

4 THE COMPUTER

In this unit, the development of the computer is covered. Lesson 4.2 looks at the invention of the integrated circuit, or microchip, its advantages and its impact on society. At the same time, the use of computers in education is covered: Lessons 4.1, 4.3 and 4.4 guide students to a more efficient use of the Internet and computers in research.

Note that students will need access to a computer with an Internet connection for some exercises in this unit.

Skills focus

Reading

- identifying topic development within a paragraph
- using the Internet effectively
- evaluating Internet search results

Writing

- reporting research findings

Vocabulary focus

- computer jargon
- abbreviations and acronyms
- discourse and stance markers
- verb and noun suffixes

Key vocabulary

access (n and v)	index	register
browse	Intranet	search (n and v)
data	keyword	search engine
database	log in/log on	software
default	log off	technology
document	login (n)	username/ID
electronic	media	web page
exit (v)	menu	
hyperlink	password	

Abbreviations and acronyms

The *Computer Jargon Buster* on page 31 of the Course Book gives the meanings of many of these.

CAD	ISP	URL
CAL	LCD	USB
CAM	PDF	WAN
CIM	PIN	WWW
HTML	PPT	
HTTP	ROM	

4.1 Vocabulary

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4.1 Vocabulary computer jargon • abbreviations and acronyms • verb and noun suffixes

A Study the words and phrases in box a.

- 1 Which words or phrases relate to computers and the Internet? Which relate to books and libraries? Find two groups of words.
- 2 Find pairs of words and phrases with similar meanings, one from each group.
- 3 Check your ideas with the first part of *The Computer Jargon Buster* on the opposite page.

B Complete the instructions for using the Learning Resource Centre with words or phrases from box a.

C Study the abbreviations and acronyms in box b.

- 1 How do you say each one?
- 2 Divide them into two groups:
 - abbreviations
 - acronyms

See *Vocabulary bank*

b

CAD	CAL	CAM	DVD	HTML
HTTP	ISP	LCD	PIN	ROM
URL	USB	WAN	WWW	

- 1 What do the letters stand for in each case?
- 2 What do they mean?
- 3 Check your ideas with the second part of *The Computer Jargon Buster* on the opposite page.

E Study the nouns in box c.

- 1 Make a verb from each noun.
- 2 Make another noun from the verb.

c

class	computer	digit
identify	machine	

a

books	browse/search	catalogue
close	cross-reference	database
electronic resources	exit/log off	hyperlink
index	library	log in/log on
menu	open page	search engine
table of contents	web page	
	world wide web	

b

HADFORD University

Learning Resource Centre

Instructions for use:

If you want to access web pages on the _____, you must first _____ to the university Intranet with your username and password. You can use any _____ but the default is Google. _____ for web pages by typing one or more keywords* in the search box and clicking on *Search*, or pressing *Enter*. When the results appear, click on a _____ (highlighted in blue) to go to the web page. Click on *Back* to return to the results listing. You can also use the university _____ of learning resources. Click on *Resources* on the main _____.

*A 'keyword' is different from a 'key word', which means a word that tells you about the main idea or subject of something.

Computer Weekly International Magazine

The Computer Jargon Buster

There are many common words used about books and libraries which are translated into jargon words when we talk about using computers and the Internet for similar functions.

books	electronic resources
index	search engine
cross-reference	hyperlink
catalogue	database
library	world wide web
table of contents	menu
look up	browse/search
page	web page
open	log in/log on
close	exit/log off

There are many abbreviations and acronyms in computing. Learn some useful ones.

Abbr./Acr.	What it stands for	What it means
CAL	computer-assisted learning	using computers to help you learn
DVD	digital versatile disk	a disk for storing data, including sound and pictures
HTML	hypertext markup language	a way to write documents so they can be displayed on a website
HTTP	hypertext transfer protocol	a set of rules for transferring files on the www, usually included at the beginning of a website address (e.g. http://www...)
ISP	Internet service provider	a company that enables access to the Internet
JPEG	joint photographic experts group	the usual format for photos and other images
LCD	liquid crystal display	the kind of screen you get on many laptops
PIN	personal identification number	a collection of numbers or letters which are used like a password to identify someone.
RAM	random-access memory	the memory you can use to store your own information
ROM	read-only memory	a type of permanent computer or disk memory that stores information that can be read or used but not changed
URL	uniform resource locator	a website address, e.g. http://www.gameteducation.com
USB	universal serial bus	a standard way to connect things like printers and scanners to a computer
WAN	wide area network	a way of connecting computers in different places, often very far apart
WWW	world wide web	a huge collection of documents that are connected by hypertext links and can be accessed through the Internet

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General note

If possible, hold this lesson in a room where there is a computer, or bring in a computer.

