

12 Information technology

Switch on

1 Look at the pictures. What uses for information technology can you think of in these places or situations?

2 Match the examples of computer use in column A with the areas of application in column B. More than one answer is sometimes possible.

A

- 1 using barcodes to identify items and prices
- 2 calculating the exact distance to a target
- 3 producing scale models of new designs
- 4 identifying an employee by his or her voice
- 5 checking credit cards used for payments
- 6 issuing seat numbers
- 7 analysing blood tests
- 8 storing employee records
- 9 keeping a record of all borrowings
- 10 calculating the stress on a component
- 11 controlling the temperature of a washing machine
- 12 monitoring the safety of each stage in the process
- 13 warning when aircraft are too close
- 14 monitoring the life signs of a patient
- 15 comparing fingerprints
- 16 co-ordinating information from all parts of a war-zone

B

- a hospital
- b airport
- c supermarket
- d design
- e security
- f library
- g military
- h oil refinery
- i the home



3 Now list the uses for computers in an area of technology you are familiar with.

In this unit

- key terms for computer use in the car industry
- Past Passive
- how to pronounce the *-ed* form of verbs and words with silent letters
- using your search skills to find out about the world's most powerful computers

Reading**CAD/CAM**

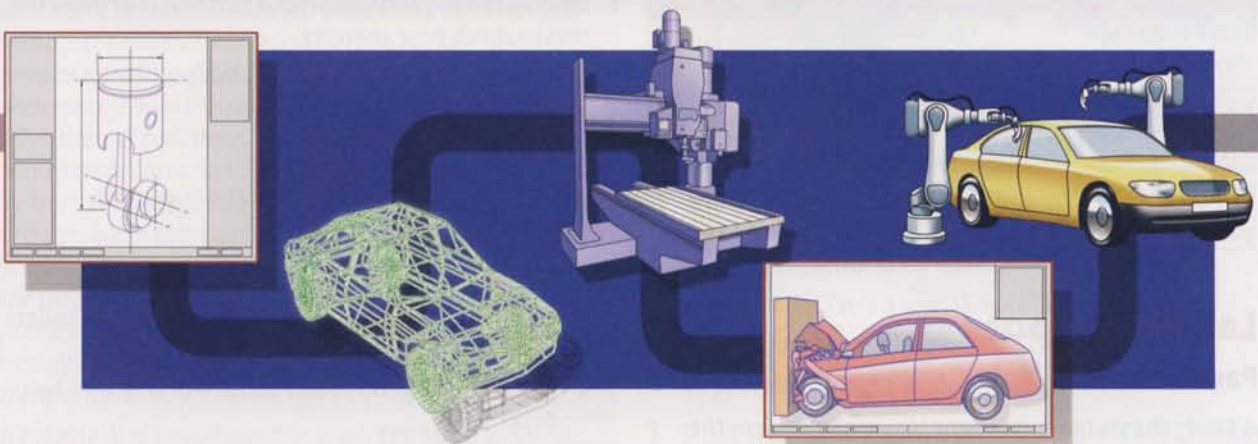
- 1 Look at the pictures below. What uses for computers in car production can you see?
- 2 What do you think terms 1–4 mean? Read the text and check your answers.

1 CAD 2 CAM 3 CIM 4 CNC

- 3 List the things computers can do in the design and production of a car.

EXAMPLES

allow 2-D and 3-D designs to be made
calculate dimensions from a design

COMPUTER USE IN THE CAR INDUSTRY

All products begin with an idea. In the past, car designers worked first on paper. At a later stage models were made in wood or fibreglass. Now everything is done using CAD (Computer-aided design) programs. These programs allow designers to work in two or three dimensions (2-D or 3-D) but most new designs are created using a solid modelling program which allows the model to be viewed from any angle. It can also be viewed by engineers and executives anywhere in the world.

The models have accurate dimensions and the design files can be sent to rapid modelling devices to produce a prototype. Before a single component is produced, programs will have worked out the forces acting on it. Crash conditions can be simulated to test the safety features of the car. Assembly can be simulated to work out the best way of building the car. This saves time and money.

