

Unit 1

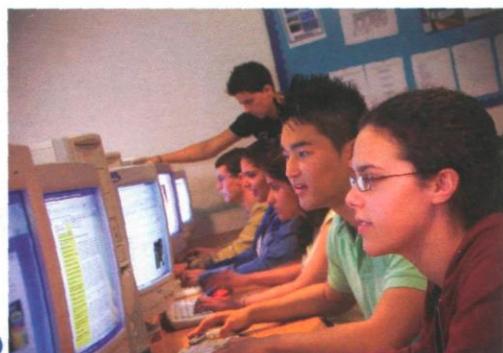
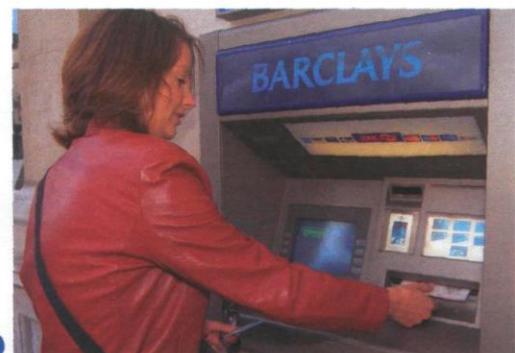
Living in a digital age

1

The digital age

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

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



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

C Read the text and check your answers to B.

The digital age

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

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

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

Mobiles let you **make** voice **calls**, **send** **texts**,
 20 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
 30 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**
 40 **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
 45 manage radar systems and regulate air traffic. On the ground, airlines are connected to travel agencies by computer. Travel agents use computers to find out about the availability of flights, prices, times, stopovers and many other details.

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

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

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

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

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

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

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

F  In pairs, discuss these questions.

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

2 Language work: collocations 1

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

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

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

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

HELP box

Collocations 1

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

3 Computers at work

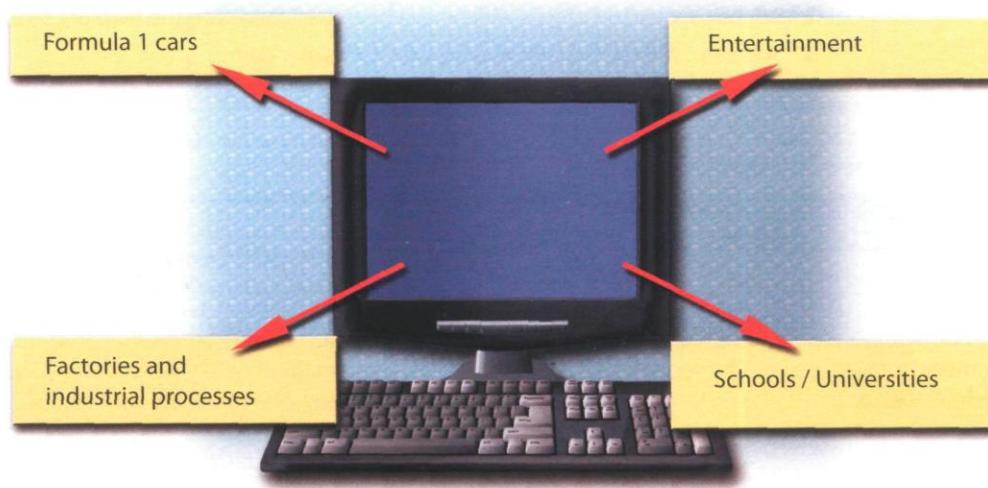
A  Listen to four people talking about how they use computers at work. Write each speaker's job in the table.

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

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

5 Other applications

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



Useful language

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

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

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

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

Computers are used to ...

A PC can also be used for ...

People use computers to ...

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

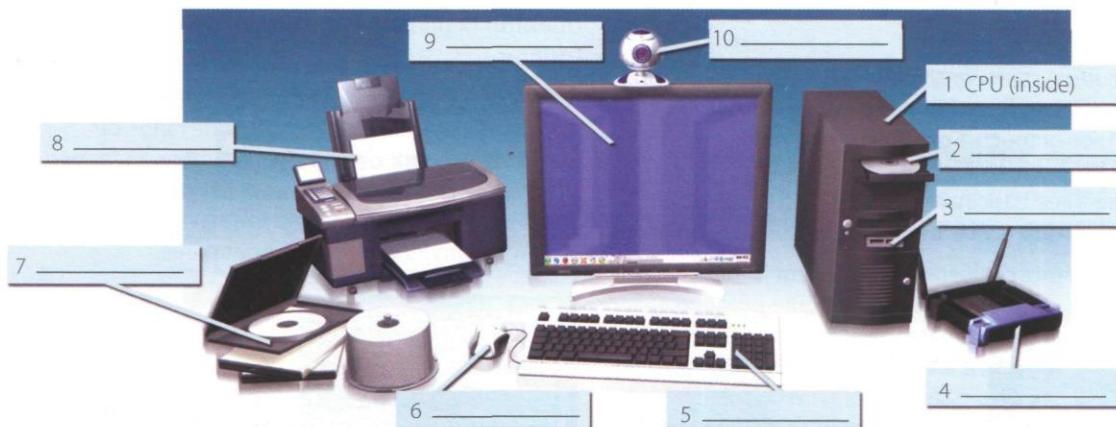
Unit 2

Computer essentials

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 Obey every impulse as if it were an extension of your hand | 2
Displays your ideas with perfect brilliance

a See the difference – sharp images and a fantastic range of colours | 3
It's quiet and fast

a ... it's easy to back up your data before it's too late | 4
Power and speed on the inside

a Let your computer's brain do the work |
| 5
... a big impact on the production of text and graphics

a | | Just what you need: a laser powerhouse | |

D Find words in the slogans with the following meanings.

