you give out personal details in chat rooms?
   Why should you be careful about this?

2 Virtual meetings

A Read the text and match the headings (1–5) with the gaps at the start of each paragraph (a–e).

1 Cheap calls over the Internet
2 Virtual worlds and online communities
3 Chat rooms on the Web; join the crowd!
4 Real-time videoconferencing
5 Private chats with IM services

Windows Live Messenger is one of the world’s most popular chat programs.

Virtual meetings

a Imagine you want to assemble a group of people from around the world for a brainstorming session. Conferencing programs such as NetMeeting or CU-SeeMe allow virtual workgroups to communicate via the Internet. To videoconference, you’ll need a webcam. Participants see each other’s faces in small windows on their monitors and hear each other’s voices on the computer speakers. You can use just audio, video and audio simultaneously, or the screen-sharing capability to collaborate on documents without audio or video.

b Internet telephony, also known as VoIP (Voice over Internet Protocol), almost eliminates long-distance phone charges, allowing you to call nearly anywhere in the world for the price of a local call. If you have flat-rate internet access, you can’t beat the price — it’s practically free.

With internet telephony, you can make a voice call from your computer to another person’s computer, landline, or mobile phone. You can download telephony software such as Skype or Net2Phone from the Net, and it’s even free!

c People also use more traditional chat conferencing or bulletin board systems (BBS) to communicate online. Note that during chat sessions, participants type messages to each other rather than communicate by voice. Chat software can be used on the Web with your browser to conduct online chat sessions with other users and can accommodate between 50 and 1,000 users simultaneously. Some companies even use chat conferencing on their websites to facilitate communication with customers.
Chat rooms can be good venues to meet people and discuss topics of mutual interest. But what if you want to chat privately with a friend, family member or business colleague? Then Instant Messaging, or IM, is the way to go. Many IM services now offer audio and video capabilities, so if you have a microphone and a webcam, you can chat and see who you're talking to. The four most popular IM services are ICQ and AIM (from AOL), Windows Live Messenger, and Yahoo! Messenger. They all work similarly. First, you enrol in the service by creating a username – which is also your screen name – and a password. Next, you build what is known as a buddy list – a list of people that you want to communicate with. When any of the contacts on your list is online, you can start a private chat with that person.

How do you know who's online? When you launch your IM software, it connects with the service's IM server and logs you on. The server checks your buddy list to see if any of your contacts are also logged on. Your list updates to show who is currently online. By clicking on a name you can send text-based messages to that person. After you type your note and click on the Send button, the message travels to the IM server, then immediately forwards to your buddy's computer. This all happens in realtime – instantly.

You can also chat in incredible 3-D worlds that are built by other users, for example Second Life. In these virtual reality environments you can play 3-D games and interact with other users via avatar identities. Avatars are 3-D graphical representations of the participants.

Avatars can run, jump, fly, dance and even enable you to express emotions.

Paragraphs a–d adapted from www.learnt net.com

B Read the text again and answer these questions.

1 Why is videoconferencing so useful for virtual workgroups?
2 What special hardware and software do you need to videoconference?
3 Which technology enables people to make phone calls over the Internet?
4 What is the difference between web chat rooms and Instant Messaging?
5 How do you log on to an IM server?

C Find terms in the text with the following meanings.

1 at a fixed price (lines 15–20) 
2 a central system that provides information about whether users are online and passes instant messages between them (lines 35–40)
3 a friend list or contact list (lines 45–50)
4 happening immediately and without delay (lines 55–60)
5 artificial reality; a 3-D space generated by the computer (lines 60–65)
6 characters used when interacting with people online (lines 60–65)
3 Netiquette

A In pairs, do this netiquette quiz. Read about netiquette rules on the Web if necessary.

1 Netiquette, or net etiquette, is a general code of behaviour for communicating online.
   ○ True
   ○ False
2 Typing in capitals letters looks like:
   ○ the message is very important.
   ○ you’re shouting.
3 What should you avoid doing in chat rooms?
   ○ Being respectful
   ○ Giving out personal or financial information
4 Spamming means
   ○ posting stupid comments in chat rooms.
   ○ posting unsolicited advertising messages.
5 Before asking questions in a chat room or posting messages to forums, you should always
   ○ read the FAQs (Frequently Asked Questions).
   ○ introduce yourself and post a test message.
6 Avoid flame wars. Flames are
   ○ angry responses or offensive comments.
   ○ people who break the rules of netiquette.
7 Keep messages short and to the point, and check spelling and grammar.
   ○ True
   ○ False

B Have you ever experienced bad netiquette? Tell your partner what happened.

4 R u free 4 a chat?

A Rewrite this IM chat, using full forms instead of abbreviations. Then look at the HELP box on page 92 to check your answers.

Abby: BTW, where r u going for ur holiday?
Sue: Girona. Have u been?
Abby: Yes. I went 2 Girona last summer.
Sue: Did u have a good time?
Abby: It’s great, IMO. How r u going 2 travel?
Sue: We’re flying.
Abby: Where r u staying?
Sue: In a youth hostel.
Abby: I.C. IOW, the cheapest place possible!
Sue: LOL! Yes. BTW, any recommendations?
Abby: Let me think. I’ll send u a msg ASAP.
Sue: TIA!
Abby: Got 2 go. BFN!
B Rewrite this IM chat using abbreviations.

Paulo: By the way, are you free on Saturday?

Emma: Sure – it would be good to meet face to face. Shall we go for a coffee?

Paulo: Good plan. Café Moka makes the best coffee, in my opinion.

Emma: It’s the closest to your house in other words!

Paulo: Laughing out loud! Yes, you’re right! But the coffee really is good.

Emma: See you at 4?

Paulo: Great. Bye for now.

C In pairs, practise having an online conversation. Write a short note and give it to your partner. Use abbreviations as necessary. Your partner will write a short response and give it back to you. Continue the conversation and try not to talk. Choose one of these topics.

- Your plans for the weekend
- What you did last night
- Your holiday plans
- What happened at school/work today
- Music / TV / The Web

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

1. Which program do you use to chat with friends?
2. Do you use abbreviations when you chat online or when you send text messages?
3. Do you use voice or video while chatting? How?
4. Have you ever used the Internet to make cheap calls?
5. Does Instant Messaging distract you from work?
6. Do you use your real name or a nickname in chat rooms?
7. Do you talk to strangers during web chats? Why shouldn’t you?
8. Would you ever go on a date with somebody you’d met on the Net?

HELP box

Chat abbreviations

We often use abbreviations in online chats and Instant Messaging. Some common examples are:

- ASAP: As soon as possible
- BBS: Be back soon
- BFN: Bye for now
- BTW: By the way
- F2F: Face to face
- GL: Good luck
- H&K: Hug and kiss
- IC: I see
- ILU: I love you
- IMO: In my opinion
- IOW: In other words
- LOL: Laughing out loud
- TIA: Thanks in advance
- msg: Message
- ur: your / you’re
- 2: to
- 4: for
- b: be
- c: see
- r: are
- u: you

It’s OK to use chat abbreviations, but try not to rely on them too much – they can make a conversation difficult to follow. They are also very informal.
5  **At a cybercafé**

A  **In pairs, discuss these questions. Give reasons for your answers.**
1. Do you ever go to cybercafés?
2. What services would you expect a cybercafé to offer?

B  **Listen to an interview with Daniel Sturdy, the manager of a cybercafé in London. Does Daniel like where he works?**

C  **Listen again and decide whether these sentences are true or false. Correct the false ones.**
1. A cybercafé is a café where you can have access to the Internet and related services.
2. You can talk to people over the Internet using internet telephony at Daniel's café.
3. They don't help people who have problems while using the Internet.
4. Using a computer with internet access costs £2 per hour or £80 for a week.
5. At the moment they've got a lot of international customers.
6. You have to pay long-distance phone rates on the Internet.
7. In the café area you can sit, drink coffee and chat to people.

6  **Plan your own cybercafé**

A  **In small groups, plan how you would open a cybercafé in your town. Consider these areas.**
- Money needed
- Type of customer
- Location
- Services you will offer (just internet access? food and drinks? newspapers and magazines? tutorials?)
- Furniture and decoration
- How to create a nice atmosphere (music, lighting, private areas, etc.)
- What type of hardware and software you need
- What type of internet connection you need
- How much you will charge
- A name and slogan for your cybercafé

B  **Present your plan to the class, using PowerPoint if possible.**
Unit 19 Internet security

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.

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 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.

1. Users have to enter a ___________ to gain access to a network.
2. A ___________ protects a company intranet from outside attacks.
3. A ___________ is a person who uses their computer skills to enter computers and networks illegally.
4. ___________ can infect your files and corrupt your hard drive.
5. You can download ___________ from the Net; this type of software is available free of charge but protected by copyright.
6. Encoding data so that unauthorized users can’t read it is known as ___________.
7. This company uses ___________ techniques to decode (or decipher) secret data.
8. 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.

<table>
<thead>
<tr>
<th>Risks</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manipulation of children</td>
<td>There are websites (4)</td>
</tr>
<tr>
<td>Invasions of (1) _________________________</td>
<td>at children:</td>
</tr>
<tr>
<td>Distribution of indecent or</td>
<td>Internet (5) _________________________</td>
</tr>
<tr>
<td>(2) _________________________ material</td>
<td>programs let parents block objectional</td>
</tr>
<tr>
<td>Violence and racist (3) ___________________</td>
<td>websites.</td>
</tr>
</tbody>
</table>

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 Whitely 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 Whitely 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.
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.

<table>
<thead>
<tr>
<th>show</th>
<th>spread</th>
<th>steal</th>
<th>launch</th>
<th>attempt</th>
<th>overwrite</th>
<th>be</th>
<th>infect</th>
<th>affect</th>
</tr>
</thead>
</table>

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 I Love You 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.


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 Whitely arrested in 1998?
B Read these landmarks in the history of the Internet and prepare at least five questions in the past simple.


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 @ 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).
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 for an online task.
6 Creative software

<table>
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<th>Unit</th>
<th>page</th>
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<td>21</td>
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<td>22</td>
<td>110</td>
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<td>23</td>
<td>114</td>
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Learning objectives

In this module, you will:

- learn and use vocabulary related to graphics software.
- learn how to describe graphics.
- study the basic features and vocabulary related to desktop publishing.
- discuss the pros and cons of e-publishing versus paper publishing.
- write a letter to a newspaper.
- learn about the main components and applications of multimedia systems.
- learn how to use conditional sentences.
- study the basic principles of web page design.
- learn how to use common modal verbs.
- design a mock home page for a college or company.
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?

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 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.

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.

**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.

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.
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.
   g

2 Businesspeople use graphics to make information more interesting visually.
   g

3 Graphs and diagrams can be more effective ways of communicating with clients than lists of figures.
   g

4 She is designing a logo for the company.
   a

5 If you need to make a presentation, I suggest using PowerPoint.
   g

6 The Internet is a network linking other networks.
   g

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.
   Composing is combining parts of different images to create a single image.

2 Texturing involves add paint, colour and filters to drawings and designs.
   Texturing involves adding paint, colour and filters to drawings and designs.

3 You can open the colour palette by click on the corresponding icon.
   You can open the colour palette by clicking on the corresponding icon.

4 CAD programs are very fast at to perform drawing functions.
   CAD programs are very fast at performing drawing functions.

5 A lot of time and money is saved by test a car design before to make the product.
   A lot of time and money is saved by testing a car design before making the product.

6 To render refers to the techniques used to make realistic images.
   To render refers to the techniques used to make realistic images.
3

**The toolbox**

A  ![Icon] 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  ![Icon] 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. ![Icon] Marquee select tools  a. cut down the dimensions of a picture
2. ![Icon] Move tool  b. select a particular part of an image (you can choose different shapes for selection)
3. ![Icon] Crop tool  c. fill in an area with a colour
4. ![Icon] Paintbrush, pencil  d. control the foreground and background colour
5. ![Icon] Eraser  e. select a specific colour in a photo
6. ![Icon] Paint bucket  f. magnify areas of an image when you are doing close, detailed work
7. ![Icon] Type tool  g. delete the part of the picture you drag it over
8. ![Icon] Colour picker (Eyedropper)  h. insert text into your document
9. ![Icon] Zoom  i. draw and paint in different shapes and patterns
10. ![Icon] Colour tools and palette  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

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.