For components such as engine parts, when the design is complete, the file is imported into a CAM (Computer-aided manufacturing) program. Here, all machining operations

are planned. The file is then sent to a post-processor which converts the data into a set of instructions in a form which can be read by Computer numerical controlled (CNC) machine tools. These instructions are fed to a CNC controller which controls the machine tools which shape the finished product.

In complete Computer-integrated manufacturing (CIM), computers control the assembly line and monitor the supply of materials, ordering new supplies when needed. They can calculate when tools need to be replaced. Computers also permit changes in a product to be made easily. Orders can be customized to meet the needs of a particular client. 'Special editions' of cars can be produced to attract new customers to a model, for example the BMW Mini.

On the assembly line, computer-controlled robots are used for tasks such as welding and painting. Robots with sensors check the finished vehicle for defects. For example, they can check the paint thickness and how well the doors fit.

The name was first suggested by a colleague. We'd been in the meeting for hours and, while he was drinking a cup of Peet's Java coffee, he picked 'Java' as an example of yet another name that would never work. The initial reaction was mixed.

Arthur van Hoff

former Senior Engineer, Sun Microsystems



4 Complete column B of the table.

A How was it done in the past?	B How is it done now?
1 designs produced on paper	a
2 dimensions calculated by measuring	b
3 models made by hand	c
4 real cars crash-tested	d
5 welding done by hand	e
6 cars inspected by people	f
7 supplies ordered by staff	g
8 painting done by workers	h

● Language spot

Past Passive

● Study the statements about *How was it done in the past?* in the table in *Reading 4*. We can make each statement into a sentence like this:

Designs *were produced* on paper.

● We use the Past Passive to describe actions in the past where the action is more important than the agent performing the action, or where the agent is not known.

» Go to **Grammar reference** p.121

- 1 Make each statement from column A of the table in *Reading 4* into a sentence using the Past Passive.
- 2 Link each pair of statements, past and present, into one sentence.

EXAMPLE

- 1 *Designs were produced on paper but now they are produced by CAD programs.*

Listening

Describing changes

- 1 Laura Santini works for a company which makes cans and containers for the food and drink industry. She explains to a journalist some of the changes which have taken place in this industry. Listen and note the six changes she describes.
- 2 Work in pairs and compare your answers.

It's my job

- 1 Discuss these questions with a partner. Then read the text to check your answers.
 - 1 What kind of work does an IT Support Technician do?
 - 2 What is a *help desk*?
- 2 Read the text again and answer the questions.
 - 1 How did Diana find her first job?
 - 2 What makes working on a help desk difficult?
 - 3 What words does Diana use to describe how callers to the help desk feel?
 - 4 What are the good points about working on a help desk?
 - 5 Why is it not a good idea to work on a help desk for long?
 - 6 What are the attractions of Diana's new job?
 - 7 What information sources does Diana use in her work?
 - 8 How will Microsoft certification help Diana?
- 3 Find an expression in the text which means:
 - a people-handling skills
 - b problem-solving
 - c working directly with people
 - d dealing with telephone calls.

Diana Mayo: IT Support Technician

I'm an IT Support Technician. I work for a large chain which sells building materials to the public and to tradespeople. Almost every business these days, large or small, needs support technicians.

When I left college, I got a job through an agency working for a company which provided online support to local businesses and individuals. I was on their help desk. That meant taking calls and providing advice on all sorts of problems. It's a job where you need not just technical skills but also good 'soft skills'. That means people-handling skills. You need to be able to understand how the caller feels as well as trying to solve their IT problems. You have to keep calm when you're under pressure. People may be pretty frustrated by the time they phone you, and they expect you to fix their problem right away. It's a demanding job because you have to cope sometimes with angry people, get all the information you need to help them with their problem, work out how to solve it technically, and then explain in a clear, simple way what they can do to put things right.

