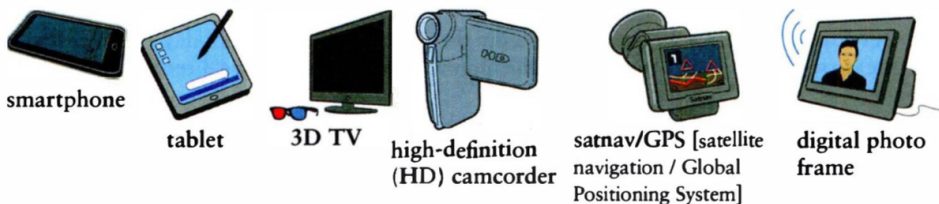# 32 Science and technology

A New sciences

You are probably familiar with the **traditional branches** of science, e.g. chemistry, physics, botany and zoology. But what about these more recently established fields?

field	definition / applications
genetic engineering	Works with genetic material (DNA) of living things to alter[1] features[2]. GM foods (genetically modified foods) are grown in some parts of the world.
ergonomics	Studies the design of physical working spaces and how people interact[3] with them.
molecular biology	The study of the structure[4] and function[5] of the molecules[6] associated[7] with living things.
voice technology	Technology which enables[8] machines to interpret[9] speech, e.g. voice-to-text software.
stem cell research	The study of the use of human cells[10] to treat diseases and injury and to repair the body.
cloning	The creation[11] of exact copies of plants or animals with the same genes as the original plants or animals.
hydroponics	The science of growing plants without using soil[12].

[1] change, usually slightly   [2] typical qualities or important parts   [3] communicate with or react to   [4] the way that parts of a system are organised   [5] purpose   [6] the basic chemical units / groups of atoms   [7] connected in our mind   [8] makes possible   [9] decide the intended meaning of   [10] smallest basic part of a plant or animal   [11] making something new that did not exist before   [12] the top layer of the earth's surface, in which plants grow

B Everyday technology

smartphone   tablet   3D TV   high-definition (HD) camcorder   satnav/GPS [satellite navigation / Global Positioning System]   digital photo frame

C Verbs used in science and technology

Note the collocations in bold.
He **experimented** with different materials before **utilising**[1] the most suitable one.
The technician **pressed a button** and lights started **flashing**.
When she **pulled** the large **lever**[2], the wheel began to **rotate**[3].
The zoologist **dissected**[4] the animal and **extracted**[5] its organs.
When they were **combined**, the two chemicals **reacted** violently with each other.
After **analysing** the problem, she **concluded** that there was a **flaw**[6] in the theory.
Insert[7] the disk into the DVD drive to **install**[8] the software.

[1] use (*fml* technical/scientific)   [2] bar or handle that moves in order to control something (e.g. a machine)   [3] turn (*fml* technical/scientific)   [4] cut open (usually a dead body or plant) to study its parts   [5] took out (*fml* technical/scientific)   [6] fault, mistake or weakness   [7] put in (*fml* technical/scientific)   [8] make it ready to use

Exercises

32.1 Fill the gaps with words from A. Then say what branch of science each person is probably talking about.

1 We grow the plants in liquids, without using s**oil**.......... . Science: ..**hydroponics**....
2 The software i................ your speech and e................ you to turn it into text. Science: ....
3 We're interested in workplaces and how people i................ with their working environment. Science: ....
4 People are often worried. They feel that the c................ of an exact copy of an animal is not morally right. Science: ....
5 We study how human c................ can be used to rebuild our bodies and to repair them when they are injured. Science: ....
6 My work is concerned with the s................ and f................ of the organic molecules a................ with living organisms. Science: ....
7 Many people refuse to eat g................ m................ foods. They consider GM foods to be unnatural. Science: ....
8 By manipulating DNA, we can a................ hereditary f................ . Science: ....

32.2 What item do you think each person needs from B?

1 'I keep losing my way and I'm not good at reading maps.' Needs: ..**a satnav**......
2 'My phone is so old I can't take any videos with it.' Needs: ....
3 'I'd love to be able to look at my photos any time I want to.' Needs: ....
4 'My old camcorder doesn't produce really sharp movies.' Needs: ....
5 'It was a fantastic film. I didn't mind wearing the special glasses. It was so realistic. I'd love to be able to do that at home.' Needs: ....
6 'I want something like a laptop with a touch screen that I can watch films on or read e-books.' Needs: ....

32.3 Match the sentence beginnings on the left with the endings on the right.

1 These chemicals	c	a that button, it turns the printer on.
2 If you pull	☐	b to flash after a few seconds.
3 The zoologist extracted	☐	c react with each other.
4 When you press	☐	d in the theory.
5 They experimented	☐	e that lever, it starts the machine.
6 I believe there is a flaw	☐	f the animal to see why it died.
7 They had to dissect	☐	g the organs from the animal.
8 A red light started	☐	h with different liquids.