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

2 What is a computer?

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

What is a computer?

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

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

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

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

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

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

Input devices enable data to go into the computer's memory. The most common input devices are the

mouse and the **keyboard**. **Output devices** enable us to extract the finished product from the system.

For example, the computer shows the output on the **monitor** or prints the results onto paper by means of a **printer**.

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



A USB port



A USB connector

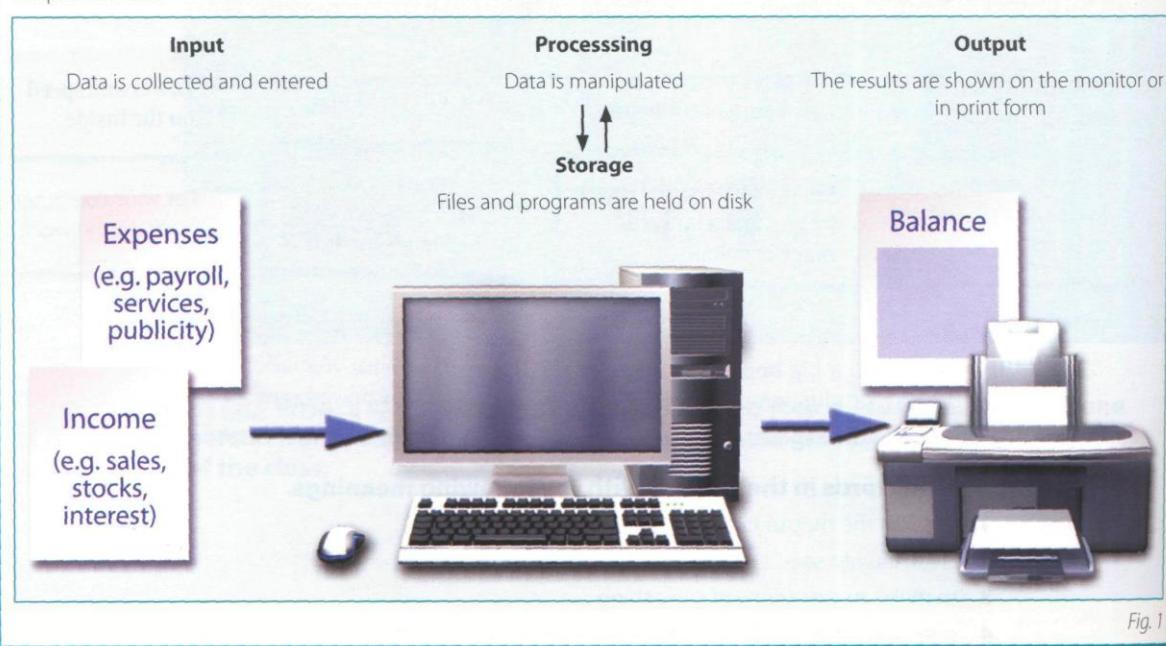


Fig. 1

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

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

3 Different types of computer

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

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



a _____



b _____



c _____



d _____



e _____

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

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

4 Language work: classifying

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

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

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

HELP box

Classifying

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

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

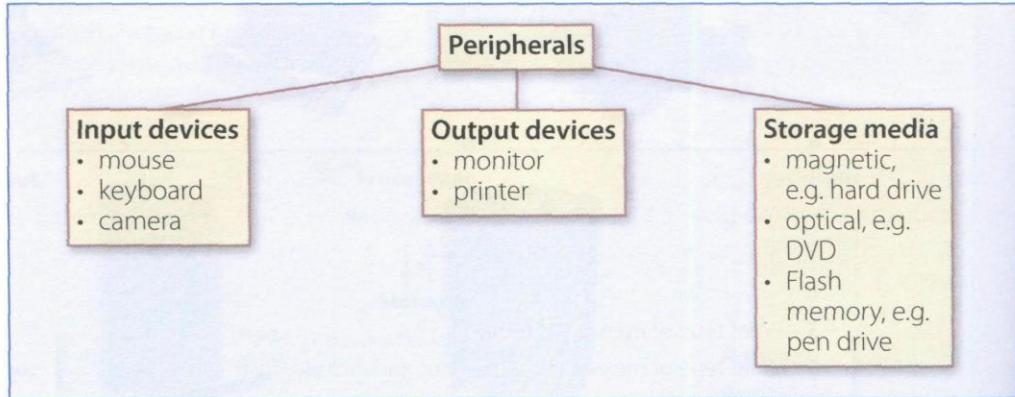
Digital computers can be **divided into** five main **types**: mainframes, desktop PCs, laptops, tablet PCs and handheld PDAs.

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

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

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

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



5 Benefits of laptops and tablet PCs

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

or

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

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?

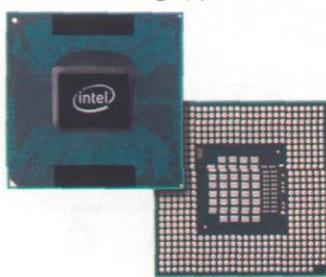
Processing

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 4GHz (four thousand million hertz, or 30 cycles, per second) will enable your PC to handle the most demanding applications.



The Intel Core 2 Duo processor; other chip manufacturers are AMD and Motorola

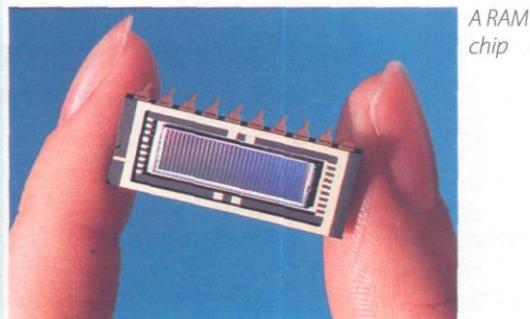
RAM and ROM

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

40 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 45 chips, usually contained in small circuit boards called dual in-line memory modules (**DIMMs**).



