به نام خدا

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رشته‌ی کامپیوتر

گروه تحصیلی کامپیوتر

زمینه‌ی خدمات

شاخه‌ی آموزش فنی و حرفه‌ای

(اجرای آزمایشی)

قاسمی‌نژاد، بهرام، ۱۳۴۱ -

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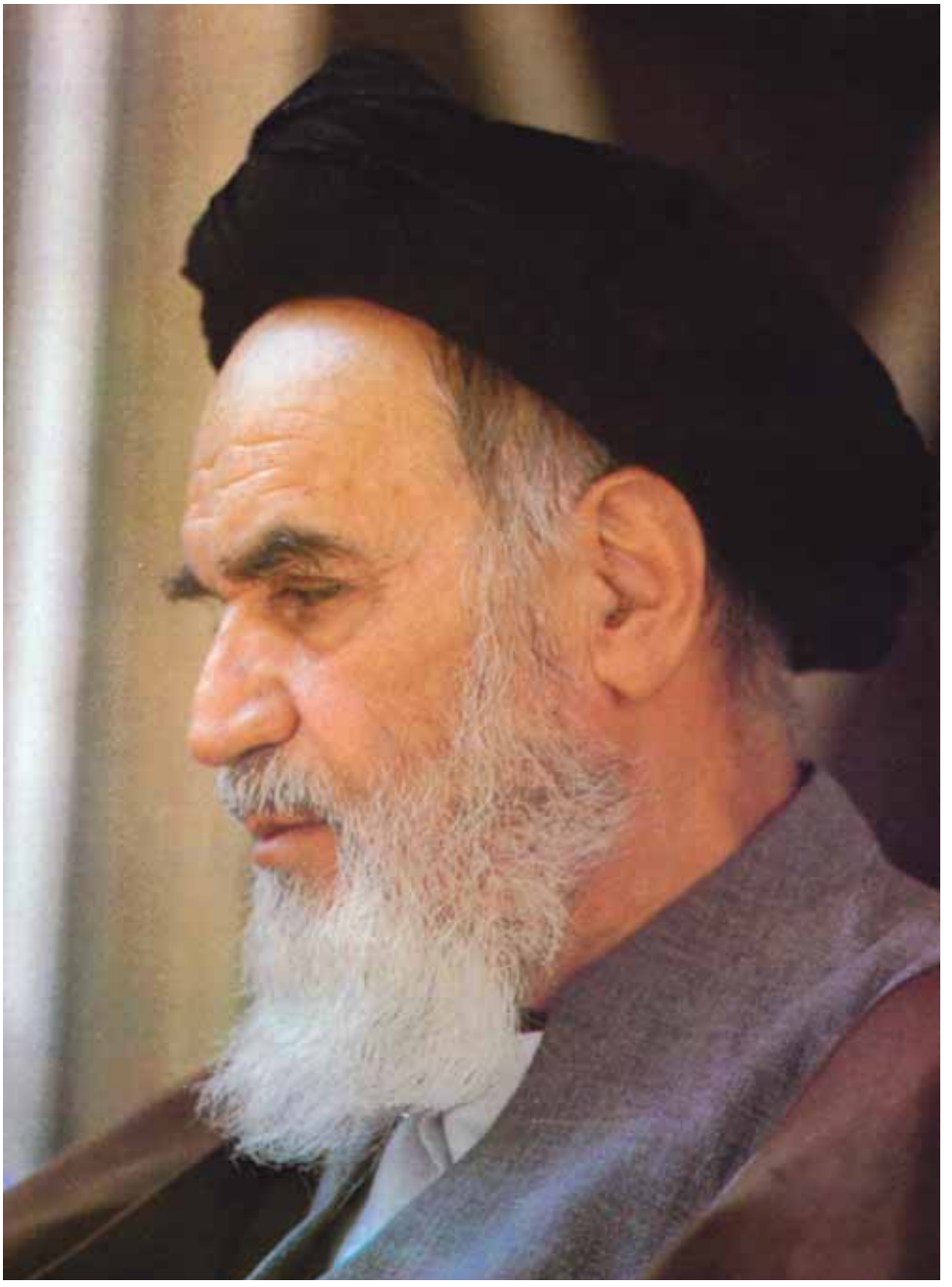
این کتاب به سفارش دفتر برنامه‌ریزی و تألیف آموزش‌های فنی و حرفه‌ای و کاردانش سازمان پژوهش و برنامه‌ریزی آموزشی وزارت آموزش و پرورش به‌وسیله‌ی مؤسسه فرهنگی فاطمی تألیف و پس از تصویب و تأیید دفتر مذکور به چاپ رسیده است.



بدانید مادام که در احتیاجات صنایع پیشرفته، دست خود را پیش دیگران دراز کنید و به دریوزگی عمر را بگذرانید، قدرت ابتکار و پیشرفت در اختراعات در شما شکوفا نخواهد شد.

امام خمینی «قدّس السرّه الشّریف»

Contents

پیشگفتار ناشر

آغاز هزاره‌ی جدید با ظهور فناوری نوین اطلاعات و ارتباطات، عصر اطلاعات نامیده شده و کلیه‌ی شئون فرهنگی و اقتصادی را تحت تأثیر قرار داده است. این فناوری به‌عنوان ابزاری توانمندکننده و برابرساز فرصت‌های جدیدی را فراهم کرده است تا بتوانیم با شتاب بیشتری در مسیر توسعه گام برداریم.

جوانان ترقی‌خواه با دستیابی به این فناوری نوین، ضمن آموزش و کسب مهارت‌های فنی و حرفه‌ای لازم، می‌توانند نقش ویژه‌ای را در مسیر توسعه ایفا نمایند.

از این رو برنامه‌های آموزشی وزارت آموزش و پرورش در شاخه‌ی فنی و حرفه‌ای توانمندسازی دانش‌آموزان در رشته‌ی کامپیوتر را با توجه به رویکردهای نوین عصر اطلاعات، هدف قرار داده است.

بدیهی است که یکی از وسایل مهم آموزش، کتاب است. وزارت آموزش و پرورش کشورمان با ابتکاری جدید، تألیف کتاب‌های آموزش کامپیوتر توسط مؤلفان متعدد با مساعی ناشران بخش خصوصی را در دستور کار و در عرصه‌ی رقابت قرار داده است که این امر از جهات گوناگون نویدبخش و ارزشمند است و امید است که افق‌ها و دریچه‌های جدیدی را به‌روی دانش‌آموزان کشور بگشاید تا نسل جوان پرشور و پرتوان به‌سوی آینده‌ای نویدبخش گام بردارند.

مؤسسه انتشارات فاطمی، در راستای رسیدن به این هدف، طی موافقت‌نامه‌ی همکاری با سازمان پژوهش و برنامه‌ریزی آموزشی تألیف تعدادی از این کتاب‌ها را برعهده گرفت و کار تألیف و تولید مطابق با راهنمای برنامه‌ی درسی و اصول تدوین محتوای کتاب‌های درسی که از طرف دفتر برنامه‌ریزی و تألیف آموزش‌های فنی و حرفه‌ای در اختیار این مؤسسه

قرار گرفت، به‌انجام رسید. این کتاب‌ها پس از تألیف چندین بار به‌وسیله‌ی کارشناسان محترم دفتر برنامه‌ریزی و تألیف آموزش‌های فنی و حرفه‌ای از نظر محتوا و ساختار مورد بررسی و تجدیدنظر قرار گرفته است. امید است این کتاب‌ها که برای اولین بار مورد استفاده‌ی دانش‌آموزان عزیز قرار می‌گیرد مورد توجه آنان واقع شود. از دریافت اظهار نظرهای سازنده‌ی دبیران و کارشناسان محترم و دانش‌آموزان عزیز پیشاپیش سپاسگزاری می‌شود و در چاپ‌های بعدی نسبت به رفع کمبودها و نقایص احتمالی اقدام خواهد شد.

مؤسسه انتشارات فاطمی

پیشگفتار مؤلف

زبان انگلیسی در دنیای امروز، به‌ویژه در رشته‌ی کامپیوتر، نیازی اساسی است و هنرجوی این رشته باید بتواند هنگام کار با کامپیوتر مفهوم عباراتی را که با آنها مواجه می‌شود به‌خوبی درک کند. امروزه، به کسی که دانش کار با کامپیوتر را دارد computer-literate یا باسواد از نظر کار با کامپیوتر گفته می‌شود. بدیهی است برای داشتن سواد کامپیوتر، آشنایی با زبان تخصصی این رشته از اهمیت ویژه‌ای برخوردار است.

این کتاب برای هنرجویان رشته‌ی کامپیوتر در ۱۲ درس تنظیم شده که هر درس شامل چهار بخش است. پیش از هر درس، موضوع کلی، اهداف، و واژه‌های کلیدی معرفی شده است تا در یک نگاه، دید کلی از محتوای درس فراهم شود.

الف) Warm-up

هدف از این بخش ایجاد انگیزه از طریق تصویرها و پرسش‌هایی است که هنرجویان را به تفکر وامی‌دارد و بدین ترتیب زمینه‌ی لازم برای آغاز درس فراهم می‌شود.

ب) Reading

این بخش شامل متن‌هایی است که مجموعه‌ی آنها موضوع درس را تشکیل می‌دهد. در ابتدا، پرسش‌هایی برای تبادل نظر پیش از خواندن متن مطرح شده که منظور از آنها ایجاد آمادگی و زمینه‌سازی برای درک مطلب است. پس از هر متن، تمرین‌های متنوعی برای سنجش درک مطلب طراحی شده است که هر یک هدف خاصی را دنبال می‌کند. برخی از تمرین‌ها نیازمند درک کامل متن و برخی دیگر با هدف پیدا کردن اطلاعات خاصی در متن هستند.

به دلیل تخصصی بودن مطلب، گاه ممکن است متن‌ها به نظر دشوار بیایند، اما طبیعی است که میزان سختی متن‌های تخصصی کامپیوتر از سطح معینی نمی‌تواند پایین‌تر باشد. برای کمک به درک بهتر متن‌ها، واژه‌نامه‌ای (انگلیسی به فارسی) برای زبان عمومی، واژه‌نامه‌ای (انگلیسی به انگلیسی) برای زبان تخصصی، و فهرستی از اختصارات رایج در علم کامپیوتر (انگلیسی به انگلیسی) در انتهای کتاب آمده است. لازم به ذکر است که در واژه‌نامه‌ی انگلیسی به فارسی، برای هر واژه فقط معنی به کار رفته در کتاب عنوان شده است.

پ) Language Focus

در این بخش، نکته‌های خاصی برای درک متن‌های تخصصی ارائه شده است که به حدس زدن معنی واژه‌های جدید و بهبود مهارت خواندن کمک می‌کند. برای مثال، پیشوندهای رایج در متن‌های تخصصی کامپیوتر، مانند پیشوندِ multi- (چندـ) در واژه‌ی multimedia (چندرسانه‌ای)، یا واژه‌های ترکیبی جدیدی که در علم کامپیوتر روز به روز بر تعداد آنها افزوده می‌شود، مانند واژه‌ی netiquette (ادب اینترنتی یا رعایت ادب و نزاکت در محیط اینترنت) که از ترکیب دو واژه‌ی etiquette و Internet ساخته شده است.

به خاطر داشته باشید که هدف از این نکته‌ها تنها یادگیری چند واژه‌ی جدید نیست، بلکه هدف آشنایی با فرایند واژه‌سازی است، تا در آینده بتوانید معنی این گونه واژه‌ها را از ساختار خود واژه و یا از بافت متن حدس بزنید.

ت) Quiz

در این بخش، میزان یادگیری شما از مطالب هر درس با آزمون کوتاهی سنجیده می‌شود تا بتوانید به این وسیله خود را محک بزنید.

برای تنوع و تفنن، پس از آزمون کوتاه پایان هر درس، کاریکاتوری مرتبط با موضوع درس گذاشته شده تا هم به یادگیری کمک کند، هم خستگی شما را برطرف کند. در پایان هر درس، سایت‌هایی مربوط به موضوع درس با توضیح کوتاهی از محتویات آنها معرفی شده است. چنانچه مایل باشید اطلاعات بیشتری درباره‌ی هر یک از موضوع‌های مطرح شده پیدا کنید، می‌توانید به این سایت‌ها مراجعه کنید.

هنرجوی عزیز، امید است با به‌کارگیری توصیه‌های یادشده و انجام تمرین‌های این کتاب بتوانید بر دانش زبان تخصصی کامپیوتر خود بیافزایید، و این کتاب پایه‌ای باشد برای پیشرفت‌های روزافزون شما در علمی که دانستن زبان انگلیسی در آن بی‌تردید یک ضرورت است.

آموزگار گرامی، لطفاً انتقادات و پیشنهادات سازنده‌ی خود را از ما دریغ نکنید تا در اصلاحات بعدی از نظرات سودمند شما بهره‌مند شویم.

در پایان لازم می‌دانم از آقای هادی اصفهانی که در بازخوانی کتاب مرا یاری نمودند صمیمانه سپاسگزاری کنم.

بهرام قاسمی‌نژاد

هدف کلی

آشنایی با برخی از اصطلاحات تخصصی زبان انگلیسی در زمینه‌ی کامپیوتر و توانایی درک متون انگلیسی مرتبط و استفاده از help نرم‌افزارها

Unit 1

Computer Applications

Topic: Different uses of computers

Learning Objective:
- To understand computer applications in everyday life

Language Focus: Collocation

Abbreviations and Acronyms: ATM, CAD, PC, TV, VCR

Key Words: access, application, chip, data, database, document, email (electronic mail), interact, microchip, personal computer, real-time, technology, word processor

A. Warm-up

Computers have many applications in a great variety of fields. Look at these photographs of different situations. These are only a few computer applications in modern life. Can you think of any other applications?

B. Reading Comprehension

Reading 1

Read the following texts which are related to the computer applications in the pictures.

Computer Applications

1. Computers can help students perform mathematical operations and solve difficult problems. They can be used to access the Internet, teach courses such as CAD (computer-aided design), programming, language, mathematics, etc. PCs (personal computers) are also used for many other purposes: for example, schools use databases and word processors to keep records of students, teachers, and materials.

2. Race organizers and journalists rely on computers to provide them with the current positions of riders and teams. Workstations in the race buses provide the timing system and give up-to-the-minute timing information to TV stations. In the press room, several PCs give real-time information on the state of the race. Computer databases are also used in the drug-detecting tests for competitors.

3. Computers store information about the amount of money held by each client and enable staff to access large databases and to carry out financial transactions at high speed. They also control the ATMs (automatic teller machines) which, by the use of a personal coded card, give money to clients.

4. Airline pilots use computers to help them control the plane. For example, monitors display information about fuel consumption and weather conditions. In airport control towers, computers are used to manage radar systems and regulate air traffic. On the ground, airlines are connected to travel agencies by computer. Travel agents use computers to find about the availability of flights, prices, times, and many other details.

Activity 1

Try to guess the meanings of the words in Column A and match them with the closest meanings in Column B.

Column A	**Column B**
1. ___ word processor	**a.** data processed by a computer
2. ___ workstation	**b.** screen
3. ___ store	**c.** self-acting
4. ___ automatic	**d.** linked
5. ___ monitor	**e.** keep, save
6. ___ information	**f.** computer software or a computer used for writing
7. ___ connected	**g.** a computer that is part of a network and receives services

Reading 2

Three people are talking about how they use computers at work. Read the texts, and then follow the instructions in *Activity 2*.

Computer Users

1. I use my computer to do the usual office things like write memos, letters, faxes, and so on. But the thing which I find really useful is electronic mail. We are an international company, and we have

offices all over the world. We are linked up to all of them by email. With email, I can communicate with the offices around the world very efficiently. It has really changed my life.

2. I use computers for almost every aspect of my job. I use them to design electrical installations and lighting systems. For example, the program will tell you how much lighting you need for a particular room or how much cable you need, and it will show where the cable should go. I also use the computer to make drawings and to keep records.

3. I use computers to find information for people. Readers come in with a lot of questions. To find what they want, I use either our own database or the national database that we are connected to. They might want to know the address of a particular university or the list of a writer's books. We also use computers to record the books that readers borrow from the library.

Activity 2

Now fill in the blanks with the help of the texts above. Then write each speaker's job in the table below.

electrical engineer	secretary	librarian

Speaker	*I use my computer . . .*	*I'm a/an . . .*
1	to do the usual office things.	
2	to design electrical installations.	
3	to find information for people.	

Reading 3

Can you think of the differences between computers and human beings? Discuss the differences with other students, and then read the text and compare your answers.

Computers vs. Human Beings

A computer can solve a series of problems and make hundreds, even thousands, of logical decisions without becoming tired or bored. It can find the solution to a problem in a fraction of the time it takes a human being to do the job. A computer can replace people in dull, routine tasks, but it has no **creativity**; it works according to the instructions given to it and cannot make any decisions by itself. There are times when a computer seems to operate like a mechanical "brain," but its achievements are limited by the minds of human beings.

A computer cannot do anything unless a person tells it what to do and gives it the appropriate information. However, because electric pulses can move at the **speed** of light, a computer can carry out lots of mathematical operations in a very short time. A person can do everything a computer can do, but in many cases that person would be dead before the job was finished.

Activity 3

Decide if the following sentences are true (T) or false (F) according to the information in the text.

1. ____ A computer can make any type of decision by itself.

2. ____ Human beings can work much faster than computers if they want to.

3. ____ A computer's mechanical "brain" works exactly like the brain of a human being.

4. ____ Computers can work endlessly without having to stop to rest unless there is a breakdown.

Activity 4

Now try to match the words in Column A with their closest synonyms in Column B.

Column A	**Column B**
1. ____ solution	**a.** do
2. ____ dull	**b.** suitable
3. ____ task	**c.** answer
4. ____ appropriate	**d.** boring
5. ____ carry out	**e.** job

Reading 4

Read the text below and underline the applications.

What can computers do?

Computers and microchips have become part of our everyday lives: we visit shops and offices which have been designed with the help of computers, we read magazines which have been produced on computer, and we pay bills prepared by computers, etc. Just picking up a telephone and dialing a number involves the use of a sophisticated computer system, as does making a flight reservation or borrowing a book from a library.

Everyday, we see many computers that come to life the moment they are switched on – e.g. calculators, the timer in the microwave oven, or the programmer inside the TV set or the VCR (video cassette recorder) – all of which use chip technology.

Each time you turn your computer on, it is capable of doing anything you ask. It is an electronic filing cabinet which manages large collections of data such as customers' lists, accounts, and many other things. It is a magical typewriter that allows you to type and print any kind of document – letters, memos, and résumés. It is a personal communicator that enables you to interact with other computers and with people around the world. If you like electronic entertainment, you can even use your PC to play computer games.

Activity 5

In each pair of the following sentences, one sentence is wrong. Put a ✓ next to the correct sentences and a ✗ next to the wrong ones.

1. ____ **a.** Microchips are part of our daily lives.
____ **b.** Microchips are not part of our daily lives.

2. ____ **a.** TVs and VCRs use chip technology.
____ **b.** TVs and VCRs don't use chip technology.

3. ____ **a.** PCs can be used to interact with other computers and people.
____ **b.** PCs cannot be used to interact with other computers and people.

Activity 6

Match these words in Column A with their closest meanings in Column B.

Column A	**Column B**
1. ____ microchip	**a.** permit
2. ____ switch on	**b.** very small chip
3. ____ e.g.	**c.** turn on
4. ____ VCR	**d.** belonging to a person
5. ____ allow	**e.** make able
6. ____ personal	**f.** video cassette recorder
7. ____ enable	**g.** for example

C. Language Focus: *Collocation*

Collocation

Some words are used together regularly; that is, they can only appear in a particular combination. This regular combination of words is called collocation. You can improve your English to a great extent by learning collocations.

Examples:
to send an email
to download music
to play a computer game
to write a computer program

Pay attention to the collocations in the following sentences:

Examples:
– **A:** *Have you ever **sent an email**?*
B: Yes, I have.

– **A:** *Have you ever **written a computer program**?*
B: No, *I have never **written a computer program**.*

Activity 7

The following collocations are used a lot in computer texts. Match the verbs in Column A with the phrases in Column B.

Column A	**Column B**
1. ____ make	**a.** an email
2. ____ insert	**b.** an icon
3. ____ run	**c.** the Internet
4. ____ surf	**d.** a floppy disk
5. ____ send	**e.** a program
6. ____ click on	**f.** part of the text
7. ____ highlight	**g.** a backup copy

Activity 8

Have you ever done any of these with a computer? Pay attention to the collocations and answer the following questions with information about yourself writing *"Yes, I have."* or *"No, I have never . . . ."*

1. **to make a website**
   A: Have you ever **made** your own **website**?
   B: *Yes, I* _____.
   OR
   B: *No, I have never made my own* _____ .

2. **to play computer games**
   A: Have you ever **played** any **computer games**?
   B: *Yes, I* _____.
   OR
   B: *No, I have never* _____.

3. **to replace a hard disk**

   A: Have you ever **replaced a hard disk**?

   B: *Yes,* _____.

   OR

   B: *No,* _____.

4. **to fix a printer fault**

   A: Have you ever **fixed a printer fault**?

   B: *Yes,* _____.

   OR

   B: *No,* _____.

5. **to have a virus**

   A: Have you ever **had a virus**?

   B: *Yes,* _____.

   OR

   B: *No,* _____.

6. **to fit an expansion card**

   A: Have you ever **fitted an expansion card**?

   B: *Yes,* _____.

   OR

   B: *No,* _____.

7. **to send an email attachment**

   A: Have you ever **sent an email attachment**?

   B: *Yes,* _____.

   OR

   B: *No,* _____.

8. **to download music**

   A: Have you ever **downloaded music** from the Internet?

   B: *Yes,* _____.

   OR

   B: *No,* _____.

D. Quiz

Fill in the blanks in the following sentences with the words in the box to check your understanding of this unit.

chip	access	creativity	filing
real-time	television	data	document
personal computer		video cassette recorder	

1. PC is an abbreviation for _____.

2. TV is an abbreviation for _____.

3. VCR is an abbreviation for _____.

4. With the help of computers, you can easily _____ the Internet.

5. Computers give _____ information in important competitions.

6. In airplanes, monitors display _____ about fuel consumption and weather conditions.

7. The car's electronic ignition, the timer in the microwave oven, and many other things use _____ technology.

8. You can type and print any kind of _____ with the help of the computer.

9. Computers can replace people in routine tasks, but they have no _____.

10. A computer can be used as an electronic _____ cabinet which manages large collections of data.

For more information on computer applications in modern life, you can visit the following websites:

– *http://www.greatachievements.org/greatachievements/qa_8_1.html*
(information about the development of the computer)

– *http://encarta.msn.com/eLearning/techcomputing.asp*
(subjects related to technology and computing)

– *http://pclt.cis.yale.edu/pclt/*
(answers to questions from the new personal computer user)

– *http://www.gamesdomain.com/*
(information on computer games, answers to FAQs, downloads, and links to gaming sites)

– *http://www.pbs.org/nerds/*
(a timeline of the development of the personal computer and other resources)

Unit 2

What is a computer?

Topic: The elements of a computer system

Learning Objectives:
- To understand the basic structure of a computer system
- To recognize differences between types of computers
- To understand the value of different units of memory

Language Focus: Function of an item

Abbreviations and Acronyms: ASCII, CPU, GB, GHz, IBM, KB, MB, MHz

Key Words: bit (binary digit), byte, circuit, clock speed, configuration, desktop, device, diskette, handheld, input, keyboard, laptop, mainframe, memory, minicomputer, monitor, mouse, multitasking, output, palmtop, peripherals, port, portable, printer, pulse

A. Warm-up

Use the words below to label the elements of the computer system in *Figure 1*. Then check your answers with other students.

monitor	keyboard	printer	mouse	disk
drive	floppy disk			

Figure 1: A computer system

B. Reading Comprehension

Reading 1

What would you say if you were asked "What is a computer?" Discuss it with other students. Then read the text and compare your answer.

What is a computer?

Computers are electronic machines which can accept **data** in a certain form, **process** the data, and give the results of the processing in a specified format. Three basic steps are involved in the process. 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 *Figure 2*).

Information in the form of instructions and programs is known as **software**, and the electronic and mechanical parts that make up a computer system are called **hardware**. A standard computer system consists of three main hardware sections: the **central processing unit** (CPU), the **main memory**, and the **peripherals**.

Storage devices (floppy, hard, or optical disks) provide a permanent storage of both data and programs. **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 – modems, fax machines, optical drives, and scanners. These are the main physical units of a computer system. The way the physical units of a computer system are put together is generally known as the **configuration**.