32.4 Use technical/scientific words from C instead of the words in bold.

1 The wheel began to ~~turn~~ ..**rotate**........ very quickly.
2 **Put in** .... the disk to get the software ready to work ....
3 We can put these chemicals together ....
4 You should **use** .... the strongest material.
5 We looked into .... the problem and decided .... that it was a computer virus.

33 Computers

A Hardware [computer equipment or machinery]

personal computer / PC / desktop computer: a computer that fits on a desk, used by individuals at work or at home

laptop (computer): a lightweight portable computer that usually fits in a briefcase

tablet: a portable personal computer operated by a touch screen

hard disk: a device [piece of equipment] inside a computer that stores large amounts of information

disk drive: a device that allows information to be read from a disk or stored

scanner: device for transferring pictures and texts into a computer

memory stick: a small device that lets you carry computer data anywhere conveniently; you can then **plug** the stick **into** any machine.

RAM (random access memory / memory): the memory available on a computer to store and use information temporarily; can be measured in gigabytes

(micro)chip: a very small piece of semiconductor, especially in a computer, that contains extremely small electronic circuits and devices, and can perform particular operations

network: when a number of computers, for example, in one office, are connected together (or **networked**) so that they can share information

B Software [computer programs that you install]

An **application** is a piece of software designed for a specific purpose. This is often shortened to **app**. You can get mobile phone apps for all sorts of things these days.

word-processing: writing and storing printed text on a computer

spreadsheet (program): a program, or the grid you create with it, to perform mathematical operations

database: a large amount of information stored in a computer system in such a way that it can be easily looked at or changed

(computer) graphics: pictures, images, and symbols that you can form on a computer

virus: hidden instructions in a program designed to destroy information

display: what you see on the screen of an electronic device

A computer shows a range of **icons** on its display. You put the **cursor** on the one you want to use and click on it to open it.

C Some computing verbs

You probably **store** a lot of important information on your computer. So, it's sensible to **back up** all your files on a regular basis. Then it'll be less of a problem if you **delete** something accidentally or if your computer **crashes**.

A particularly useful feature of most applications is the one that allows you to **undo** what you have just done – just **click** on Undo and it's quick and easy to correct anything that you have **keyed in** by mistake.
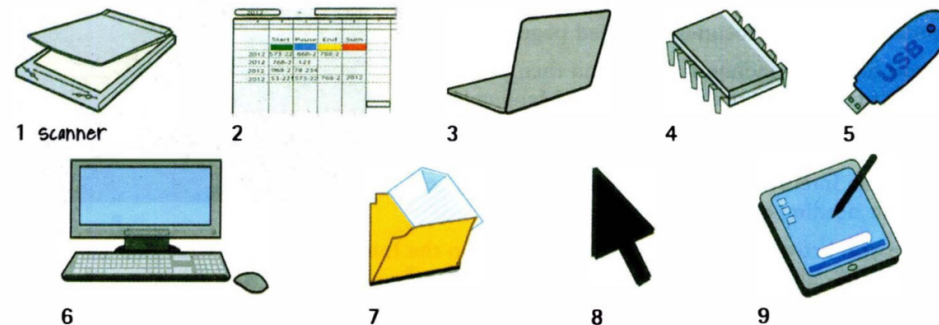
After a few years you may want to **upgrade** your computer as they are always developing machines which are faster and more powerful. If you don't do this you may not be able to **run** all the software you need. You can usually just **download** upgrades to your computer's operating system or to your applications from company websites.

3.1 Match the words in the box to the pictures below.

| laptop | desktop computer | tablet | icon | ~~scanner~~ | memory stick | microchip |
| cursor | spreadsheet | | | | | |

1 scanner 2 3 4 5
6 7 8 9

3.2 Fill in the blanks with appropriate words from the opposite page.

1 It's so easy to use a ...**scanner**...... when you want to send a handwritten document to someone by email. It's just like using a photocopier.
2 I've lost a lot of data. I wonder if my computer has a ....
3 I'm always impressed by people who carry their .... on aeroplanes and work on them during the flight.
4 I've got such a lot of photos, music and videos stored on my computer that my .... is almost full.
5 That computer game you gave me has got amazing .... – the people just look so realistic!
6 One of my most important tasks at work is to keep the .... up to date so that customers' contact details are always accurate.
7 If you put the .... in the middle of a paragraph of text and double click, you select the whole paragraph.
8 I downloaded a fantastic .... the other day – it tells me where the nearest cash machine is to wherever I am in the world.
9 .... programs make it very easy to write text and to format it.
10 It's miraculous how much data can be stored on that tiny little computer .... inside your mobile phone.