A RAM chip

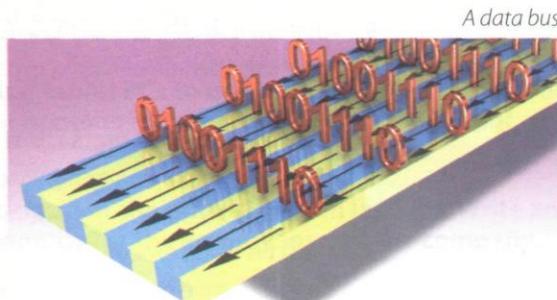
Buses and cards

The main circuit board inside your system is called the **motherboard** and contains the processor, the memory chips, expansions slots, and controllers

50 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.

55 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.

60 **Expansion slots** allow users to install **expansion cards**, adding features like sound, memory and network capabilities.



A data bus

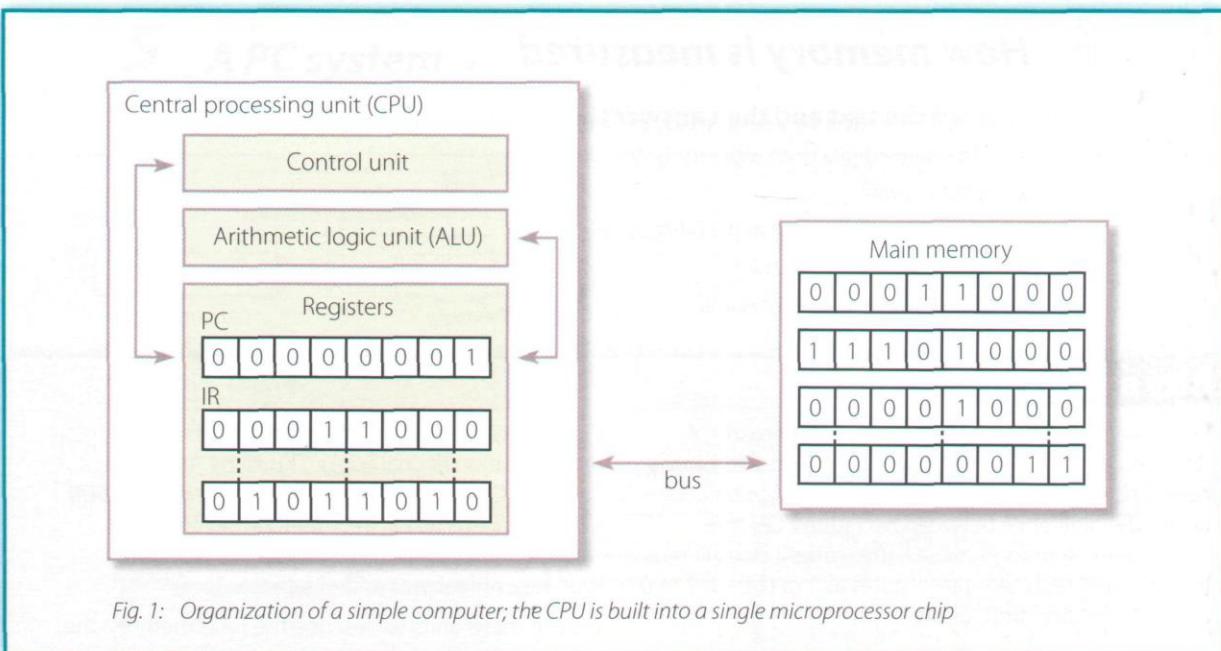


Fig. 1: Organization of a simple computer; the CPU is built into a single microprocessor chip

3 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.

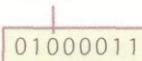
- 1 How many digits does a binary system use?
- 2 What is a *bit*?
- 3 What is a collection of eight bits called?
- 4 What does ASCII stand for?
- 5 What is the purpose of ASCII?

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

01000011

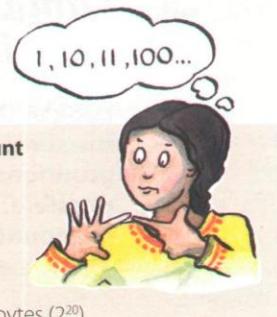
Example of a byte

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

Computers use a standard code for the binary representation of characters. This is the American Standard Code for Information Interchange, or **ASCII** – pronounced /æski/. In order to avoid complex calculations of bytes, we use bigger units such as kilobytes, megabytes and gigabytes.

We use these units to describe the RAM memory, the storage capacity of disks and the size of a program or document.