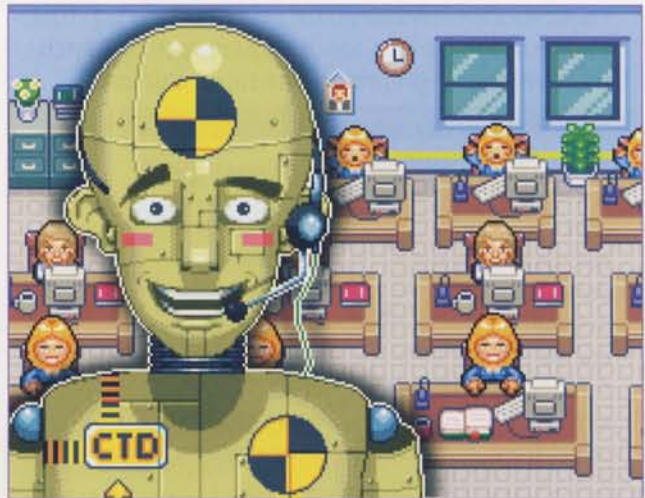
A help desk is a good place to start. You learn to think quickly and how to handle people but I wouldn't advise doing it for long. It's not the best paid job. In my present job I get to work with people face-to-face. The work is more interesting. It's not all trouble-shooting. I also get to install software, maintain servers, and advise on the best choice of new hardware. The money is better too. I

find the best way to find information on problems is to use the Internet. Most of the manufacturers have sites which provide information. There are also newsgroups for sharing information.

I'm planning to get Microsoft certification. My company is prepared to pay for the courses and the exams. It's good for them as it means I can do more and it's good for my future.



Customer care Working on a help desk



Some computing support technicians work on help desks like Diana. They take telephone calls from people with IT problems. They have to:

- record the facts about the problem accurately
- diagnose the problem
- provide the right advice.

- 1 Study this extract from a problem report form. Find out the meaning of any unfamiliar terms.

Item	_____
Location	_____
Make	_____
Model	_____
Problem	_____
Advice given	_____
Cleared by phone	Yes / No
Requires visit	Yes / No

- 2 Now listen to the recording and complete as much of the form as you can.
- 3 Work with a partner. With the help of the completed form take turns at playing the role of help desk technician and the person needing help.
- 4 Compare your performance with the Listening script on p.128. What differences do you notice between your version and the Listening script?

peripherals (n) secondary equipment connected to a computer

Computers in the future may have only 1,000 vacuum tubes and weigh no more than 1.5 tons.

Popular Mechanics, March 1949

Vocabulary

Collocations

- 1 Collocations are words which are often used together. The verbs in column A are used in computing. Match them with an appropriate noun from column B.

EXAMPLE

download + pictures

A	B
click on	a menu
calculate	an icon
download	a page
display	pictures
create	the Web
scroll up / down	costs
surf	a new document
select from	information

- 2 Use the phrases from 1 to fill the gaps in the sentences.
- Flat screens around the airport display _____ on all arrivals and departures.
 - Click on the _____ for PowerPoint to prepare a presentation.
 - You can download _____ from your camera.
 - Spreadsheets are used to calculate _____.
 - Scroll down the _____ until you find the information you need.
 - I normally spending at least one hour a day surfing _____.
 - She created _____ to keep track of software updates.
 - You can select from the _____ to choose which application you need.



Pronunciation

-ed form of verbs and words with silent letters

The -ed form of verbs is pronounced in three ways:

/t/ /d/ /ɪd/

- 1 Listen to words 1–15 used in this book. Put them in the correct columns of the table.

1 constructed	6 finished	11 planned
2 controlled	7 integrated	12 produced
3 customized	8 invented	13 reflected
4 damaged	9 mixed	14 searched
5 disabled	10 operated	15 worked

/t/ /d/ /ɪd/

- 2 Now listen and check your answers.
- 3 Can you work out a rule to help you decide how to pronounce other -ed forms?
- 4 Words 1–7 used in this book contain silent letters. Cross out the silent letters.
- EXAMPLES** *could* *design*
- | | | |
|-------------|-------------|---------|
| 1 listening | 4 pneumatic | 7 would |
| 2 might | 5 should | |
| 3 modelling | 6 vehicle | |
- 5 Now listen and check your answers.

Speaking

Computer peripherals

- 1 Work in pairs, A and B. Each of you has pictures of four computer **peripherals**. Find out which peripherals your partner has by asking questions. Don't ask directly for the names of the peripherals.

EXAMPLE

A *What shape is it?*

B *It's square.*

A *Does it have a back and front?*

B *Yes, it does.*

Student A Go to p.111.

Student B Go to p.112.

- 2 When you have identified the peripherals, together decide whether they are input or output devices.