Read the *Vocabulary bank* at the end of the Course Book unit. Decide when, if at all, to refer your students to it. The best point is probably Exercise C, or at the very end of the lesson or the beginning of the next lesson, as a summary/revision.

Lesson aims

- gain fluency in the meaning, pronunciation and spelling of key computing terms, abbreviations and acronyms
- understand how verbs can be formed from nouns, and nouns from verbs, through the addition of suffixes

Introduction

Familiarize students with computer terminology using some or all of the following activities.

- 1 Using a computer or a picture of a computer as a starting point, elicit some or all of the following:

<p>PC laptop monitor screen desktop icon keyboard keys mouse</p>	<p>CPU (central processing unit) hard disk floppy disk program database slot CD</p>	<p>DVD USB port accessory printer scanner CD burner Internet email the web</p>
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- 2 Ask students to suggest verbs used in computing. Elicit some or all of the following. A good way to do this is to open a program such as Word (in English) and look at the words and symbols on the toolbars.

<p>switch on start up shut down log on/log off click double-click hold</p>	<p>press open close exit save select copy</p>	<p>paste enter delete insert highlight undo print</p>
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- 3 Ask students whether they normally use the library or the Internet to find information. Elicit the advantages and disadvantages of both. (There is so much emphasis on using computers nowadays, students often forget that there is a lot of information readily to hand in the library.)

Answers

Possible answers:

Library

Advantages	Disadvantages
easy to look things up in a dictionary or an encyclopaedia	books can be out of date
you can find information in your own language	the book may not be in the library when you want it
information is usually correct	most books can't be accessed from home (though this is now starting to change)

Internet

Advantages	Disadvantages
a lot of information from different sources	difficult to find the right key words
information is usually more up-to-date than books	difficult to know which results are the best
can be accessed from home	information is often not correct
you can quickly and easily get copies of books or journal articles not in your library	you may have to pay for the books/articles/information

Exercise A

Ask students to study the words in box a and elicit that they all relate to research.

Set for pairwork. Tell students to decide *and justify* the pairs they choose. If necessary, give an example: *index, search engine results*.

To help students understand what a database is, refer to ones they are familiar with in your college, e.g., student records, exam results, library catalogues, etc.

Students may argue that some terms are not exact equivalents, e.g., *catalogue/database*. Discuss any objections as they arise.

Answers

Model answers:

Common word or phrase for books and libraries	Word or phrase for Internet and electronic information
books	electronic resources
index	search engine
cross-reference	hyperlink
catalogue	database
library	world wide web
table of contents	menu
look up	browse/search
page	web page
open	log in/log on
close	exit/log off

Language note

Log in and *log on*: these two verbs are used a little differently. *Log in* is used when accessing a closed system such as a college Intranet. *Log on* is used for open systems such as the Internet in general, as in *You can log on to the Internet with a hand-held computer*. Note also that the related noun has now become one word (*login*). The opposite of *log in* is *log out*, while the opposite of *log on* is *log off*.

Exercise B

Set for individual work and pairwork checking. Ensure that students read *all* the text and have a general understanding of it before they insert the missing words.

Feed back by reading the paragraph or by using an OHT or other visual display of the text. Discuss alternative ideas and decide whether they are acceptable. Verify whether errors are due to using new words or to misunderstanding the text.

Answers

Model answers:

If you want to access web pages on the world wide web, you must first log in to the university Intranet with your username and password. You can use any search engine, but the default is Google. Browse/search for web pages by typing one or more keywords in the search box and clicking on *Search*, or pressing *Enter*. When the results appear, click on a hyperlink (highlighted in blue) to go to the web page. Click on *Back* to return to the results listing.

You can also use the university database of learning resources. Click on *Resources* on the main menu.