Note: **bit** is pronounced /bit/; **byte** is pronounced /baɪt/

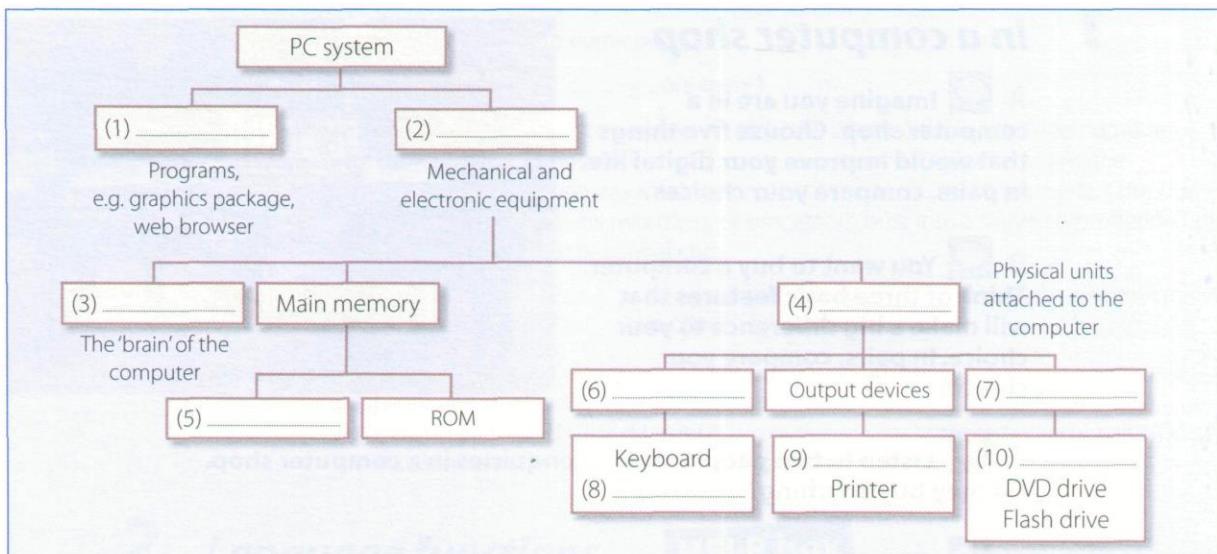


B Complete these descriptions with the correct unit of memory.

- 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.

CPU	Speed	Optical disc drives	Wireless connectivity	Minimum/maximum RAM
Monitor	Ports and card memory slots	Hard disk	Software	

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, ...

Unit 4

Buying a computer

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 _____

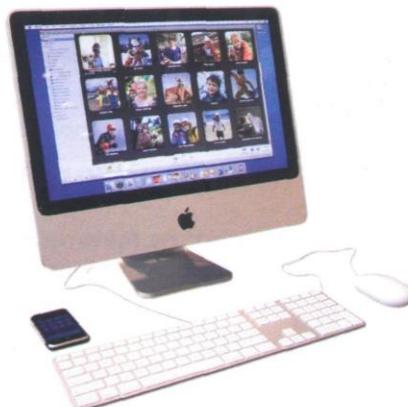
Hard drive capacity _____

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.

2

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 laptop

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.

Speaker 1 _____

Speaker 3 _____

Speaker 2 _____

Speaker 4 _____

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-definiton content

From £849

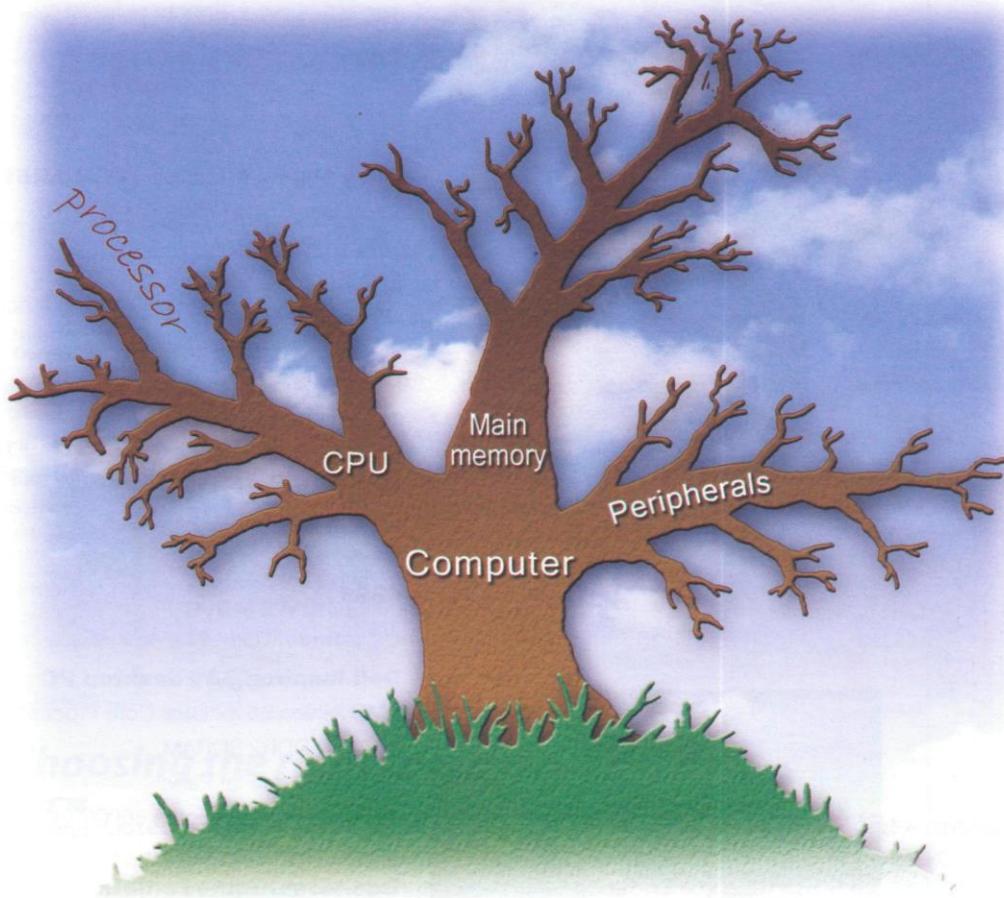


B Look at the notes you made about your ideal computer system in Unit 3 task 6 (page 15). What did you want? Look again at the descriptions of the computers above and choose the one that is closest to your ideal. In pairs, discuss your choices.

5 Vocabulary tree

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.

processor	ROM	expandable memory	ALU	DIMMs	hard drive
RAM	computer brain	byte	DVD	system clock	keyboard
mouse	gigahertz	printer	megabyte	webcam	registers



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.

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**.