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

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 ...

This picture shows ...
In this (next) stage ...
The designer has used ...
This stage is called ...
Rendering techniques include ...
As a finishing touch, ...
Unit 21 Desktop publishing

1 What is desktop publishing?

A In pairs, discuss these questions.
1 What kind of documents can be produced with a desktop publishing system?
2 Page layout software is the key component of a desktop publishing system. Which file types can be imported into a page layout program?

B Read the text and check your answers to A.

What is desktop publishing?

Desktop publishing (DTP) refers to the use of computers to design and publish books, brochures, newsletters, magazines and other printed pieces. DTP is really a combination of several different processes including word processing, graphic design, information design, output and pre-press technologies, and sometimes image manipulation.

DTP centres around a page layout program. Typically, a layout program is used to import texts created in word processing programs; charts and graphs from spreadsheet programs; drawings and illustrations created in CAD, drawing or paint programs; and photographs. The program is then used to combine and arrange them all on a page. It is this ability to manipulate so many different items and control how they are used that makes layout software so popular and useful. However, modern word processors also have publishing capabilities, meaning the line separating such programs from DTP software is becoming less clear. In general, though, powerful new publishing systems use high-quality scalable fonts and give you control over typographic features such as kerning (adjusting the spaces between letters to achieve even, consistent spacing). Another key feature of DTP software is text flow – the ability to put text around graphic objects in a variety of ways.

Once composed, DTP documents are printed on a laser printer or on a high-resolution imagesetter (see Unit 8). For transfer to a commercial printer, the documents are generally saved in their native page layout format (such as Adobe InDesign or QuarkXPress) or as PDF files. PDF stands for Portable Document Format and allows people to view, search and print documents exactly as the publisher intended – you don’t need to have the software and fonts used to create it. PDF files can be published and distributed anywhere: in print, attached to email, posted on websites, or on DVD. To open a PDF file, only the Adobe Acrobat Reader (a free download) is required.

In modern commercial printing, DTP files are output directly to the printing plates without using film as an intermediate step. This new technology is known as Computer-To-Plate (CTP) or direct to plate, and the machine that generates plates for a printing press is called a platesetter. CTP machines are expensive, so most people take their files to a service bureau, a company that specializes in printing other people’s files. Service bureaux offer a full range of scanning and printing solutions.

C Read the text again and answer these questions.
1 What type of software is used for the creation of DTP documents?
2 What are three differences between DTP software and word processors?
3 What is a PDF and what can it do?
4 Which program do you need to view a PDF document?
5 Why do people send their DTP files to service bureaux?
D Find words in the text with the following meanings.
1 shape, style and size of a typeface, for example Courier at 10pt
2 the process of adjusting the space between characters
3 feature that enables you to wrap text around images on the page
4 metal surfaces that carry the image to be printed
5 a machine that creates the printing plates

E In pairs, discuss the question What is desktop publishing? in as much detail as you can. Then look back at the text on page 105 to see how much you remembered.

2 Language work: order of adjectives

A Look at the HELP box and then make phrases using the words in the correct order.

Example: computer programmer / young / clever
a clever, young computer programmer

1 software / desktop publishing / user-friendly
2 hardware company / reliable / young
3 German / industry / graphic design
4 word processing / applications / modern
5 Sony / new / music player / portable

**HELP box**

Order of adjectives

- Adjectives usually come before the noun (also known as the headword).
  They give you control over **typographic features**.
  For transfer to a **commercial printer**, the document is ... .

- However, adjectives come after certain verbs (e.g. be, look, become, seem, sound), complementing the subject of the sentence.
  **CTP machines** are expensive.

- Adjectives can also complement the object of the sentence.
  This makes layout software **popular** and **useful**.

- This is the usual order of adjectives before a noun:

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Description</th>
<th>Origin/Place</th>
<th>Material</th>
<th>Purpose</th>
<th>Headword</th>
</tr>
</thead>
<tbody>
<tr>
<td>powerful</td>
<td>new</td>
<td>American</td>
<td>aluminium</td>
<td>publishing</td>
<td>systems</td>
</tr>
<tr>
<td>high-quality</td>
<td>scalable</td>
<td></td>
<td></td>
<td></td>
<td>fonts</td>
</tr>
<tr>
<td></td>
<td>thin</td>
<td></td>
<td></td>
<td></td>
<td>plates</td>
</tr>
</tbody>
</table>

Adjectives are ordered from the most subjective (e.g. nice) to the most objective (e.g. silicon).

Brand names (Microsoft, Sony, etc.) are considered adjectives of origin/place.

If there is more than one adjective in a sentence, they are usually separated by commas, unless the adjective forms an integral part of the headword (A fantastic, thin, Sony MP3 player).
B Translate these sentences into your own language. How does the use of adjectives differ from English? Think about word order and whether the form of the adjective changes or not.
1. DTP refers to the use of personal computers to produce high-quality printed documents.
2. A page layout application is used to import text from word processing programs and pictures from painting and drawing programs.
3. In modern commercial printing, DTP files are output directly to the printing plates.

C In pairs, choose an object in your classroom or office and think of three words to describe it. Put the words into the correct order and make a sentence.
Example: PC: black, old, DELL

On my desk I've got an old, black, DELL PC.

3 Steps in a DTP publication

A Look at this extract from an online tutorial for DTP publishing. Put the steps in the creation of a DTP document (a–f) into the correct order.

1. □ 2. □ 3. □ 4. □ 5. □ 6. □

a. First, the DTP designer decides the basic form of the document (the type of document, general design, colour, fonts, images required, etc.).

b. The last step is to take the files to a service bureau, which will print the publication.

c. To create the DTP document, the designer begins by selecting a template or by specifying the settings of a new document (the page size, margins, columns, paragraph styles, master pages, etc.).

d. When the text has been edited, the designer imports the pictures and uses precise tools to position, scale, crop and rotate all the items.

e. The next step is to type the text directly or to import it from a word processing program like Word or WordPerfect.

f. Once the file is composed and saved, the designer has to prepare it for printing, which involves verifying the colour specification, creating a Postscript or PDF file, exporting the file in HTML format for the Web, checking proofs, etc.

B Listen to the audio from the online tutorial and check your answers to A.
4 Writing a letter

A Although most written communication these days is carried out by email, letters are still appropriate for more formal correspondence. Look at this letter. What is the writer asking for?

A Rhondda High School
31 Prospect Place, Cardiff, Wales

C The Editor
El Independiente
Moratin, 7
28006 Madrid
Spain

D Dear Sir/Madam,

E We are writing to ask if you can help us with our school project. We are doing a survey of the major newspapers in the European Union to find out which computer systems and desktop publishing programs they use.

F We would be very grateful if you could tell us which hardware, graphic design and page layout software you use at El Independiente. Could you also tell us how long your online edition has been running for? Thank you very much in advance.

G We look forward to hearing from you.

H Yours faithfully,

Katherine Powell
Katherine Powell, student representative
B Match the parts of the letter (a–h) with the descriptions (1–8).

1. **b.** For example, *28th March 2008,* or *28 March 2008,* or *28/03/2008.*
2. **☐** This is usually in the top right corner of the letter, but can be in the centre if it’s a printed letterhead.
3. **☐** State the reason for writing: *I am / We are writing to … / We are currently …*
4. **☐** This should be included on the left hand side of the page, before the greeting.
5. **☐** Start with *Dear Sir/Madam* or *Dear Mr/Mrs/Ms …* Use *Ms* if you are not sure if the recipient is married or not. It is often best to use *Ms,* as *Mrs* can cause offence.
6. **☐** Make any requests or ask any questions you need to: *We would be grateful if you could …, Could you also …*
7. **☐** Request further contact, if necessary: *We / I look forward to hearing from you. / Please contact us by …*
8. **☐** If you have started the letter with the person’s name (for example, *Dear Mr Robinson*), then end with *Yours sincerely.* If you do not know the name of the recipient, end with *Yours faithfully.*

C **Write a letter to a local newspaper, asking for information about the hardware they use in their production, the page layout software they use, and the data communications systems they use. Use A and B above to help you.**

5 **E-publishing versus paper publishing**

A **Look at this web extract about e-publishing. What examples of e-publishing can you find in the text?**

Publishing has existed in its current form for centuries. Ever since paper was first invented, human beings have found ways of using it to pass on messages to each other. Books, magazines and newspapers are now part of our everyday lives, but with the invention of the Internet and the speed of new technological advances, the world of publishing is changing. Online newspapers and magazines, blogs, and even e-book readers are changing the way we get information. But will we ever stop picking up a good old-fashioned newspaper? E-publishing versus paper publishing – who will win?

B **Work in teams. Team A prepares a list of the advantages of traditional publishing over e-publishing. Team B prepares a list of the advantages of e-publishing over traditional publishing. Use your dictionary, the Internet and your teacher to help you.**

C **Debate your ideas. Which team has the most convincing position?**

An e-book, *the electronic equivalent of a printed book*
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.

```
Multimedia system

Hardware

Peripherals

CPU and a lot of RAM

monitor

Large hard drive

DVD drive

Card

Stereo

Windows Media Player or Apple QuickTime

Adobe Flash for media

Audio, video and software

Hypermedia databases

CD and DVD
```
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.

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.

1 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.

2 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

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.
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:

```
start with <HTML>
  have heading text that begins with <HEAD>, which has a title enclosed between tags and ends with </HEAD>
  have body text that starts with <BODY>, where you place the contents of the actual document (i.e. text, images, links, etc.) and ends with </BODY>
end with </HTML>
```

You can create links to other web pages by using the tag `<A href="filename">active text</A>`

Some basic HTML source code

```
My name is Marina. I was born in Zaragoza in 1994. My favourite city is Zaragoza. 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.
```

Marina's web page

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.

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, 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?

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 for an online task.
Programming / Jobs in ICT

Unit | page 
--- | --- 
24 Program design and computer languages | 120 
25 Java | 125 
26 Jobs in ICT | 129

Learning objectives:

In this module, you will:

- study basic concepts in programming.
- learn and use vocabulary connected with programming and become familiar with word families.
- ask and answer questions about computer languages.
- learn and use the basic vocabulary associated with the Java language.
- talk about your personal experience of using computers.
- practise the use and pronunciation of the "ed" form of verbs.
- discuss the personal qualities and professional skills needed for a job in ICT.
- learn how to understand job advertisements.
- learn how to write a CV and a letter applying for a job.
Unit 24 Program design and computer languages

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?

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)

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
<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.

<table>
<thead>
<tr>
<th>program</th>
<th>programmers</th>
<th>programming</th>
<th>programmable</th>
</tr>
</thead>
</table>

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.

<table>
<thead>
<tr>
<th>compile</th>
<th>compiler</th>
<th>compilation</th>
</tr>
</thead>
</table>

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.

<table>
<thead>
<tr>
<th>bug</th>
<th>debug</th>
<th>debugger</th>
<th>debugging</th>
</tr>
</thead>
</table>

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.*  
  (= 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

<table>
<thead>
<tr>
<th>Visual BASIC</th>
<th>VoiceXML</th>
</tr>
</thead>
<tbody>
<tr>
<td>What does Visual BASIC / VoiceXML stand for?</td>
<td></td>
</tr>
<tr>
<td>When was it developed?</td>
<td></td>
</tr>
<tr>
<td>What are its main features?</td>
<td></td>
</tr>
<tr>
<td>What is it used for?</td>
<td></td>
</tr>
</tbody>
</table>

B  Ask your partner about the other language and complete the table.
1 Java applets

A Match the examples of Java programs, known as applets, (a–e) with the descriptions (1–5).