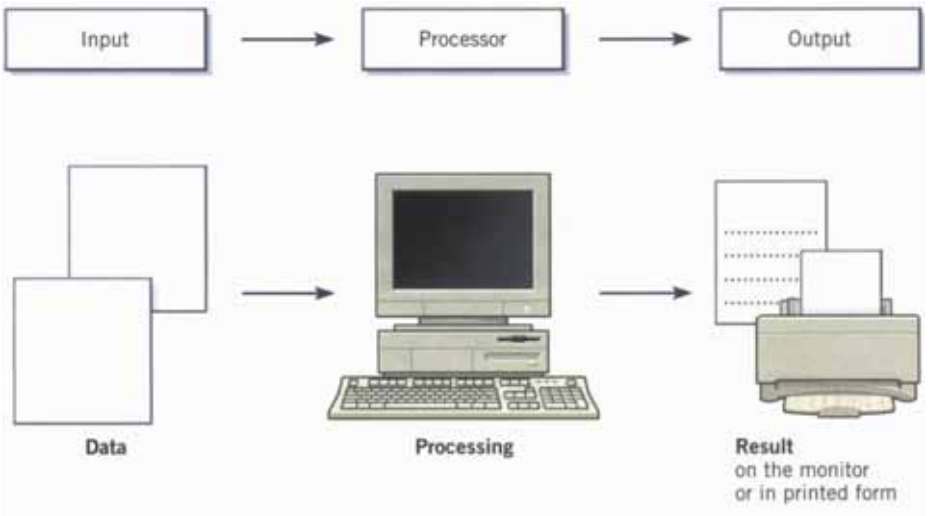


Figure 2: The function of a computer

Activity 1

Use the information in the text and *Figure 2* to help you match the terms in the box with the appropriate explanations or definitions below.

a. software	**b.** monitor	**c.** input	**d.** port
e. floppy disk	**f.** hardware	**g.** peripherals	**h.** output

1. _____ physical parts that make up a computer system

2. _____ programs which can be used on a particular computer system

3. _____ the data which is presented to the computer

4. _____ results produced by a computer

5. _____ hardware equipment attached to the computer system

6. _____ visual display unit

7. ____ small device used to store information; same as "diskette"

8. ____ any socket or channel in a computer system into which an input/output device may be connected

Reading 2

How many types of computer systems do you know? Read the following text and compare your answer.

Types of Computer Systems

Computers can be divided into four main types depending on their size and power. They are supercomputers, mainframes, minicomputers, and microcomputers.

Supercomputers are the largest and most powerful computers. They are capable of processing huge amounts of data in a short time. Supercomputers are very expensive and are used for scientific and engineering applications that must handle very large databases or do a great amount of computations such as animated graphics, petroleum exploration, and nuclear energy research.

Mainframes are also large and powerful, but not as large and powerful as supercomputers. The basic configuration of a mainframe consists of a central system which processes large amounts of data very quickly. This central system provides data and computing facilities for hundreds of terminals connected together in a network. Mainframes are usually used by large companies, factories, and universities.

Minicomputers are smaller and less powerful than mainframes. They can handle multitasking, that is, they can perform more than one task at the same time. Minicomputers are mainly used as file servers for terminals. Typical applications include academic computing, software engineering, and other sophisticated applications in which many users share resources.

Microcomputers carry out their processing on a single microchip. They are used as personal computers at home or as workstations for a group. Typical examples are the IBM PC or the Apple Macintosh.

Broadly speaking, there are two classes of microcomputers: (a) **desktop PCs**, which are designed to be placed on your desk, and (b) **portable PCs**, which can be carried. Some portable PCs are as small as a notebook (this is why they are called **notebooks** or **laptops**); some are even smaller and can be held in one hand (this is why they are called **handheld** computers or **palmtops**). Portable PCs are ideal for business people who travel a lot.

Activity 2

Choose the correct answer **a** or **b**, using the information in the text.

1. Which one of the following PCs is portable?
   a. desktops
   b. notebooks

2. What are two main classes of PCs?
   a. laptops and minicomputers
   b. desktop PCs and portable PCs

3. What are the smallest computers called?
   a. laptops
   b. palmtops

4. Computers are divided into different types _____.
   a. depending on their shape and price
   b. depending on their size and power

5. According to the text, _____.
   a. a mainframe is less powerful than a minicomputer
   b. a mainframe is more powerful than a minicomputer

6. Multitasking means _____.
   a. doing a number of tasks at the same time
   b. access to a minicomputer through terminals

Reading 3

Do you know the main components inside a PC system? Read the following text and check your answer.

What's inside a PC system?

The nerve center of a PC is the **central processing unit** or **CPU**. This unit is built into a single **microprocessor chip** which executes program instructions and supervises the computer's overall operation. One area where microprocessors differ is in the amount of data – the number of bits – that they can work with at a time. There are 16, 32, and 64-bit processors. A 64-bit processor is able to address 4 billion times more information than a 32-bit system.

The programs and data which pass through the central processor must be loaded onto the **main memory** (also called the internal memory)

in order to be processed. Thus, when the user runs an application, the microprocessor looks for it on **secondary storage devices** (disks) and transfers a copy of the application into the RAM area. **RAM** (random access memory) is temporary, i.e. its information is lost when the computer is turned off. However, **ROM** (read only memory) is permanent and contains instructions needed by the processor.

Most of today's computers have internal **expansion slots** that allow users to install adaptors or **expansion boards**. Popular adaptors include high-resolution graphics boards, memory expansion boards, and internal modems.

The power and performance of a computer is partly determined by the speed of its microprocessor. A **clock** provides pulses at fixed intervals to measure and synchronize circuits and units. The clock speed is measured in MHz (megahertz) or GHz (gigahertz) and refers to the frequency at which pulses are emitted. For example, a CPU running at 1,600 MHz (1,600 million cycles per second) will enable the computer to handle complex applications.

Activity 3

Decide if the following sentences are true (T) or false (F) according to the information in the text.

1. ____ The CPU directs and coordinates the activities taking place in the computer system.

2. ____ RAM, ROM, and secondary storage devices are components of the main memory.

3. ____ Information cannot be processed by the microprocessor if it is not loaded onto the main memory.

4. ____ "Permanent" storage of information is provided by RAM.

5. ____ The speed of the microprocessor is measured in gigahertz or megahertz.

Reading 4

What do you know about different units of memory? Are you familiar with bits, bytes, KB, MB, and GB? Read the text and check your answer.

Units of Memory

Bits – basic units of memory

Information is processed and stored in computers as electrical signals. A computer contains thousands of electronic circuits connected by switches that can only be in one of two possible states: ON (the current is flowing through the wire) or OFF (the current is not flowing through the wire). To represent these two conditions, we use **binary notation** in which 1 means ON and 0 means OFF. This is the only way a computer can "understand" anything. Everything about computers is based on this binary process. Each 1 or 0 is called a binary digit or bit (**b**inary + dig**it** → **bit**).

Bytes and Characters

1s and 0s are grouped into eight-digit codes that represent **characters** (letters, numbers, and symbols). Eight bits together are called a **byte**. Thus, each character in a keyboard has its own arrangement of eight bits. For example, 01000001 for the letter A, 01000010 for B, and 01000011 for C.

The ASCII Code

Most computers use a standard system for the binary representation of characters. This is the American Standard Code for Information Interchange, known as **ASCII** (pronounced "ask-key"). There are 256 different ways of combining 0 and 1 bits in a byte. So they can give us 256 different signals. However, the ASCII code only uses 128 codes to represent characters. The rest of the codes are used for other purposes. What makes this system powerful is that these codes are standard.

Kilobytes, Megabytes, and Gigabytes

In order to avoid astronomical figures and sums in the calculation of bytes, we use units such as **kilobytes**, **megabytes**, and **gigabytes**. One kilobyte is 1,024 bytes (2^{10}) and it is represented as KB, or more informally as K. One megabyte is equivalent to 1,024 KB, and one gigabyte is 1,024 MB. We use these units (KB, MB, GB) to describe the RAM memory, the storage capacity of disks, and the size of any document.

Activity 4

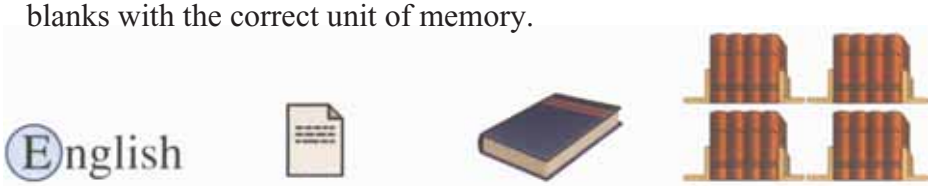
Fill in the blanks in the following sentences using the information in the text.

1. The only way computers can "understand" anything is by using binary _____.
2. Bits are 1s and 0s; in other words, they are _____ digits.
3. The digit "1" in binary notation means _____; that is, the current is flowing through the wire.

4. The digit "0" in binary notation means _____; that is, the current is not flowing through the wire.
5. A collection of eight bits is called a _____.
6. The ASCII system is powerful because its codes are _____.

Activity 5

Look at the illustrations and the captions below. Then fill in the blanks with the correct unit of memory.



1. One _____ represents one character.

2. One _____ represents 1,024 characters (about a small page of text).

3. One _____ represents 1,000,000 characters (about the text of this book).

4. One _____ represents 1,000,000,000 characters (about 1,000 books in a library).

Activity 6

What is your ideal computer system? Make notes about the features of the computer that you have or would like to have.

CPU: _____

Speed: _____

Minimum/Maximum RAM: _____

Hard Disk: _____

Optical Disk Drives: _____

Monitor: _____

Software: _____

C. Language Focus: *Function of an Item*

Function of an Item

It is important to know how the function of an item is expressed in computer texts because in such texts we usually read about how an item works and what its function is. One of the most common ways to describe the function of an item is this structure:

is/are used to + (verb)

Example:
*ROM **is used to hold** instructions which are needed to start up the computer.*

Activity 7

Match each **item** on the left with its **function** on the right, making sentences to express the function of each item.

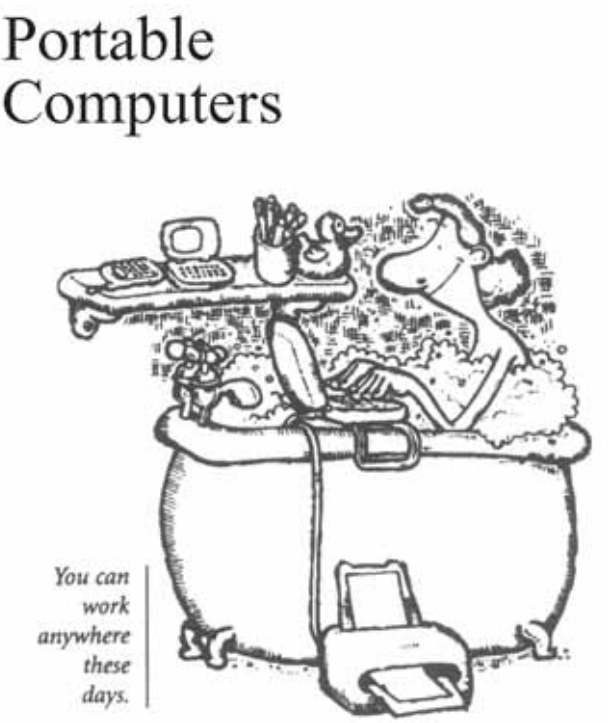
Item		Function
1. ___ Mouse **2.** ___ RAM **3.** ___ Monitor **4.** ___ CPU **5.** ___ 3.5" floppy drive **6.** ___ Keyboard **7.** ___ ROM **8.** ___ Modem **9.** ___ DVD-ROM drive **10.** ___ Clock	is used to	**a.** read DVD-ROMs. **b.** input data through keys like a typewriter. **c.** access the Internet. **d.** control the curser. **e.** read and write to removable magnetic disks. **f.** hold data read or written to it by the processor. **g.** execute all the operations in a computer. **h.** control the timing of signals in the computer. **i.** display the output from a computer on a screen. **j.** hold instructions which are needed to start up the computer.

D. Quiz

Fill in the blanks in the following sentences with the words in the box to check your understanding of this unit.

cycles	gigabyte	RAM
brain	digit	CPU
kilobyte	ROM	megabyte
input		

1. KB stands for _____.
2. MB stands for _____.
3. GB stands for _____.
4. The most common _____ devices are the mouse and the keyboard.
5. The word “bit” is made from the words binary and _____.
6. Instructions needed by the _____ are stored in the ROM section.
7. When the computer is switched off, _____ memory is lost.
8. It can be said that the CPU is the _____ of the computer.
9. A megahertz is equivalent to 1,000,000 _____ per second.
10. The _____ section is for storing data and programs permanently.



For more information on the basic features of computers, you can visit the following websites:

– *http://infocomp.csuchico.edu/metis/fundamental/start.htm*
(instructions on computer hardware and software, terminology, and history)

– *http://www.adita.com/literacy.htm*
(basic concepts about computers, such as bits and bytes, and the features of a "good" computer)

– *http://www.howstuffworks.com/computer-memory.htm*
(basic information about the different types of computer memory)

– *http://www.howstuffworks.com/ram.htm*
(basic information about RAM, including diagrams and photographs)

– *http://www.howstuffworks.com/rom.htm*
(basic information about ROM, including diagrams and links to related sites)

– *http://www.howstuffworks.com/bytes.htm*
(an explanation of the concepts underlying the units of information known as bits and bytes)

Unit 3

Hardware

Topic: The electronic and mechanical parts of a computer system

Learning Objectives:
- To understand the structure of the CPU and the functions of its different elements
- To distinguish between main memory and secondary storage devices
- To distinguish between different types of magnetic disks and drives
- To recognize different input devices

Language Focus: Comparison and contrast

Abbreviations and Acronyms: CD, CRT, DVD, HD, LCD, OS, PDA, RAM, ROM, rpm

Key Words: components, digital, floppy disk, hard disk, hardware, high density, microdrive, optical disk, pocket-sized drive, removable hard drive, storage capacity, storage devices

A. Warm-up

What do you know about the following terms? Read the text in *Reading 1* and check your answers.

hardware	software	CPU	RAM	ROM	peripherals

B. Reading Comprehension

Reading 1

Can you name the main hardware sections of a computer system? Discuss with other students. Then read the text and check your answers.

What is hardware?

A computer system consists of two parts: the **software** and the **hardware**. The software is the information in the form of data and program instructions. The hardware components are the electronic

and electromechanical parts of the system. The basic structure of the computer system is made up of three hardware sections: (a) the central processing unit or **CPU**, (b) the main memory, and (c) the **peripherals**.

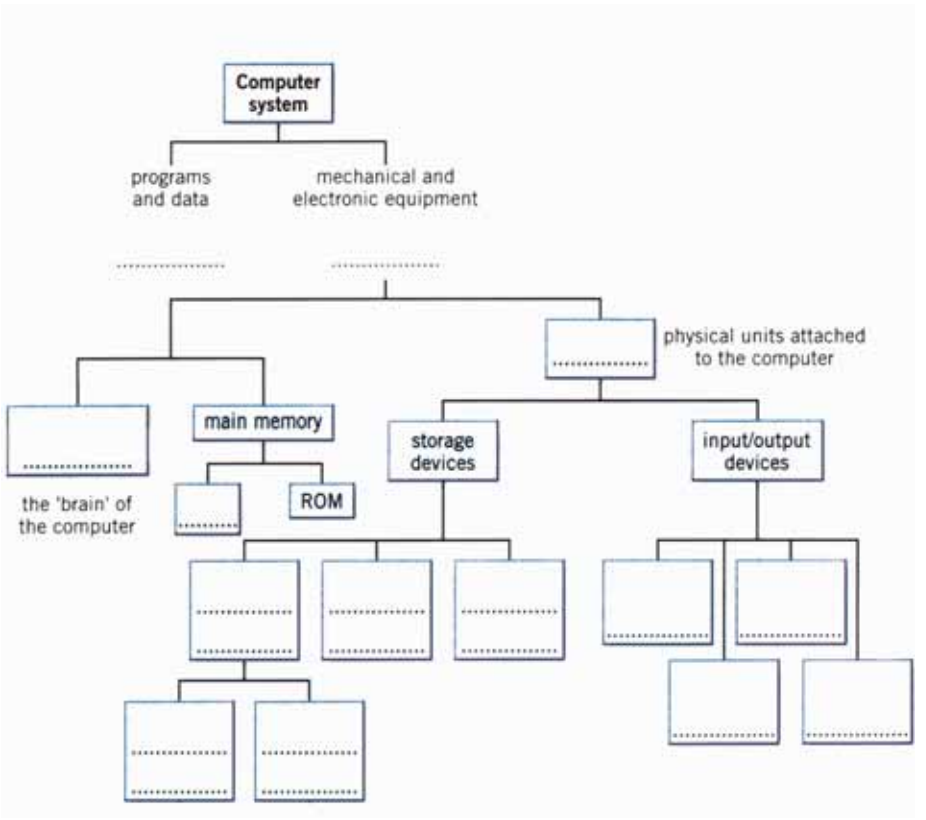
Perhaps the most influential component is the central processing unit. The CPU is a microprocessor chip which executes program instructions and coordinates the activities of all the other components. In a way, it is the "brain" of the computer. The main memory of a computer holds the instructions and data which are processed by the CPU. It is usually composed of two sections: **RAM** (random access memory) and ROM (read only memory).

The peripherals are the physical units attached to the computer. They include input/output devices as well as storage devices. Input devices, like the **keyboard** and the **mouse**, enable us to present information to the computer.

Output devices allow us to extract the results from the computer; for example, we can see the output on the **monitor** or in printed form by the **printer**. Secondary storage devices such as **floppy**, **hard**, and **optical disks** are used to store information permanently; for example, we use **CDs** and **DVDs** to store large amounts of information.

Activity 1

Label this diagram with the correct terms. The terms that you need are typed in **bold** in the text.



Activity 2

In each pair of the following sentences, one sentence is wrong. Put a ✓ next to the correct sentences and a ✗ next to the wrong ones.

1. ____ **a.** The CPU is a software component of the computer.

____ **b.** The CPU is a hardware component of the computer.

2. ____ **a.** The hardware components are information in the form of data and program instructions.

____ **b.** The software components are information in the form of data and program instructions.

3. ____ **a.** The keyboard and the mouse are output devices.

____ **b.** The keyboard and the mouse are input devices.

4. ____ **a.** CDs and DVDs are used to store only little information.

____ **b.** CDs and DVDs are used to store lots of information.

Activity 3

Look at the illustrations of different types of drives in *Figure 1* and find out:

1. the size of a floppy disk _____

2. the storage capacity of a high-density diskette _____

3. the name of a hard drive inside a PC _____

4. the storage capacity of a SyQuest cartridge _____

5. the system that can hold 10 GB of data on tape _____

6. a type of drive which is used by digital cameras and music players _____

Figure 1: Types of drives

Reading 2

Try to match the terms on the left with the explanations on the right. Read the text and check your answers.

1. ____ floppy	**a.** a catalog of where each piece of data is stored and how to find it
2. ____ disk drive	**b.** recording head
3. ____ formatting	**c.** diskette
4. ____ directory	**d.** setting tracks and sectors on magnetic disks
5. ____ read/write head	**e.** a device which spins disks and contains a read/write head

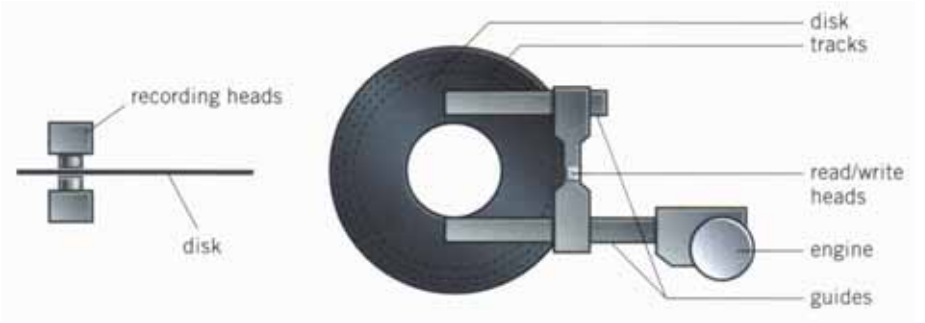
Magnetic Disks and Drives

Floppy disks are so called because they consist of flexible plastic material which has a magnetizable surface. The surface of a disk is divided into concentric circles or "tracks," which are then divided into "sectors." When you insert a blank disk into a drive, it must be formatted before information can be recorded onto it. This means that magnetic areas are created for each track and sector, along with a directory which will record the location of files.

When you save a file, the operating system (OS) moves the read/write heads of the disk 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 sectors, and reads the file into the RAM area.

Hard disks work in the same way as floppies. But they have important advantages: they can hold much more data and spin at higher speed, so you can store and retrieve information much faster than with floppies.

Another type of hard drive, known as "removable," allows you to record data on "cartridges," which can be removed and stored to be used later. Some systems allow you to back up your entire PC on one disk. Laptops use pocket-sized drives. Digital cameras and music players use micro drives with special cards.



A floppy disk drive spins at 360 rpm (revolutions per minute). A hard disk drive spins at 7,200 rpm and stores data on a stack of metal rotating disks, called platters.

Activity 4

Read these sentences and decide if they are true (T) or false (F) according to the information in the text.

1. ____ Hard drives are faster than floppy drives.

2. ____ Hard disks are rigid rotating disks.

3. ____ A hard drive is 20 times faster than a floppy disk drive.

4. ____ Removable cartridges are not transportable.

Reading 3

What is an input device? How many input devices do you know? Read the text and check your answers.

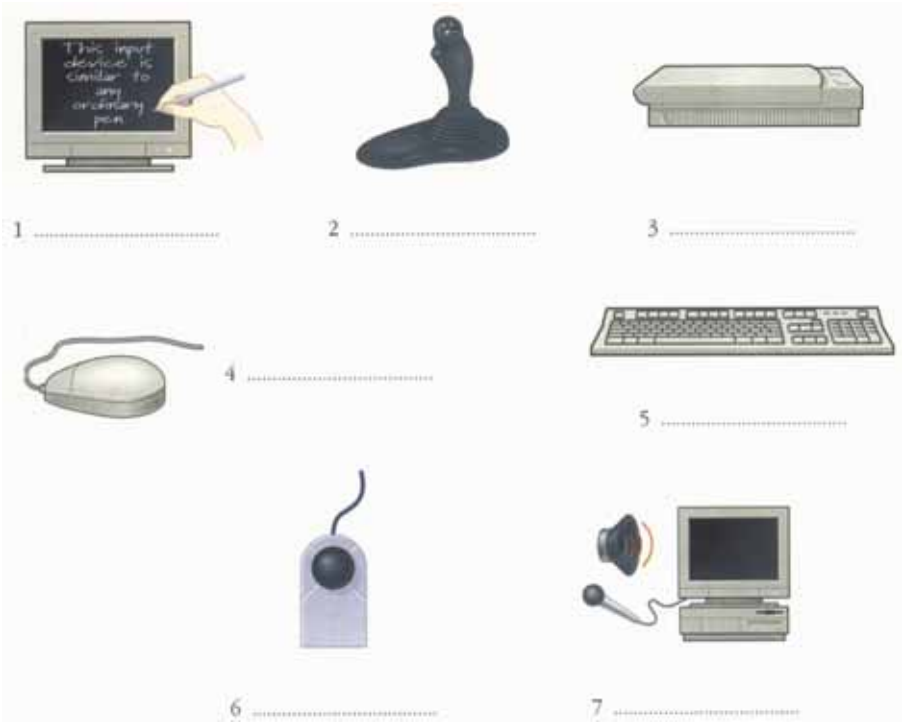
Input Devices

Input devices are the pieces of hardware which allow us to enter data 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 scanner, a joystick, a light pen, a trackball, or a voice recognition device.

Activity 5

Look at the illustrations and see if you can name the input devices.



Activity 6

Read the descriptions of three input devices. Then write their names in the spaces provided.

1. _____

This device is used to enter data into the computer. As well as

having typewriter keys for characters and a numeric keypad, it may also have function keys and editing keys for special purposes.

2. _____

This is a device for controlling the curser and selecting items on the screen. The ball underneath is rolled in any direction across the surface of a pad to move the curser on the screen. By clicking a button, the user can activate icons or select items and text.

3. _____

In shape, this input device is similar to an ordinary pen. It works by detecting light from the computer screen and is used by pointing directly at the screen display. It allows the user to answer multiple-choice questions and to draw diagrams.

Activity 7

You are more or less familiar with mouse actions. Read this text and fill in the blanks with the help of the clues in *italics*.

click	double-click	drag	select	grab	move

Mouse Actions

A mouse allows you to control the curser and move around the screen very quickly. Making the same movements with the arrow keys on the keyboard would take much longer. As you (1) _____ *[change the place of something]* the mouse on your desk, the pointer on the screen moves in the same direction. The pointer usually looks

like an I-bar (I), an arrow (↖), or a pointing hand (☝), depending on what you are doing.

The mouse has buttons to communicate with the computer. For example, if you want to choose a menu option, you just (2) _____ *[press and release]* on the mouse button, and the option is chosen. The mouse is used to start a program or open a document: you put the pointer on the file name and (3) _____ on the name – that is, you *press and release the mouse button twice*. The mouse is also used to (4) _____ *[choose]* text and items on the screen. You can highlight text to be deleted, or you can select an item from a checkbox.