Exercise C

Set for pairwork. Feed back, eliciting ideas on pronunciation and confirming or correcting. Build up the two lists on the board. Establish that one group are acronyms, i.e., they can be pronounced as words: PIN = /pin/. The other group are abbreviations, i.e., they are pronounced as letters: HTTP = H-T-T-P. Drill all the abbreviations and acronyms. Make sure students can say letter names and vowel sounds correctly.

Elicit that words with normal consonant/vowel patterns are *normally* pronounced as a word and those with unusual patterns are *normally* pronounced with single letters. Refer to the *Vocabulary bank* at this stage if you wish.

Methodology note

Don't discuss the meaning at this point. This is covered in the next activity.

Answers

Acronyms: CAD /kæd/, CAL /kæl/, CAM /kæm/, PIN /pin/, ROM /rɒm/, WAN /wæn/.

Abbreviations: DVD, HTML, HTTP, ISP, LCD, URL (not pronounced /ɜ:l/), USB, WWW.

Exercise D

- 1 Introduce the verb *stand for*. Elicit examples of common abbreviations and ask what they stand for. Set for pairwork. Tell students to pick out the ones they already know first. Next, they pick out the ones they are familiar with but don't know what they stand for – and guess.
- 2 Elicit the meanings without reference to the *Computer Jargon Buster* if possible.
- 3 Refer students to the *Computer Jargon Buster* to verify their answers. As a follow-up, elicit other common abbreviations from IT or electrical engineering.

Language note

If students don't use acronyms or initial abbreviations in their language, a discussion about the reasons for using them is useful. They will then know how to find the meaning of new ones when they meet them. You might point out that abbreviations can sometimes be longer than the thing they abbreviate! For example, world wide web is three syllables, whereas WWW is six. It evolved because it is quicker to write, but it is longer, and harder, to say. Note that WWW is frequently written in lower case letters (www), presumably because it is lower case in URLs.

It is also possible to mix acronyms with abbreviations: for example, JPEG – J /peg/. Point out the field of ICT is developing at an incredible speed and new acronyms and abbreviations are constantly being created.

Exercise E

Set for individual work and pairwork checking. Feed back, highlighting the changes from noun form to verb in the case of *identity/identify* and *machine/mechanize*.

Answers

Model answers:

Noun 1	Verb	Noun 2
class	classify	classification
computer	computerize	computerization
digit	digitize	digitization
identity	identify	identification
machine	mechanize	mechanization

Language note

Both *-ise/-ize* (*-isation/-ization*) forms are acceptable in British English. American English usage is *-ize* (*-ization*).

Closure

Ask students whether they agree with the following statements.

- 1 Every college student must have a computer.
- 2 The college library uses a computer to help students find information.
- 3 College departments use computers to store research data.
- 4 Students can't do research without a computer.
- 5 College computers can access research data from other colleges and universities.
- 6 College computers can access research data from businesses and the media.
- 7 A personal computer can store information students think is important.
- 8 Computers can help us to talk with students from other colleges and universities.
- 9 Computers can help students access data from anywhere in the world.
- 10 A computer we can carry in our pocket can access worldwide data.

4.2 Reading

4.2 Reading preparation for reading research • topic development

A Discuss these questions.

- When was the first computer invented?
- What inventions and discoveries were important to the development of the computer?

B Look at the title of the text on the opposite page.

- What will the text be about?
- The article talks about three 'generations' of computers. What do you think they are?
- Write some questions that you would like the text to answer.

C Work in pairs. Look at pictures 1, 2 and 3.

- Choose a picture. Describe it. Can your partner guess which one it is?
- What are the objects in the pictures?

D One student wrote some ideas about the development of the computer before reading the text on the opposite page. Write T (this is true), F (this is false) or ? (I'm not sure) next to the statements.

E Look carefully at the topic sentences in the text on the opposite page.

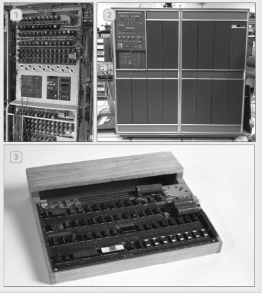
- Identify the topic and the comment about the topic. See *Skills bank*
- What do you think each paragraph will be about?

F Read the text carefully. Were your questions from Exercise B answered?

G According to the writer of the text, are the statements in Exercise D true or false? Which ideas are not mentioned?

H Study the notes a student made in the margin of the text on the opposite page.