Webquest

Find out about the five fastest supercomputers in the world and complete the table. Compare your answers with others in your class.

Order	Type or name	Speed	Maker	Location
1st				
2nd				
3rd				
4th				
5th				

This site may help:

- www.top500.org

Checklist

Assess your progress in this unit. Tick (✓) the statements which are true.

- I know key terms for computer use in the car industry
- I can use the Past Passive
- I know how to pronounce the *-ed* form of verbs and words with silent letters
- My reading and listening are good enough to understand most of each text in this unit

Key words

Adjectives

customized
simulated
three-dimensional (3-D)
two-dimensional (2-D)

Nouns

assembly line
CAD/CAM
CIM
CNC
defect
machine tool
machining
peripheral
software
supplies

Verb

inspect

Note here anything about how English is used in technology that is **new** to you.

13 Telecommunications

Switch on

- 1** Work in small groups. List as many ways as you can to send and receive messages.

EXAMPLE

1 *by phone* 2 *writing*

- 2** Identify the devices used in telecommunications in pictures A–F.

- 3** Work in pairs. Choose one device each and explain to your partner what it does.

EXAMPLE

A *I'll choose the space satellite.*

B *OK. What does it do?*

A *It follows an orbit in space. Some satellites help communication and others provide information ...*



In this unit

- key terms in telecommunications
- Past Simple v Present Perfect
- listening and reading for detail
- making simple explanations
- hearing the difference: Past Simple v Present Perfect

It's my job

- 1 Listen to Todd McArthur, a Telecommunications Technician. Note the following things.

- 1 the number of years he has worked for his company
- 2 as many items of telecommunications equipment as you can
- 3 as many country names as you can
- 4 the meaning of VoIP

- 2 Listen again and answer the questions.

- 1 Where did he first learn about telecommunications?
- 2 Name a change he has experienced in telecommunications.
- 3 Why is his job now much more about brain than muscle?
- 4 What does he like most about his job?
- 5 What does he not like?

Language spot**Past Simple v Present Perfect**

● Study these examples from *It's my job*. Why is the Past Simple used for sentences 1–3 and the Present Perfect for sentences 4–6?

- 1 *I was in the army for four years.*
- 2 *I joined when I left school.*
- 3 *I travelled quite a lot.*
- 4 *I've been with the company for eight years.*
- 5 *I've been to Norway, Kenya, and Belize.*
- 6 *I've seen quite a few changes in phone systems.*

● We use the Past Simple for things that happened at a particular time in the past or during a period that ended in the past:

I travelled a lot when I was in the army.

● We use the Present Perfect to talk about past experiences but not when they happened:

I've been to the USA.

● We use the Present Perfect for actions which happened during a period from the past to the present: *He's worked as a technician for eight years. (He's still a technician.)*

● We often start a topic using the Present Perfect and then switch to the Past Simple:

A *Have you ever been to Norway?*

B *Yes, I went there in 2001.*

» Go to **Grammar reference p.121**

- 1 Complete the text about developments in radio and television. Put the verbs in brackets in the correct form: Past Simple or Present Perfect.

In just over a hundred years, radio _____¹ (develop) into a major form of entertainment and communication. Marconi _____² (invent) a wireless telegraph system in 1896. This _____³ (be) the birth of radio. Voice transmission _____⁴ (start) in 1909 following the invention of the valve. Semiconductors _____⁵ (make) it possible to develop much smaller, portable radios. The introduction in recent years of digital radios _____⁶ (allow) us to enjoy much better sound quality.

There _____⁷ (be) many changes in television too. In the UK, the BBC _____⁸ (start) daily TV broadcasts in 1936. Colour broadcasts _____⁹ (begin) in the late 1960s. Since the 1970s satellite broadcasting _____¹⁰ (allow) viewers a wider choice of programmes. The recent introduction of digital TV _____¹¹ (mean) better picture and sound quality. Manufacturers _____ now _____¹² (develop) entertainment systems which include television, radio, DVD recorder / player, and computer. The Internet

_____¹³ (make) it possible to enjoy radio and television from around the world on our PCs.





Gadget box

Japan's DoCoMo network allows users of 3G mobiles to use their phones as electronic wallets. The phone acts as a credit card. When the phone is passed over a special reader, it can pay for things and allow money to be withdrawn from a cash machine. As well as password protection, some phones using the system have a fingerprint scanner.