The mouse is widely used in graphics and design. When you want to move an image, you position the pointer on the object you want to move, press the mouse button, and (5) _____ *[take]* the image to a new location on the screen. Similarly, the mouse is used to change the shape of a graphic object. For example, if you want to convert a square into a rectangle, you (6) _____ *[hold]* one corner and stretch it into a rectangle.

Reading 4

A customer wants to buy a PC. Read the conversation, and then follow the instructions in *Activity 8*.

Buying a Computer

Shop Assistant: Do you need any help?

Customer: Yes, we're looking for a personal computer.

Shop Assistant: Yes, sure. Come over here, please.

Customer: What different models are there?

Shop Assistant: At the moment, we've got these two models: The *iMac*, which is a desktop computer with a microprocessor operating at 1 gigahertz, and the portable *iBook*, which has a processor running at 700 megahertz.

Customer: So the *iMac* is the faster one. And which one has more memory? I mean – which has more RAM?

Shop Assistant: Well, the *iMac* has 256 megabytes of RAM, which can be expanded up to 1 gigabyte, and the *iBook* has 128 megabytes, which can be expanded up to 640 megabytes. The *iMac* is suitable for home users and small offices. The *iBook* is ideal for students and people who travel.

Customer: What's the memory on the hard disk of each one?

Shop Assistant: The *iMac* has a storage capacity of 40 gigabytes, and the portable *iBook* has a hard disk of 20 gigabytes.

Customer: And how much are they?

Shop Assistant: The *iMac* is $1,425, and the *iBook* is $1,207.

Customer: Are the optical drive and the operating system included in those prices?

Shop Assistant: Yes. They each come with a high-speed DVD drive and with Internet access software.

Customer: Thank you very much. I think we need to go away and think about it for a bit.

Shop Assistant: Fine. Do you want to take these leaflets and the pricelist?

Customer: Yes, thanks very much. OK, goodbye.

Shop Assistant: Goodbye.

Activity 8

Fill in the missing information according to the conversation.

iMac

Processor speed _____

RAM standard _____

Hard disk capacity _____

DVD included? _____

Price _____

iBook

Processor speed _____

RAM standard _____

Hard disk capacity _____

DVD included? _____

Price _____

C. Language Focus: *Comparison and Contrast*

Comparison and Contrast

Sometimes when you read about the computers, you will see two items are compared; for example, to show a CPU is faster than another, a hard disk has more storage capacity than another, a monitor has a better picture quality than another, etc. Pay attention to the following examples.

Examples:
*LCD monitors have a **better** picture quality than CRT monitors.*
*PDAs are **smaller** and **lighter** than laptops.*
*Supercomputers are **larger** and **faster** than mainframes.*
*Desktops are ideal for home users **while** notebooks are ideal for people who travel.*

Activity 9

The *iMac* and the *iBook* are compared and contrasted in the following sentences. Circle the right PC using the information in the conversation. The first one has been done for you.

1. *The iMac/iBook is desktop, while the iMac/iBook is laptop.*
2. *The iMac/iBook is faster than the iMac/iBook.*
3. *The iMac/iBook has more RAM than the iMac/iBook.*
4. *The iMac's/iBook's RAM can be expanded up to 640 megabytes, while the iMac's/iBook's RAM can be expanded up to 1 gigabyte.*
5. *The iMac/iBook has more memory on the hard disk than the iMac/iBook.*
6. *The iMac/iBook is lighter than the iMac/iBook.*
7. *The iMac/iBook is more expensive than the iMac/iBook.*

8. *The iMac/iBook is suitable for home users, while the iMac/iBook is ideal for people who travel.*

D. Quiz

Fill in the blanks in the following sentences with the words in the box to check your understanding of this unit.

data	flexible	double-click	read only memory
highlight		peripherals	central processing unit
mechanical		brain	random access memory

1. CPU stands for _____.

2. RAM stands for _____.

3. ROM stands for _____.

4. The hardware components are the electronic and _____ parts of the system.

5. The physical units attached to the computer are called the _____.

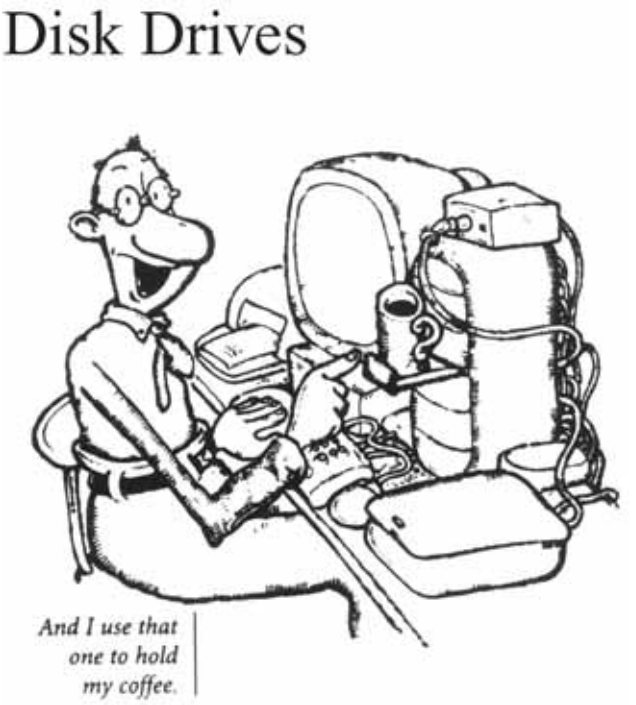
6. Hard disks can hold much more _____ and spin at higher speed than floppies.

7. We can say the central processing unit is the _____ of the computer.

8. Floppy disks are so called because they consist of _____ plastic material.

9. You put the pointer on the file name and _____ on the name – that is, you rapidly press and release the mouse button twice.

10. When you want to delete a word or text, you can _____ it first with the mouse.



For more information on the basic features of computers, you can visit the following websites:

– *http://infocomp.csuchico.edu/metis/fundamental/start.htm*
(instructions on computer hardware and software, terminology, and history)

– *http://www.adita.com/literacy.htm*
(basic concepts about computers, such as bits and bytes, and the features of a "good" computer)

– *http://www.howstuffworks.com/computer-memory.htm*
(basic information about the different types of computer memory)

– *http://www.howstuffworks.com/ram.htm*
(basic information about RAM, including diagrams and photographs)

Unit 4

Operating Systems

Topic: Operating systems

Learning Objectives:
- To understand the function of operating systems
- To learn the terminology related to operating systems

Language Focus: Common prefixes in computer science

Abbreviations and Acronyms: DEL, DIR, DOS, IBM, MS, MS- DOS, OS, USB

Key Words: activate, antivirus, applications software, command, compatible, delete, develop, directory, file, load, program, interface, multitasking, operating system, operation, resources, supervisor program, support, system software, system utilities

A. Warm-up

Look at *Figure 1.* What is the function of the operating system?

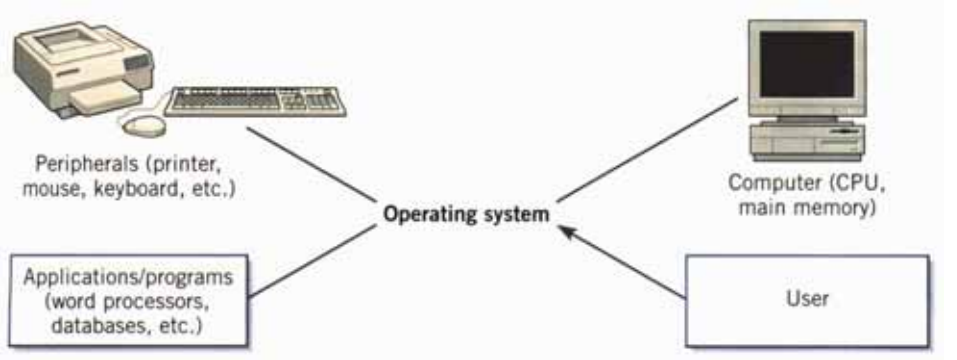


Figure 1: Function of the operating system

B. Reading Comprehension

Reading 1

It is said that operating systems are hidden software. Do you know why?

Operating Systems: Hidden Software

When a brand of new computer comes out of the factory assembly line, it can do nothing. The hardware needs software to make it work. Are

we talking about **applications software** such as word processing or database software? Partly. But an applications software package does not communicate directly with the hardware. Between the applications software and the hardware is a software interface – system software such as an **operating system**. An operating system is a set of programs that lies between applications software and the computer hardware.

An operating system has three main functions: (1) to manage the computer's resources, such as the CPU or the central processing unit, memory, disk drives, and printers, (2) to establish a **user interface**, and (3) to execute and provide services for applications software. However, much of the work of an operating system is hidden from the user. For instance, the first listed function – managing the computer's resources – is carried out without the user being aware of the details. Furthermore, all input and output operations, although presented by an applications program, are actually performed by the operating system.

Activity 1

In each pair of the following sentences, one sentence is wrong. Put a ✓ next to the correct sentences and a × next to the wrong ones.

1. ____ **a.** According to the text, the hardware can't work without software.

____ **b.** According to the text, the hardware can work without software.

2. ____ **a.** An operating system is a software interface between the hardware and applications software.

____ **b.** Applications software is a software interface between the hardware and the operating system.

3. ____ **a.** None of the work of an operating system is hidden from the user.

____ **b.** Much of the work of an operating system is hidden from the user.

Activity 2

This is a summary of the passage on operating systems. Fill in the blanks using the words in the box.

operating system	resources	applications programs	resident

The user is aware of the effects of different applications programs, but operating systems are hidden from most users. They lie between the hardware and (1) _____, such as, word processing. The supervisor program is the most important. It remains in memory; therefore, it is referred to as (2) _____. Others are called non-resident because they are loaded into memory only when needed. Operating systems manage the computer's (3) _____, such as the CPU. In addition, they establish a user interface, and execute and provide services for applications software. Although input and output operations are presented by applications programs, they are carried out by the (4) _____.

Activity 3

Read the text below and fill in the blanks with the terms in the box.

applications software	operating system
software	system software

- Information provided by programs and data is known as (1) _____. Programs are sets of instructions that make the computer execute operations and tasks. There are two main types of software:

- The (2) _____ refers to all the programs which control the basic functions of a computer. They include operating systems, system utilities (e.g. an antivirus program) and language translators (e.g. a compiler – the software that translates instructions into machine code).

- The (3) _____ refers to all those applications – such as word processors and spreadsheets – which are used for specific purposes. Applications are usually stored on disks which are loaded into the RAM memory when activated by the user.

- The (4) _____ is the most important type of system software. It is usually supplied by manufacturers and consists of a set of programs and files that control the hardware and software resources of a computer system. It controls all the elements that the user sees, and it communicates directly with the computer. The OS is automatically loaded into the RAM section when the computer is started up.

Reading 2

What operating systems do you know of? Read the text to know more.

Common Operating Systems

MS-DOS

This operating system was developed by Microsoft in 1981 for all IBM PC compatibles. Today it is mainly used in old PCs. In this text-based OS, you communicate with the computer by typing commands that exist within its library. For example, some basic DOS commands include: DIR (shows a list of all the files in a directory), COPY (makes a copy of a file), DEL (deletes files).

Windows XP

Most home PCs use Windows. Here are the most recent versions:

- With **Windows 98**, Internet access becomes part of the user interface. Its active desktop lets you find information easily. The system includes Outlook Express for email, a chat program, and a web-page editor. It offers advancements

	such as USB and multimedia extensions. • **Windows 2000** is built upon the Windows NT architecture and designed for business uses. • **Windows Millennium** is designed for home use. It includes new system safeguards and support for DVD, music players, and portable computers. • **Windows XP** is an update to all Windows versions, with a new visual design. It's more secure and reliable. It offers support for the latest technologies.
Pocket PC OS (Microsoft) 	This OS is developed for handheld computers (or palmtops) that use a stylus or a small keyboard for input.
OS/2 Warp (IBM)	This is the most technically sophisticated OS in the PC world. It provides true multitasking; thus, not only can numerous programs run simultaneously, but one program can perform many tasks at the same time. The IBM OS/2

	Warp includes easy access to networks via modem, support for Java applications, and voice-recognition technology.
UNIX	This OS, designed by Bell Laboratories for minicomputers and workstations, is used by many large companies. From the very first, it was designed to be a multitasking system. It is written in C language. It has become an operating environment for software development, available for any type of machine, from IBM PCs to Macs to Cray supercomputers.

Activity 4

Read the text again and find:

1. the text-based operating system used in older PCs _____

2. the most secure and reliable version of the Windows family _____

3. the OS designed for handheld computers _____

4. the term which means several programs are executed at the same time _____

5. the OS written in C language and used on minicomputers and workstations _____

C. Language Focus: *Common Prefixes in Computer Science*

Prefixes

One way to guess the meaning of a new word is by knowing the meaning of the different parts, e.g. *prefixes, roots,* and *suffixes*. In the table below, you can see the prefixes which are commonly used in computer science. Knowing the meaning of these prefixes will help you understand the meaning of new words.

Common Prefixes in Computer Science

Prefix	Meaning	Examples
Quantity & Size		
bi-	two	*bidirectional, bidimensional, binary*
deci-	ten	*decimal, decibel*
giga-	10^9 (1,000,000,000)	*gigahertz, gigabyte*
kilo-	10^3 (1,000)	*kilohertz, kilogram, kilowatt*
macro-	large	*macrochip*
mega-	10^6 (1,000,000)	*megahertz, megaton*
micro-	very small	*microcomputer, microchip*
milli-	10^{-3} (-1,000)	*millisecond, millimeter*
mini-	small	*minicomputer, minibus, minimum*
mono-	one	*monolingual, monosyllable*
multi-	many	*multimedia, multitasking*
tri-	three	*triangle, trilingual, tricycle*
uni-	one	*unidirectional*

Others		
anti-	against	*antivirus software*
auto-	by itself	*automatic, automobile*
cyber-	relating to computers, esp. the Internet	*cyberspace, cybercafé, cybersickness, cybercrime, cyberwidow*
hyper-	above, beyond	*hyperlink, hypertext, hyperactive*
infra-	below	*infrared, infrastructure*
inter-	between	*the Internet, international*
intra-	within	*intranet*
super-	higher in quantity or degree	*supercomputer, superstar, superman, superhuman*
tele-	distant, far	*telephone, television, teleconference, telecommunications*

Activity 5

Complete the explanations of the words below, taking into account the prefixes and the root words.

Example:

the binary system

The binary system is a notation which uses <u>two</u> digits, 0 and 1.

a. a microchip

A microchip is a very _____ chip.

b. a multi-user configuration

A multi-user configuration is a system in which _____ users are connected to the central computer.

c. a bidimensional chessboard

A bidimensional chessboard is a chessboard which has _____ dimensions.

d. the decimal system

The decimal system is the system in which the _____ digits 0 to 9 are used.

e. a monochrome monitor

A monochrome monitor is a monitor which uses the shades of only _____ color.

f. a document of 3 kilobytes

A document of 3 kilobytes is a document which is _____ bytes.

g. a CPU with 512 MB of RAM

A CPU with 512 MB of RAM is a CPU which has _____ bytes of RAM.

Activity 6

Find computer-related terms for the definitions below. Each of them includes a prefix in the table of "common prefixes in computer science."

supercomputer	bidirectional	Automatic
auto-correction	multi-user	binary

1. a system of numbers with 2 digits as its base _____
2. a word-processing feature which corrects by itself _____
3. a program which allows two-way communication _____
4. a computer higher in scale than any other _____
5. a system used by many people _____

6. a machine which provides cash to bank customers without requiring a human operator: an _____ Teller Machine (or ATM)

D. Quiz

Fill in the blanks in the following sentences with the words in the box to check your understanding of this unit.

update	system software	communicates
compatibles	functions	palmtops
RAM	operating system	hardware
operations		

1. OS stands for _____.

2. An operating system is a set of programs that lies between applications software and the computer _____.

3. All input and output _____ are presented by an applications program, but they are actually carried out by the operating system.

4. There are two main types of software: applications software and _____.

5. One of the most important _____ of a computer is to process large amounts of data quickly.

6. An operating system controls all the elements the user sees, and it _____ directly with the computer.

7. The OS is automatically loaded into the _____ section when the computer is started up.

8. MS-DOS is an operating system that was developed by Microsoft in 1981 for all IBM PC _____.

9. Windows XP is an _____ to all Windows versions, with a new visual design. It's more secure and reliable.

10. Pocket PC is an OS developed for _____ that use a stylus or a small keyboard for input.

For more information on operating systems, you can visit the following websites:

– *http://www.howstuffworks.com/operating-system.htm*
(basic information about operating systems, including diagrams)

– *http://www.microsoft.com/windows/default.asp*
(information about various versions of the Microsoft Windows operating system)

– *http://g.msn.com/OENNAW/weblink_winxp*
(resources for the Windows XP operating system, including upgrade, an XP tour, and a user forum)

Unit 5

The Graphical User Interface

Topic: The graphical user interface (GUI)

Learning Objective:
- To recognize the characteristics of a typical GUI

Language Focus: Instructions and advice

Abbreviations and Acronyms: ELF, GUI, LCD, WIMP

Key Words: accessories, browser, control panel, dock, document, ergonomics, execute, file, folder, graphics-based, icon, pointer, pop-up box, pull-down menu, scroll bars, text-based, toolbar, user-friendly, user interface

A. Warm-up

A User-friendly Interface

Figure 1 illustrates a user interface based on graphics. Read the definitions in the box and then find the following interface elements in the figure.

1. window
2. scroll bars
3. menu bar
4. pull-down menu
5. pointer
6. toolbar buttons
7. disk icons
8. folders
9. program icons
10. document icons
11. printer icon
12. dock icons

- **window:** a viewing area less than or equal to the screen size. By using different windows, you can work on several documents or applications at the same time
- **pull-down menu:** a menu that the user "pulls down" from a name in the menu bar at the top of the screen by selecting the name with a mouse
- **the pointer:** an arrow, controlled by the mouse, that allows you to move around the screen
- **toolbar buttons:** found at the top of a window, they take you to the Home folder and others
- **icons:** graphic images used to represent an object or task
- **folders:** containers or documents and applications
- **dock:** set of icons at the bottom of the screen that give you instant access to the things you use most

Figure 1: The interface elements of the Macintosh

B. Reading Comprehension

Reading 1

Read the article below and decide which of the words in the box best describe a GUI (graphical user interface).

user-friendly	slow	attractive
text-based	complex	graphics-based

GUIs

The term **user interface** refers to the standard procedures the user follows to interact with a particular computer. A few years ago, the way in which users had access to a computer system was quite complex. They had to memorize and type a lot of commands just to

see the content of a disk or to copy files. In fact, only experts used computers, so there was no need for a user-friendly interface. Now, however, computers are used by all kinds of people, and as a result, there is a growing emphasis on the user interface.

A good user interface is important because when you buy a program you want to use it easily. Moreover, a graphical user interface saves a lot of time. You don't need to memorize commands in order to execute an application; you only have to point and click so that its content appears on the screen. For example, Macintosh computers – with a user interface based on graphics and special tools – were designed with a single clear aim: to facilitate interaction with the computer. Their interface is called WIMP: **Window**, **Icon**, **Menu** (or **Mouse**), and **Pointer**, and software products for the Macintosh have been designed to take full advantage of its features using this interface.

Today, the most creative GUIs are the Macintosh, Microsoft Windows, and IBM OS/2 Warp. These three GUIs include similar features: a desktop with icons, windows and folders, a printer selector, a file finder, a control panel, and various desk accessories. For instance, double-clicking a folder opens a window which contains programs or documents.

These interfaces have been so successful because they are easy to use. It is well-known that computers running under an attractive interface help users to be more creative and produce high-quality results.

Activity 1

Read the text again and find the answers to these questions.

1. What does the abbreviation "GUI" stand for?

_____

2. What does the acronym "WIMP" stand for?

_____

3. What are the most creative GUIs?

_____

4. Why are GUIs like the Macintosh and Microsoft Windows so successful?

_____

Reading 2

As you know, Microsoft Windows is one of the best GUIs. Read this interview with a program developer to know more about it.

Microsoft Windows

Interviewer: There is no doubt that Windows has revolutionized the way we use PCs today. Can you explain why this system is so popular?

Program developer: Well, people find this system very easy to use because everything is presented in **graphic images**. It's **compatible** with thousands of programs and allows multitasking.

Interviewer: How many types of Windows systems are there?

Program developer: The Windows family covers almost all IBM PC compatibles. All the **versions** like Windows 98 and Windows 2000 have been replaced by Windows XP. This operating system comes in two versions: the Windows XP Home Edition and the Windows XP Professional. The Home Edition is ideal for home users, and the Professional version is designed for business users.

Interviewer: What other factors make Windows so attractive?

Program developer: The user interface has been redesigned with a new visual style, and the system offers support for the latest technologies, from digital cameras to DVDs. It also includes Windows Media Player, a program that lets you download, play, and organize your music CDs and videos.

Interviewer: What about Internet connections? Have they been improved?

Program developer: Yes. Internet Explorer is more **reliable** and **secure**. The browser is integrated into the operating system, so you can **surf the Web**. The system also has a connection **firewall** that protects your computer from Internet attacks.

Interviewer: And what sort of applications can you use with Windows?

Program developer: The most popular is Microsoft Office, a suite that includes a word processor, an email program, a spreadsheet program called Excel, and a presentation graphics program known as PowerPoint.

Interviewer: Thanks very much.

Figure 2: A sample screen from Windows XP

Activity 2

Use the information in the Interview to complete this fact file.

Why is it so popular?	*Windows versions*	*Other features*	*Internet connections*	*Windows programs*
It's (1) _____, because everything is presented in graphic images. It's (2) _____ with thousands of programs and allows multitasking.	Older versions like Windows 98 and Windows 2000 have been replaced by the new Windows XP. The Windows XP (3) _____ Edition is ideal for home users. The Windows XP (4) _____ is aimed at business users.	It offers support for the latest technologies. It includes Windows (5) _____ Player, a program that lets you play music CDs and videos.	Internet Explorer is more reliable and secure. A connection firewall protects your PC from Internet (6) _____.	The most popular is Microsoft (7) _____, a suite that includes a word processor, an email program, a spreadsheet, and a presentation graphics program.

Activity 3

Study the Windows desktop in *Figure 3* and answer the questions.

1. Microsoft Outlook Express lets you send _____ mail.
2. A pop-up box tells you the _____ when you keep the mouse pointer over the time for a moment.
3. The Taskbar shows the _____ that you are running currently.
4. My Briefcase helps you keep the files organized and _____.
5. Most new PCs have a green-blue _____ color.
6. When you delete files, they go to the _____ Bin.
7. You can _____ files if you delete them by mistake.

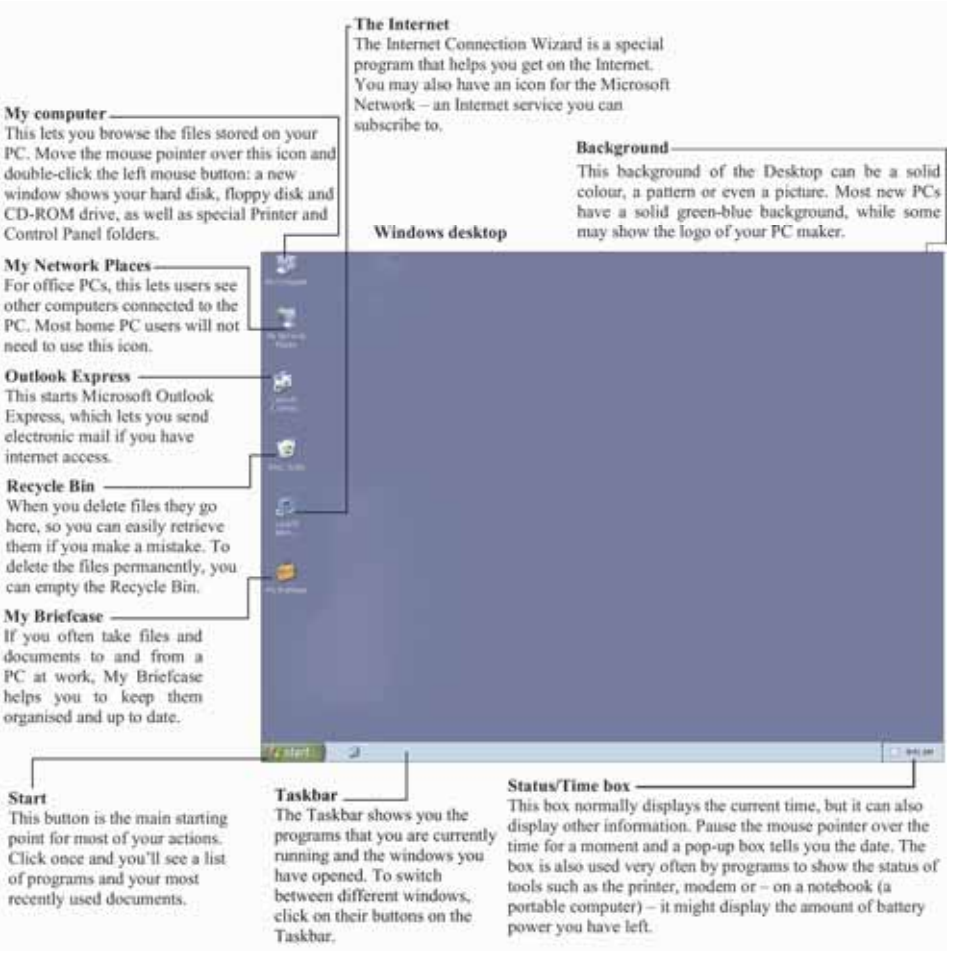


Figure 3: Windows desktop

Reading 3

Ergonomics is the study of fitting equipment to people so that it is easier to use and does not cause harm to users. This means pieces of equipment can be harmful if they are not designed ergonomically or used properly.