1 This Land Rover applet allows you to change the look of the vehicle.
2 The Pythagoras theorem applet gives the proof of the Pythagorean theorem without words. It allows you to manipulate triangles and go through the steps of the geometrical proof.
3 The Jman for Java applet permits medical researchers to view sequential MRI (Magnetic Resonance Images) of the brain.
4 An analogue clock applet displays the time according to the web user's computer and lets you set the colours and style of the hands and numbers.
5 A banner applet displays graphic images on websites in order to advertise products or services.

B Match the terms (1–5) with the definitions (a–e).

1 Java
2 applet
3 plug-in
4 platform-independent
5 object-oriented programming

a an auxiliary program that enables web browsers to support new content, for example animation
b software that can run on any operating system
c an island in Indonesia, coffee (in American slang), and a programming language for internet applications
d a computer programming technique that allows the creation of objects that interact with each other and can be used as the foundation of others; used to create graphical user interfaces
e a small Java application, usually designed to run automatically within a web page
The Java language

Java is a programming language developed by Sun Microsystems, specifically designed to run on the Web. Java programs (called applets) let you watch animated characters and moving text, play music, and interact with information on the screen (for example, control animations and select options).

Characteristics of the Java language

Java is an object-oriented language, similar to C++, but more dynamic and simplified to eliminate possible programming errors. A Java program is both compiled and interpreted (see Unit 24). First, the source code (a file with a .java extension) is compiled and converted into a format called bytecode (a file with a .class extension), which can then be executed by a Java interpreter (see Fig. 1). Compiled Java code can run on most computers because there are Java interpreters, known as Java Virtual Machines, for most operating systems.

Java is multi-threaded, meaning a Java program can have multiple threads (parts) – that is, many different things processing independently and continuously. This enables the program to make the best use of available CPU power.

Why is Java popular?

Most programmers like Java because it allows them to write applets which make web pages more interactive and attractive. They can create graphical objects (for example, bar charts and diagrams) and new controls (for example, check boxes and push buttons with special properties). A web page that uses Java can have sounds that play in real time, music that plays in the background, cartoon-style animations, real-time video and interactive games.

The Java Micro Edition platform (Java ME) is used in mobile devices. It provides flexible tools to create applications that run on mobile phones, PDAs, TV set-top boxes and printers. Nowadays, most phones are configured to use Java games.

Alternatives to Java

One alternative to Java is Microsoft’s C#, pronounced ‘C sharp’, a .NET language based on C++ with elements from Visual Basic and Java. There are no substantial differences between C# and Java. When software developers do measurements on pieces of code, sometimes Java is faster, sometimes C# is.

Another competitor is Adobe Flash technology, which supports graphics, a scripting language called ActionScript, and the streaming of audio and video. Flash is used to create animation and advertisements, to integrate video into web pages, and to develop rich internet applications such as portals. Flash files, traditionally called flash movies, have a .swf file extension. They may be an object on a web page or be played in the stand-alone Flash Player.

Fig. 1
B Match the words (1-6) with the words (a-f) to make technical terms from the text.

1. Java  
2. operating  
3. programming  
4. web  
5. source  
6. graphical

a. applet  
 b. page  
c. code  
d. system  
e. object  
f. language

C Complete the sentences with words from the box.

<table>
<thead>
<tr>
<th>interpreted</th>
<th>animated</th>
<th>configured</th>
<th>used</th>
<th>pronounced</th>
<th>object-oriented</th>
<th>compiled</th>
</tr>
</thead>
</table>

1. Java lets you watch __________ characters on web pages.
2. Java is an __________ language, similar to C++ but more dynamic.
3. First, the source code of a Java program is __________ into an intermediate format called bytecode. This is then __________ by any system possessing a Java interpreter.
4. The Java ME platform is widely __________ in mobile devices.
5. Nowadays, most mobile phones are __________ to use Java games.
6. Microsoft's C# is a simplified version of C and C++ for the Web. It's __________ 'C sharp'.

3 Language work: the -ed form

A Look at the HELP box and then put these verbs into the correct column.

<table>
<thead>
<tr>
<th>stopped</th>
<th>asked</th>
<th>described</th>
<th>decided</th>
<th>produced</th>
<th>called</th>
<th>watched</th>
<th>executed</th>
<th>published</th>
<th>object-oriented</th>
<th>programmed</th>
<th>persuaded</th>
<th>configured</th>
<th>converted</th>
<th>arranged</th>
<th>designed</th>
<th>/t/</th>
<th>/d/</th>
<th>/id/</th>
</tr>
</thead>
</table>

HELP box

The -ed form

We use the -ed form in the following ways:

- To make the past simple (affirmative) of regular verbs

  Sun Microsystems developed Java in 1995.

  Remember that not all verbs in the past simple end in -ed. See page 166 for a list of irregular verbs. See Unit 19 for more about the past simple.

- To make the past participle of regular verbs

  Flash is used to create animation.

- To make the adjectival form of some verbs

  Java applets let you watch animated characters.

The -ed is pronounced as:

- /t/ after voiceless sounds: /p/, /k/, /θ/, /s/, /ʃ/, /ʃ/, /f/ or /v/. (e.g. developed, talked, pronounced)

- /d/ after voiced sounds: /v/, /g/, /ð/, /z/, /r/, /dʒ/, /n/, /r/, nasal consonants: /n/, /n/ or /n/; and vowels (e.g. compiled, designed, simplified)

- /id/ after /t/ or /d/ (e.g. interpreted, multi-threaded)
B Complete this extract from a lecture handout about Java with the correct form of the verbs in the box.

| call | be | begin | can | decide | rename | have | support | develop | base |

The idea for Java started in 1990, when a team of software engineers at Sun Microsystems (1) ____________ to create a language for a handheld device that could control and interact with various kinds of electronic appliances, ranging from Nintendo Game Boys to VCRs and TV set-top boxes. They (2) ____________ an object-oriented programming language that one of the engineers, James Gosling, (3) ____________. Oak, after the tree outside his window. The device even (4) ____________ an animated character named Duke, who would go on to become Java’s mascot.

With the advent of the Web in 1993, the company made a web browser (5) ____________ on the Oak language. Later on, this language was adapted to the Internet and (6) ____________ Java. The 1.0 version of Java was officially introduced by Sun in May 1995.

At that time, web pages (7) ____________ only display text, pictures and hyperlinks. With the arrival of Java, web designers (8) ____________ able to include animation and interactive programs on web pages. The first major application created with Java was the HotJava browser. The Java language (9) ____________ to attract serious attention from the internet community and was soon (10) ____________ by Netscape Navigator and MS Internet Explorer. Today, Java is a hot technology that runs on multiple platforms, including smart cards, embedded devices, mobile phones and computers.

C ☀️ Listen to an extract from the lecture and check your answers to C. Listen carefully to the pronunciation of the verbs that end in -ed.

4 Your experience with computers

A Make notes about the different stages in your computer history. Add more stages if you want to.

Example: 1990: Played my first computer game. It was …

Possible stages:
- First computer game
- First computer lesson at school/college
- First programming language learnt
- First software used
- First computer course/qualification
- First job involving computers
- First steps on the Internet
- First chat online

B ☀️ Ask a partner about their computer history. Look at the Useful language box to help you.

Useful language

When did you first …?
How long ago did you …?
How old were you when …?
I started … in…
I learnt … when I was …
I didn’t use the Internet until …
1

**IT professionals**

A Complete these definitions with jobs from the box.

<table>
<thead>
<tr>
<th>software engineer</th>
<th>computer security specialist</th>
<th>blog administrator</th>
<th>help desk technician</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTP operator</td>
<td>hardware engineer</td>
<td>network administrator</td>
<td>webmaster</td>
</tr>
</tbody>
</table>

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?

<table>
<thead>
<tr>
<th></th>
<th>Senior programmer</th>
<th>DTP operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>logical reasoning</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>patience and tenacity</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>being good with figures</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>imagination</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>self-discipline</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>accuracy</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>leadership skills</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>efficiency</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>creativity</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>drawing skills</td>
<td></td>
</tr>
</tbody>
</table>

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

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) __________ until 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.

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. Maria 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 for an online task.
# Computers tomorrow

<table>
<thead>
<tr>
<th>Unit</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>27 Communication systems</td>
<td>135</td>
</tr>
<tr>
<td>28 Networks</td>
<td>140</td>
</tr>
<tr>
<td>29 Video games</td>
<td>145</td>
</tr>
<tr>
<td>30 New technologies</td>
<td>150</td>
</tr>
</tbody>
</table>

## Learning objectives

**In this module, you will:**

- learn about different ICT systems.
- study the basics of networking.
- describe networks.
- learn and use phrasal verbs common in ICT.
- describe different game platforms and genres.
- give opinions about video games.
- learn and use adverbs.
- learn how to write a *For and Against* essay.
- make predictions about future trends.
- learn and use future forms.
Unit 27  Communication systems

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) __________.
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?

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.)?

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 Small networks

A 🌐 In pairs, discuss these questions.
1 What is a computer network?
2 What are the benefits of using networks?

B 🎤 Listen to an extract from a lecture on networks and answer these questions.
1 What does LAN stand for?
2 Where are LANs usually located?
3 What is the difference between a wired LAN and a wireless LAN?

C 🎫 Listen again and label the elements of this LAN.

(1) A ________________ wired and wireless LAN

(2) 

(3) 

(4) 

(5) ___________ or hub

(6) 

Desktop computer

Internet

Desktop computer

Printer

Laptop

Gaming console

PDA
Networking FAQs

A Look at the FAQs (i–vi) without reading the whole text. In pairs, try to answer as many of the questions as you can.

B Read the whole text and answer these questions.

1. What does PAN stand for?
2. What is a network protocol?
3. How do you log on to an Internet Service Provider?
4. WiMAX is a type of wireless network. What is it used for?
5. What equipment do you need to set up a wireless LAN?
6. What are the advantages and disadvantages of wireless networks?

i How many types of network are there?

Networks are classified according to different criteria:

- **Geographical area**: 
  - **PANs** (Personal Area Networks) typically include a laptop, a mobile phone and a PDA; **LANs** cover a building; **MANs** (MetroLopolitan Area Networks) cover a campus or a city; **WANs** (Wide Area Networks) cover a country or a continent.

- **Architecture**: In a client-server network, a computer acts as a server and stores and distributes information to the other nodes, or clients. In a peer-to-peer network, all the computers have the same capabilities — that is, share files and peripherals without requiring a separate server computer.

- **Topology**, or layout: In a bus network, all the computers are connected to a main cable, or bus. In a star network, all data flows through a central hub, a common connection point for the devices in the network. In a ring network, all devices are connected to one another in a continuous loop, or ring.

- **Network protocol**: This is the language, or set of rules, that computers use to communicate with each other. Networks use different protocols. For instance, the Internet uses TCP/IP.

ii How do I install a wired modem router?

A modem **router** is a device that connects your computer or home LAN to the Internet.

- Plug one end of the phone cord directly into a phone jack, and the other end into the ADSL port on the router.
- Plug one end of the Ethernet cable into your computer’s network port and the other end into an Ethernet port on the router.
- Turn on your computer. To set up, or configure, the router, you’ll need to input some parameters, for example your ISP’s name and phone number.

iii How do I log on to the Internet Service Provider?

You need to type in your username and password. Once you are online, you can get email, look for information on the Web, look up IT words in dictionaries, try out new software, and sign up for RSS feeds, newsletters, etc. It is important that you remember to log off after using the Internet. An open line increases the risk of viruses, and hackers might break into your computer to steal confidential data.

iv What is wireless networking?

Wired networks are linked by Ethernet cables, phone lines and high-speed fibre optic cables. Wireless networks, however, use electromagnetic waves, such as radio waves, to transmit data. These are the main types of wireless networks:

- **Satellites** — for long distances
- **WiMAX** — for connecting Wi-Fi hotspots
- **Wi-Fi** — for medium-range distances
- **Bluetooth** — for short distances
- **GSM** — for mobile phones

v What do I need to set up a home wireless LAN?

You’ll need computers equipped with a wireless adapter or wireless card, a wireless access point (a wireless router) and a broadband internet connection.

vi Which is better, a wired or wireless LAN?