1 _____



2 _____



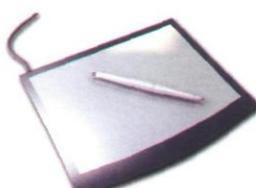
3 _____



4 _____



5 _____



6 _____



7 _____



8 _____

2 Describing input devices

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

1 _____ 2 _____ 3 _____

B Listen again and complete these extracts.

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

3 Describing functions and features

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



Sony PlayStation 3 controller

Functions

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

Features

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

HELP box

Describing functions

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

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

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

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

Describing features

We can describe features like this:

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

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

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

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

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

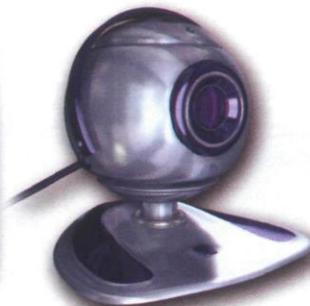
B In pairs, choose one of these input devices and describe its functions and features. Try to guess which device your partner is describing.



Barcode reader



Touchpad on a portable PC



Webcam



Touch screen

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?



The Iomega eGo portable hard drive.

3 Magnetic storage

A Read the text and then identify a sector and a track in Fig. 1.

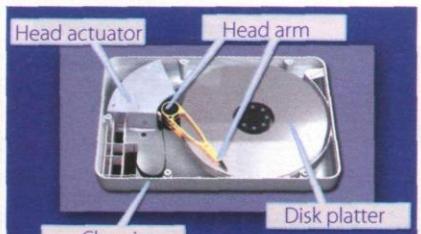
B Read the text again and decide whether these sentences are true or false. Correct the false ones.

- 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.



The inside of a hard drive

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.



Fig. 1

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.



Toshiba's 1.8" hard drive; mini hard drives are used in small gadgets, such as PDAs and wristwatches

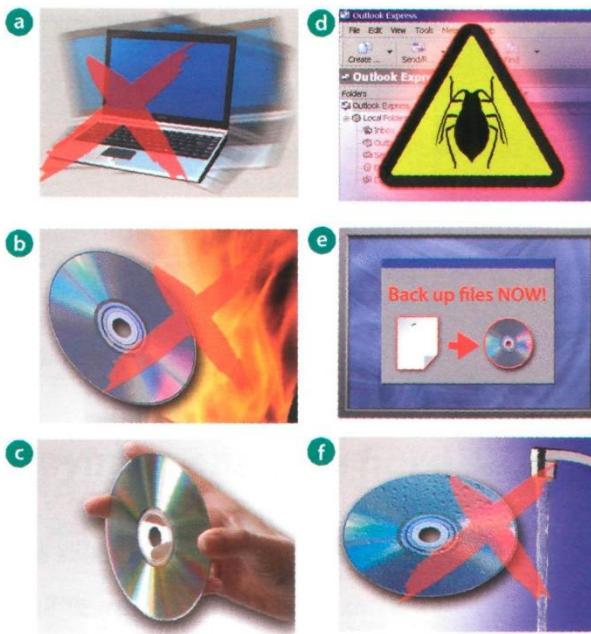
C Match these words (1–5) with the definitions (a–e).

- | | |
|-------------------|--|
| 1 formatted | a a file system that defines the structure for keeping track of the files |
| 2 directory | b the part of a drive that reads and records data on a disk |
| 3 read/write head | c to make a copy of data or software in case the original disk is damaged |
| 4 head crash | d initialized; when the tracks and sectors on magnetic disks are set |
| 5 back up | 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.

magnet _____	magnetic _____	magnetically _____
magnetism _____	magnetize _____	magnetized _____

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*.

fragment _____	fragmentation _____
defragmenter _____	fragmented _____

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.



In a fragmented disk, a file is stored in non-continuous sectors



In a defragmented disk, a file is stored in neighbouring sectors

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.



A DVD drive with disc

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

2 Optical discs and drives

A Read the text on page 53 and find the following.

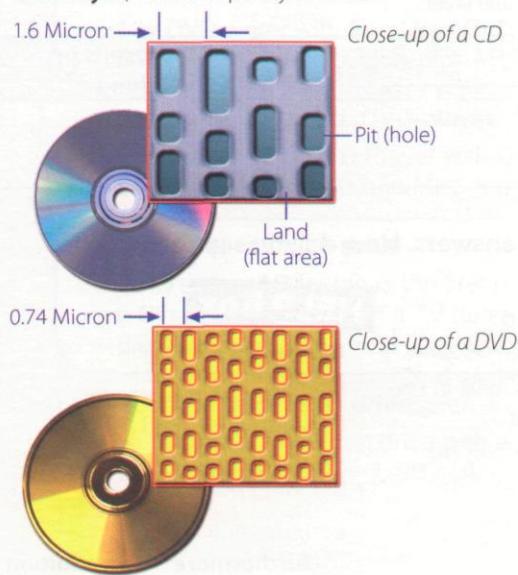
- 1 the advantages and disadvantages of optical discs over magnetic disks
- 2 the storage capacity of a double-sided, dual layer DVD
- 3 the difference between a DVD burner and a DVD recorder
- 4 the feature of a portable DVD player which allows the user to play different formats
- 5 two possible successors 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.

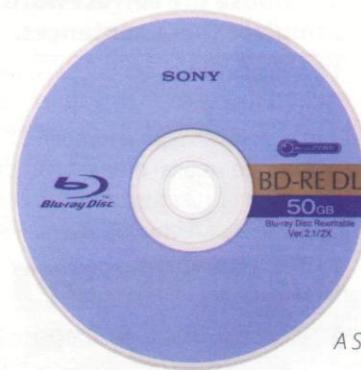
DVDs also come in several formats:

- 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 Sony Blu-ray disc

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.