A lecturer in computer ergonomics is talking to some students about health and safety in a computer classroom. Read it and underline the pieces of advice.

Health and Safety with Computers

Lecturer: As you may know, researchers worry about the health risks of spending a lot of time in front of the computer. Anyone spending more than four hours a day working on a PC may start to suffer from aching hands, neck, or shoulders, occasional headaches, and eyestrain.

Student: Is there anything we can do to avoid these risks?

Lecturer: Yes, there's quite a lot you can do. For example, if you position your computer properly, you can avoid backache. Get a good chair – one that supports your lower back and is adjustable so you can have both your feet on the floor. Position the keyboard at the same height as your elbows. And position the monitor so that is at or just below eye level. You should look *down* at it slightly, not *up*. Don't put your monitor in front of a window, and make sure there isn't a lamp shining directly into your eyes.

Student: Often my eyes feel really sore and tired after I use a computer for a few hours. How do I stop that happening?

Lecturer: Don't use a monitor that distorts the image. Give your eyes a rest – look away from the monitor from time to time, out of the window or across the room.

Student: I've heard that monitors can be dangerous because they emit electromagnetic radiation. Is that true?

Lecturer: All monitors except LCDs emit ELF or extremely low frequency radiation. We don't really know how serious this problem is, but recent results are not very hopeful. To minimize the risk, stay an arm's length away from the front of the monitor when you are working. If you work in a room with a lot of computers, make sure you sit at least 1.20 m away from the sides or backs of any monitors because the radiation fields can be strong there.

Student: What do you think of radiation guards? Are they really useful?

Lecturer: Yes, they are. As you know, they are protective filters that fit over the front of the monitor. They can't absorb all the ELF radiation, but they do reduce it.

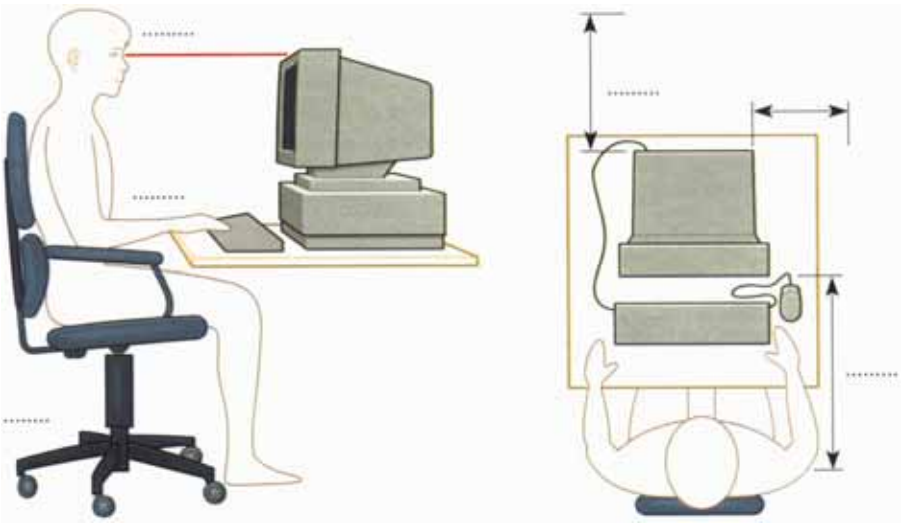


Figure 4: Health and safety with computers

Activity 4

Write the numbers of the following sentences in the appropriate spaces in *Figure 4*.

1. You should get a good chair, one that supports your lower back and is adjustable so that you can have both feet on the floor.
2. Position the keyboard at the same height as your elbows.
3. You should position the monitor at eye level, or just below.
4. Stay an arm's length away from the front of the monitor.
5. If you work in a room with a lot of computers, sit at least 1.20 m away from the sides or backs of the other monitors.

C. Language Focus: *Instructions and Advice*

Instructions and Advice

When you work with any program, you will need to understand the instructions in the "Help" section. Or when you install a program, if you don't know English well, you may keep clicking "Yes" when you see commands until the computer crashes! Therefore, it is good for you to understand "Instructions and Advice."

Examples:
On the file menu, ***click*** *"Save As."*
In the "File Name" box, ***enter*** *a new name for the file.*
Don't use *a monitor that distorts the image.*
You ***should position*** *your keyboard at the same height as your elbows.*

Activity 5

Fill in the blanks in the sentences below about health and safety with *should/shouldn't* or *do/don't.* Follow the example.

Example:

- You shouldn't look up at the monitor.

Don't look up at the monitor.

1. Do not stare at the screen for long periods of time.

   You _____ *at the screen for long periods of time*.

2. You should keep the screen clean to prevent distorting shadows.

   _____ *the screen clean to prevent distorting shadows.*

3. Position your keyboard at the same height as your elbows.

   You _____ *your keyboard at the same height as your elbows.*

4. You should buy a protective filter that cuts down the ELF emissions.

   _____ *a protective filter that cuts down the ELF emissions*.

D. Quiz

Fill in the blanks in the text below with the words in the box to check your understanding of this unit.

memorize	graphical	interaction	run	interface

In the past, only experts used computers. Nowadays, however, many people have access to computers, so there is an emphasis on the user

interface. GUIs – or (1) _____ user interfaces – are easy to use; therefore, there is no need to (2) _____ complex commands anymore. Instead, the user can (3) _____ a program on a computer with a GUI simply by double-clicking its icon. A well-designed GUI also helps users to be more creative. From the first, Macintosh computers had a user-friendly (4) _____ based on graphics and special tools; pull-down menus, windows, icons, mouse, pointer, etc. Macintosh computers were designed on a WIMP interface to facilitate the user's (5) _____ with the computer. Other creative GUIs are MS Windows and IBM OS/2 Warp.

For more information on GUIs and computer ergonomics, you can visit the following websites:

– *http://www.howstuffworks.com/graphics-card.htm*
(basic information about floppy disk drives, including photographs and links to relevant sites)

– *http://www.howstuffworks.com/lcd.htm*
(information about the history and science behind LCDs, including photographs and diagrams)

– *http://www.engr.unl.edu/ee/eeshop/rsi.html*
(information on repetitive stress injury and advice on prevention, including MPEG animations of stretching exercises)

– *http://www.orosha.org/cergos/*
(solutions for common ergonomics problems that students encounter while using computers)

– *http://kidshealth.org/parent/firstaid_safe/home/ergonomics.html*
(information on protection from repetitive stress injuries, including ergonomically correct guidelines for working at a computer)

Unit 6

Software

Topic: Programs or instructions executed by the computer

Learning Objective:
- To understand the basic features of software products

Language Focus: Guessing meaning from context

Abbreviations and Acronyms: DTP, WYSIWYG

Key Words: antivirus, application, backup, corrupted file, database, data recovery, desktop publishing, field, format, interactive, manipulate, record (n), replace, screen saver, search, software, system utilities, word processor

A. Warm-up

Look at the list of software products and number the items in the order in which they appear in the text.

____ multimedia
____ DTP (desktop publishing)
____ database program
____ educational software

1. This application helps students learn a language. It also includes a series of activities to practice pronunciation, grammar, and the use of language.

2. This package allows you to store, manipulate, and retrieve data. With the given information, you can keep track of sales, orders, invoices, and other details.

3. With this program you can easily include frames, image maps, multimedia elements, and interactive effects in your page designs.

4. This is a page layout program with many powerful typographical features. It allows text and graphics to go automatically from one page to the next.

B. Reading Comprehension

Reading 1

Why do you think word processors have replaced typewriters? Discuss it with other students, and then read the text to check your answer. Underline the features that you did not mention.

Word Processors

Writing letters, memos, or reports are the ways most people use computers. They **manipulate** words and text on a screen to print at some time later. Computers reduce much of the hardship of typing, proofreading, and manipulating words. Since computers can store and recall information so easily and quickly, **documents** need not be retyped from scratch just to make corrections or changes. The real strength of word processing is in this ability to **store**, **retrieve**, and change information. Typing is still necessary (at least, for now) to put the information into the computer, but once in, you only need to retype new information. However, word processing is more than just typing. Features such as **Search** and **Replace** allow users to find a phrase or word in no time. This becomes more useful as the text becomes longer.

Word processors usually include different ways to view the text. Many word processors include the ability to show exactly how the text will appear on paper when printed. This is called WYSIWYG (What You See Is What You Get, pronounced "wizzywig"). WYSIWYG shows **bold**, *italic*, underline, and other type style

characteristics on the screen so that users can see what they are typing. Another feature is the correct display of different **typefaces** and **format** characteristics (margins, indents, super- and sub-scripted characters, etc.). This allows the user to plan the document and see it as it will be printed.

Activity 1

Look at the words in the box and complete the following sentences with them. Use the information in the text or *Glossary* if necessary.

format	indent	justification	WYSIWYG

1. _____ stands for "What You See Is What You Get." It means that your printout will exactly match what you see on the screen.
2. A/An _____ is the distance between the beginning of a line and the left margin, or the end of a line and the right margin.
3. _____ refers to the process by which the space between the words in a line is divided evenly with both left and right margins.
4. The _____ menu of a word processor allows you to set margins, page numbers, spaces between columns, and paragraph justifications.

Activity 2

Match the words and expressions on the left with their explanations on the right.

1. ___ display	**a.** type again
2. ___ store	**b.** recover information from a computer system
3. ___ proofreading	**c.** show
4. ___ retype	**d.** save; keep
5. ___ retrieve	**e.** read through something that is written or printed to correct any mistakes in it

Reading 2

Look at *Figure 1* and think about the tasks that can be performed by using a database. Discuss it with other students.

Name Sohrab Ferdosi
Address 12, Sasani St.
Marital status Single
Identification 0994989
Job Software Engineer
Home phone 4563672
Salary 5000, 000 rls
Department Data processing

Figure 1: A record from an employee file in a database

Database Programs

With a **database** you can store, organize, and retrieve a large collection of related information on computer. We can say it is the electronic equivalent of a filing cabinet. Let us look at some features and applications.

- Information is entered on a database via **fields**. Each field holds a separate piece of information, and the fields are collected together into **records**. For example, a record about an employee might consist of several fields which give his or her name, address, telephone number, age, and salary. Records are grouped together into **tables** which hold large amounts of information. Tables can easily be updated; you can always add new records or delete old ones.

- Another feature of database programs is that you can automatically look up and find records containing particular information. You can also search on more than one field at a time. For example, if a managing director wanted to know all the customers that spend more than 600,000 rials per month, the program would search on the name field and the money field at the same time.

A computer database is much faster to use and **update** than a card index system. It occupies less space, and records can be automatically sorted into numerical or alphabetical order using any field. Any part of the program can be protected by **user-defined passwords**. For example, if you want to share an employee's personal details, but not their salary, you can protect the salary field.

Activity 3

Fill in the blanks in the following sentences, using the terms in the box.

database	store	passwords	field	delete

1. Each piece of information is given in a separate _____.
2. A database is used to _____, organize, and retrieve a large collection of related information.

3. Updating a file means it is always possible to add new records or _____ old files.
4. A computer _____ is much faster to use than a card index system.
5. Any part of the program can be protected by user-defined _____.

Reading 3

Are you familiar with system utilities? Read the information in the box, and then read the advertisements about four utilities.

System Utilities

System utilities are small programs which improve a system's performance and help users to take advantage of the computer's capabilities. They are often desk accessories that can be used while you're working in another application. Utilities are available for backup, file search, disaster recovery, virus protection, and so on. They include antivirus programs, backup utilities, disk repair programs, file finders, and screen savers.

Activity 4

Have you ever used any system utilities? What utilities were they? Write the system utilities below in the blanks, according to the information in each advertisement.

screen saver	virus detector	data recovery
multimedia player		

1. _____

Worried about computer viruses? Afraid that someone could

invade your system and delete your files or destroy the contents of your hard disk? Don't worry. With *Antidote*, the new virus detector from our company, you can use disks with no worry. *Antidote* scans all disks, finds and destroys any viruses, and will also remove any existing infections. *Antidote* is your only choice in virus protection.

2. _____

Computer screens need protecting. If the same image remains on your screen for a long time, it can be burned into it and remain as a permanent ghost image. To stop this happening, you can use *Screen Shapes*, a new and inexpensive program that will darken the screen automatically and display all sorts of animated patterns if the screen is left unused for a few minutes. Available from your local computer center now.

3. _____

Would you like to have just one program for all your multimedia activities? What you need is *Media Wizard* – a utility that lets you watch video and DVDs, listen to radio stations on the Internet, play MP3 music, and burn your CDs. It's like having a radio, a CD player, and a movie organizer in a single program. *Media Wizard* is the best player for your media collection.

4. _____

Oh, no! You're having another problem with your computer! You've accidentally deleted a file or reformatted a disk that you wanted to keep? What can you do? With *Disk Rescue* there is no

need to worry. *Disk Rescue* is a utility which will repair hard and floppy disks, restore deleted files, and even recover corrupted files that refuse to open. Buy *Disk Rescue* today to ensure the health of your disks.

Activity 5

Read the text again. Which utility would you use for each of these requirements?

1. To play and organize multimedia on your PC. _____
2. To diagnose and repair damaged disks. _____
3. To protect your system against computer viruses. _____
4. To automatically blank out the screen after a period of inactive time (so that the image does not burn into the screen).

   _____

C. Language Focus: *Guessing Meaning from Context*

Guessing Meaning from Context

When you read texts, you may come across some new words. However, you don't always need to understand every single word in order to understand a text. There are several ways to guess the meaning of new words; e.g. by the help of prefixes (which you learned in *Unit 4*). You can also guess the meaning of some words from clues in the context; that is, words and sentences before and after the word you don't know. If you practice, you can make a good guess before you look up new words in the dictionary. At first, it may sound difficult, but if you do it for some time, you can make better guesses and improve your reading skill.

Activity 6

a. Read the following text and try to guess the meaning of new words from clues in the context and before looking them up in the *Glossary* or the dictionary.

Schools of Tomorrow

Some people believe that soon schools will no longer be necessary. These people say that because of the Internet and other new technology, there is no longer any need for school buildings, classes, or teachers. Perhaps this will be true one day, but it is hard to imagine a world without schools. In fact, we need to look at how we can use new technology to make schools better – not to eliminate them.

We should invent a new kind of school that is linked to libraries, museums, science centers, and laboratories. Experts could give talks on video or over the Internet. Laboratories could have websites to demonstrate new technology so that students could view it on the Internet. How will this new kind of school change learning? It is too early to be sure, but it is very exciting to think about. Technology will surely change the way we learn, and schools will change as well.

b. Were there any words in the text that you didn't know? Which ones could you guess from the clues in the context? Write them on the lines below.

_____

_____

D. Quiz

Fill in the blanks in the following sentences with the words in the box to check your understanding of this unit.

updated	ghost image	antivirus	database
field	word processors	virus protection	
manipulate	corrupted files	desktop publishing	

1. DTP stands for _____

2. Today most letters and reports are typed by _____.

3. You can decide how many fields you want to have on a _____.

4. Each piece of information is given in a separate _____.

5. Files can easily be _____ by adding new information or deleting the old one.

6. The function of _____ software is to scan, find, and destroy viruses.

7. Word processors _____ words and text on a screen to print later.

8. System utilities are available for backup, disaster recovery, and _____.

9. If an image remains on your screen for a long time, it can be burned into it and remain as a permanent _____.

10. Data recovery is a utility which will restore deleted files and recover _____ that refuse to open.

For more information on computer software, you can visit the following websites:

– *http://www.archive.org/*
(downloadable software; the collection will eventually reach 10 terabytes and provide a complete record)

– *http://www.microsoft.com/downloads/search.asp?*
(free software downloads from Microsoft)

– *http://www.packardbell.com/*
(free software downloads from Packard Bell)

– *http://www.qwerty.com/startacs.htm*
(information about how computer programs work, both for the beginner and for the more advanced student)

– *http://www.howstuffworks.com/virus.htm*
(an explanation of computer viruses and how they function; protection information and links)

– *http://www.avp.ch/avpve/*
(a searchable dictionary of computer viruses)

Unit 7

Computer Graphics

Topics: Computer graphics, tool palette, and transformation

Learning Objectives:
- To learn about computer graphics and its importance in different fields
- To identify the function of different graphics tools

Language Focus: Gerunds

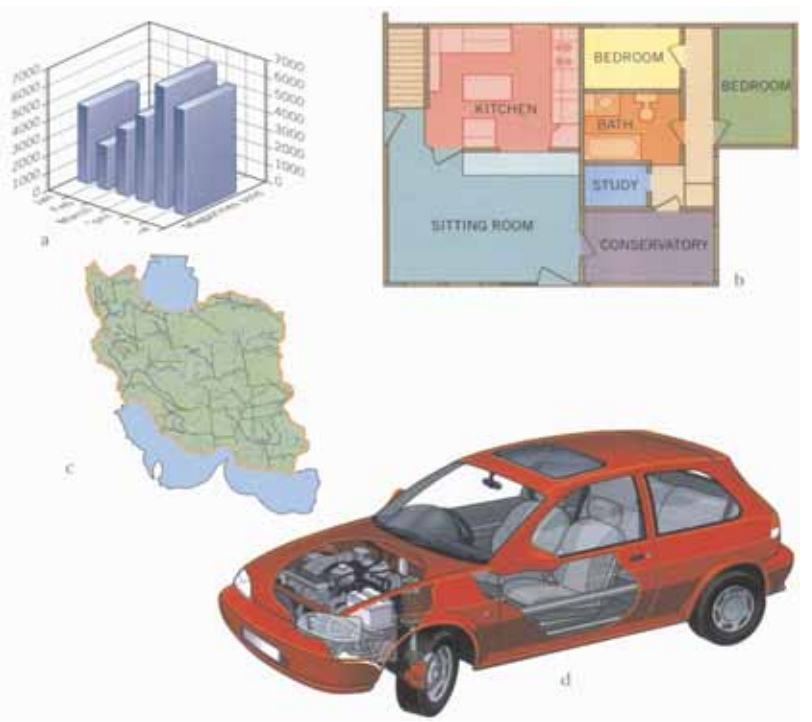
Abbreviations and Acronyms: CAD, CAE, CAM, 3-D

Key Words: activate, attributes, axis, complex, convert, depth, diagram, drawing, figure, graph, graphics, horizontal, icon, image, paintbrush, palette, pattern, primitives, three-dimensional, transform, vertical, visual, zoom in/out

A. Warm-up

Look at the pictures below, which were all created on computer. Write the terms in the box next to the letters for the pictures.

architecture	geography	mechanical engineering	graph



a. _____ **c.** _____

b. _____ **d.** _____

B. Reading Comprehension

Reading 1

What is computer graphics? What applications for computer graphics can you think of? Read the text and check your answers.

Computer Graphics

Computer graphics are pictures and drawings produced by computer. A graphics program interprets the input provided by the user and transforms it into images that can be displayed on the screen or printed on paper. In the process, the computer uses hundreds of mathematical formulas to convert the bits of data into shapes and colors. Graphics can be developed for a variety of uses including illustrations, desktop publishing, architectural designs, and engineering drawings.

Mechanical engineers use sophisticated programs for applications in **computer-aided design** (CAD) and **computer-aided manufacturing** (CAM). Let us take, for example, the car industry. CAD software is used to develop, model, and test car designs before the actual parts are made. This can save a lot of time and money.

Computers are also used to present data in a more understandable form: electrical engineers use computer graphics to design circuits, and people in business can present information visually to clients in graphs and diagrams. These are much more effective ways of communicating than lists of figures or long explanations.

Today, **three-dimensional** (3-D) graphics, along with color and animation, are necessary for such applications as, graphic design, web-page design, **computer-aided engineering** (CAE), and academic research. **Computer animation** is the process of creating objects and pictures which move across the screen; it is used by scientists and engineers to analyze problems. Basically, computer graphics help users to understand complex information quickly by presenting it in a clear visual form.

Activity 1

Fill in the blanks in the following sentences with the words in the box.

visual	time	drawings	manufacturing
design	creating	effective	engineering

1. CAD stands for computer-aided _____.
2. CAE stands for computer-aided _____.
3. CAM stands for computer-aided _____.
4. Computer graphics are pictures and _____ produced by computer.
5. Testing car designs before the actual parts are made can save a lot of _____ and money.
6. Graphs and diagrams are much more _____ ways of communicating than lists of figures and long explanations.
7. Computer animation is the process of _____ objects and pictures which move across the screen.

8. Computer graphics help users to understand complex information quickly by presenting it in a clear _____ form.

Reading 2

The following text is about different drawing and painting tools in a graphics package. Do you know how to use these tools? Read the text below and fill in the blanks with the given words. The meanings are given to help you choose the correct items.

graphical	related to graphics
attributes	qualities or features
activate	to make a system start working
polygons	flat shapes with three or more sides
drawing	something that you draw with a pencil, pen, etc.
manipulate	to work skillfully with systems to achieve the result that you want
icons	small signs or pictures on a computer screen that are used to start a particular program

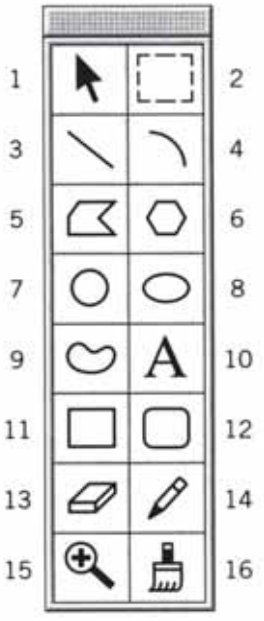
Drawing and Painting Tools

A graphics package is the software that enables you to draw and (1) _____ objects on a computer. Each graphics package has its own facilities, plus a wide range of basic drawing and painting tools. The collection of tools in a package is known as a palette. The basic shapes which are used to make (2) _____ objects are called “primitives.” These are usually geometric lines

between two points, arcs, circles, (3) _____, and even text. You can choose between the primitive you want and where it should go on the screen. Moreover, you can specify the (4) _____ of each primitive, such as its style, color, line type, fill area, and so on. The various tools in a palette usually appear as pop-up (5) _____ in a menu. To use one, you can (6) _____ it by clicking on it. For example, if you want to draw a rectangle, you activate the rectangle tool and the pop-up options allow you to choose the origin of the rectangle (using the insertion point as its center or corner) and the possibility of (7) _____ a rectangle with rounded corners.

Activity 2

Look at the functions represented by the icons in the tool palette on the left and match them with the definitions on the right.



a.___ This is used to scale the view. Similar to the command "Zoom in/out."
b.___ This is used to delete the part of the picture you drag it over. It is known as "Eraser."
c.___ This is used to type text.
d.___ This draws a straight line between two points.
e.___ This is a paintbrush used to add color and patterns. It often comes in different shapes.
f. ___ This is used to draw polygons with irregular sides.
g.___ This is used to draw thin, free-form lines.
h.___ These are used to select text and images.
i. ___ This draws an arc, or part of a circle.
j. ___ This draws curved, free-form shapes.
k.___ This is used to draw a circle.

l. ___ This is used to draw polygons with equal sides.

m. ___ These two are used to draw all kinds of rectangles, even ones with rounded corners.

n. ___ This is used to draw a curved shape like a circle, but with two longer sides.

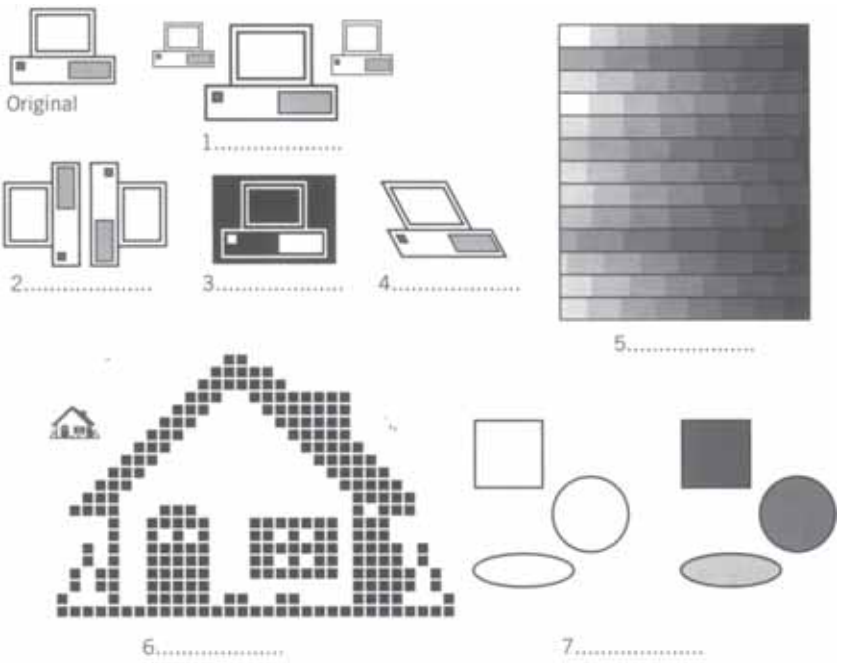
Activity 3

Graphics programs have several options that work along with the tools menu to enable the user to manipulate and change pictures. Look at the facilities on the left and match them with the definitions on the right.