Wired LANs are more difficult to install, but they are cheaper, faster and more reliable. Wireless networks let you move, or roam, from one access point to another, but they are less secure and subject to interference.
In a **basic network**, two computers are connected by cable to allow *file sharing*.

In many homes, **Ethernet cables** are used to connect computers. *Phone* or *cable TV lines* then connect the home LAN to the ISP. Much of the Internet uses high-speed **fibre optic cable** to send data over long distances.

**WANs** cover a large geographic area, like a country or even multiple countries. They are built by large telecommunication companies. The largest WAN in existence is the Internet.

**Wi-Fi** is the standard technology for building wireless **LANS** and public **hotspots**. **Bluetooth networks** allow handhelds, mobile phones and other devices to communicate over short distances. **Cellular networks** are used in mobile phone communications.

---

**C In pairs, do this network quiz. See which pair can finish first.**

1. This network typically consists of two or more local area networks, covering a large geographical area.
   - a LAN  
   - b WAN  
   - c Intranet

2. This type of network does not have a dedicated server; all the computers are independent.
   - a peer-to-peer  
   - b client-server  
   - c Metropolitan Area Network

3. On this topology, all devices are connected to the same circuit, forming a continuous loop.
   - a star  
   - b ring  
   - c bus

4. The language used by computers to communicate with each other on the Internet is called
   - a Ethernet  
   - b ADSL  
   - c TCP/IP

5. Which cables are used to transfer information for the Internet over long distances at high speeds?
   - a telephone lines  
   - b Ethernet cables  
   - c fibre optic cables

6. Which device allows several computers on a local network to share an internet connection?
   - a an ADSL port  
   - b a router  
   - c an Ethernet port

7. Which device serves as a common connection point for devices in a wireless network?
   - a wireless access point  
   - b wired router  
   - c wireless adapter

8. Bluetooth is a wireless technology that uses radio waves to transmit data over
   - a long distances  
   - b medium-range distances  
   - c short distances (ten metres or less)
3 Language work: phrasal verbs

A Look at the HELP box. Do you have the equivalent of phrasal verbs in your language? How do you say the phrasal verbs in the HELP box?

HELP box

Phrasal verbs
- The meaning of some verbs with particle (often called phrasal verbs) can be easily understood from its two parts.

Look at the photos.
A network consists of two or more …
Separate networks are linked over a public network, the Internet.
- However, many phrasal verbs have an idiomatic meaning, not predictable from the meaning of its parts.

carry (= transport); carry out (= execute)
Computers carry out the programs …
- Certain particles have similar meanings, regardless of the verb (on/off, in/out, etc.).

turn on / switch on (= start the operation of something)
turn off / switch off (= stop the operation of something)
- Other common phrasal verbs in computing include:

plug into (= connect)
Plug one end of the phone cord into the phone jack.
set up (= establish)
What do I need to set up a wireless LAN?
sign up (= register, enrol in a service)
Once connected, you can sign up for RSS feeds, newsletters, etc.
try out (= test or use experimentally)
You can try out new software on their site.

find out (= learn, discover)
Search the Web to find out more information about WiMAX.
take up (= occupy)
Fibre optic cables take up less space than copper cables.
make up (= constitute, form)
Several LANs connected together make up a WAN.
fill in (= write the necessary information)
You need to fill in this online form.
- When the verb has a preposition associated with it, the preposition must precede the object:

You can look for information on the Web.
(not: look information for)
Hackers might break into your PC.
(not: break your PC into)
When the particle is an adverb, it can precede or follow the direct object:

You need to type in your username /
… type your username in.
You can look up words in a dictionary /
… look words up in a dictionary.
Turn on the computer. /
Turn the computer on.
If the direct object is a pronoun, the particle must follow it:

You need to type it in.
(not: type in it)

B Complete these sentences with the correct form of a phrasal verb from the HELP box.

1 To join the club, __________________ this form and send it to our office.
2 The CPU __________________ all the basic operations on the data.
3 Digital music _______________ a lot of space – about 10 MB for every minute of stereo sound.
4 Thousands of networks _______________ the Internet.
5 You can use newsgroups to _______________ about the latest trends, customer needs, etc.
C Match the questions (1–6) with the answers (a–f).
1. Why was the hacker arrested?
2. Is it OK to log on to my bank account using public computers in a cybercafé?
3. How do I set up an internet connection at home?
4. Can I download software from your site?
5. How can I add video to instant messaging?
6. What do I need to do to sign up for a Yahoo! email account?

a. Yes, but always remember to log off after you’ve ended your session.
b. Yes, you can even try the programs out for a period before you buy them!
c. Because he broke into a computer system and stole confidential data.
d. Simply install this program and plug the webcam into your computer.
e. You need to install the software for your router. Follow the instructions provided by your ISP, probably in the form of a .pdf file on a CD.
f. You have to create a username and password and then give some personal details.

4 WANs and satellites

A Prepare a description of the network below to present to the rest of the class. Use PowerPoint if possible. Use the Useful language box, the HELP box on page 143 and the text on pages 141–142 to help you.

Useful language
The diagram represents/shows …
This network is made up of / consists of …
Two networks are connected via …
The computers are linked up to …
The satellite receives signals from …
The signals are sent on to …
The purpose of … is to …

B Present your description to the rest of the class.
1 **Game platforms**

A  In pairs, discuss these questions.

1 Do you play video games?
2 What are your favourite games? Make a list.

B  Label the pictures (a–f) with the types of game in the box.

- PC games
- Console games
- Arcade games
- Handheld games
- Mobile phone games
- Massively multiplayer online games

C  Video games are played on a variety of electronic devices, or platforms. Complete these sentences with game platforms from the box and types of game from B.

1 ____________ are played on ______________, such as the Sony PS3 or Microsoft Xbox 360. In the past, these electronic devices were just connected to a standard TV or video monitor; now they can also be connected to the Net, via cables or wirelessly.

2 ____________ are played on ______________, such as the Sony PSP and the Nintendo DS. You can also play games on some graphing calculators and watches.

3 Don’t worry if you don’t have a game console. You can still play ______________ on a ______________. The graphics are even more impressive if you have a high-resolution monitor. You can buy games on CDs and DVDs, or download them from the Internet.

4 ______________ allow you to play against other users in other parts of the world using the Internet – something unique to electronic gaming. Players connect to a game server hosted by an ISP, a game company, or an individual enthusiast.

5 Some ______________ are programmed to run natively on the chip of ______________. For instance, Snake is installed on many Nokia phones. Many Java-based games are also available via download.

6 ______________ are played on coin-operated machines, typically installed in restaurants, bars and amusement arcades. For example, you can fly an aircraft or a spaceship using a joystick.
In pairs, discuss these questions. Give reasons for your answers.

1. Which is your favourite game platform? What advantages and disadvantages does it have over other game platforms?
2. Which game platform would you most like to own?
3. Do you play games on your mobile phone? What is the experience like?

2

Game genres

A How many different game genres can you think of? In pairs, make a list and then read the text to see how many genres from your list are mentioned.

Game genres

There are so many different genres and mixes of genres that it’s difficult to put each game into a specific category. In the following article we’ll cover the basic genres that differentiate between games.

5 The First-person shooter (FPS) and Action genres are currently the most popular. Games like Half-Life, Halo and Call of Duty are the most popular games in the FPS category. For Action, innovative titles like the Grand Theft Auto series, Gears of War and Splinter Cell are huge successes.

The Role-playing game (RPG) genre has remained strong throughout the entire history of console and PC gaming. Current hits like Final Fantasy XII, Oblivion and the Knights of the Old Republic series are all based on RPG roots. The recent development of massively multiplayer online RPGs has been made possible by widespread broadband access, allowing gamers to play internationally with thousands of people across the globe in a constant virtual world.

10 Adventure games and Puzzle games remain strong despite being limited in scope and technology. The new concept of party games – where people play together in multiplayer mode – has recently injected new life into this genre. Titles like Zelda and Wario-Ware are familiar names.

Sports games are an increasingly popular portion of the gaming industry. Electronic Arts (EA) have been making games licensed from the NBA, NFL and MLB for over a decade. Another sector of the Sports industry is the entire racing sub-genre. Massive hits like the Burnout and Need for Speed series are hugely exciting, and the crashes can be realistic and terrifying.

35 The Simulation genre has enjoyed wild success, including the best-selling PC games of all time: The Sims & The Sims 2. The entire Sims series, designed by Maxis, is dominant in this genre. Jet fighter and flying sims are also important types of simulation game.

40 Strategy is a genre mainly restricted to PC, largely because the mouse and keyboard are central to gameplay. There are a few good Strategy games for console, however. Big names in Strategy include Warcraft III, Starcraft, Command and Conquer and Warhammer 40,000.

45 Finally, we have the Fighting genre. Developed from early hit games like Street Fighter II, Fighting games have enjoyed a renaissance as they’ve been updated fully to include 3-D characters and arenas. Titles like Dead or Alive, Tekken and Soul Calibur are big favourites.

50 So what kind of game player are you? Chances are that if you’re a PC gamer, you prefer FPS, RPG, Simulation, and Strategy games. The console gamer typically enjoys Sports, Racing, Fighting, RPGs, and a few FPS titles. Of course, many people own both a console and a PC, therefore combining the best of both worlds.
B These statements about gaming are all false. Read the text again and correct them.
1 Role-playing games are currently the most popular.
2 Massively multiplayer online RPGs have been made possible by widespread internet access.
3 Oblivion is an Action game.
4 The Sims series is the least popular in the Simulation category.
5 Strategy games are generally restricted to game consoles.
6 Warcraft belongs to the Fighting genre.
7 Console gamers typically prefer Simulation and Strategy games.

C Find words or phrases in the text with the following meanings.
1 now; at this time or period (lines 5–10) ________________________________
2 existing or happening in many places and/or among many people (lines 15–20) ________________________________
3 in spite of; notwithstanding (lines 20–25) ________________________________
4 more and more (lines 25–30) ________________________________
5 a smaller category within a particular genre (lines 30–35) ________________________________
6 big successes (lines 30–35) ________________________________
7 sold in very large numbers (lines 35–40) ________________________________
8 modernized (lines 45–50) ________________________________

D In pairs, discuss these questions. Give reasons for your answers.
1 What is your favourite and least favourite genre of game?
2 What are your favourite games? Describe them to your partner.

3 Language work: adverbs

A Look at the HELP box on page 148 and then complete these sentences with the adverbial form of the words in brackets.
1 Simulation games are (wide) ____________________________ used in both universities and businesses.
2 Massively multiplayer online RPGs have (recent) ____________________________ become more popular, mainly due to faster internet connections.
3 Strategy is a genre (main) ____________________________ restricted to PC.
4 Video games often come with a clear set of motivation tools, such as scores and moving to higher levels when a player performs (good) ____________________________.
5 Cheap PCs don't process data (fast) ____________________________ enough to support high-end games.

B Are the words in bold adjectives or adverbs? Write adj or adv.
1 Atari's platform was the most popular early video game console, and many developers emulated Atari games to attract customers. ______
2 The chess game ended early, at the 24th move. ______
3 On the TPS Report gaming blog, you will find reviews, a forum and a monthly podcast. ______
4 The podcast is broadcast monthly. ______
5 You have to work hard to succeed in the gaming industry. ______
6 Some experts say that hard work makes people happy. ______
HELP box

Adverbs

- We use adverbs to give information about an action. Adverbs of manner, time and place describe how, when or where something happens.

  They've been updated **fully** to include 3-D characters. (= manner, i.e. how)
  The Action genre of games is **currently** the most popular. (= time, i.e. when)
  … allowing gamers to play **internationally** … (= place, i.e. where)

- We also use adverbs to modify adjectives.

  *Sports games are an increasingly **popular** portion of the gaming industry.*

- We usually form an adverb by adding **-ly** to an adjective.

  *typical ➔ typically*
  The console gamer **typically** enjoys Sports, …

- With adjectives ending in **-y**, we change the **y** to **i** before adding the ending **-ly**.

  *easy ➔ easily*
  The Nintendo Wii connects **easily** to the Internet.