	Capacity and formats	Possible uses
CD		
DVD		
Blu-ray		

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 ...

Indicating addition	Making contrasts	Explaining the results or effects of something

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.

HELP box

Connectors 2

In addition to the uses of connectors covered in Unit 8, we also use connectors for the following purposes:

- Indicating addition
furthermore **in addition**
besides **moreover**
and
- Making contrasts
however **whereas**
although **but**
on the other hand
- Explaining the results or effects of something
therefore **as a result**
so **thus**
consequently **because**

4 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

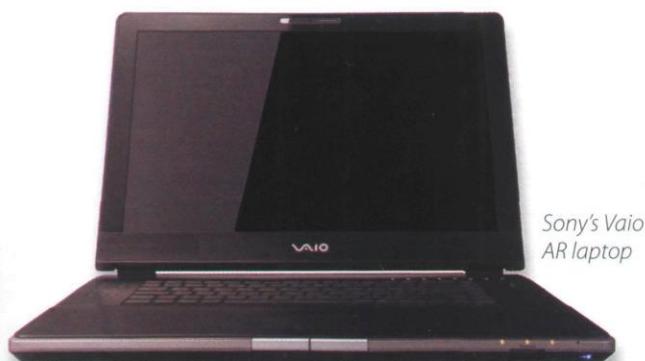
8" portable LCD DVD Player with Car Kit. Compatible with DVD-Video, CD, JPEG image CD and MP3-formatted audio CD.

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.



Sony's Vaio AR laptop

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

Unit 12 | Flash memory

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 5 ‘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 10 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 rewritable, so you can update programs via 15 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 20 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 25 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.

45 ■ 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.

50 ■ **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.

55 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 60 computers to boot, or start, more quickly, and also reduces power consumption.



SanDisk’s card readers read and write to just about every flash memory card

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.

blog	mail	print
<i>blogger</i> (a person who writes a blog)	<i>to mail</i> (the verb form)	<i>printout</i> (the pages produced by the printer)

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/connected), 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**
- 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, **web site** 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.

Features	Dragon flash drive	Dragon MP4 player
Back up computer data	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Transport files between PCs	<input type="checkbox"/>	<input type="checkbox"/>
Audio and video playback	<input type="checkbox"/>	<input type="checkbox"/>
FM radio tuner	<input type="checkbox"/>	<input type="checkbox"/>
Voice recorder	<input type="checkbox"/>	<input type="checkbox"/>
Games	<input type="checkbox"/>	<input type="checkbox"/>

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?



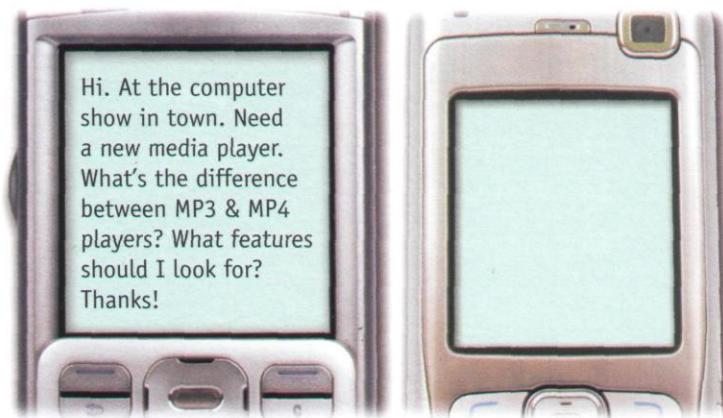
An MP4 player



USB drives are typically designed to attach to a key ring, such as the Cruzer Freedom USB flash drive

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.



Useful language

It has a storage capacity of ...

It features ... and ...

It supports multiple formats: ... and ...

You can ... and ...

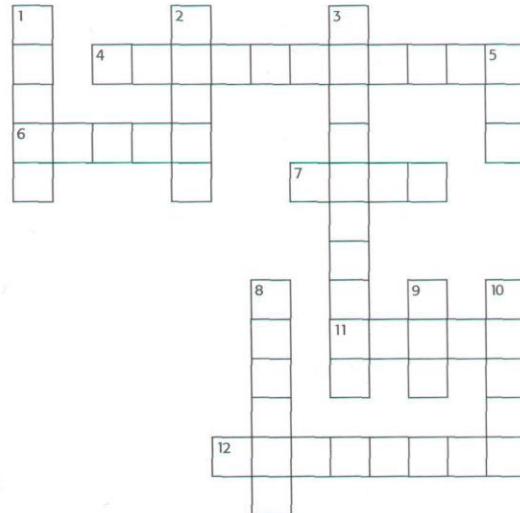
Its battery life is ...

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.