1. ___ Patterns Menu	**a.** Turning an image around
2. ___ Scaling	**b.** A tool which lets you scale the "view" of a picture and edit a small part of it as if you were working under a magnifying glass. It is very useful for doing detailed work as you can edit the picture one dot at a time.
3. ___ Rotating	**c.** Making the object larger or smaller in any of the horizontal, vertical, or depth directions.
4. ___ Inverting	**d.** A shading technique where two different colors are placed next to each other; the human eye blends the colors to form a third one. It is also used to show shading in black and white.
5. ___ Zoom	**e.** A palette from which you choose a design to fill in shapes.
6. ___ Slanting	**f.** Changing the color of the dots in the selected part of a picture, so that white dots become black and black dots become white.
7. ___ Black-and-White Dithering	**g.** Inclining an object to an oblique position.

Activity 4

Look at the pictures below and label them with the facility that has been used to change the original.



Reading 3

What do you know about transformation? Discuss it with other students. Read the text below and check your answer.

Transformation

You cannot create a picture simply by specifying **primitives**. Instead, you must specify the primitives and their attributes, then transform them by specifying where and how you want them to be placed on the screen so they create your picture. **Transformation** means moving or manipulating the object by translating, rotating, and scaling the object.

Translation is moving an object along an axis to somewhere else in the viewing area. **Rotation** is turning the object around an axis. **Scaling** is making the object larger or smaller in any of the horizontal, vertical, or depth directions (corresponding to the x, y, and z axes). The term **rendering** describes the techniques used to make your object look real. Rendering includes shading, light sources, and reflections.

C. Language Focus: *Gerunds*

Gerunds

A gerund is a noun formed by adding *-ing* to a verb. Sometimes verbs are used as nouns (gerund) to show an action, process or state. Knowing this will improve your reading comprehension. Pay attention to the following examples.

Examples:
***Smoking** is bad for your health.*
*She has never done any **computing**.*
*CAD programs are very fast at **performing** drawing functions.*
*His favorite pastime is **playing** computer games.*

Activity 5

Read the text again and underline the gerunds.

Activity 6

Fill in the blanks in the following sentences by using the gerunds in the box.

creating	adding	clicking	processing
printing	rendering		

1. Graphic artists like _____ color and depth to their drawings and designs.

2. A 32-bit painting program has a complete palette of tools for _____ images from scratch.
3. The speed of a microprocessor is important in _____ information.
4. Before _____ a document, the user should decide on the layout.
5. You can open the color palette by _____ on the corresponding pop-up icon.
6. The term _____ refers to the techniques used to make realistic images.

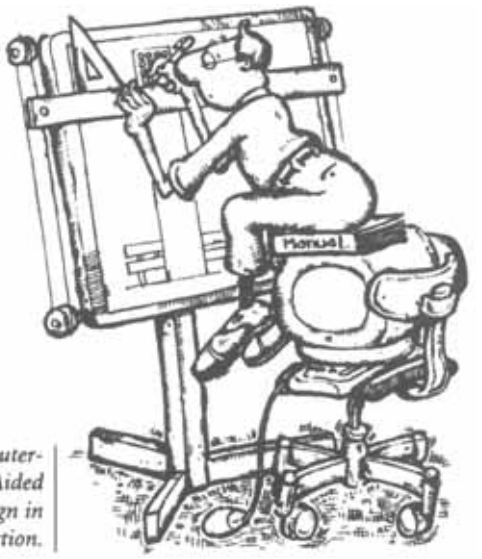
D. Quiz

Fill in the blanks in the following sentences with the words in the box to check your understanding of this unit.

CAD	DTP	transformation	scaling
three-dimensional		page-layout	axis
tool palette		primitives	patterns

1. 3-D stands for _____.
2. A/An _____ program is a category of applications used to design products and buildings on a computer.
3. A/An _____ is a collection of drawing and painting tools in a package.
4. The use of personal computers to design and arrange the writing and pictures for a magazine or book is called _____.
5. A/An _____ program is used to combine and arrange text and images on the page.
6. Rotation is turning the object around an _____.

7. To create a picture, you must specify the _____ and their attributes, then transform them on the screen.
8. Making the object larger or smaller in any direction is called _____.
9. Moving or manipulating the object by translating, rotating, and scaling it is called _____.
10. A palette from which you choose a design to fill in shapes is called _____ menu.



Computer-Aided Design in action.

For more information on computer graphics, you can visit the following websites:

– *http://www.symbols.com/*
(an online encyclopedia of graphic symbols, containing more than 2,500 signs; users can search for a sign according to its meaning or appearance)

– *http://siggraph.org/*
(information about the activities and artwork of the Association for Computing Machinery Special Interest Group (SIG) for computer graphics)

– *http://www.irt.org/*
(articles, tutorials, and FAQs on several Internet technology topics, including markup languages, graphics and design)

Unit 8

Multimedia

Topic: Multimedia technology

Learning Objectives:
- To understand the main components and applications of multimedia systems
- To learn the basic terminology related to multimedia technology
- To recognize file formats
- To understand MP3

Language Focus: Meaning markers

Abbreviations and Acronyms: 3-D, MIDI, MP3, MPEG

Key Words: animation, buffer, built-in, combination, compress, download, extension, file format, hypermedia, hypertext, integrate, media, motion picture, multimedia, optical, plug-in, streaming, video

A. Warm-up

Look at the cover of *Microsoft Encarta*. What types of data are integrated in multimedia applications?

B. Reading Comprehension

Reading 1

A computer instructor is explaining the components of a multimedia system to an interviewer. Read the interview and complete the diagram.

What is multimedia?

Interviewer: This is an obvious question, but what exactly is multimedia?

Instructor: Multimedia refers to the technologies and applications that integrate sound, music, video, text, images, animation, and any other media in any other combination.

Interviewer: Why would you want to have it? What are its advantages over traditional computing?

Instructor: It's very interesting and entertaining to use. A lot of people really enjoy using a program with sound and motion pictures. It's much more fun than an ordinary program or watching TV because you can interact with it. You can choose what you want to watch, listen to, or write. Watching TV is very passive whereas with multimedia you can actually do things so that you get much more involved.

Interviewer: What's the basic hardware you need to run an application?

Instructor: You need a Pentium or Power PC with at least 256 megabytes of RAM. You also need a high-quality color monitor, plenty of storage capacity on your hard disk, and a DVD (Digital Video/Versatile Disk) drive or a CD-Rewritable drive.

Interviewer: I think you also need some sort of sound capabilities.

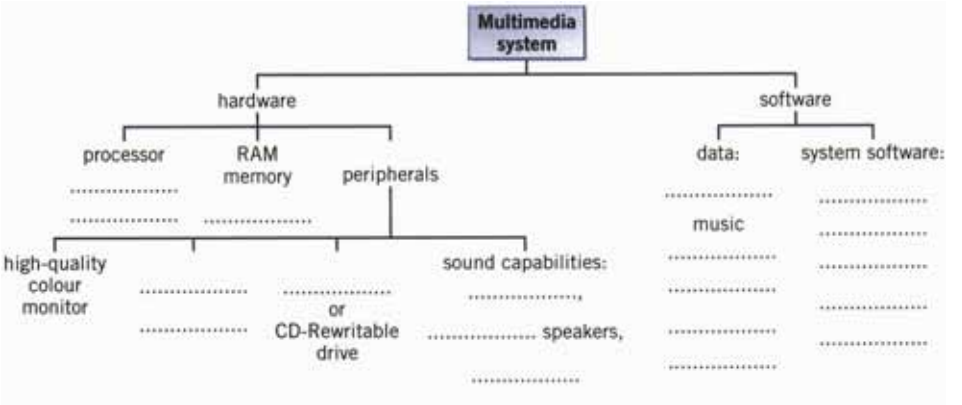
Instructor: Yes, of course. Modern PCs come with a sound card, stereo speakers, and a microphone.

Interviewer: What about software? Is there a standard operating system for multimedia work?

Instructor: No, not yet. Microsoft, for example, has Windows with multimedia control panels to work with audio and video files.

Interviewer: Thank you very much.

Instructor: You're welcome.



Reading 2

Read the texts and match them with the headings in the box. Write the headings in the space before each text.

- Sound, Music, and MIDI
- Editing photos and making movies
- The potential of using multimedia
- CDs and DVDs full of pictures, action, and sound

Multimedia Magic

1. …….

Multimedia applications are used in all sorts of fields. For example, teachers use multimedia programs to teach subjects such as music and languages. It is clear that moving images, sound, and music involve viewers emotionally as well as inform them, and make the message more memorable. The power of multimedia is in hypertext and hypermedia. If you click on a hypertext word, you jump to another screen with more

information about the subject. Hypermedia is similar, but also works with sound, graphics, and video.

2. …….

To capture sounds in digital format and play them back, modern PCs contain a sound card. This is a type of expansion card which offers two important capabilities: (a) a built-in stereo synthesizer and (b) a system called Musical Instrument Digital Interface, or MIDI. This allows electronic musical instruments to communicate with computers. You can also listen to music on your PC. Many radio stations broadcast on the Web using a technique called "streaming." This lets you play an audio file in a continuous stream, while it's downloading, before the entire file is transmitted.

3. …….

There are two ways of storing photos on a computer. The first way is to use a digital camera. Photos are stored in a memory chip and then they are downloaded to the computer. The second way is to scan printed photos by using a scanner. With special software you can repair flaws, add effects, and even save your photos on a CD. Video is another important part of multimedia. It is possible to record, manipulate, and store video in digital format. In fact, you can make your own movies on your PC by capturing images with a digital video camera and transferring the digital video to your computer.

4. …….

Multimedia software is usually interactive and comes on CD-ROMs or DVDs. For example, *Microsoft Encarta* enables you to read about many subjects, look at photos, listen to sounds, and view animated sequences. Other CD-ROMs include games, guides, dictionaries, and educational courses about history, science, the human body, cinema, literature, and foreign languages.

Activity 1

In each pair of the following sentences, one sentence is wrong. Put a ✓ next to the correct sentences and a ✗ next to the wrong ones.

1. ____ **a.** Multimedia PCs can integrate text with graphics and video.

____ **b.** Multimedia PCs cannot integrate text with graphics and video.

2. ____ **a.** You need to have a sound board on your PC to hear speech and music.

____ **b.** You don't need to have a sound board on your PC to hear speech and music.

3. ____ **a.** Digital cameras store photos in a roll of film.

____ **b.** Digital cameras store photos in a memory chip.

4. ____ **a.** There are language courses available on CD-ROM.

____ **b.** There are no language courses available on CD-ROM.

Activity 2

Fill in the blanks in the following text about streaming, using the words in the box.

buffer	playback	clip	data	download

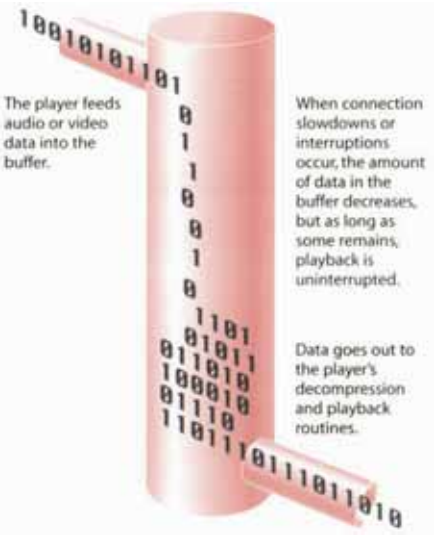


Figure 1: Video buffering

Streaming

Streaming is a way of dealing with bandwidth problems when you download video from the Internet. One key to successful streaming is the process of buffering. When you (1) _____ a movie, the video player stores part of the movie in memory before playing it. Imagine the (2) _____ as a container filled from the top as shown in the *Figure1*. As long as the container is full, the player sends (3) _____ on for playback from the bottom. Data keeps coming in while a clip plays. The user can view the beginning of the movie as the rest of the (4) _____ downloads.

When connection slows down or interruptions occur, the amount of data in the buffer decreases but as long as some remains, (5) _____ is uninterrupted. Playback continues at a steady rate until the buffer is empty.

Reading 3

Read the text about file format and find:

1. the language used to create the majority of text files on the Web _____
2. the graphics interchange format created by CompuServe to compress images _____
3. the small program (plug-in) that lets you hear audio recordings on the Net _____
4. the most popular video formats _____
5. the extension for the files that can be decompressed with a program line *Winzip* _____

File Formats

Web pages can contain different multimedia elements: text, graphics, sounds, video, and animation. To identify the **format** or type of file, an **extension** (a three-letter suffix) is usually added to the file name when it is saved on disk.

Text

The most common text extensions are **.txt**, **.pdf**, **.doc**, and **htm** (or **.html**). Most of the text files that you find on the Web have the extension **.htm**, created with the hypertext markup language.

Graphics

Graphics on the Web can include pictures, photos, paintings, image-maps, and buttons. The most common formats are **.gif** (a standard image format developed by CompuServe) and **.jpg** or **.jpeg** (created by Joint Photographic Experts Group).

Sounds

The Internet is a great place to find and hear songs, movie soundtracks, and recorded interviews. The most common formats are these:

- **.wav:** Wave files can be played with Sound Recorder included in Windows.
- **.ra** or **ram:** RealAudio files can be heard with RealPlayer, a plug-in you can download from the Web.
- **.mp3:** Compressed music files that can be played with an MP3 player.

Video and Animation

You can see cartoons and movie clips on the Web, but you need the appropriate software. Video files are usually stored in: **.avi**, **.mov**, and **.mpg** (or **.mpeg**) formats. To view MPEG videos, you just need Video for Windows. However, to create high-quality movie clips, you need a special MPEG expansion card. You can also find animation and 3-D worlds. One of the standard tools to manipulate animated worlds is Java.

Compressed Files

When you download files, they're usually compressed. Windows files have a **.zip** extension.

Reading 4

Do you know how MP3 reduces the size of music files? Discuss with other students, and then read the text to check your answers.

A Word or Two about MP3

The name comes from MPEG (pronounced EM-peg), which stands for the Motion Picture Experts Group. MPEG develops standards for audio and video **compression**. MP3 is actually MPEG audio Layer 3. MP3 competes with another audio file format called WAV. The key difference is that MP3 files are much smaller than WAV files. An MP3 file can store a minute of sound per megabyte, while a WAV file 11 or 12 megabytes to hold the same amount. How does MP3 achieve this compression? By omitting sounds most people can't hear, MP3 reduces the information stored. For instance, most people can't hear notes above a frequency of 16 KHz, so it removes them from the mix. Similarly, it removes quiet sounds masked by noise at the same frequency. The result is a file that sounds very similar to a CD, but which is much smaller.

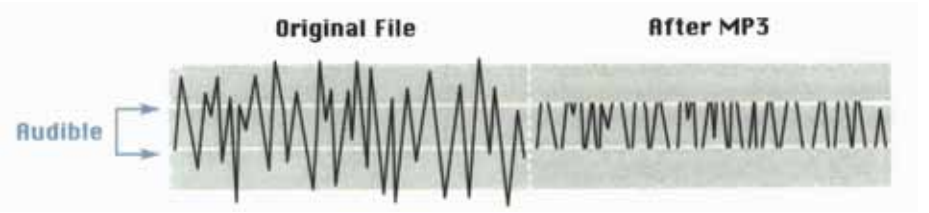


Figure 2: Understanding how MP3 works

Activity 3

Answer the following questions.

1. What does MPEG stand for?

   _____

2. What does MP3 stand for?

   _____

3. How many megabytes does an MP3 file need to store a minute of sound? _____

4. How many megabytes does a WAV file need to store a minute of sound? _____

Activity 4

In each pair of the following sentences, one sentence is wrong. Put a ✓ next to the correct sentences and a ✗ next to the wrong ones.

1. **a.** ____ MP3 files are much bigger than WAV files.
   b. ____ MP3 files are much smaller than WAV files.

2. **a.** ____ WAV strips out sounds that most people can't hear.
   b. ____ MP3 strips out sounds that most people can't hear.

3. **a.** ____ When we listen to music, we can tell the difference between an MP3 file and a WAV file.
   b. ____ When we listen to music, we can't tell the difference between an MP3 file and a WAV file.

C. Language Focus: *Meaning Markers*

Meaning Markers

We use sentence connectives to show different kinds of relations between phrases and sentences. These connective words act like "meaning markers" and serve different purposes such as adding new information, comparing and contrasting, or showing a result. Knowing them will improve your reading skill, and you can make better guesses when you see new words. Study these common meaning markers:

- Add new information:
  and, also, in addition, moreover, furthermore, similarly, in other words
- Compare and contrast:
  but, yet, however, whereas
- Show a result:
  as a result, therefore, thus, so, so that
- Emphasize a point:
  as a matter of fact, in fact
- Show different steps:
  first, firstly, first of all
  second, secondly, then, next
  finally
- Show examples:
  for example, for instance, e.g.

Activity 5

Underline the "meaning markers" used in the following sentences. Then write the kind of relation that each one shows. Follow the example:

Example:

If there is not a lot of information, the home page may be the only page. But usually you will find at least a few other pages.

compare and contrast

1. A good user interface is important because when you buy a program you want to use it easily. Moreover, a graphical user interface saves a lot of time.

_____

2. RAM contains temporary information; however, ROM contains permanent information.

_____

3. Watching TV is very passive whereas with multimedia you can actually do things so that you get much more involved.

_____

4. Video computing refers to recording, manipulating, and storing video in digital format. In fact, today you can make your own movies on your PC.

_____

5. This is what you have to do: first, capture images with a digital video camera, and then transfer the digital video to your computer. Next, with a video editing program cut your favorite segments and add effects. Finally, save your movie on a video CD, a DVD, or a videotape.

_____

6. Most aspects of a database program can be protected by user-defined passwords. For example, if you wanted to share an employee's personal details, but not their salary, you could protect the salary field.

_____

D. Quiz

Fill in the blanks in the following sentences with the words in the box to check your understanding of this unit.

multimedia	compress	hypertext	format
streaming	MIDI	MPEG	buffer
jpg	digital video disk		

1. DVD stands for _____.

2. MP3 is used to _____ music files.

3. Text with hyperlinks, which take you to other pages, is called _____.

4. The integration of text, sound, graphics, animation, and movies on the computer screen is called _____.

5. One of the most common formats for graphics on the Web is _____.

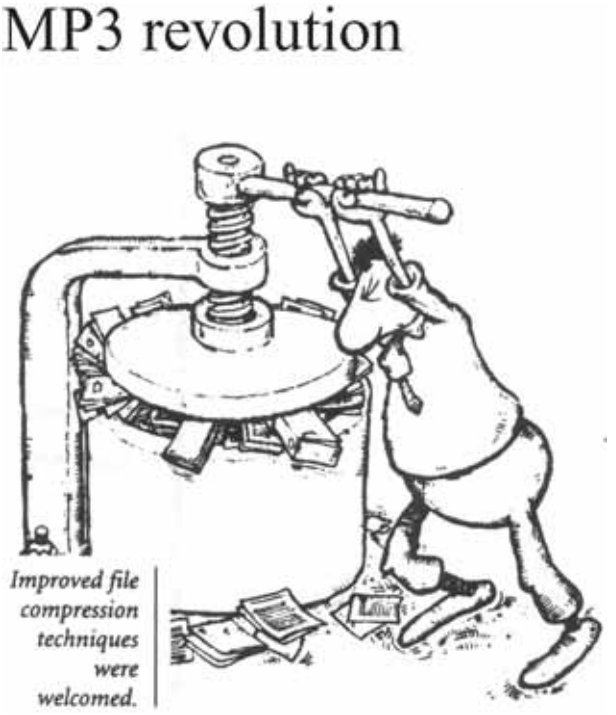
6. _____ allows electronic musical instruments to communicate with computers.

7. The technique of playing sound and video files as a continuous stream, while they're downloading is called _____.

8. To identify the file's _____, we can use the extension that is added to a file name and describes its contents.

9. The format created by Motion Picture Experts Group to capture, store, and play back movies is _____.

10. A _____ is an area in a computer's memory where information can be stored for a short time.



For more information on multimedia, you can visit the following websites:

– *http://www.artmuseum.net/w2vr/contents.htm*
(a history of multimedia and its impact on art, technology, and culture, as well as profiles of the pioneers of multimedia)

– *http://www.brainpop.com/*
(a multimedia-rich site with information about activities, videos, games, and much more)

– *http://www.stack.com/*
(a list of computer file name extensions with a brief description of what the extensions mean)

– *http://www.longman.com/multimedia*
(multimedia English courses for beginners and advanced students)

– *http://www.encarta.msn.com*
(an online encyclopedia, offering information on almost any subject)

Unit 9

Programming Languages

Topic: Computer programming

Learning Objectives:
- To understand basic concepts in computer programming
- To learn about Visual BASIC and Java

Language Focus:
- Prefixes: *de-* and *re-*
- Negative makers: *un-* and *dis-*

Abbreviations and Acronyms: AI, BASIC

Key Words: algorithm, assembler, assembly languages, bug, byte-code, coding, compiler, computer programming, debug, diagnose, error, flowchart, high-level language, low-level language, object program, object-oriented, machine code, program design, programmer, programming languages

A. Warm-up

Try to think of an answer to the question below, and then discuss it with other students.

What is computer programming?

B. Reading Comprehension

Reading 1

Try to complete the following definitions with the words and phrases in the box before reading the text.

language	binary numbers	a given problem
may be in programs	the various parts of the program	

1. **flowchart:** a diagram showing the logical order between _____
2. **coding:** the translation of the logical steps into a programming _____

3. **machine code:** the basic instructions understood by computers; the processor operates on codes which consist of

   _____

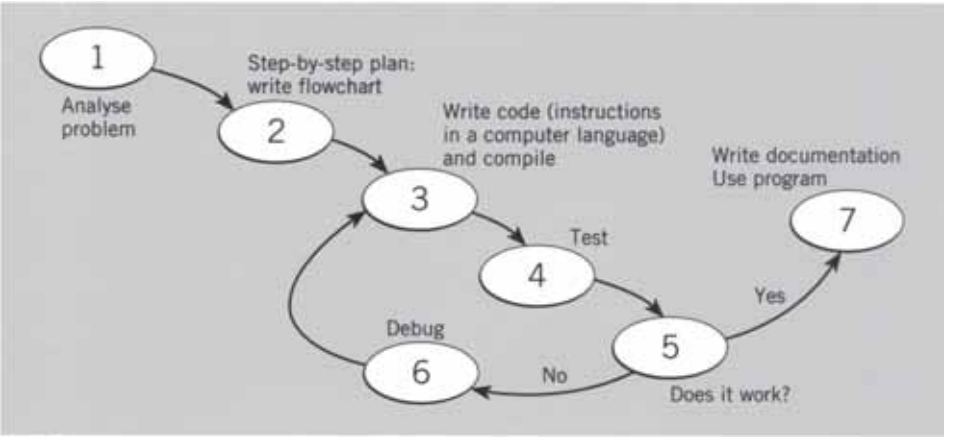
4. **debugging:** the techniques of detecting, diagnosing, and correcting errors or "bugs" which _____

Now read the following text about how a program is produced.

Program Design

First of all, you have to understand exactly what the **problem** is, and define it clearly. This means you have to decide in a general way how to solve the problem. The next step is to design an **algorithm**, which is a step-by-step plan of instructions used to solve the problem. You do this in a **flowchart**. You use special symbols to show how the computer works through your program; that is, where it makes decisions, where it starts, ends, and things like that. Then you **translate** the steps in the flowchart into instructions written in a computer language. You usually write these in a high-level language like BASIC or Pascal. Then you have to use something called a **compiler**, which translates instructions into **machine code**, which is the only language understood by the processor.

Once you have written your program, you have to **test** it with sample data to see if there are any **bugs** or errors. Usually there are, so the program has to be cleared of them, or **debugged**. Last of all, you have to write instructions explaining to people how to use it. A great program is not of much use unless people know how to use it.



Activity 1

Number these steps in the order you read them.

1. ___ Provide documentation of the program.

2. ___ Understand the problem and plan the solution.

3. ___ Test and correct the program.

4. ___ Make a flowchart of the program.

5. ___Write the instructions in coded form and compile the program.

Reading 2

As you know, the language used by computers is different from the language used by human beings. So how do you think we can communicate with computers? Discuss it with other students. Then read the text and check your answer.