- Note that not all words that end in **-ly** are adverbs. These words are adjectives: **friendly**, **deadly**, **lovely**, **lonely**.

- The adverb from **good** is **well**.

  *His French is very **good**. He speaks French **well**.*

- Some words have the same form as an adjective and an adverb (e.g. **fast**, **hard**, **early**, **late**, **daily**, **monthly**).

  *New games require a **fast** processor. (= adjective)*
  *The processor speed tells you how **fast** your PC executes instructions. (= adverb)*

4 Present and future trends in gaming

A Listen to an interview with Matt Robinson, the administrator of the TPS Report gaming blog. How many game platforms does he mention?

B These statements about video games are all false. Listen to the interview again and correct them.

1 Video games are popular because they are fun and addictive.
3 The Nintendo Wii is aimed at hardcore gamers.
4 It’s free to play World of Warcraft.
5 Holography is an advanced form of photography that uses lasers to produce two-dimensional images.
6 In the future, gesture recognition systems will produce photo-realistic images.
C. Listen again and complete these extracts from the interview with adverbs.

1. With a game you are ____________ in control of the action.
2. Games are now even more life-like and ____________ attractive.
3. A lot of modern games ____________ draw inspiration from films and even TV.
4. Their ____________ released Wii console has an inexpensive, simplistic, pick up 'n' play feel to it.
5. Wii is ____________ the most popular of the three machines.
6. Logging onto an ____________ separate universe to meet and play alongside your friends has enormous attraction.
7. Mobile gaming has ____________ been about easy, simplistic 2-D games.

D. In pairs, discuss if you agree with everything that Matt says in his interview about the future of gaming. What are your own predictions?

5. The pros and cons of gaming

A. In pairs, look at the statements about gaming (1–4) and say if you agree or disagree with them. Give reasons for your answers.

1. TV and video games are amusing and can be educational. But too much of this kind of entertainment can be addictive and make children become accustomed to violence.
2. Massively multiplayer online games are interactive and fun.
3. Video games have negative effects on children and distract them from school and homework.
4. Modern games and simulations offer a great deal of adventure and challenge. In addition, they can teach skills such as strategic thinking, interpretative analysis and problem solving.

B. Write an essay called The pros and cons of gaming (80–120 words). Use these steps and the Useful language box to help you.

- The opening (paragraph one):
  Present the topic in one or two sentences.
- The body (paragraphs two and three):
  Give pros (arguments in favour) with facts and examples. Give cons (arguments against) with facts and examples.
- The closing (paragraph four):
  Summarize your main ideas and give your opinion.

Useful language

To add arguments:
In addition, ... Furthermore, ...

To introduce opposing ideas:
On the one hand, ... On the other hand, ...
Some people say ... Others say ... However, ...

To express opinions:
In my opinion, ... I believe that ...
It seems to me that ... It's clear that ...

To conclude:
In conclusion, ... To sum up, ... In short, ...
Unit 30  New technologies

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?

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.

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.
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

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 microchips and memory) every day, each invisibly embedded in our environment and communicating with each other without cables.

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 the refrigerator will cooperate to make our lives more comfortable.

Adapted from 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.
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 barcodes 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.
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 / I'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 for an online task.
Appendix: a model CV

Curriculum vitae

Personal information
Name: Maria 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, www.elearnbusiness.com

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 www.keo.es; 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**
- @/at/ The '@' sign that separates the recipient's name from the domain name in an email address.
- Acrobat Reader /ak'strøt n/ Adobe's free software for displaying and printing PDF files.
- ADSL /'ædɔsəl/ aym N Aym 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 /'ædɔsl mədəm/ 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 /'ælfənəmətrik k Conditioning (C) /'keɪ tʃant/ N Keys that represent letters and numbers, arranged as on a typewriter.
- Amazon.com /'æməzon .kɒm/ A popular online shopping site.
- android /'ændroid/ n A robot that resembles a human.
- animations /'ænimʃənizɛm/ n Images made up of a series of independent pictures put together in sequence to look like moving pictures.
- applet /'æplɪt/ n A small Java application, usually designed to run automatically within a web page.
- application software /'æplɪkeɪʃən swɛfə/ n Programs that let you do specific tasks, such as word processing, database management, or financial planning.
- arcade game /'ærkɑd, ˈgɛm/ A game played in a coin-operated machine, typically installed in pubs, restaurants and amusement arcades.
- arithmetic logic unit (ALU) /'ærɪθmətɪk 'lɒgɪk jʊnɪt/ n A component of the CPU which performs the actual arithmetic and logical operations asked for by a program.
- ARPANet /'ærpiɪnet/ 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 /'aɪtərɪlfɪnəl ɪnteljəns/ n The study of methods by which a computer can simulate aspects of human intelligence.
- ASCII code /'æski, 'kɔd/ 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 'rɛtɪəri/ 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 /'æsməlaɪn/ n A special program that converts a program written in a low-level language into machine code.
- assembly language /'æsməli 'læŋgwɪdʒ/ A low-level language that uses abbreviations, such as ADDS, SUB and MPP, to represent instructions.
- ATA adapter /'ætə'ædəpət/ n An analogue telephone adaptor, which converts the analogue telephone signals of your traditional phone into digital signals.
- Athlon /'æθlɔn/ n A processor manufactured by AMD.
- attachment /'ætʃmənt/ n A file that has been included as part of an email message.
- attributes /'ætrɪbjuːtɪz/ n Characteristics that affect the visual representation of lines and polygons, e.g. line styles, rectangle colour, etc.
- authentication /'ɔtʃentɪn'fæntɪʃən/ n The process of 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 3D chat room.

**B**
- back up /'bek ʌp/ v To copy files from one disk to another.
- backbone /'baʊkboʊn/ n High-speed lines or connections that form the major access pathways within the Internet.
- backup /'baʊkɛp/ n A copy of data or software, usually kept in case the original disk is damaged.
- bandwidth /'bændwɪd/ n The quantity of data that can be transmitted through a network, measured in bits per second (bps).
- bar code reader /'bɑr kɑd, rɛdər/ n A specialized scanner used to read price labels in shops.
- BASIC /'bæsɪk/ n A high-level programming language developed in the early 1960s, widely used in programming because it was interactive and easy to use. Short for Beginner's All-purpose Symbolic Instruction Code.
- binary code /'baɪnəri kɔd/ n A code made of just two numbers, 0 and 1.
- binary digit /'baɪnərɪ dɪgit/ n The smallest unit of information in the binary system, 0 or 1. Also called a bit.
- binary system /'baɪnəri 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 /'baɪmɪtrɪks/ 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 /'bɪt ˈmæpt ˈɡræfɪks/ n See raster graphics.
- BitTorrent /'bɪttərɒnt/ 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 /'blaɪkборri/ 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 /'blɪnd kɔrnəl kɔp/ 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** /'blɒɡ/ 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 Barger in 1997 to refer to an online diary. 2 v To write entries in a blog.
- blog administrator /'blɒg əd'mɪnɪstərət/ n Someone who edits and deletes posts or comments made by contributors to a blog.
- blogger /'blɒɡər/ n A person who writes on a blog.
- blogging /'blɒɡɪŋ/ n Writing web logs. See blog.
- blogsphere /'blɒɡsfɛr/ n The collective term including all blogs as a community.
- Bluetooth /'bluːtɔθ/ n A radio link that makes computers communicate over short distances.
- Blu-ray disc /'bluəriː dɪsk/ n A new optical disc, created by Sony, which can record and play back high-definition 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 /'bɜːkmɑːk/ n A saved link that takes users directly to a web address. Bookmarks are also called favourities.
- 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 əm'boʊsər/ n An impact printer that produces tactile Braille symbols.
- brightness /'brɪtʃəs/ n The amount of light produced by an LCD monitor, measured in cd/m².
- broadband /'b्रɔːbdemand/ n High-speed transmission, usually referring to internet access via cable and ADSL; about 400 times faster than dial-up.
- browser /'brəzuər/ n A program designed to fetch and display web pages on the Internet.
- buddy list /'bʌdi ˈlɪst/ n A list of people that you may want to communicate with via instant messaging.
- bug /'bʊg/ n An error in a computer program.
- built-in /'bʌtɪn/ adj Integrated; constructed as part of a larger unit.
- bulletin board system (BBS) /'bʌltən bɔːz/ n A system that enables its users, usually members of a particular interest group, to share information and programs.
- burn /bɜrn/ 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 ˈtəʊpolædʒi/ 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 ˈwɪdθ/ 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.
and retrieve a large collection of data. Among other facilities, data can be searched, sorted, and updated. 
debug /dɪˈbʌɡ/ v To correct program errors, or bugs. 
debugger /dɪˈbʌɡər/ n A program used to test and debug other programs. 
debugging /dɪˈbʌɡɪŋ/ n The techniques of detecting and correcting errors (or bugs) which may occur in programs.
decryption /dɪˈkrɪpmənt/ n The process of decoding (deciphering) secret data.
dedicated keys /ˈdedɪkatɪd kɪz/ n Special keys used to issue commands or to produce alternative characters, e.g. the Ctrl key or the Alt key. 
desk accessory /dɛsk ˈæsesəri/ 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 /dɛskˈtɒp pɪk/ 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) /dɛskˈtɒp pʌbˈlɪʃɪŋ/ n The use of a computer and software to produce paper documents such as brochures, newsletters, business forms, and signs. 
device driver /dɪˈvɪs ˈdrevəl/ n A program that allows a hardware device, such as a printer, to communicate with a computer.
dial-up connection /ˈdaɪəlʌp ˈkənˈkæŋʃən/ n A form of computer access through which the user connects to a modem connected to a computer via a telephone line to dial into an Internet Service Provider. A dial-up connection is slower than a broadband connection like ADSL.
dialog box /ˈdaɪəloʊ bɔks/ n A message box requiring input from the user. 
digital /dɪˈɡɪtl/ adj Describes a system that performs operations by means of digits, represented as binary numbers (0s and 1s). The opposite of digital is analogue. 
digital camera /dɪˈɡɪtl kəˈmərə/ 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 /dɪˈɡɪtl səˈtɪfɪkət/ n A file that identifies a user or a server, like a digital identification card. 
digital radio /dɪˈɡɪtl rɛˈdɪoʊ/ n Radio technologies which carry information as digital signals, also known as digital audio broadcasting (DAB). 
digital TV /dɪˈɡɪtl tɪˈvi/ n A way of transmitting pictures by means of digital signals, in contrast to the analogue signals used by traditional TV. 
digital video camera /dɪˈɡɪtl vɪdɪəˈkæmərə/ n A camera that records moving images and converts them into digital data. Also called a camcorder. 
digitize /dɪˈɡɪtɪz/ v To translate into digital form, i.e. convert information into binary codes (1s and Os) so that it can be processed by a computer. It is possible to digitize images, sound and video. 
directory /dɪˈrektəri/ n An alphabetical or chronological list of files on a disk. Also known as a catalogue. 
disk drive /dɪsk dɪˈvr/ 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 pərˈtʃærnɪŋ/ 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 /ˈdɪspleɪ/ n A screen or monitor. v To show text and graphics on a screen. 
DivX /ˈdɪvɪks/ 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 /dəˈmeɪn ˈneɪm/ 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.com) 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 ˈmɛtrɪks/ n A regular pattern of dots. 
dot-matrix printer /dɒt ˌmɛtrɪks ˈprɪntər/ n A printer that uses pins to print an array of dots; used to print multipart forms, self-copying paper and continuous form labels. 
double click /ˈdʌbl kɪkl/ v To press and release the left button on a mouse twice, in rapid succession. 
download /ˈdaʊnloʊd/ 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 /ˈdrɛməˌwɛvr/ n A program from Adobe (originally created by Macromedia), used for building websites. 
drop-down menu /ˈdrɒp ˌmɛnju/ n A list of options that appear below a menu item when selected; also called a pull-down menu. 
DTP operator /ˈdɪpti ˈpɪpiər/ n Someone who uses page-layout software to prepare electronic files for publication. 
dual-core processor /djuːəl kɔːr ˈprɔsərəs/ n A CPU that combines two execution cores (processors) on a single chip. 
DVB /dɪˈvɪr ˈdiːv/ 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. 
DVB burner /dɪˈvɪr ˈbɜːnər/ n A DVD drive that records information by burning via a laser to a blank DVD disc. 
DVB-R /ˈdiːvɪs ɹiːˈviː ˈdiːv/ n A rewritable (write-many) DVD, for movies and data. 
DVB-ROM /ˈdiːvɪs ˈɹiːm/ 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.). 
Ebay /ˈɛbɪ/ n An online auction and shopping website where you can buy and sell things. 
e-card /ˈɛkɑːd/ n A digital greeting card. 
e-cash /ˈɛkəʃ/ n Money available as an electronic account, used in internet commerce. 
e-commerce /ˈɛkəmɑːrəɪ/ n The buying and selling of products on the Internet. 
edit /ˈɛdɪt/ v To make changes and corrections to text and graphics. Well-known editing techniques are: select, undo, copy, cut, and paste. 
e-learning /ˈɛlɛrnɪŋ/ n Instruction via computers.
email /ˈɛmɔl/ n A facility which allows users to exchange messages electronically, short for electronic mail. 
email address /ˈɛmɔl əˈdres/ n A unique address used to receive and send email. This is a typical format: janmar1984@telefonica.net, where 'janmar1984' is the user name, @ means 'at', 'telefonica' is the Internet Service Provider, and '.net' means the server is a network provider. 
email client /ˈɛmɔl kliənt/ n A program used to read and send email from a computer. 
embedded /ɪmˈbɛdɪd/ adj Inserted into, fixed into the surface of something. 
emotion /ˈemənʃən/ n See smiley. 
encrypt /ɪnˈkrɪpt/ v To encode data so that unauthorized users can't read it. 
encryption /ɪnˈkrɪŋʃən/ 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. 
epal /ˈɛpəl/ n A friend, you write email to. 
eraser /ˈɛrəzə/ n A tool used to delete the part of the picture you drag it over. 
egonomics /ˈɛɡənəmɪks/ n The study of how people interact safely and efficiently with machines and their work conditions. 
e-signature /ˈɛsɪɡnətʃər/ n The electronic equivalent of a human-written signature. 
etailer /ˈɛtɪlər/ n An electronic retailer, or online store. 
Ethernet /ˈɛrəθənt/ 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 /ɪkˈskɛl/ n A spreadsheet program from Microsoft. 
execute /ɪkˈskɛktʃu ɹɪv/ v To perform an action, as in executing a program or a command; the same as run. 
expandable /ɪkˈspændəbəl/ adj Upgradable; 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 /ɪkˈspænʃən kɑːd/ n A 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** /ɪkˈspɛnʃən ˈsloʊts/ n
The connectors that allow the user to install expansion cards to improve the computer's performance.