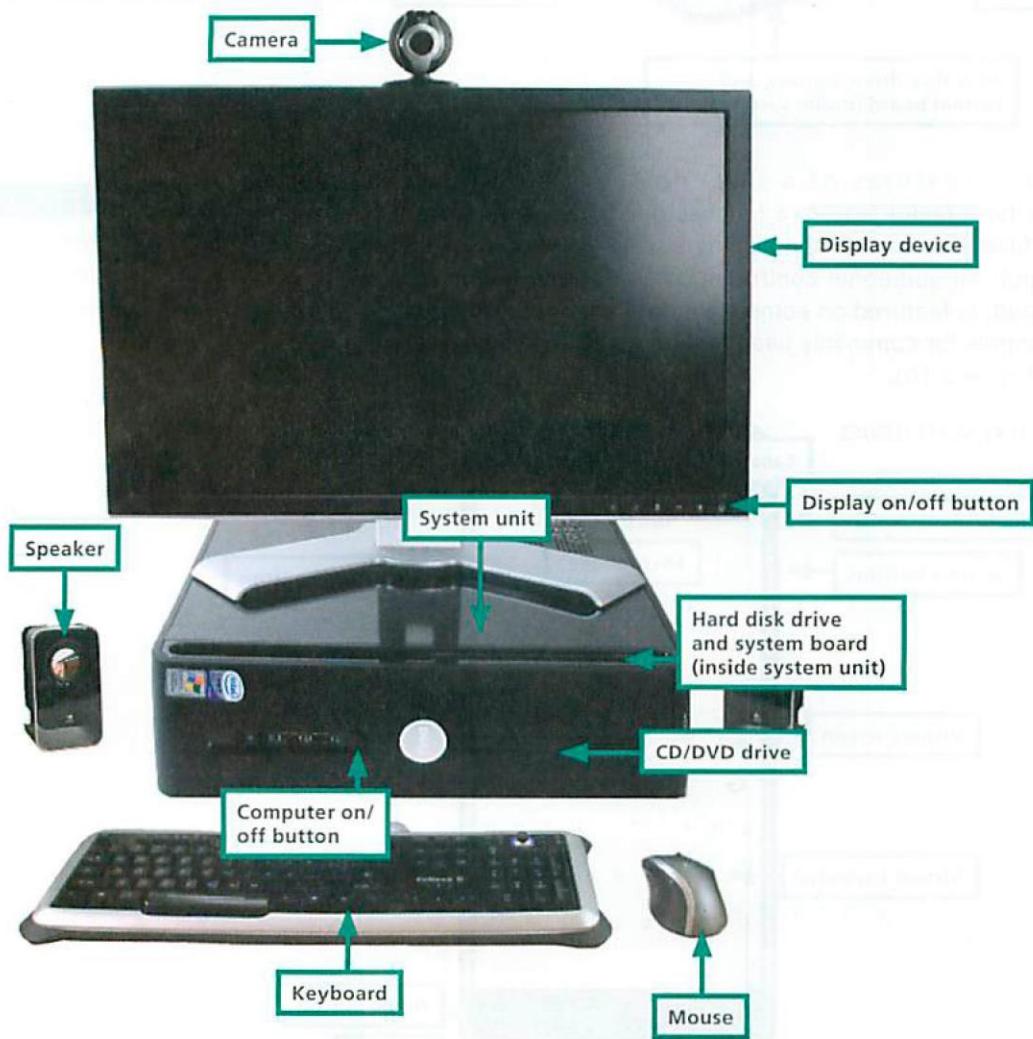
COMPONENTS

When you acquire a new digital device, your first step is to locate the power button and all the other hardware components. The devices we use today have a fairly predictable collection of features, depending on the device's form factor.

► **What is a form factor?** In the computer industry, the term **form factor** refers to the size and dimensions of a device or components, such as circuit boards and system units. The term **system unit** is tech speak for the part of a digital device that holds the system board. It can apply to the body of a smartphone or laptop, as well as to the tower unit of a desktop computer. Digital devices are available in all sorts of form factors; some of the most popular include component, clamshell, and slate.

► **What are the features of a component system?** A component device is composed of various standalone parts, such as a display unit, system unit, and keyboard. Components can be connected using cables or wireless signals. Most of the first personal computers were component systems. Today, this form factor is much less popular because of the effort required to assemble the components. Figure 2-8 illustrates the hardware features of a typical component system.