Programming Languages

Unfortunately, computers cannot understand human languages. The only language they can understand directly is called **machine code**. This consists of the 1s and 0s (binary codes) processed by the CPU.

However, machine code as a means of communication is very difficult to write. For this reason, we use symbolic languages that are easier to understand. Then, by using a special program, these languages can be translated into machine code. For example, the so-called **assembly languages** use abbreviations such as ADD, SUB, MPY to represent instructions. These codes are like labels that refer to the related items. Basic languages, where the program is similar to the machine code version, are known as **low-level languages**. In these languages, each instruction is equivalent to a single machine code instruction, and the program is converted into machine code by a special program called an **assembler**. These languages are still quite complex and restricted to particular machines.

To make the programs easier to write and to overcome the problem of intercommunication between different types of machines, **high-level languages** were designed such as BASIC, COBOL, FORTRAN, or Pascal. These are all problem-oriented rather than machine-oriented. Programs written in one of these languages (known as **source programs**) are converted into a lower-level language by means of a **compiler** (generating the **object program**). On compilation, each statement in a high-level language is generally translated into many machine code instructions.

People communicate instructions to the computer in **symbolic languages**. When this communication is easier, the application of computers will be wider. Scientists are already working on **Artificial Intelligence** (AI), and the next generation of computers may be able to understand human languages.

Instructions are written in a high-level language
(e.g. Pascal, BASIC, COBOL, Ada, C, Lisp).
This is known as the source program

▼

Compiler
Compilers translate the original code
into a lower-level language or machine code
so that the CPU can understand it.

▼

Instructions are compiled and packaged into
a program. The software is ready to run the
computer.

Activity 2

In each pair of the following sentences, one sentence is wrong. Put a ✓ next to the correct sentences and a ✗ next to the wrong ones.

1. **a.** ____ Computers understand human languages.
b. ____ Computers understand symbolic languages.

2. **a.** ____ High-level languages are machine-oriented.
b. ____ High-level languages are problem-oriented.

3. **a.** ____ BASIC and Pascal are low-level languages.
   b. ____ BASIC and Pascal are high-level languages.

4. **a.** ____ The only language computers understand is English.
   b. ____ The only language computers understand is machine code.

5. **a.** ____ The CPU cannot process binary codes.
   b. ____ The CPU can only process binary codes.

6. **a.** ____ The compiler converts the object program into a lower-level language.
   b. ____ The compiler converts source programs into a lower-level language.

7. **a.** ____ Scientists believe computers can never understand human languages.
   b. ____ Scientists believe computers may someday understand human languages.

Reading 3

What do you know about Visual BASIC? Why is it called Visual? Discuss them with other students. Then read the following text and check your answers.

Visual BASIC

Visual BASIC is a programming language and an environment developed by Microsoft in 1990. It is used to create applications for Windows operating systems. The name **BASIC** is an acronym for

Beginner's All-purpose Symbolic Instruction Code. The original BASIC language was created in 1965 and used by many programmers and PC manufacturers because it was **user-friendly** and easy to learn.

The adjective **Visual** refers to the technique used to create a graphical user interface. Instead of writing a lot of instructions to describe interface elements, you just add pre-defined objects such as buttons and dialog boxes, which can be chosen from a toolbox. It takes only a few minutes to create a Visual BASIC program. Using the mouse, you simply **drag and drop** controls (e.g. option buttons, text boxes, icons, menu bars, etc.) into the required position, and then define their color, size, and behavior.

Because of its **object-oriented** and **interactive** nature, Visual BASIC enables the programmer to quickly create all sorts of applications from small system utilities to database programs and Internet server applications.

Activity 3

Now fill in the blanks in the following sentences according to the information in the text.

1. The acronym BASIC stands for _____.

2. The original BASIC language was first created in _____.

3. Language programmers and PC manufacturers like Visual BASIC because it is _____ and easy to learn.
4. To create a Visual BASIC program, you can _____ and _____ controls into the required position.

Reading 4

The term "Java" refers to three things:

a. an island in Indonesia

b. a cup of coffee

c. a language for Internet applications

Java Steaming Coffee Cup
(the Java Technology logo)

What is Java in the world of computers? Have you seen the effects of Java programs on web pages? Read the text and check your answers.

Java

Java is a programming language developed by Sun Microsystems which is specially designed to **run on the Web**. When you see a web page that uses Java, a small program called "applet" is executed automatically. **Java applets** let you play music, make and watch animated characters and moving text and images, and create graphical objects (e.g. charts, graphs, diagrams).

Characteristics of the Java Language

Java is an **object-oriented** language which can easily remove possible programming errors. A Java program is both compiled and interpreted. First, the **source code** (file with a .java extension) is

compiled and converted into a format called **bytecode** (file with a .class extension), which can then be executed by a Java interpreter. Compiled Java code can run on most computers because there are Java interpreters, known as Java Virtual Machines, for most operating systems, including Mac OS, Windows, or UNIX.

Before 1995, web pages could only display text, pictures, and hyperlinks. With the arrival of Java, web designers were able to include **animation** and **interactive** programs on web pages. The first major application created with Java was the HotJava browser. The Java language began to attract lots of attention from the Internet community and was soon supported by Netscape Navigator and Microsoft Internet Explorer. Today Java is a hot technology that runs on any computer.

Activity 4

Fill in the blanks in the following sentences using the words in the box.

applet	runs	Sun Microsystems
characters	animation	

1. With the arrival of Java, web designers were able to include _____ and interactive programs on the web.
2. Java attracted lots of attention, and today it _____ on all computers in the world.
3. Java was invented by _____.
4. A small program written in Java is called _____.

5. Java lets you watch animated _____ on your web pages.

C. Language Focus: *More about Prefixes*

More about Prefixes

de-

In the word *debug,* the prefix *de-* is added to *bug*. In this word, *bug* is the root, and *de-* is the prefix. The prefix *de-* means "to remove from." So *debug* means "to remove bugs from a computer program." Study the examples and pay attention to the meanings:

defragmentation: the action of arranging fragmented files
decompression: the action of removing compression from something

re-

In the word *retype,* the prefix *re-* is added to *type*. Here, the word *type* is the root, and *re-* is the prefix. The prefix *re-* means "again or back." So *retype* means "to type again." Study the example and pay attention to the meanings:

restart: to start again
redesign: to design again

un-* and *dis-

Prefixes are often used to give words a negative meaning. The opposite of *comfortable* is *uncomfortable* and the opposite of *like* is *dislike*. Study the examples and pay attention to the negative meanings:

uninstall: to remove an installed program
disconnect: to stop the connection

Activity 5

Fill in the blanks in the following sentences, using the words in the box. Pay attention to the way the prefixes change the meaning of the root parts of the words.

disconnect	undo	unzip	unplug
decodes	reformat	unlock	restart
uninterrupted	redo		

1. If your computer doesn't work properly, you can_____ your computer.

2. If you want to remove the effect of your last action, you can press Ctrl + Z to _____ your last action.

3. You can _____ a zipped file after you have stored and moved it.

4. Press the _____ button if you want to work offline.

5. After you undo an action, you can _____ it if you want to.

6. When a computer _____ the data it receives, it changes the codes into a form that can be used by the computer.

7. It is recommended to _____ the cable from the back of your computer, if you don't want to use it for a long time.

8. If you _____ a document, you change the way it is arranged, for example the amount of space between the lines.

9. If your keypad is locked, you should press the *Num Lock* button on the numeric keypad in order to _____ it.

10. In streaming, when connection slows down, the amount of data in the buffer decreases but as long as some remains, playback is _____.

D. Quiz

Fill in the blanks in the text below with the words in the box to check your understanding of this unit.

compile	flowchart	documentation	runs
detect	plan	high-level	
source code	debugging	machine code	

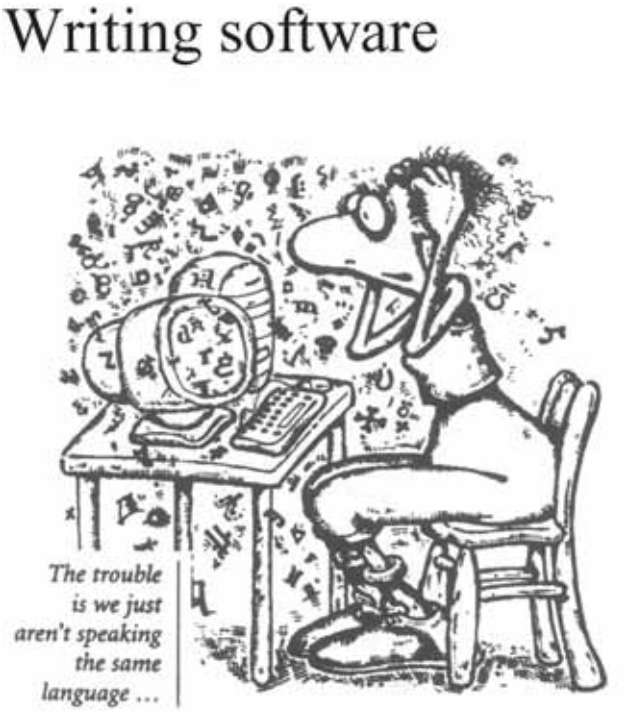
To write a program, software engineers usually carry out the following steps:

First, they try to understand the problem and define the purpose of the program. Next, they design a step-by-step (1) _____ of instructions. This usually takes the form of a (2) _____ (a diagram that uses standardized symbols showing the logical relationship between the various parts of the program).

These logical steps are then translated into instructions written in a (3) _____ computer language (Pascal, COBOL, C++, etc.). These computer instructions are called (4) _____. The program is then "compiled" a process that converts the source code into (5) _____ (binary code), the language that computers understand.

Testing programs are then run to (6) _____ errors in the program. Errors are known as "bugs" and the process of correcting these errors is called (7) _____. Engineers must find the origin of each error, write the correct instruction, (8) _____ the program again, and then conduct another

series of tests. Debugging continues until the program (9) _____ smoothly. Finally, software developers write detailed (10) _____ for the users. Manuals tell us how to use the programs effectively.



For more information on programming languages, you can visit the following websites:

– *http://www.soft-design.com/softinfo/objects.html*
(a non-technical explanation of object-oriented programming)

– *http://www.ibm.com/java/education/intro/courseoptions.htm*
(a free multimedia tutorial on Java; registration required)

– *http://javaboutique.internet.com/*
(information on the Java programming language, including tutorials, news, and a collection of applets for downloading)

Unit 10

Networking

Topic: Computer networks

Learning Objective: • To understand the components and functions of a computer network

Language Focus: Suffixes

Abbreviations and Acronyms: HTML, ISP, LAN, URL, WAN, WWW

Key Words: fiber-optic cable, gateway, glass fiber, home page, interconnect, modem, navigate, network, node, protocol, satellite dish, surf, token, topology, transceiver, transmit, the World Wide Web (the Web)

A. Warm-up

Read the definition of a computer network in the box.

> A **computer network** is a set of computers and peripheral devices that are connected together so that they can share information.

What are the advantages of connecting computers and peripherals in a network? Discuss it with other students.

B. Reading Comprehension

Reading 1

With a partner, list some places where you may find a set of computers and peripheral devices connected together. Then read the following text to know more about small area networks.

LANs

Small networks are called **local area networks** or LANs. They are groups of computers connected within a small physical area like a

building or an office. In *Figure 1*, the central computer is a **file server** that manages communications and stores common files. The file server acts as a kind of traffic controller, which regulates the communication between the computers and peripherals on the network. A file server usually has a large hard disk used to store common files and applications programs. The computers connected to the central computer act as **clients** and are linked to a laser printer and other hardware resources. This local area network is linked to the **telephone lines** by a **modem**. This allows users to send and receive data and electronic messages to and from other computers over long distances.

Activity 1

Use the information in the text and label the different elements in *Figure 1*.

LAN, or _____

Figure 1: An example of a LAN

Reading 2

What are the main elements that are needed to run a network? Discuss it with other students. Then read the text and compare your answers.

Network Configurations

A **network** is a group of devices (PCs, printers, etc.) or "nodes" connected by communications circuits so that users can share data, programs and hardware resources. A network has two main elements: the **physical structure** that links the equipment and the **software** that allows communication.

The physical distribution of devices and their circuits is known as network "topology" or "architecture." The software consists of **protocols**, i.e. the rules which determine the formats by which information may be exchanged between different systems. The transceiver (**trans**mitter + re**ceiver** → **transceiver**) is the hardware that sends and receives network signals. We could say that cables and transceivers allow computers to "hear" one another, while the software is the "language" that they use to "talk" to one another over the network.

To transmit data, a workstation needs a **token**. As there is only one token per network, only the machine that has this piece of software can transmit on the network. LANs can be interconnected by **gateways**. These devices help manage communications and control traffic on large networks. They change the data to make it compatible with the protocols of different networks.

Activity 2

Match the technical terms on the left with the explanations on the right.

1. ___ LAN	**a.** the hardware that sends and receives signals in a computer network
2. ___ network architecture	**b.** a network in a small area topology
3. ___ nodes	**c.** the arrangement of nodes in a communication system
4. ___ protocol	**d.** a device that translates protocols between different types of networks
5. ___ transceiver	**e.** only the machine that has this piece of software can transmit on the network
6. ___ token	**f.** rules that allow the exchange of information over a network
7. ___ gateway	**g.** computer devices interconnected in a network

Reading 3

How can computers be linked up worldwide? What is the name of such a network? Read the text about long-distance communications and check your answers.

WANs

For long-distance or worldwide communications, computers and LANs are usually connected into a **wide area network** (WAN) to form a single, integrated network. The largest WAN in the world is the Internet.

Networks can be linked together by either **telephone lines** or **fiber-optic cables**. Modern telecommunications use fiber-optic cables

because data can be transmitted at a very high speed through the extremely wide bandwidths of glass fibers. The fiber system operates by transmitting light pulses at high frequencies along the glass fiber. This offers several advantages: (1) the cables require little physical space; (2) they are safe because they do not carry electricity; (3) they avoid electromagnetic interference.

Networks on different continents can also be connected via **satellite**. Computers are connected by a modem either to ordinary telephone wires or to fiber-optic cables, which are linked to a satellite dish. This dish has a large concave reflector for the reception and sending of signals. Then, when signals are received by the satellite, they are amplified and sent on to workstations in another part of the world.

Activity 3

What do the following acronyms stand for?

LAN: _____

WAN: _____

Activity 4

In each pair of the following sentences, one sentence is wrong. Put a ✓ next to the correct sentences and a ✗ next to the wrong ones.

1. **a.** ____ The Internet is the biggest LAN in the world.
b. ____ The Internet is the biggest WAN in the world.

2. **a.** ____ Fiber-optic cables avoid electromagnetic interference.
b. ____ Ordinary telephone lines avoid electromagnetic interference.

3. **a.** ____ Fiber-optic cables transmit data slower than ordinary telephone lines.

b. ____ Fiber-optic cables transmit data faster than ordinary telephone lines.

4. **a.** ____ Telephone lines require less physical space than fiber-optic cables.

b. ____ Telephone lines require more physical space than fiber-optic cables.

5. **a.** ____ Fiber-optic cables are dangerous because they carry electricity.

b. ____ Fiber-optic cables are safe because they do not carry electricity.

Reading 4

Read these meanings of the word "web":

a. a net of thin threads made by a spider to catch insects

b. the system on the Internet that allows you to find and use information (= WWW)

Do you see any relations between the two meanings? Discuss it with other students. Then read the text and check your answer.

The World Wide Web

The **World Wide Web** is a collection of electronic documents that are linked together like a spider web. These documents are stored on computers called **servers** located around the world.

What is the Web made of?

The Web consists of:

- Your **personal computer**
- **Web browser software** to access the Web
- A connection to an **Internet service provider** (ISP)
- **Servers** to host the data
- **Routers** and **switches** to direct the flow of data

Web Pages

A **web page** is an electronic document written in a computer language called **HTML**, short for Hypertext Markup Language. Web pages can contain text, graphics, video, animation, and sound, as well as **interactive features**, such as data entry forms. Each page has a unique address known as a **URL** (Uniform Resource Locator), which identifies its location on the server. Web pages usually contain **hyperlinks** to other web pages. Hyperlinks are text and images that refer to the URLs of other web pages.

Websites

A **website** has one or more related web pages, depending on how it is designed. Web pages on a site are linked together through a system of **hyperlinks**, enabling you to jump between them by clicking on a link. On the Web, you navigate through pages of information according to your interests.

Home Pages

When you browse the World Wide Web, you will see the term **home page** often. Think of a home page as the starting point of a website.

Like the table of contents of a book or magazine, the home page usually provides an overview of what you will find at the website. Home pages are very different in design and content, but many use an ordinary magazine format. At the top of the page, there is a list of items, such as articles, often with a short description. The items in the list usually link to other pages on the site, or to other sites.

How does the Web work?

The World Wide Web is the most popular part of the Internet. Once you spend time on the Web, you will begin to feel like there is no limit to what you can discover. The Web physically consists of your personal computer, **web browser** software, a connection to an **ISP**, computers called **servers** that host digital data, and **routers** and **switches** to direct the flow of information.

Navigating the Web

There are three main ways to move between web pages or websites:

- Typing the **URL** of a **web page** in the **location box** (also known as the address field) of your web browser and then pressing the **Enter** key
- Clicking a **text hyperlink**
- Clicking a **hyperlinked graphic image**, such as a button, photograph, or drawing

The Web is known as a **client-server** system. Your computer is the **client**; the remote computers that store electronic files are the servers. First, you enter the address or URL of a website in a **web browser**, such as Netscape Navigator or Microsoft Internet Explorer. Then, your browser requests the web page from the web server. The server

sends the data over the Internet to your computer. Your web browser interprets the data, showing it on your computer screen.

How does your web browser distinguish between web pages and other types of data on the Internet? Web pages are written in a computer language called Hypertext Markup Language or HTML. Text links appear in a different color from the rest of the text – usually in blue and underlined. When you move your cursor over a text link or over a graphic link, it will change from an arrow to a hand. The hypertext words often hint at what you will link to. The "glue" that holds the Web together is called **hypertext** and **hyperlinks**. This feature allows electronic files on the Web to be linked so you can jump easily between them. On the Web, you navigate through pages of information – known as **browsing** or **surfing** – based on what interests you at that particular moment.

Activity 5

Fill in the blanks in each of the sentences below with one word only.

1. HTML stands for Hypertext Markup _____.
2. URL stands for Uniform _____ Locator.
3. A website usually has more than one web _____.
4. Hyperlinks enable you to _____ easily from one page to another by clicking on a link.
5. The _____ page is like the table of contents of a book or magazine.
6. Web pages have different styles, but most of them use a traditional magazine _____.
7. Text links have a different color; they are usually in _____ and are underlined.

8. When you move your cursor over a text link, it will change from an arrow to a _____.

9. When you return to a page you've already visited, the hypertext words will often be in a different _____, so you know you've already been there.

C. Language Focus: *Suffixes*

Suffixes

In *Unit 4* you learned about prefixes and how they can help you to guess the meaning of new words. Another way to guess the meaning of new words is by paying attention to suffixes, which come at the end of words. Suffixes help you know if a word is a noun, verb, or adjective.

They may be used:

- to make a noun:

-ion *animation, application, communication, expansion, installation, transformation*

- to make a verb:

-ize *computerize, memorize, minimize, maximize, customize, synchronize*

- to make an adjective:

-able *removable, rewritable, wearable, clickable, editable, programmable, magnetizable, rechargeable, searchable, downloadable*

- to show the doer of an action:

-er/-or *user, compiler, transceiver, debugger, converter, defragmenter, screen saver*

In the following sentences, you will see more computer terms with common suffixes in English. Read the sentences, and pay attention to the way the underlined terms are made by adding suffixes.

-ion:

MP3 *compression* is used for music files.

This is a high-*resolution* monitor, and it is *distortion*-free.

Information in the form of data and programs is known as software.

-ize:

If the page is too small, you can *maximize* it.

There is no doubt computers have *revolutionized* the way we live.

Windows Media Player is a program that lets you download and *organize* your music CDs and videos.

-able:

Portable PCs are *suitable* for people who travel.

Windows XP is more secure and *reliable* than the previous versions.

Wearable computers should be small so the user can wear them.

-er or ***–or:***

Word *processors* have different facilities that make typing easier.

A *scanner* is an input device, while a *printer* is an output device.

In a *computer*, the *microprocessor* is the microchip which controls its most important functions.

A computer *programmer* is a person who writes programs for computers.

D. Quiz

A journalist is interviewing a university professor, asking him about the Internet. Fill in the blanks in the interview with the words in the box to check your understanding of this unit.

network	Web	modem	links	computers
online	transmit	ISP	port	Internet

What is the Internet?

Journalist: What exactly is the Internet?

Professor: It's a global (1) _____ of computers, which allows users to share all sorts of information and computer resources. The system comprises networks interconnected all over the world.

Journalist: What do you need to connect yourself up to the Internet?

Professor: You just need a PC, a (2) _____, and a telephone line.

Journalist: Is it easy to install a modem?

Professor: Yes, you just connect one cable of the modem to the communications (3) _____ of the computer and the other to the telephone line.

Journalist: Right. And I imagine you need special software to get (4) _____.

Professor: Yes, that's right. You need telecommunications software. This enables you to (5) _____ and receive data. To get your Internet identity, you have to set up an

account with an (6) _____, which is a commercial company that offers connection for a fixed period of time.

Journalist: What services are offered by the (7) _____?

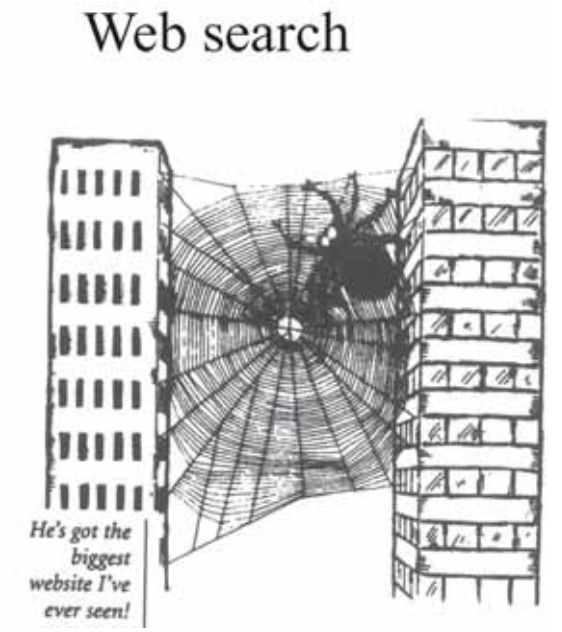
Professor: It offers services such as email, file transfer, real-time chats, and information search on the World Wide Web.

Journalist: The (8) _____ is the most important part of the Internet, isn't it? What is the Web?

Professor: The Web is a huge collection of "pages" stored on (9) _____ all over the world. Web pages contain all sorts of information in the form of text, pictures, sounds, and video. They also have (10) _____ to other resources on the Net.

Journalist: OK. Thanks very much. You've been very helpful.

Professor: You're welcome.



For more information on computer networking, you can visit the following websites:

– *http://www.w3.org/*
(a history of the World Wide Web, news, and updates)

– *http://www.howstuffworks.com/modem.htm*
(a basic explanation of the functioning of modems and links to other resources)

– *http://www.howstuffworks.com/firewall.htm*
(basic information about Internet firewalls, including diagrams and links)

– *http://info.med.yale.edu/caim/manual/pages/page_design.htm/*
(information about designing and judging the design of web pages)

– *http://www.easyhtml.com/*
(software to convert word-processing files to Hypertext)

– *http://www.webreference.com/html/*
(links to tutorials and other materials needed to create HTML documents)

Unit 11

The Internet

Topics: Telecommunications and Internet tools

Learning Objectives:
- To learn about telecommunications
- To recognize Internet tools
- To understand different parts of Web addresses

Language Focus: Blending

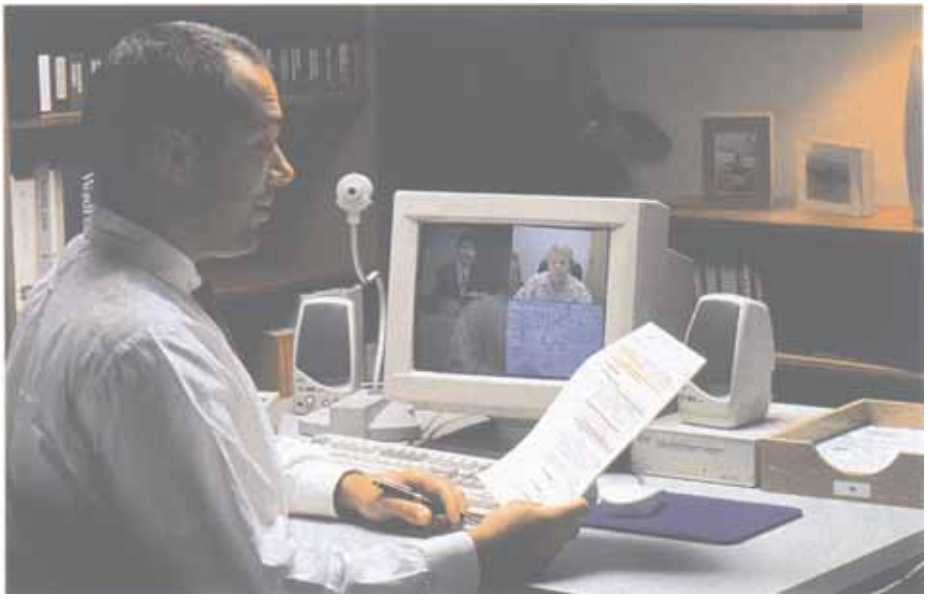
Abbreviations and Acronyms: http, IP, IRC, ISP, kbps, URL

Key Words: access, account, browse, browser, demodulate, domain name, global, the Internet, intranet, location bar, log on, modem, modulate, navigate, the Net, online, password, telecommunications, transfer, transmit, username, web page, web server, website

A. Warm-up

Some computer users refer to the postal system as **snail mail**, because it is very slow in comparison with **email**.