**eyegaze system** /ˌɛgˈgiːz, ˈsɪstəm/ n
A system activated by the user's eye movements.

**e-zine** /ˈɛziːn/ n
An electronic magazine.

**FAQ**, cfr: 'kjus' 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** /ˈfaɪbr ˈɒptɪk ˈkoʊˌmjuːnɪˈkeɪʃoʊn/ 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** /fɪld/ n
A unit of information in a record. In a database, information is entered via fields.

**file** /fɪl/ n
A collection of records in a database. A section of information stored on disk – a document or a program.

**file server** /fɪl, ˈsɛrvər/ n
A fast computer that stores the programs and data shared by users in a network.

**File Transfer Protocol (FTP)** /ˈfɪl, ˈtrɜːnsfɜːr ˈprɔtəkəl/ n
A standard for transferring files from one computer to another over a network.

**filter** /ˈfɪltr/ n
A special effect that can be applied to pictures.

**filtering program** /ˈfɪltərɪŋ ˈprəramər/ n
Software designed to restrict the access to specific aspects of the Web.

**Find and Replace** /fɪn ənd ˈrɛpli/ n
A command that lets you find a word or phrase in a document and change it to new text.

**Firefox** /ˈfɜːrəfiːks/ n
A web browser, part of the open-source Mozilla project.

**firewall** /ˈfaɪərˌwɔl/ 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** /ˈfɜːrmweər/ n
Permanent software instructions contained in the ROM.

**frame** /frɑːm/ n
An angry or insulting comment on a discussion group.

**Flash** /flʌʃ/ 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** /ˈflʌʃ ˈkɑːrd ˈrɛdər/ n
A device that reads and writes a flash memory card.

**flash drive** /ˈflʌʃ ˈdrɛv/ n
A USB storage device, small enough to fit on a key ring, used to store and transport computer data.

**flash memory** /ˈflʌʃ ˈmɛməri/ n
A type of non-volatile memory that can be erased and reprogrammed.

**flatbed scanner** /ˈflætbed ˈskændər/ n
A scanner with a glass scanning surface on which objects are placed; similar to a copier.

**flat-rate internet** /ˈflætret ˈɪntənet/ n
Access to the Internet at any time of the day, at a fixed and cheap tariff.

**Flickr** /ˈflɪkr/ n
A website where users can share photos.

**floppy disk** /ˈflʌpi ˈdɪsk/ 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** /ˈflɔːtʃaːt/ n
A diagram which shows the logical steps of a computer program.

**folder** /ˈfɔːldər/ n
A directory that holds programs, data files and other folders.

**font** /fɒnt/ n
The shape, size and style of a particular typeface, e.g. Times Bold at 10pt.

**footer** /ˈfʊtər/ n
Customized text printed in the bottom margin of a document.

**format** /ˈfɔːrmæt/ n
1 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** /ˈfɔːrmætɪŋ ˈtəlbɔːr/ 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** /ˈfɔːrmələ/ n
A mathematical equation that helps you calculate and analyse data.

**FORTRAN** /ˈfɔːtrən/ 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 FORMula TRANslation.

**fractals** /ˈfrepəkts/ n
Geometrical patterns that are repeated at small scales to generate irregular shapes, some of which describe objects from nature.

**fragmentation** /ˈfræŋmətəˈʃən/ 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** /ˈfrɛimz/ n
1 Rectangular areas that allow the display of different pages in the same browser window. 2 Single pictures in a film.

**Freehand** /ˈfrɪəhænd/ n
A Macromedia program for creating vector graphics, which use geometrical primitives such as points, lines, curves and polygons to represent images.

**freeware** /ˈfriːwɛr/ n
Software that is available free of charge, but protected by copyright.

**FrontPage** /ˈfrɔːntpeɪdʒ/ n
A web editor from Microsoft, used for designing web pages.

**function** /ˈfəŋkʃən/ n
1 Ready-to-use formula that helps you perform a specialized calculation, e.g. SUM, AVERAGE, etc.

**function keys** /ˈfəŋkʃən ˈkiːz/ n
Keys that appear at the top of the keyboard and can be programmed to do special tasks.

**gadget** /ˈgædʒət/ n
A small hardware device. Synonymous with gizmo (slang).

**game controller** /ˈɡeɪm ˈkændələr/ n
A device used to control video games.

**game genre** /ˈɡeɪm ˈdʒriːn/ 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** /ˈɡeɪm ˈplɔːtʃəm/ n
An electronic device on which video games are played. Examples are personal computers and game consoles.

**Geographic Information System (GIS)** /dʒiˈziːəˌɡræfɪk ɪnˈfərənsi ˌsɪstəm/ n
A type of software that allows us to analyse geographic data and then make maps, plan the use of land, predict natural disasters, etc.

**gigabyte** /ˈɡiɡəˌbæt/ n
1.024 megabytes.

**gigahertz** /ˈɡɪɡəˌhɜːrtz/ n
A unit of one billion hertz, or cycles per second, used to measure computer speed.

**Global Positioning System (GPS)** /ˈɡloʊbəl pəˈzoʊʃən ˌsɪstəm/ 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** /ˈɡoʊɡl/ n
A popular search engine on the Web. 2 To search the Web for something.

**grammar checker** /ˈɡrɑːmər ˈfɛktʃər/ n
A software utility that analyses the grammar of a written text.

**graphical user interface (GUI)** /ˈɡræfɪklə ˈjuːzər ˌɪntərfeɪs/ n
A user-friendly interface based on graphics. A GUI uses a Window environment: windows, icons, menus and pointer. Typical examples are the Mac OS and Microsoft Windows.

**graphics tablet** /ˈɡræfɪks ˈtæбл/ n
An input device which allows the user to enter drawings and sketches into a computer.

**hacker** /ˈhækər/ 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 dorks.

**handheld game** /ˈhændhɛld, ˈgæm/ n
A game played on portable gaming devices, such as the Sony PSP and the Nintendo DS.

**handheld scanner** /ˈhændhɛld, ˈskændər/ n
A scanner that is moved by hand, ideal for capturing small pictures, logos and bar codes.

**hard disk** /ˈhɑːrd ˈdɪsk/ n
See hard drive.

**hard drive** /ˈhɑːrd ˈdrɛv/ 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** /ˈhɑːrdweə/ n
The physical units which make up a computer system. See software. A hardware engineer /ˈhɑːrdweə ˈenjər/ n
Someone who designs and develops IT devices.

**header** /ˈhɛader/ n
Customized text printed in the top margin of a document.
lithium-ion battery /ˈlɪθiəm ɪənˈbeɪtəri/ n A type of battery composed of Lithium, a metallic chemical element, used in PDAs, cameras and mobile phones.

load /loʊd/ v To read program instructions into the main memory.

Local area network (LAN) /ˈloʊkəl ˈeərə ˈnetwɜrk/ n A group of computer devices interconnected within a small physical area, like a home or office building.

log in/on /ˈloʊg ˈɪn/ /ˈloʊg ˈɪn/ v To gain access to a computer system or network.

log out/off /ˈloʊg ˈaʊt/ /ˈloʊg ˈɒf/ v To sign off; to end a computer session. The opposite of log in.

login/logon /ˈloʊɡɪn/ /ˈloʊɡən/ n The process of identifying yourself when entering a computer system or network. You usually type your user name and password.

low-level language /ˈloʊ ˈlevəl ˈleɪvəɡwɪdʒ/ n A programming language that is very close to machine language. See assembly language.

M

Mac OS /mæk ˈɑːs/ n An operating system created by Apple and used on Macintosh computers.

MacBook /ˈmækbʌk/ n A Macintosh notebook computer.

machine code /ˈmæʃin kəd/ n Binary code numbers; the only language that computers understand.

magnetic storage devices /ˈmæɡnɪtɪk ˈstrɔrɪd z/ n Devices that store data by using magnets to hold information on a disk or tape (e.g., hard drive, tape drive).

magnetic tape /ˈmæɡnɪtɪk ˈteɪp/ n A sequential storage device used for data collection, backup and archival. A tape consists of a magnetic coating on a thin plastic strip.

mail merging /ˈmeɪl ˈmerɪŋ/ n The process of combining a database file with a word processor to personalize a standard letter.

mail server /ˈmeɪl ˈsɜrvər/ n The computer where your Internet Service Provider stores your e-mails.

mailbox /ˈmeɪlbɔks/ n The place where your e-mail program stores new e-mail for you.

mailing list /ˈmeɪlɪŋ ˈlɪst/ n A system used to distribute e-mail to many different subscribers at once.

main memory /ˈmeɪn ˈmeməri/ 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 /ˈmækɪntʃə/ n A popular computer from Apple, introduced in 1984; the first computer with a graphical user interface.

mainframe /ˈmeɪnfrɛm/ n The largest and most powerful type of computer. Mainframes process enormous amounts of data and are used in large installations.

malware /ˈmeɪlweə/ n Malicious software, created to damage computer data. It includes viruses, worms, Trojan horses and spyware.

markup language /ˈmɑːkæp, ˈlæŋɡwɪdʒ/ n A computer language that uses instructions, called markup tags, to format and link web documents.

marque select tools /ˈmɑːk ˈsektəl, ˈtuːdz/ n Tools used to select a particular part of an image.

master page /ˈmeɪstər ˈpeɪdʒ/ 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 /ˈmiːdiə ˈpleɪər/ n A program that plays audio, video or animation files.

megabits /ˈmeɡəbɪts/ n A million bits (1,048,576)

megabytes /ˈmeɡəbeɪtəz/ n A unit of a million cycles per second, used to measure processor speed.

megapixel /ˌmeɡəˈpɪksəl/ n One million pixels.

memory card /ˈmɛməri ˈkɑːrd/ 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 /ˈmeɪnu bær/ n A row of words at the top of the screen that open up menus when selected.

message threads /ˈmesɪdʒ ˈθredz/ n A series of interrelated messages on a given topic.

microchip /ˈmɪkroʊˌtʃɪp/ n See chip.