FIGURE 2-8: A TYPICAL COMPONENT SYSTEM

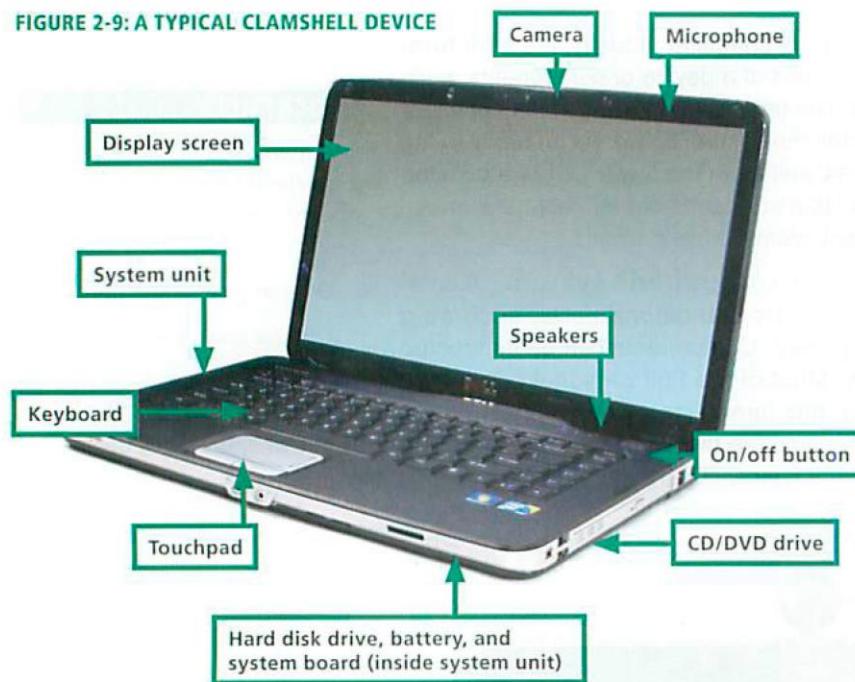


QUICKCHECK

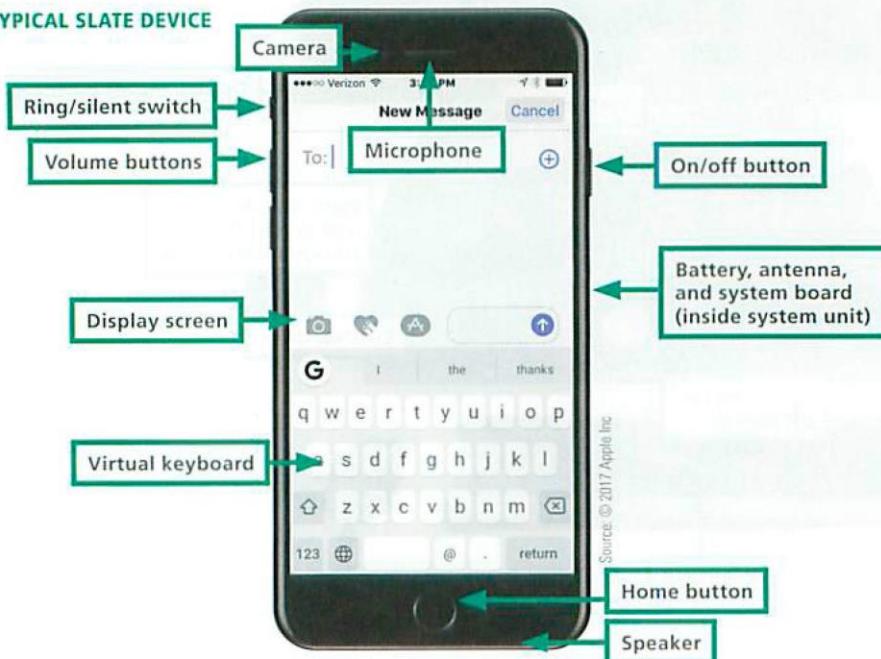
How many on/off buttons would you expect on a component system like the one in Figure 2-8?

- One on the system unit
- One for each standalone device
- One on the system unit and one on the display device

► **What are the features of a clamshell device?** Clamshell devices have a keyboard as the base and a screen on the hinged cover. The system unit on these devices contains all of the basic components required for input, processing, storage, and output (Figure 2-9).

FIGURE 2-9: A TYPICAL CLAMSHELL DEVICE

► **What are the features of a slate device?** Devices configured in the slate form factor feature a touchscreen that covers most of the device's surface. The screen can display a virtual keyboard for text and numeric input. An additional control, such as a Home button or a circular control pad, is featured on some slate devices. The system unit also includes controls for commonly used features, such as volume and airplane mode (Figure 2-10).

FIGURE 2-10: A TYPICAL SLATE DEVICE**QUICKCHECK**

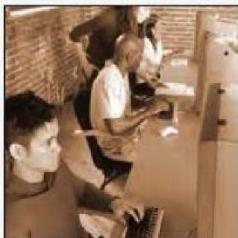
How many components are typically housed on the top half of a clamshell device?

- One
- Two
- Three
- Four

TRY IT!

Check out the devices that you own. Can you find all of the components listed in the figures?

I(nformation and) C(ommunication) T(echnology) at Work



ICT plays a key role in business today. In fact, its use is now so widespread that it is difficult to succeed without it. Rapid developments in the ICT sector in the last two

decades have produced a huge range of new products and services. These include products such as personal computers (PCs), notebooks and fax machines, and services such as e-mail, intranet and the Internet. Businesses of all sizes and types use computer-based systems like these because they offer a better way to work – one which can save time and money.

Firstly, ICT is a faster and more efficient way for people to communicate. Businesses no longer have to rely on slow postal services. They can send and receive information and documents by text, e-mail or fax. Video-conferencing means people do not need to travel long distances to attend meetings. ICT provides a way for people within an organization to contact each other quickly and share work. It also means that they can work with people around the world.

ICT is also used to input, store and manage information. One common use of office computers is to record, find and work with information. For example, businesses use word-processing (WP) or desktop publishing (DTP) packages to produce company documents, and databases to store customer details and produce mailing lists. In the past, these tasks took hours, days or even weeks and produced a lot of paperwork. With ICT they take less time and cost less. Such electronic systems also save storage space.

Another area where ICT is important is the retail industry. Most items on sale in shops have a small black and white label called a bar code. Many shops combine bar-coding with electronic point-of-sale (EPOS) systems. The customer takes an item to the cashier, who uses a scanning device to read the bar code and find out the price of the item. The EPOS system logs each sale and helps the shop manager to decide which products to reorder from the supplier. Some EPOS systems are even programmed to do the ordering.

Manufacturers use new technology to design and build products. At the design stage, they use computer-aided design (CAD) software to produce new ideas and designs. In the production stage, many companies use robots. These are machines that do the work of people, and are controlled by computer-assisted manufacturing (CAM) programs. Robots can carry out routine, complex and dangerous procedures. They can work 24 hours a day and the standard of their work remains constant because they do not get tired or bored. As a result, companies can improve their production rates without losing quality.

New technology, then, offers a range of benefits. Firstly, it saves time. Tasks that once took a long time to do by hand now take a fraction of that time. Secondly, ICT improves communication between people, speeding up business transactions and decision-making, and opening up new markets around the world. Thirdly, inexpensive ICT solutions can often replace expensive people. Consequently, companies can reduce the size of their workforce and their wage bills. Finally, ICT can increase the quantity and improve the quality of goods produced, which may also increase profits.

However, it is important to understand that there are costs as well as benefits. ICT systems can be very expensive. Companies have to choose systems which suit their needs and are cost-effective before investing in ICT. They have to consider several factors. Firstly, technology is constantly developing, which means that systems need to be regularly upgraded. Another issue is staff training. There is no point installing an ICT system if workers cannot use it. Lastly, there is the cost of technical support, such as a helpdesk, to ensure that everything runs well on a daily basis.

Modern technology is here to stay. It would be almost impossible to ignore computer-based systems or to return to working without them. However, successful use of ICT requires investment in both equipment and skills. Businesses of all sizes need to make the right choices because there are risks, as well as benefits, involved.