What communication systems which have replaced the postal system can you think of? Discuss it with other students.



B. Reading Comprehension

Reading 1

Match the data communication services on the left with the requirements on the right. Then read the passage and check your answers.

1. ___ fax
2. ___ email
3. ___ teletext
4. ___ online service

a. to send a personal message to a friend who is at a different workstation
b. to send a copy of a paper document – for instance, a scientific article from one university to another
c. to access databases containing all kinds of information
d. to find out weather forecasts and sports information from the television

Telecommunications

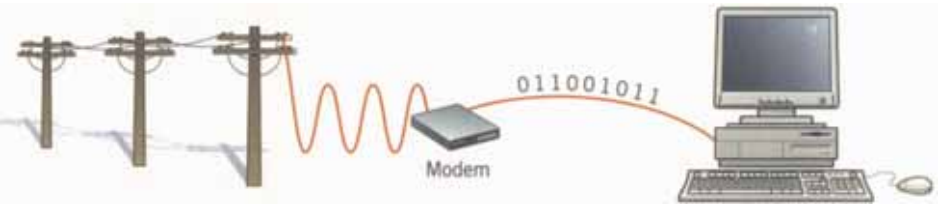
What are telecommunications?

This term refers to the transmission of information over long distances using the telephone system, radio, TV, satellite, or computer links. Examples are two people speaking on the **phone**, a company sending a **fax** to a client, or someone reading the **teletext** pages on TV. However, in the modern world, telecommunications mainly means transferring information from **one PC to another** via modem and phone lines (or fiber-optic cables).

What can you do with a modem?

A modem is your computer's **link** to the external world. With a modem you can **exchange email** (electronic mail) and files with

friends; you can **access the Web** and search for information about sports, entertainment, etc.; you can participate in live conversations; you can buy things for your home online. Today, a lot of companies find it more efficient to have some employees doing their work at home. Using a modem, the employees transfer their work into the office where it is printed. The list of applications is endless.



Modems

Your PC is a digital device (it works with 1s and 0s). However, the telephone is an analog device, designed to transmit the sounds of human voice. That's why we need a modem – a bridge between digital and analog signals. A modem is a device which serves a dual purpose because it acts as a ***mo****dulator (digital to analog) and* ***dem****odulator (analog to digital); hence, the blend* ***modem****. When a modem modulates, it sends rapid on/off pulses. The computer on the other end translates (demodulates) those signals into intelligible text or graphics. Modem transmission speed is measured in kilobits per second. The typical modem transmits data at 56 kbps (kilobits per second).*

What do you need to telecommunicate?

You just need a PC, a modem connected to the computer and the telephone line, and communication software. Once you have installed your modem, you can communicate with people through online services.

Internet Service Providers

To have access to the Net, you must first open an account with an Internet service provider. ISPs give you a software package, username, password, and access phone number. You can then log on to the Internet and browse the Web, download files, and send and receive email.

Activity 1

Fill in the blanks in the following sentences using the words in the box.

online	telephone	account	modem	network

1. When you are connected to the Internet, you are described as being _____.
2. To communicate via the Internet, you need a PC, a modem, and a _____ line.
3. To have access to the Internet, you must first open an _____ with an Internet service provider.
4. You need a _____ to convert computer data into a form that can be transmitted over the phone lines.
5. The Internet is a global _____ of computer networks.

Reading 2

How much time do you usually spend online? In what ways can you exchange information through the Internet? Discuss it with other students. Then read the following text to know more.

The Internet

Web Browsers

The Web is a hypertext-based system where you can find news, pictures, games, online shopping, virtual museums, electronic magazines – any topic you can imagine. You navigate through the Web using a program called a **browser**, which allows you to search and print web pages. You can also click on keywords or buttons that take you to other places on the Net. This is possible because browsers understand hypertext markup language (HTML), a set of commands that shows how a web page is formatted and displayed.

Email

Email is your personal connection to the Internet. It allows you to exchange messages with people all over the world. It can include text, pictures, and even audio and video. When you set up an account with an ISP, you are given an address and anyone can send you email. The mail you receive is stored on the server of your ISP until you next connect and download it to your hard disk.

The format of an email address:

you@yahoo.ca
1 2 3 4

1. User name or nickname
2. The @ sign means “at”; it is pronounced “at”.
3. The computer system where the user gets email. Yahoo is an Internet service provider.
4. Tells people that the company is in Canada.

Audio and Video Chatting

IRC – Internet relay chat – is a system for real-time conversation (usually typed). It's easy to use. To start a **chat** session, you run an IRC program, which connects you to an IRC server. Then, you join a channel, which connects you to a single chat area. Next, you type a message, and the other participants can see it. Internet telephone and video chatting are based on IRC protocols. **Videoconferencing** programs enable users to talk to and see each other. Such systems combine data, voice, and video. They can be used in intranets – company networks that use Internet software but make their website accessible only to employees and authorized users.

Activity 2

Match the terms on the left with the activities on the right.

1. ____ email	**a.** to view web pages on the Internet
2. ____ web browser	**b.** to have a live conversation (usually typed) on the Internet
3. ____ chat program	**c.** to send a message to another person via the Internet
4. ____ videoconferencing	**d.** to participate in live conversations, using text, audio, and video

Reading 3

Are you familiar with the different parts of a web address? Discuss it with other students. Then read the text and check your answer.

Web Addresses

You can think of the World Wide Web as a network of electronic files stored on computers all around the world. **Hypertext** links these

resources together. **Uniform Resource Locators** or **URLs** are the addresses used to locate these files. You enter the URL of a site by typing it into the **Location bar** of your web browser, just under the toolbar. The information contained in the URL gives you the ability to go from one web page to another with just a click of your mouse. When you type a URL into your browser or click on a hypertext link, your browser sends a request to a remote computer, called a **web server**, to download one or more files.

Anatomy of a URL

Study this URL and the description of its parts.

http://www.learnthenet.com/english/start.htm

http:// – Short for **Hypertext Transfer Protocol**. This indicates a hypertext document or directory.

www. – This indicates a page on the **World Wide Web**.

learnthenet.com/ – Called the **domain name**, it often tells you the name of a company, university, or organization. It can also tell you the country of origin.

www.learnthenet.com/ – Together, these indicate the **web server name**.

english/ – This is the **directory** or **folder** on the web server that contains a group of related web pages within the website.

start.htm – This is a **web page** inside the folder. The same file can be named start.html.

Domain Names

When you think of the Internet, you may think of ".com." What do those three letters at the end of a World Wide Web address mean?

The Structure of a Domain Name

A domain name has two or more parts separated by dots and usually consists of some form of an organization's name and a three letter or

more suffixes. For example, the domain name for IBM is "ibm.com"; the United Nations is "un.org." The domain name suffix is known as a **generic top-level domain** and it describes the type of organization.

.com – For businesses; most companies use this extension.
.edu – For educational institutions and universities.
.info – For all uses.
.net – For networks; usually reserved for organizations such as Internet service providers.
.org – For non-commercial organizations.

Country Codes

Each country has a special code by which it is recognized. You can see a few examples in the following table:

Country	Code
China	.cn
India	.in
Iran	.ir
Japan	.jp
Malaysia	.my
Russia	.ru
UAE	.ae

Activity 3

Look at these web addresses and choose the most suitable website from the cyber list.

http://www.yahoo.com/
http://www.greenpeace.org/
http://www.ibm.com/
http://www.gofly.com/
http://www.bbcworld.com/
http://www.oscars.org/

1. Read about environmental problems _____

2. Get news reports _____
3. Find out about specific hardware and software _____
4. Make flight reservations _____
5. Read about films and Hollywood awards _____
6. Search for web addresses _____

Activity 4

The picture on the next page illustrates a typical web page. Look at the box, and then find the following features in the picture.

1. URL address
2. Basic functions of the toolbar
   - **a.** go to the home page
   - **b.** go back page by page
   - **c.** go forward one page
   - **d.** stop the transfer
   - **e.** update a page
   - **f.** find words within a page
   - **g.** load and display the page's images
   - **h.** print this page
3. Clickable image link
4. Clickable hypertext link

- **URL:** uniform resource locator, the address of a file on the Internet.
  A URL looks like this:
  http://www.netscape.com/
  - "http://" means hypertext transfer protocol and tells the program to look for a web page
  - "www" means World Wide Web
  - "netscape.com" is the domain name and tells people that it is a commercial company
- **navigation buttons:** buttons on the toolbar which allow you to go back or forward to other web pages. You can also return to your start-up page or stop the transfer when the circuits are busy.
- **links:** shortcuts (underlined text or images) that, when clicked, take you to other web pages.
- **security on the Web:** Just a few websites are secure. When the page is not encrypted, the security lock is open.

A sample screen from Netscape Communicator, http://www.netscape.com/

C. Language Focus: *Blending*

Blending

Sometimes a new word is made by combining two other words. For example, the late breakfast which some people eat – about 10 or 11 o'clock – on weekends is neither breakfast nor lunch; therefore, it is called *brunch* (breakfast + lunch → *brunch*). This process of word formation is called blending.

In computer science, many new words are made by blending two other words; for example, a device which modulates and demodulates is called a *modem* (modulator + demodulator → *modem*).

In the following sentences, you will see more computer terms made by blending. Note how the meaning of the new word is related to the meanings of the two parts.

bit *(**b**inary + dig**it**)*: each 1 or 0 in binary notation

digicam *(**digi**tal + **cam**era)*: a digital camera

transceiver *(**trans**mitter + re**ceiver**)*: a hardware component that transmits and receives network signals

cyborg *(**cyb**ernetic + **org**anism)*: a being that is part machine, part human

computerate *(**compu**ter + li**terate**)*: computer-literate, i.e. able to use a computer well; e.g. *Nowadays, students need to be computerate as well as literate.*

floptical *(**flop**py + op**tical**)*: a disk which is the same size as a floppy disk (3.5") and the storage capacity of up to 1.3 GB

netiquette *(**net** + e**tiquette**)*: rules of etiquette (good manners) when sending massages on the Internet *(e.g. Don't SHOUT – writing in capital letters on the Internet is bad netiquette.)*

FORTRAN *(**for**mula + **tran**slation)*: a high-level computing language

edutainment *(**edu**cation + enter**tainment**)*: a system that has both educational and entertainment value *(e.g. Edutainment makes learning fun.)*

slo-mo *(**slo**w + **mo**tion)*: used to describe action that appears to happen more slowly than it really happens, in computer games, on video, etc.

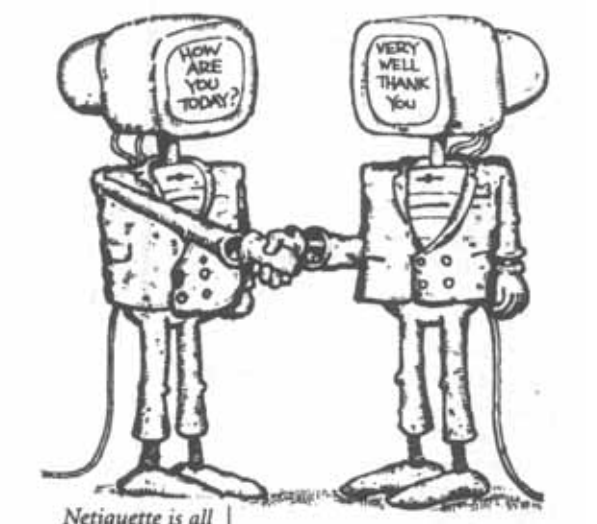
emoticon *(**emoti**on + **icon**)*: a sign that is used to show an emotion in email messages by making a picture when you look at it sideways; for example ;-) looks like a wink and means you made a joke or were pleased about something.

D. Quiz

Fill in the blanks in the text below with the words in the box to check your understanding of this unit.

website	click	log on	sites	online

Nowadays, if people want to find information about almost any subject in the world, the Internet is the best place to start their search from. First, users must (1) _____, or connect their computer to the Internet. Then, once they're (2) _____, they type in the Web address of the page on the Internet they wish to visit. A few seconds later, they will see the (3) _____ appear on the screen. Some pages provide links, which people can (4) _____ on to visit related pages. When someone doesn't know which page will be most useful, he or she can use a search engine like Yahoo, AltaVista, or Google to suggest different (5) _____.



Netiquette is all about good manners.

For more information on Internet tools, you can visit the following websites:

– *http://photo2.si.edu/infoage.html*
(photographs of early communications devices and computers)

– *http://www.computerhistory.org/exhibits/internet_history/index.page*
(a timeline of the history of the Internet, including images)

– *http://www.howstuffworks.com/fiber-optic.htm*
(information on fiber optics, including photographs, diagrams, and links)

– *http://www.ora.com/reference/dictionary/*
(a searchable dictionary of computer and network terminology)

– *http://www.tekmom.com/buzzwords/index.html*
(a glossary of computer-related terms and word games to test your knowledge of technical terminology)

– *http://www.whatis.techtarget.com*
(an IT encyclopedia which explains computer and Internet terms in layman's language)

Unit 12

New Technologies

Topic: New technologies

Learning Objectives:
- To learn about new computer technologies
- To understand the advantages of handheld computers

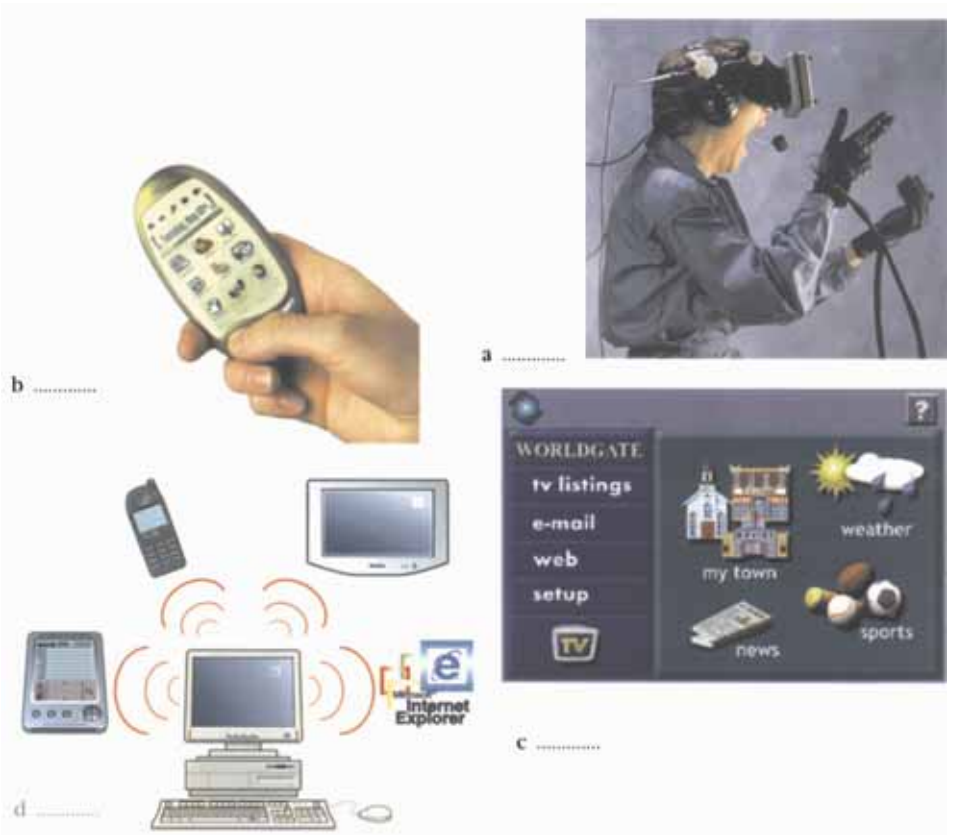
Language Focus: Compound adjectives

Abbreviations and Acronyms-: 3G, CRT, LCD, PDA, SMS, VR, WAP

Key Words: Bluetooth, gadget, infrared, Internet-enabled TV, keypad, rechargeable, simulation, smart card, speech recognition, tou-ch-sensitive, videoconferencing, virtual reality, voice-input, wireless

A. Warm-up

Look at the following pictures. What new technologies can you see in the pictures? Discuss your ideas with other students.



B. Reading Comprehension

Reading 1

Read the following texts and match them with the pictures in *Warm-up* by writing the text numbers next to the pictures.

New Technologies, New Devices

1. Not long ago, mobile phones could just transmit voice and SMS messages. Now, they can show Internet information because of the Wireless Application Protocol or WAP. Some models combine a phone with a PDA (personal digital assistant). They look like a regular phone with a keypad and a small screen on its front. But if you flip up the front cover, you find a larger screen that is **touch-sensitive**. The future models are called "third-generation" (3G) mobiles. They transmit a caller's picture and voice via wireless and satellite networks.

2. Internet TV sets allow you to surf the Net and check your email while you are watching TV. Imagine watching a film on TV and at the same time accessing a website where you get information about the actors in the film. WebTV was the first company which brought Internet services to TV viewers through a set-top computer box. Another option is WorldGate's technology, which offers the Internet through cable TV. The next generation of **Internet-enabled** televisions will include a smart card for home shopping, banking, and other services.

3. Virtual reality (VR) lets people interact with artificial objects and environments through three-dimensional computer **simulation**. In a

VR system, you are connected to a computer through a controlling device such as a glove, and head-mounted displays give you the feeling of being in an artificial three-dimensional world. VR can be applied to anything from video games, testing automobiles, visiting virtual museums, to checking imaginary house designs.

4. Bluetooth is a standard short-distance **wireless** technology designed to connect mobile phones, computers, and other devices, replacing direct cable links. Since it uses high-frequency radio waves, the transfer of data and voice is very fast. Bluetooth was introduced by Ericsson, and the purpose was to remove cables between mobile phones, PC cards, headsets, etc. Today it is supported by companies such as Nokia, IBM, Toshiba, and Intel. With Bluetooth, a handheld computer can be used to surf the Internet wherever you are. Mobile phones will soon be used to control all sorts of gadgets in the house, from TV sets to microwave ovens.

Activity 1

Match the terms on the left with the explanations on the right.

1. ___ Internet-enabled TV	**a.** location on the Internet where a company puts web pages
2. ___ website	**b.** technology that allows users to see a computer simulated world
3. ___ Virtual Reality	**c.** TV set used as an Internet device
4. ___ WAP	**d.** device that can handle multiple data types including voice and video
5. ___ wireless	**e.** protocol that enables mobile phones to access the Internet
6. ___ 3G mobile phone	**f.** without the use of wire

Reading 2

a. Look at the picture of a handheld PC, and try to answer the questions. Compare your answers with other students.

1. What is different about this computer?
2. How do you enter information?
3. What sort of power supply do you think it uses?
4. What kind of screen do you think it has:
   a cathode ray tube (CRT) or a liquid-crystal display (LCD)?

b. Now read this interview about portable computers with a computer magazine writer.

Laptops and Palmtops

Interviewer: Some portable computers are known as laptops and others as palmtops. Can you explain the difference?

Writer: Sure. **Laptops** are simply smaller versions of desktop PCs, but they can run similar applications. However, **palmtops** are handheld computers and weigh less than a kilogram. They are used as PC companions or as personal digital assistants known as PDAs.

Interviewer: What are the basic features of palmtops?

Writer: These **handheld** devices run on rechargeable alkaline batteries and have small keyboards and high-contrast LCD screens. Sometimes they have buttons for running applications, and a stylus or pen which is used for interacting with a touch-sensitive screen.

Interviewer: Do they need special operating systems?

Writer: Yes, they usually run Palm OS from Palm Computing or Pocket PC OS, the system developed by Microsoft for mobile computing devices. Some **pen-based** systems can also recognize hand-written characters and transfer them into editable text.

Interviewer: Right. What sort of things can you do with handheld computers?

Writer: They are usually designed to store personal information. They have, for example, a calendar, an address book, a calculator, and a voice recorder. They may also come with a built-in modem and Internet software, which lets you send and receive email from a payphone, a hotel, or even a plane.

Interviewer: Are they compatible with traditional PCs?

Writer: Yes, of course. They can transfer information to printers and PCs via cables or **infrared** link.

Interviewer: How do you see the future of palmtops?

Writer: Well, I think they will become more and more popular with business people who travel a lot.

Psion (pronounced "sy-on") series 5mX handheld computers have a keyboard and a touch-sensitive screen. Although very light weight, they have one month battery capacity, 16 MB of RAM, a windowing OS, a microphone for sound recording, and a full range of applications including an application which lets you send and receive email and surf the Web.

Activity 2

Decide if the following sentences are true (T) or false (F) according to the information in the interview.

1. ____ Palmtops are a type of portable computers.
2. ____ Palmtops have a mouse and a keyboard as input devices.
3. ____ Handheld computers run Windows XP.
4. ____ Some pen-based systems come with operating systems that can recognize handwriting.
5. ____ Handhelds are mainly designed to organize and communicate personal information.
6. ____ You cannot transmit data from handheld computers to desktop PCs and peripherals.
7. ____ Business people will make up a large section of the handheld market.

Reading 3

Do you think it is possible to communicate with your computer by *speaking* to it rather than using the mouse and keyboard? Discuss it with other students, and then read the following interview with an expert in voice-input technologies.

Voice-input Technologies

Interviewer: Mobile phones and the Internet have changed the way we communicate. However, we still need the keyboard and the mouse to communicate with computers. When will we be able to interact with PCs by voice?

Expert: The technology already exists, but people are not in the habit of talking to a computer yet.

Interviewer: What are the basic parts of a speech-recognition system?

Expert: Basically, you need speech-recognition software, a sound card, and a microphone. If you want to have good results, you should get a high-quality headset microphone.

Interviewer: What sort of things can you do with a speech-recognition system?

Expert: The system changes voice into text, so you can dictate text directly onto your word processor or email program.

Interviewer: But is dictation accurate? I mean does the system understand all the words correctly?

Expert: The system is quite accurate if you train the software by reading aloud a sample text for a few minutes. This teaches

the program to recognize words that are not in its built-in dictionary; for example, proper names, abbreviations, etc.

Interviewer: Can you execute programs and navigate around menus and windows?

Expert: Yes, you can control your PC by voice commands. Some systems even let you search the Web or chat by voice, using your voice instead of the keyboard.

Interviewer: That sounds exciting. And how do you see the future of speech recognition?

Expert: In a few years' time, I think a lot of people will use their voices to interact with computers. Someday, we'll be talking to our PC naturally like a friend.

Activity 3

Fill in the blanks in the following sentences using the words in the box.

surf	converts	high-quality
interact	recognize	word processor

1. If you want to have good results, you should get a _____ headset microphone.
2. A speech-recognition system _____ speech into text, so the computer will understand what you say.
3. With the new technology, you can dictate text directly onto your _____.

4. With many speech-recognition programs, the user should first train the software to _____ individual pronunciations.
5. In a few years' time, a lot of people will use their voices to _____ with computers.
6. In the future, people can even _____ the Web by speaking to the computer.

Reading 4

Have you ever seen a PC which you can wear? Check your answer with other students. Then read the text to know more about wearable computers.

Wearable Computers

Can you imagine wearing a PC on your belt and getting email on your eyeglasses? Wearable computers are battery-powered systems worn on the user's body – on a belt, backpack, or vest, and are designed for mobile or hands-free operation. They often have a microphone and a head-mounted display. Some devices are waist-mounted, equipped with a wireless modem, a keypad, and a small screen. Others are voice-activated, worn like a scarf and can access email or voice mail. Users of wearable technology are called "cyborgs." This term comes from "cybernetic organism" (**cyb**ernetic + **org**anism → **cyborg**), referring to a being that is part machine, part human.

Activity 4

Fill in the blanks in the following sentences, using the words in the box.

hands-free	cybernetic	head-mounted

1. Cyborg is a blend of the two words _____ and organism.
2. In the future, many people will be wearing waist-mounted PCs with _____ displays.
3. Wearable computers are designed for _____ operation so you can even use them while eating.

C. Language Focus: *Compound Adjectives*

Compound Adjectives

A compound adjective is an adjective which is made up of two parts and is usually written with a hyphen [-], e.g. *battery-powered, touch-sensitive, high-frequency*. Its meaning is usually clear from the words that are combined. For this reason, and because many new words are made day by day, you may not find the meaning of compound adjectives in the dictionary. A large number of compound adjectives are used in computer-related texts. So it is important for you to be familiar with this process of word formation to be able to guess the meaning of compound adjectives from the combined words.