Microsoft Access /ˈmɪkroʊsəft ˈækses/ n A relational database management system.

Microsoft Office /ˈmɪkroʊsəft ˈɒfɪs/ n An integrated package that includes: Word, Excel, PowerPoint, Access and Outlook, along with various internet and other utilities.

MIDI /ˈmɪdi/ n A standard for connecting computers and musical instruments. MIDI files contain the MIDI extension, short for Musical Instrument Digital Interface.

millisecond /ˈmɪlsɛkand/ n One thousandth of a second.

mobile (phone) /ˈmɔlbəuli/ n (US: cell phone) A phone connected to the telephone system by radio, rather than by a wire.

modern /ˈmɒdən/ 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.

modern-router /ˈmɒdərn ˈrəʊtər/ n A device that connects various computers (e.g. a home LAN) to the Internet.

monitor /ˈmɔnɪtər/ n An output device with a screen on which words or pictures can be shown. Also called a display screen.

motherboard /ˈmʌðəˌbɔrd/ n The main circuit board of a computer, which contains the processor, memory chips, expansion slots and controllers for peripherals, connected by busses.

mouse /mɔs/ 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 /ˈmplɛs/ 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 /ˈmplɛs ˈpleɪər/ n A digital music player that supports the MP3 format.
non-volatile memory /nɒnˌvɒlətɪəl ˈmeməri/ n Permanent memory, able to hold data without power. ROM and Flash memory are examples of non-volatile memory.

notebook computer /ˈnəʊtbək ˈkɒmˈpjuːtə/ n A light, portable computer that is generally smaller and thinner than a laptop.

numeric keypad /njuːˈmərɪk ˈkiːpæd/ n A key section that appears to the right of the main keyboard and contains numeric and editing keys.

O

object-oriented programming /ˌɒbjektˈɔːrɪəntɪd ˈprəʊgræmɪŋ/ n A technique that allows the creation of objects that interact with each other and can be used as the foundation of other programs. Used to develop graphical user interfaces.

offline /ˌɒffləin/ adj or adv Not connected to the Internet.

online /ˈɒnliːn/ adj or adv Connected to the Internet.

online banking /ˌɒnliːn ˈbeɪkɪŋ/ n Performing transactions and payments through a bank’s website. Also known as internet banking.

onscreen keyboard /ˌɒnskɜːrn ˈkiːbəʊd/ 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 /ˈəʊpənˌsɔːs/ adj Refers to the source code (of software) that is free and available to anyone who would like to use or modify it.

operating system /ˌɔpərətɪŋ ˈsɪstəm/ 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 /ˌɒptɪkal ˈkæraktər ˈrekənˈʃɪnjən/ 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 /ˌɒptɪkal ˈdɪsk/ 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 /ˈɒputs/ n The results produced by a computer. 2 To transfer information from a CPU to an output device.

output devices /ˈɒputs diˈvaɪzəz/ n The units of hardware which display the results produced by the computer (e.g. plotters, printers, monitors).

P

PDF /ˈpiːdɪəf/ n A portable document format from Adobe, commonly used to distribute text files over the Internet, and read with Acrobat Reader.

page description language /ˈpeɪdʒ ˈdeɪskriptʃəl ˈlæŋgwɪdʒ/ n A computer language that describes how to print the text and images on each page of the document.

Page-layout program /ˈpeɪdʒ ˈleɪtʃʊt ˈprəʊgræm/ 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.

platform-independent /ˌpleɪtʃɔːrm ɪnˈdɪpendənt/ adj Refers to software that can run on any computer or device.

platter /ˈplætər/ 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 /ˈpleɪsteɪʃn/ n A video game console from Sony.

plotter /ˈplɔːtər/ n A graphics output device which is used to make various types of engineering drawings.

plug-ins /ˈplɪɡ ˈɪnz/ n Special programs which extend the capabilities of a web browser so that it can handle audio, video, 3D and animation elements.

podcast /ˈpoʊdəsk/ 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 /pɔɪnt/ n A unit used to measure font sizes 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 /ˈpɔɪntər/ 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 /pɔːrt/ 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 /ˈpɔːrtəbəl ˈdɛvəl ˈpliːər/ n A handheld device with a built-in DVD drive and a screen.

portable hard drive /ˈpɔːrtəbəl ˈhɑːrd ˈdrɪv/ n An external hard drive that is connected to the USB or FireWire port of the computer.

portable media player /ˈpɔːrtəbəl ˈmiːdiə ˈpliːər/ n A handheld device that plays audio and video files.

PostScript /ˈpəʊstskrɪpt/ n A page description or graphics language developed by Adobe Systems. A PostScript font is any font defined in this language, e.g. Times, Helvetica, etc.

power-line Internet /ˈpaʊər ˈlaɪn ɪntəˈnɛt/ n A technology that provides low-cost Internet access via the power plug.

PowerPoint /ˈpaʊərpɔɪnt/ n A presentation graphics program from Microsoft.

Pretty Good Privacy (PGP) /ˈprɪti ˈgjuː ˈprɪvəsɪ/ n A freeware program, written by Phil Zimmermann, designed to send email privately.

primary colours /ˈprɪməri kəʊləz/ n These are red, green and blue (RGB) in computers. Compare with the colours considered basic in links (magenta, yellow and cyan).

primitives /ˈpriːmɪtvz/ n The basic shapes used to construct graphical objects: lines, polygons, etc.

print preview /ˈprɪnt ˈpriːvi/ n A function that shows how pages will look when printed.

printer /ˈprɪntər/ n An output device which converts data into a printed form. The output from a printer is referred to as a print-out or hard copy.

printer driver /ˈprɪntər ˈdraɪvə/ n A program installed to control a particular type of printer.

printing plate /ˈprɪntɪŋ ˈpleɪt/ n A metal surface that carries the image to be printed.

processor /ˈprəʊsəsər/ n The chip that processes the instructions provided by the software. See central processing unit (CPU).
program /ˈprəʊgræm/ 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 Math's problem to the production of a graphics package.

programmer /ˈprəʊgræmər/ n Someone who writes computer programs.

programming /ˈprəʊgræmɪŋ/ n The process of writing a program using a computer language.

protocol /ˈprəʊtəʊkəl/ n A set of rules which determine the formats by which information may be exchanged between different systems.

proxy /ˈprɒksi/ n A computer server which controls the traffic between the Internet and a private network.

Q

QuarkXPress /ˈkwɔːrk ɪkˈspres/ n A page layout application produced by Quark.

query /ˈkwɛri/ n A request for data; in a database, a function that allows you to extract data according to certain conditions or criteria.

QuickTime /ˈkwɪktaɪm/ n Software from Apple that enables users to play, edit, and manipulate multimedia files.

R

radio tags /ˈreɪdiəʊ ˈteɪp/ n Microchips attached to, or embedded into, products, animals or people, for the purpose of identification.

radio-frequency identification (RFID) /ˈreɪdiəʊ ˈfriːkwənsi ɪdɛntɪˈfɪkeɪʃn/ n Technology that uses radio waves and chip-equipped tags (called RFID tags) to automatically identify people or things.

random access memory (RAM) /ˈrændəm ˈeɪkses, ˈmɛməri/ 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 /ˈreɪstər ˈɡreɪfɪks/ n Images stored and displayed as pixels, which can become distorted when manipulated. Also called bit-mapped graphics.

read-only memory (ROM) /ˌriːd ˈəʊnli, ˈmɛmərɪ/ n Chips of memory containing information which is present and permanent. Also known as firmware.

read/write head /ˈreɪd ˈraiət ˈhɛd/ n The part of a disk drive that reads and writes data on a magnetic disk.

RealPlayer /ˈriːælplɪər/ n A media player, created by RealNetworks, that plays a variety of audio and video formats.

real-time /ˈrɛəltaɪm/ adj Refers to something live, simultaneous (without delay), e.g. real-time chat.

reboot /ˈriːbɔt/ v To restart the computer.

record /ˈrekɔrd/ n A unit of a file consisting of a number of interrelated data elements (fields).

register /ˈreɡɪstr/ n The component in the processor or other chip which holds the instruction from the memory while it is being executed.

relational database /ˌrɛləˈʃənl ˈdeɪtəbæs/ n A database system that maintains separate related files (tables), but combines data elements from the files for queries and reports.

rendering /ˈrɛndərɪŋ/ n A technique that generates realistic reflections, shadows and highlights.

resolution /ˈrezərveɪʃn/ 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 /ˈriːrɪˈtɜːrəbl/ adj Able to be rewritten many times.

right click /ˌraɪt ˈklɪk/ v To press and release the right button on a mouse; this action displays a list of commands.

RIM /raɪm/ n An operating system used on BlackBerry communication devices, developed by Research In Motion.

ring topology /ˈrɪŋ tɔpəˈlɒdʒi/ n One of the three principal topologies for a LAN, in which all devices are interconnected in a continuous loop, or ring.

ringtone /ˈrɪŋtəʊn/ n A digital sound file played by a telephone to announce an incoming call.

ripping /ˈrɪpɪŋ/ v Converting music tracks from a CD to the MP3 format.

rotation /rəˈteɪʃn/ n Turning an object around its axis.

router /ˈrəʊtər/ n A device used to transmit data between two computers or networks. See also modem-router and wireless router.

route/turner /ˈruːtən/ 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 /ˈɛrəs, ˈfɛd/ n A web feed format that allows subscribers to receive updates of blogs, news, podcasts, etc.

run a program /rʌn ə ˈprəʊgræm/ 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 /skeɪl/ v To magnify or shrink a particular font. 2 To make an object larger or smaller in any direction.

scan /skænd/ v To digitize an image by passing it through a scanner.

scanner /ˈskænər/ 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 /ˈskreɪn, ˈmeɪgnɪfɪər/ n Software that enlarges text and images on the screen, making the content more readable for users with low vision.

screen reader /ˈskreɪn ˈrɪdər/ n Software for the blind that converts screen contents into spoken words.

screensaver /ˈskreɪn, ˈsɛrvər/ 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 /ˈskrɪn ˈseɪz/ n The viewing area of a monitor, measured diagonally, in inches.

scroll /ˈskrɔːrl/ 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 /ˈskrɔːrl, ˈbɑːr/ n A horizontal or vertical bar containing a box that is clicked and dragged to the desired direction.

search /sɛtʃ/ v To look for specific information.

search engine /ˈsɛtʃ ɪndʒəm/ n A program that allows users to search a large database of web addresses and internet resources. Examples are Google and Yahoo!

Second Life /ˈsiːndɔʊl/ n A 3-D virtual world on the Internet, entirely built and owned by its residents.

sector /ˈsektər/ n A part of a track on a magnetic disk.

seek time /ˈsiːk ˈtiːm/ 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 ˈæp/ v To install and configure hardware or software.

set-top box /ˌset ˈtɒp ˈbɒks/ 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 /ˈsetæp/ n The way in which a program or device is configured.

shareware /ˈʃeəweər/ n Software distributed similarly to freeware, but requiring payment after a trial period. Also known as 'try before you buy' software.

shopping cart /ˈʃɒpɪŋ ˈkaːrt/ n Software that lets you choose products from a website and processes the order through the payment gateway.

sign up /ˈsaɪn ʌp/ v To register in a service.

signature /ˈsɪgnaʃər/ n A file with personal information that is automatically attached at the end of an e-mail message.

silicon chip /ˈsaɪlkən, ˈʃɪp/ n A device made up of a semi-conducting material (silicon), which contains a set of integrated circuits.

simulation /ˌsɪmjuˈleɪʃn/ n Using computer models (programs) to imitate real life or make predictions.

sip-and-puff /sɪp ənd ˈpaʊf/ 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 /sai/ n See website.