- What ideas are in the other paragraphs? Write some key words.
- Which words introduce new ideas in each paragraph? See *Skills bank*



The development of the computer
Computers have had a big influence on the field of Electrical Engineering. _____
The first computers used punched paper tape for input. _____
Transistors were an immediate improvement on vacuum tubes. _____
Disk drives were in use before the invention of the microchip. _____
Canada played an important role in the development of computers. _____
In a microchip, the components are soldered to a printed circuit board. _____
It only became possible to manufacture computers commercially after the invention of the microchip. _____
Applications of integrated circuits are limited to computers. _____

Results of computers
Impact on EE
Results of transistors
Example of second-gen
Output of transistors

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4 THE COMPUTER

HADFORD University
Faculty: Electrical Engineering

Smaller, faster, cheaper!
The computer's family tree

In all fields, the impact of computers has been enormous. Everyday working life has changed for many professionals due to the development of the computer. Obviously, this is also true for electrical engineers. The design, analysis and operation of electrical and electronic systems have been completely dominated by computers. However, the connection is even closer than this – electrical engineers played a key role in the development of the computer in the first place!

Historically, the development of the computer started relatively recently, in the middle of the 20th century. These early models known as *first-generation computers*, were hand built and consisted of circuits containing vacuum tubes. They often used punched paper tape for input and storage. The Colossus computers developed during the Second World War in Britain are famous examples of these first-generation computers.

The *second-generation computers* were more advanced. In their design, they used transistors which were soldered to a printed circuit board instead of vacuum tubes. Transistors were rather unreliable at first, but they soon improved and brought great advantages. Firstly they were more reliable than vacuum tubes. Secondly, they were smaller. Finally, they were cheaper to produce and the computers were cheaper to run. The *IBM 1401* was a very popular commercially produced second generation computer and sold over one hundred thousand units. Using transistors improved the central processing unit (CPU) and also the peripheral devices, such as disk drives – both fixed and removable – for storing tens of millions of letters and digits. It became possible to connect a computer to remote terminal units, such as teletype machines, via a telephone connection. This was the very beginning of a computer network and would eventually lead to the Internet that we know today. The invention of the integrated circuit – or microchip – signalled an important development. Computers that contain these devices are known as *third-generation computers*. An integrated circuit is a type of electronic circuit. However, the components are not soldered to a circuit board and their interconnections are formed on one single surface, typically a semiconductor such as silicon. This means that integrated circuits are much smaller than normal circuits. For example, the smallest microchip produced is currently just nine nanometres across.

Integrated circuits have brought many advantages. Firstly, the integration of large numbers of tiny transistors into a small chip was a great improvement on the manual assembly of ordinary circuits, and it became possible to mass produce integrated circuits. In addition, integrated circuits cost much less than discrete circuits because chips with all their components are printed as a single unit and not constructed one element at a time. Obviously, they require much less material in their construction, but the most important thing is that their performance is very high. The components are very small and close together, which means that they can operate quickly and consume little power, because the signals travel short distances.

This new technology had important consequences. Small, low-cost computers were now possible and could be bought by individuals and small businesses. A very early model was the *Apple I* made by Apple Computer. However, integrated circuits are not only used in computers but are also used in almost all electronic equipment available today and have revolutionized the world of electronics. For example, the mobile phone is a digital appliance that is a fundamental part of modern society, and it was only made possible by the low-cost production of integrated circuits.

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General note

Read the *Skills bank – Developing ideas in a paragraph* at the end of the Course Book unit. Decide when, if at all, to refer students to it. The best time is probably Exercise E, or at the very end of the lesson or the beginning of the next lesson, as a summary/revision.

Lesson aims

- prepare to read a text by looking at title, topic sentences
- understand the purpose of discourse markers and stance markers in the development of a topic

Introduction

Ask students how, where and why they use computers. They should answer in some detail with examples. Encourage them to use the vocabulary, abbreviations and acronyms from Lesson 4.1.

Exercise A

Set for general discussion. Allow students to debate differences of opinion. Encourage them to give examples if they can.

Answers

Possible answers:

- 1 It depends to some extent on the definition of 'computer'. The abacus is a kind of calculating device, so could be considered an early type of computer in that it is a tool for computation. It was invented around 2400 BC. However, the first digital computers were invented in the 1940s.
- 2 The diode, the semiconductor, the integrated circuit, the microprocessor – all these were key inventions and discoveries in the development of the computer.

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