Why do you think a fingerprint scanner is useful with this system?

2 Choose the correct alternative.

- Interviewer** How long *have you been / were you*¹ a Telecommunications Technician?
- Todd** About ten years. I *have trained / trained*² in Signals when I was in the army.
- Interviewer** How long *have you been / were you*³ in the army?
- Todd** I *have served / served*⁴ for four years. Then I *have joined / joined*⁵ this company about eight years ago.
- Interviewer** *Have you seen / Did you see*⁶ many changes during this time?
- Todd** Yes, *we've replaced / we replaced*⁷ copper lines with fibre-optic cables and *we've introduced / we introduced*⁸ VoIP phone systems.

Pronunciation

Past Simple v Present Perfect

🔊 Study these pairs of sentences. You are going to hear one of each pair. Tick (✓) the one you hear.

- a They've spent time in the army.

b They spent time in the army.
- a I've texted him an invitation.

b I texted him an invitation.
- a He faxed me a reply.

b He's faxed me a reply.
- a Todd's phoned the office.

b Todd phoned the office.
- a She emailed me twice.

b She's emailed me twice.

Speaking

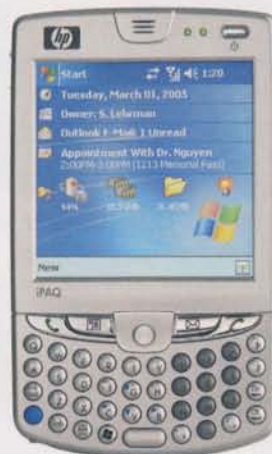
Mobile phones

Work in pairs, A and B. Each of you has information about a mobile phone. Find out the information you need to complete this table by asking each other.

Student A Go to p.113.

Student B

	A	B
Make		HP
Model		iPaq hw6510 Mobile Messenger
Keyboard type		full Qwerty
Screen		3 inch, 64K
Software		Windows Mobile 2003
Other features		GPS satellite navigation
		Bluetooth
		voice control, SMS (text) and MMS (picture) messaging
Email		instant messaging



First telegraph message, 1844: *What hath God wrought?*
 ('What has God done?') Samuel Morse
 First telephone message, 1876: *Mr Watson, come here, I
 want you.* Alexander Graham Bell
 First email message, 1971: test signal, not preserved.

Reading

VoIP phone systems

- 1 Work in pairs and answer the questions. Then read the text and check your answers.
- 1 What does VoIP stand for?
 - 2 What is a *packet*?
 - 3 What is a *wireless hotspot*?

How VoIP phone systems work

VoIP (Voice over Internet Protocol) phone systems work by sending data via the Internet in tiny packets. This is called packet switching. It works like this:

- 1 Your voice signal, which is analogue, is converted into digital data. If you have a standard phone, you need an extra piece of hardware to do this called an ATA (Analogue telephone adaptor). If you have an IP phone, it produces a digital signal so you don't need an adaptor. You can also use your PC and a microphone as a telephone.
- 2 The sending computer uses software to compress the digital data, much like MP3 files.
- 3 The data is divided into packets, each one 30 milliseconds long.
- 4 The packets are sent to a router which decides the best path through the Internet for each packet. They will travel by many different paths. They will arrive at different times and some may even be lost.
- 5 The receiving computer uses special software to store the packets and put them in the right order. Because the packets are so small, you won't hear the difference if some are lost.
- 6 The data is converted back to voice and played through your standard phone, IP phone, or PC headphones.

If you have a wireless VoIP handset, you can make and receive calls anywhere near a wireless hotspot. Some mobile phones are dual-mode. You can use a mobile phone network or wireless VoIP, depending where you are.

- 2 Put the steps in the correct order to make a flowchart showing how this type of VoIP phone system works.
- a The packets are sent to a router.
 - b The digital data is compressed by the sending computer.
 - c The data is converted back to voice.
 - d The receiving computer puts the packets back together again.
 - e The voice signal is converted to digital.
 - f The digital data is divided into very small packets.
 - g The router sends each packet through the Internet by the best available path.