Skype /ˈskiːp/ n A program that allows you to make voice and video calls from a computer.

slide scanner /ˈslaɪd, ˈskænər/ n A device used to scan 35mm slides or film negatives, also called a film scanner.

smart device /ˈsmɔːt dɪvəɪz/ n An object containing a microchip and memory.

smart home /ˈsmɔːt, ˈhɔm/ 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 /ˈsmɔːt, ˈfʌm/ 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.

smiles /ˈsmɑːlz/ n Faces made from punctuation characters to express emotions in email messages, e.g. :-| for happy, :-o for surprised, etc. Also called emoticons.

software /ˈsɔːfweɪər/ n The set of program instructions that tell the computer what to do. See hardware.

software engineer /ˈsɔːfweɪər ɪnˈgɪnjər/ n Someone who writes computer programs, also known as programmer or programmer analyst.

Solaris /ˈsəʊlərɪs/ n A Unix-based operating system, developed by Sun Microsystems, which runs on SPARC computers and other workstations.
solid modeling / solid 'mædəlɪŋ/ 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 /sɔːrt/ v To classify; to reorder data into a new sequence.

sound card /sɔʊnd 'kɑːd/ n An expansion card that processes audio signals; also called a sound board.

source code /sɔːs kəd/ 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 Unsolicted, junk email.

spamming /spæmɪŋ/ n Posting unsolicited advertising messages.

speaker /ˈspiːkər/ 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 /ˈspiːʃ ˌsɪnθəˌzaɪzər/ n A device that produces audio output.

spell checker /ˈspɛl ˌtʃeɪkər/ n A utility to correct typing mistakes.

split /spɪt/ n Spam (unsolicited messages) over internet telephony.

spoiler /ˈspoʊlər/ 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 /ˈspredʃeɪt/ n A program for financial planning which allows the user to analyse information presented in tabular form, by manipulating rows and columns.

spyware /ˈspaɪwɛr/ n A type of software that collects information from your computer without your consent.

standard toolbar /ˈstændərd ˈtəbʊlær/ 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 /ˈstɑːr ˈtɒpɒlədʒi/ 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 /ˈstɔːriɪdʒ ˈdɪvɪs/ n A hardware device used to record and store data, e.g. a hard disk, DVD or flash memory card.

store /stɔːr/ v To copy data from the computer's internal memory to a storage device, such as a disk, tape or flash memory card.

streaming /ˈstrɪmɪŋ/ 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 being downloaded.

stylus /ˈstɪləs/ n A pen-shaped tool that is used to draw images or point to menus on pressure-sensitive screens (e.g. on PDAs).

subject /ˈsʌbdʒekt/ n The line that describes the content of an email.

subroutine /ˈsəbrətruːn/ n A set of instructions which performs a specific function of the program.

surf /sɜːf/ v To navigate and search for information on the Web.

Symbian OS /ˈsɪmbiən əʊˈsiːz/ n An operating system used by some phone makers, including Nokia and Siemens.

system clock /ˈsɪstəm ˈklɒk/ n A clock that measures and synchronizes the flow of data.

system software /ˈsɪstəm ˌsɔftwɛr/ n The programs that control the basic functions of a computer, e.g. operating systems, programming software, device drivers and utilities.

touchpad /ˈtʌtʃ ˌpæd/ 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 /ˈtrækball/ 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 /trænˈzɪʃn/ n Moving an object to a different location.

Troyon horse /ˈtrɔɪən ˈhoʊs/ n Malicious software disguised as a useful program.

two-dimensional (2-D) /ˈtuːwdɪrənˈmɑːnʃəl/ adj Having only two dimensions, length and width. 2-D drawings look flat.

type style /ˈtaɪp ˈstɪl/ n A visual characteristic of a typeface, e.g. plain text, italic, bold, etc.

typeface /ˈtaɪfɪs/ 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 visual type of a typeface, such as the size (e.g. 12 points) and style (e.g. normal, italic, bold).

U

Undo /ʌnˈdʌs/ n A command that reverses or undoes the last editing change done to the document.

Uniform Resource Locator (URL) /ˈjuːnɪfɔːrzm ˈreərəs ˈleɪtər/ n The address of a file on the Internet, e.g. http://www.bbc.co.uk/radio.

UNIX /ˈjuːnɪks/ n An operating system, designed by Bell Laboratories in the USA, that runs on mainframes and workstations in corporate installations.

update /ˈʌp əˈdɛst/ v To make something more modern or suitable for use now by adding information or changing its design.

upgradable /ˈʌpɡrədəbl/ adj Can be upgraded or expanded.

upgrade /ˈʌpɡrəd/ v To add or replace hardware or software in order to expand the computer's power.

upload /ˈʌpləd/ v To send files to a central, often remote computer. Compare with download.

USB /ˈjuːzɪz ˈbiːz/ 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 /ˈjuːzɪz ˈpɔːrt/ n A USB socket on a computer device into which you can plug a USB cable.

Usenet /ˈjuːznɛt/ n A large collection of discussion areas (called newsgroups) on the Internet.

user interface /ˈjuːzər ˈɪntərfaɪs/ n The standard procedures for interaction with specific computers.

user-friendly /ˈjuːzər ˈfrendli/ adj A system that is easy to learn and easy to use.

username /ˈjuːznəmən/ 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 /juˈstɪli/ 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 /vɛkˈtɔr ɡrəˈfɪks/ 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 /ˈvɪdiəʊ əˈdʒɛptəl/ n A expansion card that processes images and sends the video signals to the monitor; also called video graphics board.

video editing /ˈvɪdiəʊ ɪˈdɪtɪŋ/ n The process of manipulating video images.

video projector /ˈvɪdiəʊ prəˈdʒɛktər/ n A device that projects images on a large screen using a lens system.

videoblog /ˈvɪdiəʊˌbɑləŋ/ n A blog that includes video.

videoconferencing /ˌvɪdiəʊˌkɒnˈfɜːrənsɪŋ/ n A technology that allows organizations to create virtual meetings with participants in multiple locations, enabling them to talk to and see each other.

descriptive interface /ˌvɪstʃərəl ˈɪntɛrfeɪs/ 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 /ˌvɪrʊl ˈrɛələtɪ/ 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 in an illusionary, yet sensible, world.

Virus /ˈvɜːrəs/ 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.

Visual Basic /ˈvɪzəl ˈbæsɪk/ n A high-level programming language, developed by Microsoft in 1990, used to create graphical user interfaces in Windows applications.

Voice over IP /ˈvoɪs òv ˈɛp/ n Voice over Internet Protocol, which allows you to make phone calls using the Internet instead of the regular phone lines.

Voice recognition /ˈvoɪs ˈrɛkˈɪznəʃən/ n A technology that allows computers to interpret human speech, converting spoken words into digital text or instructions.


Volatile memory /vɒləˈtɪl ˈmɛməri/ n Temporary memory (e.g. RAM); it doesn’t hold its contents without power.

W

wearable computer /ˈweərəbl ˈkʌmətər/ 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) /ˌweɪ bɛˈsɪsɪstəri ɪnˈʃɪtɪɛv/ n A project that tries to make the Web accessible to people with disabilities.

web editor /ˈweb ɪˈdɪtər/ n Software that lets you design web pages without writing HTML codes.

web page /ˈweɪb ˈpeɪdʒ/ 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 /ˈwebˌkæm/ n A web camera used to send live video images via the Internet.

webcasting /ˈwebbəʊtʃɪŋ/ n Sending audio and video live over the Internet.

webmaster /ˈwebˌmɑːstər/ n Someone responsible for designing, developing, marketing or maintaining websites.

website /ˈwɛbsɪt/ 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) /ˈweɪd ˈeərə ˈnetwɜːk/ 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 /ˈweɪfə/ 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 /ˈweɪfə fəʊn/ n A mobile phone that can switch from the cellular network to a wireless VoIP network and vice versa.

tv /tv/ n A video game console from Nintendo, introduced in 2006.

wiki /ˈwɪki/ n A collaborative website whose content can be edited by anyone who has access to it, e.g. WikiWikiWeb, Wikipedia, etc.

WiFiMAX /ˈwɪfɪmɛks/ 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 /ˈwɪndəʊ/ n A scrollable viewing area on screen, which can contain files or folders.

Windows /wɪndəʊz/ 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 /wɪndəʊz ˈməʊbɪl/ n An operating system used on many PDAs and smartphones.


wireless /ˈwaɪrələs/ adj Having no wires; without the use of cables.

wireless access point (WAP) /ˌwaɪrələs ˈækses ˈpɔɪnt/ n A device that connects wireless communication devices together to form a wireless network.

wireless adapter /ˈwaɪrələs əˈdʒɛptəl/ n A device that adds wireless connectivity to a computer or PDA. It is attached to 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 /ˈwaɪrələs ˈlaɪn/ n A wireless local area network, linking two or more computers without cables.

wireless network /ˈwaɪrələs ˈnetwɜːk/ 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 /ˈwaɪrələs ˈruːtər/ n A device which allows computers to communicate via radio waves. Also called wireless access point or base station.

Word /wɜːd/ n A word processor from Microsoft.

word processor /ˈwɜːd pɹəˈsərəs/ n An application that manipulates text and produces documents suitable for printing.

word wrap /wɜːrd ˈræp/ 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 /ˈwɜːkstətʃən/ n A high-performance computer, typically used for graphics, CAD, software development and scientific applications. Any computer connected to a network.

World Wide Web /ˈwɜːld ˈwiːb/ n See Web.

worm /wɜːm/ 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 /ˈɡæksbɪns/ n A video game console from Microsoft.

XML /ˌɛksˈɛmˈɛl/ n Extensible Markup Language. While HTML uses pre-defined tags, XML allows us to create our own tags to better describe data.

Y

Yahoo! /ˈjuːhəʊ/ 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 /ˈjuːtɪˌvɪd/ n A popular website which lets users upload, view, and share video clips.

Z

zip /zap/ n An extension that identifies compressed files. To decompress them you need a shareware program like WinZip.

zoom /zuːm/ 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

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<th>Past simple</th>
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### C Past simple = Past participle

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### E All three forms different cont.

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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/m2 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
COSO 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
DADW 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
DTV 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
DV Interface Digital Video Interface
EEPROM Electrically Erasable Programmable ROM
EPS Encapsulated PostScript
FAQ Frequently Asked Questions
FORTRAN FORMula TRANslating
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

JPEG Joint Photographic Experts Group
k kilo, used to denote a thousand: 2,104,024 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
OLE2 Organic Light-Emitting Diodes (display)
OODP Object Oriented Programming
OS Operating System
.pdf portable document format
PAN Personal Area Network
PC Personal 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 Postscript Image Processor
RISC Reduced Instruction Set Computer
ROM Read Only Memory
rpm revolutions per minute

RSI Repetitive strain injury
RSS Really Simple Syndication
Rich Site Summary
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 Socket Layer
SXGA Super XGA (Extended Graphics Array)

TAN Transaction Authorization Number
TB Terabyte (1,024 gigabytes)
TCP/IP Transmission Control Protocol / Internet Protocol
TFT Thin Film Transistor (dis)
TIFF Tagged Image File Format

UMTS Universal Mobile Telecommunications System
URL Uniform Resource Loca
USB Universal Serial Bus

VAT Value Added Tax
VCR Videocassette Recorder
VDU Visual Display Unit
VGA Video Graphics Adapte
VoiceXML Voice Extensible Language
VoIP Voice over Internet Protocol
VRML Virtual Reality Modelling Language

.wav Windows wave audio file
W3 See Web in Glossary
WAI Web Accessibility Initiative
WAN Wide Area Network
WAP 1 wireless access point
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
XWG Wide XGA (Extended Graphics Array)