3.3 Answer the questions using a verb from C opposite.

1 What do you do when you want to add new information to, for example, a database?
You key it in.
2 If you don't want to lose computer data, what must you do?
3 If you notice you've repeated a paragraph in an essay, what can you do?
4 You want to open your spreadsheet program, so what should you do?
5 If your computer is old and working very slowly, what might you consider doing?
6 If you accidentally delete some text you've just been working on, what can you do?
7 What can you do to immediately get hold of music or a film from an internet store?
8 If you buy new software when you have an old operating system, what may you find?

A The Internet

The Internet / the net is a network connecting millions of computer users worldwide. The World Wide Web / the Web is a huge portion of the Internet containing linked documents, called pages.

If you have a broadband connection then your access to the Internet should be fast. Many cafés and other public places now offer people a wi-fi /waɪfaɪ/ connection to the Internet – this means that you can access the Internet through a wireless network, i.e. without needing a cable of any kind.

When you browse, you look for information on the Internet. The software that helps you do this can be called a browser (e.g. Internet Explorer® or Firefox®). You use a search engine to help you locate what you want. Google® is one of the best known search engines and people now talk about googling someone or something. You can easily spend a lot of time surfing the net / the Web. [navigating around the Internet, sometimes aimlessly]

A website is a document on the Web giving information about a particular subject, person or institution. The introductory page is called the home page. From this there are links to other pages. Good websites are easy to navigate or find your way around. One option on many websites is an FAQ page. This stands for 'frequently asked questions', a list of common questions and helpful answers. You can bookmark websites that you log on[1] to frequently. If a website gets a lot of hits, that means that it has been visited by a lot of people.

Sometimes you need to subscribe to a site, which means you become a member of it. This may involve having a special username and choosing a password. You will only be able to log in[2] to the site if you enter this information correctly.

[1] opp = log off   [2] opp = log out

B Online communication

| Home | Links | News | Help |

You can communicate with others by email. With an email you can include an **attachment**. You can **attach** a photo, for example. You can also send someone an **e-card**. A **server** is a powerful central computer from which other computers get information. If your **(ISP) internet service provider**'s server is **down** [not functioning], you may not be able to send emails.

You can use your computer to **Skype** friends and family – the software allows you to make phone calls using your computer and the Internet, and you can see which people on your **contact list** are online at the same time. If you each have a **webcam**, you can see each other as you talk.

Many modern online programs can be called **interactive**, i.e. they allow users to become involved in the exchange of information. For example, **social networking** sites like Facebook are a popular way for people to keep in touch with their friends.

A **wiki** is a website which allows users to add, delete and edit its contents. Wikipedia is perhaps the world's largest wiki. **Blogs** are also interactive as they are a kind of online diary that readers can add comments to. Many people are involved in **online gaming**, playing with people who they have never met. Often these games make use of **virtual reality**. [a set of images and sounds produced by a computer, which represent a place or a situation that the gamer can take part in]

34.1 Which word from the box matches each definition?

| attachment | bookmark | browser | ~~contact list~~ | navigate | internet service provider |
| password | search engine | server | | | |

1 email addresses, phone numbers, etc. for the people you know ...contact list...
2 something that you send with an email ....
3 an individual combination of letters and digits that you use to log in to a website ....
4 a way of accessing a favourite website quickly ....
5 software that allows you to surf the web ....
6 a company that enables you to use the web ....
7 software that helps you to locate the websites that you need ....
8 a large computer that holds information that can be accessed by smaller computers ....
9 to find your way around a website or between websites ....

34.2 Choose a word from the opposite page to complete each sentence.

1 WWW stands for World Wide ..web........ .
2 I read that journalist's .... every day – he's always got something interesting to say and often readers add some very interesting comments.
3 I couldn't .... the Internet last night. The server must have been ....
4 It's wonderful being able to .... my cousins who live in Australia – I love seeing them as well as talking to them.
5 I've decided to .... to my favourite newspaper's website. It doesn't cost much and it has lots of interesting stuff there.
6 I like this website because it has lots of very useful .... to all sorts of other sites that interest me.
7 My brother loves online gaming, particularly .... reality games.
8 An .... website is one which allows users to add comments to it or edit its content in some way.

34.3 Are these statements true or false? If they are not true, correct them.

1 Google® is the name of a browser. False – Google is the name of a search engine.
2 FAQ stands for Fast Answers to Questions.
3 If a café says that it has wi-fi access, you can get online with your laptop there.
4 A wiki is a kind of computer device.
5 When you want to use some websites you may be asked to enter a password.
6 If you send someone an e-card they will receive it in the post.
7 When you want to stop using the net, you log on.
8 A website's home page is the one where you will find key information about the site and links to its other pages.

34.4

Over to you

Answer these questions about yourself.

1 What do you mainly use the Internet for?
2 What is your search engine of choice?
3 Which websites have you bookmarked?
4 How often do you use social networking sites?
5 Do you write a blog or read anyone else's blog?
6 Do you enjoy online gaming?