1 e 3 5 7
 2 4 6



geosynchronous (adj) describing satellites which orbit at the same speed as the earth but may not be above the equator. Some have figure-of-eight orbits.

Customer care

Explaining in simple terms



1 Like Todd McArthur, you may have to explain to clients in simple terms a process, or what a device is for and how it works. Work in pairs, A and B. Find out more about your device or process, then explain it in simple terms to your partner.

Student A the difference between analog and digital signals

Student B the difference between DVDs and CDs

Useful language

Basically...

In general...

To put it simply...

In very simple terms...

The main thing is...

These sites may help:

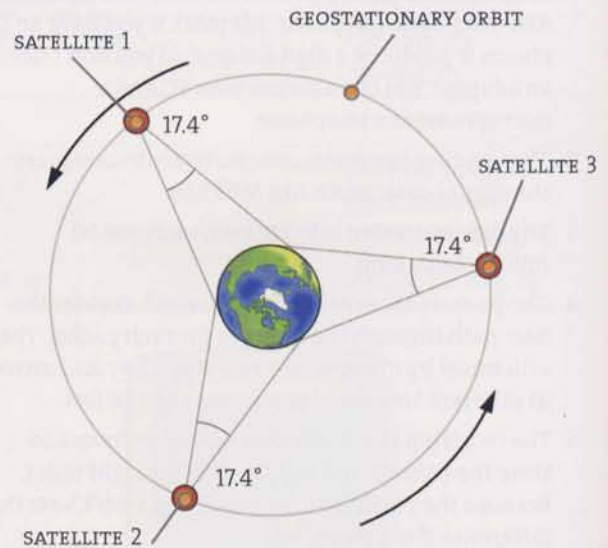
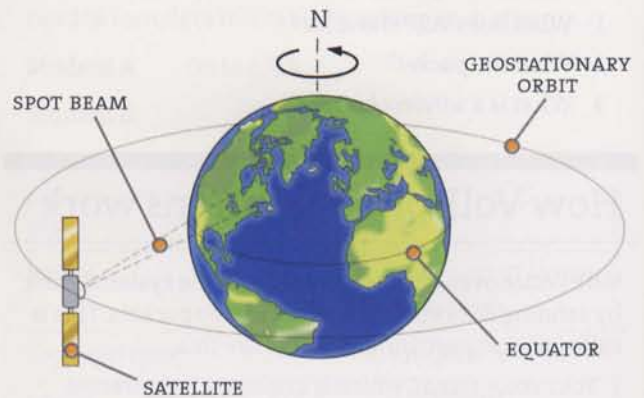
- www.howstuffworks.com
- www.wikipedia.org

2 Now listen to a native speaker explaining the differences. Compare your explanation with his. What differences can you find in the language used and the points made?

Webquest

Satellite communications systems

1 Study the diagrams which explain geostationary orbit. Then answer questions 1–4.



- 1 How long does a satellite in geostationary orbit take to rotate round the earth?
- 2 How many satellites in geostationary orbit are required to provide global coverage?
- 3 Why is it an advantage to launch geostationary satellites from countries near the Equator?
- 4 What are communications satellites used for?

Technology

2 Study the information about Milstar.

System	Milstar
Used for	US military communications
Number of satellites	5
Altitude	41,200 km
Orbit	geosynchronous
Coverage	global

3 Find out similar information about one of these satellite communication systems and complete the form below.

- SES Astra
- Eutelsat
- Worldspace

System	
Used for	
Number of satellites	
Altitude	
Orbit	
Coverage	

These sites may help:

- www.wikipedia.org
- www.eutelsat.com
- www.ses-astra.com
- www.worldspace.com



Checklist

Assess your progress in this unit. Tick (✓) the statements which are true.

- I know key terms in telecommunications
- I understand the difference: Past Simple v Present Perfect
- I can make simple explanations of technical terms and devices
- I can hear the difference: Past Simple v Present Perfect
- My reading and listening are good enough to understand most of each text in this unit

Key words

Adjectives
compatible
complex

Adverb
in orbit

Nouns
adaptor
antenna
computer file
dish
network
router
satellite
screen
semiconductor
wireless hotspot

Verbs
compress (data)
replace

Note here anything about how English is used in technology that is **new** to you.