Activity 5

Underline any compound adjectives you can find in *Reading 3* and *Reading 4*. Pay attention to the compound adjectives and how they are related to the meaning of the combined words.

Activity 6

Fill in the blanks in the following sentences, paying special attention to the meaning of the compound adjectives.

Example:

Battery-powered systems are systems that are powered with *batteries*.

1. *High-speed* Internet access is Internet access that has high _____.
2. *Hands-free* operations are operations that are done without _____.
3. A *waist-mounted* computer is a computer that is worn on the _____.
4. *High-contrast* LCD screens are LCD screens with high _____.
5. *Three-dimensional* images are images that have _____ dimensions.
6. A *high-quality* headset microphone is a headset microphone with high _____.
7. *Touch-sensitive* screens are screens that are sensitive to _____.
8. *Speech-recognition* software is software that recognizes _____.
9. *Internet-enabled* televisions are televisions that are enabled to connect to the _____.
10. A *computer-literate* person is a person who is able to use a _____.

Activity 7

Here are some predictions by a supercomputer. Do you agree with them? Write "Yes" or "No" in the spaces provided.

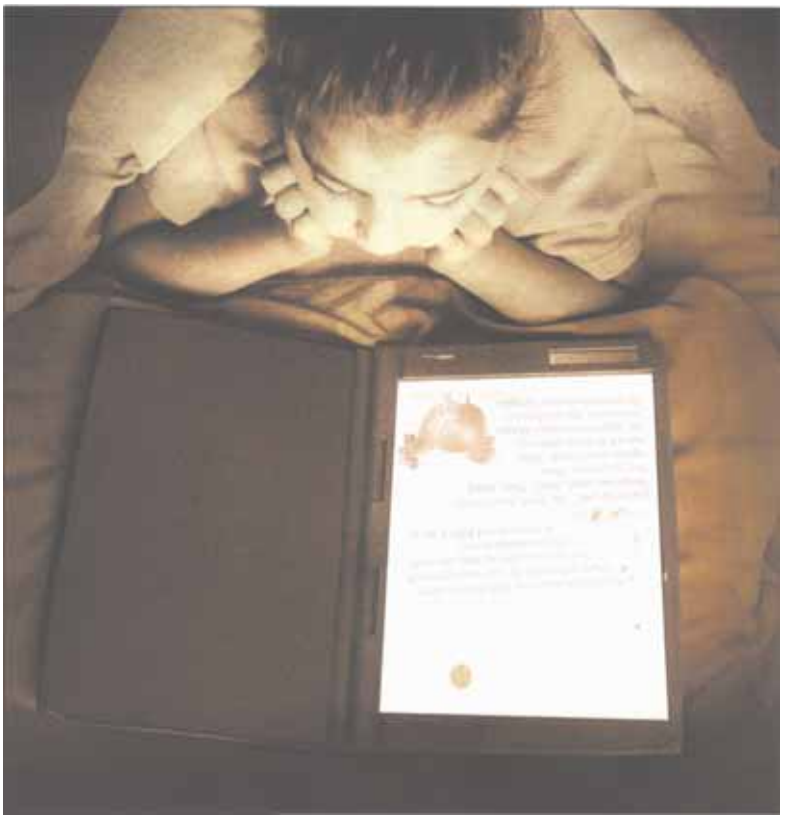
1. By 2020, every student in every school will have a PC. ____

2. In twenty years' time, talking machines might be built. ____

3. In a few years' time, portable PCs will have replaced desktop PCs. ____

4. By the end of the next century, families could have robots to do the housework. ____

5. By the end of the next century, students could have robots to do their homework. ____



D. Quiz

Fill in the blanks in the following sentences with the words in the box to check your understanding of this unit.

surf	infrared	PDA
built-in	hands-free	wearable
pen-based	Bluetooth	virtual reality
speech-recognition		

1. Modern laptops come with a DVD drive and a _____ modem.
2. Many types of _____ computers have been designed so you can wear them, and send and receive email wherever you are.
3. A _____ phone or other device can be used without being held in your hand.
4. Some pocket-sized PCs are _____; that is, they can recognize hand-written characters.
5. With all the advances in computer technology, _____ software is still unreliable.
6. Millions of people around the world use their computers to play games, send email, or _____ the Net.
7. Nowadays, _____ systems are developed for different uses such as three-dimensional computer simulation.
8. _____ technology allows users to communicate between all their computer and telephone equipment without the need for cables.
9. Modern portable PCs can transfer information to printers and desktop PCs via cables or _____ link.

10. A _____ is a very small computer that you can carry with you, and that you use to store information such as telephone numbers, addresses, and appointments.

For more information on new technologies, you can visit the following websites:

– *http://encarta.msn.com/column/computerschoolsmain.asp*
(the use of computers in schools)

– *http://encarta.msn.com/quide/TV.asp*
(the currently available TV technologies and related encyclopedia articles and websites)

– *http://www.howstuffworks.com/pda.htm*
(information about PDAs, including photographs and links)

– *http://www.howstuffworks.com/cell-phone.htm*
(information on the functioning of cellphones, including diagrams, images, and links)

– *http://www.botspot.com/*
(information and resources related to types of automated spiders and robots)

Glossary of General English

A

administrative	اداری
abbreviation	علامت اختصاری، کوته‌نوشت
ability	توانایی
able	قادر
absorb	جذب کردن
academic	آموزشی، دانشگاهی
access (*n*)	دسترسی، دستیابی
access (*v*)	دست یافتن به، دسترسی پیدا کردن به
accessible	قابل دسترس
accessories	لوازم جانبی
accidentally	به‌طور تصادفی
according to	مطابق با، بر اساسِ
account	حساب
take into account	به‌حساب آوردن، در نظر گرفتن
accurate	دقیق
ache	درد
- *aching hand*	*دست‌درد*
acronym	سرواژه (کلمه‌ای که از حروف اول چند کلمه‌ی دیگر ساخته می‌شود.)
across	در عرضِ
act	عمل کردن
action	عمل
activate	به کار انداختن
activity	فعالیت
actual	واقعی، حقیقی
adjustable	قابل تنظیم
adopt	برگزیدن، انتخاب کردن
advance	پیشرفت
advantage	مزیت، امتیاز
take advantage of	بهره بردن از، استفاده کردن از

advantages	مزایا، برتری‌ها
advertisement	آگهی تبلیغاتی
advice	توصیه
affect	تأثیر گذاشتن، اثر گذاشتن
afford	استطاعت داشتن، توانایی خرید (چیزی را) داشتن
afraid	
be afraid	ترسیدن
again	دوباره
against	در برابرِ
air traffic	رفت و آمد هوایی
allow	اجازه دادن، گذاشتن
alphabetical	الفبایی
alternative	
as an alternative to	به جایِ
amount	مقدار
amplify	تقویت کردن
analyze	بررسی کردن، تجزیه و تحلیل کردن
and so on	و غیره
animated	متحرک
animation	۱. پویانمایی، انیمیشن ۲. متحرک‌سازی
annual	سالانه
another	یکی دیگر
antivirus	ضد ویروس
anymore	دیگر
appear	ظاهر شدن، آمدن
application	کاربرد
apply	به کار بردن
be applied to	کاربرد داشتن در
appropriate	مناسب
arc	قوس، کمان
architectural	[مربوط به] معماری
architecture	۱. معماری ۲. ساختار
area	منطقه، ناحیه
arrange	مرتب کردن
arrangement	نظم، ترتیب، آرایش
arrival	ورود
arrow	پیکان، فلش (⟵)
article	مقاله
artificial	مصنوعی
Artificial Intelligence	هوش مصنوعی
as	آن‌چنان که، همان‌طور که
as if	گویی، انگار
aspect	جنبه
assembly line	خط تولید
astronomical	نجومی
as well as	هم‌چنین
at least	دست کم، حداقل
at the same time	هم‌زمان
attract	جلب کردن
attractive	جالب
audio	صوتی
authorized	مجاز
automatic teller machine	دستگاه خودپرداز
automatically	به طور خودکار
availability	موجود بودن
available	موجود
average	میانگین، متوسط

avoid ۱. اجتناب کردن از، پرهیز کردن از ۲. دچار نشدن
award جایزه
aware آگاه
axis محور

B

backache کمردرد
backpack کوله‌پشتی
based on بسته به این‌که، براساسِ
basic ۱. اساسی، اولیه ۲. ساده
basically اساساً
battery-powered با (نیروی) باتری
because of به خاطرِ
beginning ابتدا، شروع
behavior رفتار
being موجود
believe اعتقاد داشتن
belt کمربند
bill قبض، صورت‌حساب
blank ۱. خام ۲. جای خالی
blend (*v*) ترکیب کردن
blend (*n*) ترکیب
blending [لغت] ترکیب
borrow قرض کردن، به امانت گرفتن
both هر دو
bottom پایین
brand نوع، مدل
brief خلاصه
broadcast پخش کردن
browse جست و جو کردن در
burn سوزاندن
burn a CD روی لوح فشرده کپی کردن
burn into the screen روی صفحه‌ی نمایش‌گر سایه انداختن
button دکمه

C

cable کابل، سیم
cable TV تلویزیون کابلی
calculating machine ماشین‌حساب
calculation محاسبه
call ۱. صدازدن ۲. نامیدن
capability قابلیت، توانایی
capable قادر
capacity ظرفیت
carry حمل کردن
carry out اجرا کردن
catalog (*n*) فهرست، کاتالوگ
catalog (*v*) فهرست کردن
catch گرفتن
cathode ray tube لامپ تصویر
character ۱. شخصیت ۲. نویسه
characteristics ویژگی‌ها
chart نمودار
choice انتخاب
circuit مدار
clearly به روشنی
client مشتری
clue سر نخ
collect جمع کردن

collection	مجموعه
column	ستون
combination	ترکیب
combine	ترکیب کردن
come across	مواجه شدن با، برخوردن به
command	فرمان
commercial	تجاری
communicate	ارتباط برقرار کردن
communications	ارتباطات
community	جامعه
compare	مقایسه کردن
compatible	سازگار
competition	مسابقه
competitor	رقیب، حریف
complex	پیچیده
component	جزء
components	اجزا
composed of	متشکل از
composer	آهنگساز
compound	مرکب، ترکیبی
compressed	فشرده
compression	فشرده‌سازی
comprise	شامل (چیزی) بودن، تشکیل شدن از
computer-literate	آشنا با کامپیوتر
computing	۱. کار با کامپیوتر ۲. محاسبات
computing device	کامپیوتر
concave	مقعر، کاو
concentric	هم‌مرکز
concept	مفهوم
concert	کنسرت
conduct	انجام دادن
confidence with confidence	با خیال راحت
connect	۱. وصل شدن ۲. متصل کردن
connection	۱. اتصال ۲. ارتباط
consist of	متشکل از (چیزی) بودن، شامل (چیزی) بودن
consumption	مصرف
contain	در بر داشتن، داشتن
container	۱. ظرف ۲. پوشه
content	محتوا
contents	محتویات
context	بافت متن، سیاق عبارت
continent	قاره
continue	ادامه یافتن
continuous	پیوسته، بی‌وقفه، مداوم
conventional	معمولی
convert	تبدیل کردن
coordinate (*v*)	هماهنگ کردن
corner	گوشه
corporate	[مربوط به] شرکت، شرکتی
correct	درست، صحیح
correction	تصحیح
corresponding	معادل، برابر
corrupted	آلوده، خراب
courseware	نرم‌افزار آموزشی
cover	در بر گرفتن
cover (*n*)	جلد
create	خلق کردن، به‌وجود آوردن

creative	خلاق
crisis	بحران
current	جاری
current (*n*)	جریان برق
currently	در حال حاضر، هم‌اکنون
curved	منحنی
customer	مشتری
cut down	کاهش دادن، کم کردن
cybercafé	کافی‌نت
cybercrime	جُرم کامپیوتری یا اینترنتی
cybersickness	کامپیوترزدگی (خستگی و منگی ناشی از کار زیاد با کامپیوتر)
cyberspace	فضای اینترنتی
cyberwidow	بیوه‌ی کامپیوتری (زنی که شوهرش تمام وقت خود را صرف کار یا بازی با کامپیوتر می‌کند)
cycle	چرخه، دور

D

daily	روزانه، هر روز
damaged	آسیب‌دیده، خراب
dangerous	خطرناک
darken	تاریک کردن
data	داده، داده‌ها
database	پایگاه داده‌ها
decide	تصمیم گرفتن
decision	تصمیم
decrease	کاهش یافتن
define	تعریف کردن، معنی کردن
definition	تعریف، معنی
delete	حذف کردن
demonstrate	نشان دادن
department	قسمت
depend	بستگی داشتن
depending on	بسته به این‌که
depth	عمق
describe	توصیف کردن، شرح دادن
description	توصیف
design (*n*)	طرح، طراحی
design (*v*)	طراحی کردن
designer	طراح
desktop	رومیزی
destroy	نابود کردن، از بین بردن
detailed	با جزئیات، مفصل
details	جزئیات
detect	پیدا کردن، ردیابی کردن
determine	تعیین کردن
develop	تولید کردن، به وجود آوردن
development	تولید
device	ابزار، وسیله
diagnose	پیدا کردن مشکل، تشخیص دادن
diagram	نمودار
dictate	دیکته کردن
direct	هدایت کردن
direction	جهت
directly	به‌طور مستقیم، مستقیماً
discover	کشف کردن
discuss	تبادل نظر کردن، بحث کردن
display (*n*)	نمایش
display (*v*)	نشان دادن، نمایش دادن

distance	فاصله
distinguish	تشخیص دادن
distort (*v*)	[تصویر] کج و کوله کردن، خراب کردن
distribution	توزیع
divide	تقسیم کردن
document	سند، مدرک
dot	نقطه
doubt	تردید
- *no doubt*	*بدون تردید*
drag	کشیدن
drop	انداختن
drug-detecting test	آزمایش دوپینگ
dual	دوگانه
duplicate	کپی، مشابه

E

e.g.	به‌طور مثال، مثلاً
easily	به آسانی
edit	ویرایش کردن
editable	قابل ویرایش
education	آموزش
educational	آموزشی
effect	۱. جلوه ۲. اثر
effective	مؤثر
effectively	به‌طور کارآمد
efficient	کارآمد
efficiently	به طور کارآمد
electrical	[مربوط به] برق، برقی
electrical engineer	مهندس برق
electromagnetic	الکترومغناطیسی
electronic	الکترونیکی
electronic mail	پست الکترونیکی
elegance	آراستگی، زیبایی
element	جزء، بخش
elements	اجزا
eliminate	حذف کردن، کنار گذاشتن
email	پست الکترونیکی
emission	تشعشع
emit	ساطع کردن، پخش کردن
emotionally	از نظر احساسی
emphasis	تأکید
employee	کارمند
enable	قادر کردن، اجازه دادن به
encyclopedia	دایرة المعارف
endless	بی‌پایان
engineer	مهندس
ensure	اطمینان حاصل کردن از
enter	۱. وارد کردن ۲. وارد شدن
entertaining	سرگرم‌کننده
entertainment	سرگرمی
entire	تمام، همه
environment	محیط
environmental	محیط زیستی
equal (*v*)	برابر بودن با
equal (*adj*)	برابر
equipment	تجهیزات، لوازم
equipped with	مجهز به
equivalent	معادل، برابر
eradicate	ریشه‌کن کردن
eraser	پاک‌کن

error	خطا
essential	اساسی
establish	برقرار کردن، ایجاد کردن
etc.	و غیره
etiquette	آداب معاشرت
evenly	به‌طور مساوی
exact	دقیق
exactly	دقیقاً
except	به‌جز
exchange	مبادله کردن
exciting	هیجان‌انگیز
execute	اجرا کردن
executive (*n*)	مدیر
exhibition	نمایشگاه
exist	وجود داشتن، بودن
existing	موجود
expert	متخصص
explain	توضیح دادن
explanation	توضیح
extension	[پرونده] پسوند
extensions	متعلقات
external	بیرون، بیرونی
external world	دنیای بیرون
extract	استخراج کردن، بیرون کشیدن
extremely	فوق‌العاده، بسیار
eyeglasses	عینک
eyestrain	خستگی چشم، چشم‌درد

F

facilitate	آسان کردن
facilities	امکانات
factor	عامل، فاکتور
fairly	نسبتاً
familiar	آشنا
feature	۱. ویژگی، مشخصه ۲. شاخص
feeling	احساس
fiber-optic	فیبر نوری
field	زمینه، حوزه
figure	۱. تصویر، نمودار ۲. عدد، رقم
filing cabinet	قفسه‌ی پرونده
fill in	پر کردن
financial	مالی
find	پیدا کردن
first of all	اول این که، اولاً
fit	کار گذاشتن، نصب کردن
flaw	عیب، ایراد
flexible	انعطاف‌پذیر، نرم
flight	پرواز
flip up	باز کردن
flow (*n*)	جریان
flow (*v*)	جریان داشتن
following	ذیل
formula	فرمول
404 (*adj*)	چهارصدوچهار، چِل‌چار (به شوخی به کسی گفته می‌شود که در کار با کامپیوتر و وسایل الکترونیکی دست و پا چلفتی است.)
fragmented	پراکنده، تکه‌تکه
frequency	فرکانس

from scratch	از هیچ، از صفر
front	جلو
fuel	سوخت
function	کارکرد، کار

G

gadget	ابزار، وسیله
general	کلّی
generation	نسل
genre	[هنر، ادبیات، موسیقی] نوع
geometric	هندسی
ghost	روح، شبه
ghost image	سایه‌ی تصویر، تصویر محو و شَبَه‌مانند
global	جهانی
glove	دست‌کش
glue	چسب
graph	نمودار، منحنی
graphic	گرافیکی، نموداری
graphical	گرافیکی، نموداری
graphics	گرافیک
graphics-based	گرافیکی، نموداری
great	۱. بزرگ ۲. عالی
green-blue	سبزآبی
group	دسته‌بندی کردن
growing	روزافزون
guard	محافظ
guess	حدس زدن

H

habit	عادت
handle	۱. از عهده‌ی (کاری) برآمدن ۲. در دست گرفتن
hands-free	بدون استفاده از دست، بی‌دست
happen	رخ دادن
hardship	سختی
hardware	سخت‌افزار
harm	آسیب
- cause harm to	*آسیب رساندن به*
harmful	مضر
head-mounted display	نمایش‌گری که به سر بسته می‌شود
health	سلامت
height	بلندی، ارتفاع
hence	بنابراین
hidden	پنهان
highlight	برجسته ساختن، مشخص کردن
high-quality	با کیفیت بالا، مرغوب
hint	سر نخ دادن، اشاره کردن
hold	گنجایش داشتن، نگه داشتن
hold	در بر داشتن
hopeful	امیدوارکننده
horizontal	افقی
host	نگه‌داری کردن
hot technology	فن‌آوری پرطرفدار
however	اگرچه، با این وجود
huge	عظیم، خیلی بزرگ
human being	انسان، بشر

I

idea	نظر، عقیده
ideal	ایده‌آل

identification	شناسایی
identify	۱. شناختن ۲. تشخیص دادن
identity	هویت
i.e.	یعنی این که
illustrate	نشان دادن
illustration	تصویر
image	تصویر
imaginary	خیالی
imagine	تصور کردن
improve	بهتر کردن، بهبود بخشیدن
in fact	در واقع
in other words	به عبارت دیگر
in particular	به‌خصوص
inactive	غیر فعال
incline	مایل کردن
include	در بر داشتن، شامل بودن
index	فهرست راهنما
indicate	نشان دادن
individual	فردی
industry	صنعت
inexpensive	ارزان
infection	آلودگی، ویروس
inform	مطلع کردن، باخبر کردن
informally	به‌طور غیر رسمی
information	اطلاعات
infrared	مادون قرمز
insect	حشره
insertion	درج، قرار دادن
install	نصب کردن
installations	تأسیسات
installed	نصب‌شده
instant	فوری
instant access	دسترسی فوری
instantaneously	بلافاصله، بی‌درنگ، آناً
instead	در عوض
instead of	به جایِ، در عوضِ
instructions	دستورالعمل، دستور
integrate	تلفیق کردن، ترکیب کردن
intelligence	هوش
intelligible	قابل فهم
interact	۱. ارتباط برقرار کردن ۲. روی یکدیگر اثر گذاشتن
interaction	تعامل، ارتباط متقابل
interactive	۱. دوسویه، داد و ستدی ۲. ارتباطی، کنشی- واکنشی
intercommunication	ارتباط دوطرفه
interconnected	مرتبط، درهم‌تنیده
interest	جلب توجه کردن
interface	رابط، میانجی
interference	تداخل
internal	داخلی
Internet, the	اینترنت
Internet café	کافی‌نت
Internet-enabled	اینترنتی، قابل اتصال به اینترنت
interpret	تفسیر کردن، معنی کردن
interrupt	۱. وقفه ایجاد کردن ۲. قطع کردن
interview	مصاحبه
interviewer	مصاحبه‌گر
introduce	معرفی کردن
invade	اشغال کردن

invent	اختراع کردن
invert	وارونه کردن، برعکس کردن
invoice	فاکتور فروش
involve	درگیر کردن
involved	درگیر
irregular	۱. نامنظم ۲. بی‌قاعده
island	جزیره
item	مورد، عنصر

J

journalist	روزنامه‌نگار

K

keep	نگه‌داشتن
keypad	صفحه‌کلید کوچک
keyword	کلمه‌ی کلیدی
kind	نوع
known as	معروف به

L

label (*n*)	برچسب
label (*v*)	مشخص کردن
laboratory	آزمایشگاه
laptop (computer)	کامپیوتر کیفی
last	آخرین
last of all	در پایان، سرانجام
later	بعداً، بعد
latest	جدیدترین، تازه‌ترین
law	قانون
layer	لایه
layout	صفحه‌آرایی
leaflet	بروشور، اعلامیه
lecturer	استاد دانشگاه
left	چپ
length	درازا، طول
- an arm's length	*به‌اندازه‌ی نوک انگشتان تا شانه*
less than	کمتر از
librarian	کتابدار
library	کتاب‌خانه
lie	قرار داشتن، بودن
light *(adj)*	سبک
light *(n)*	نور
limit (*v*)	محدود کردن
limit (*n*)	محدودیت
limited	محدود
line	خط
link (*n*)	پیوند، ارتباط
link (*v*)	وصل کردن، متصل کردن
liquid	مایع
live (*adj*)	زنده
load (*v*)	۱. بار کردن ۲. بار شدن
local	محلی
located	واقع‌شده
location	محل، جا
lock	قفل کردن
locked	قفل‌شده، قفل
log on	وارد شدن
logical	منطقی
logo	آرم

long-distance	راه دور
look up	۱. دنبال (چیزی) گشتن، جست و جو کردن ۲. [معنی لغت] پیدا کردن
lyrics	ترانه، شعر

M

made up of	متشکل از
magical	جادویی
magnetic	مغناطیسی، آهن‌ربایی
magnetizable	مغناطیسی‌شدنی
magnifying glass	ذره‌بین
main	اصلی
mainly	عمدتاً
majority	اکثریت
make	درست کردن، ساختن
manage	اداره کردن، کنترل کردن
managing director	مدیر عامل
manipulate	به‌کار بردن، دستکاری کردن
manual	راهنما
manufacturer	سازنده
margin	حاشیه
marital status	وضعیت تأهل
market	بازار
marketing manager	مدیر بازاریابی، بازاریاب
masked	پوشیده، پنهان
mass	توده
match	۱. با هم جفت کردن، ربط دادن ۲. یکی بودن با
materials	مواد (درسی و غیره)
means	وسیله
by means of	به وسیله‌ی، از طریقِ
measure	اندازه گرفتن
mechanical	مکانیکی
mechanical engineer	مهندس مکانیک
mechanical engineering	مهندسی مکانیک
media	رسانه‌ها
media (*adj*)	صوتی- تصویری
medium	رسانه
memo	یادداشت
memorable	به‌یادماندنی، فراموش‌نشدنی
memorize	حفظ کردن
memory	حافظه
mention	ذکر کردن
menu	فهرست
microwave (oven)	مایکروفر
minimize	کاهش دادن
miraculous	اعجاب‌آور، معجزه‌آسا
mistake	اشتباه
- *by mistake*	*اشتباهاً*
mobile (*adj*)	قابل حمل، سیار
model (*v*)	شکل دادن، فرم دادن
modify	اصلاح کردن، تغییر دادن
moreover	بعلاوه
motion	حرکت
motion picture	فیلم
move	۱. حرکت کردن ۲. حرکت دادن
multimedia	چندرسانه‌ای
multiple choice	چندگزینه‌ای

museum	موزه

N

naturally	به‌طور طبیعی
necessary	ضروری
need	نیاز
negative maker	منفی‌کننده
nerd	خوره
- *a computer nerd*	*خوره‌ی کامپیوتر، کامپیوترباز*
net	تور
Net, the	اینترنت
network	شبکه
nickname	نام مستعار
no longer	دیگر
notebook (computer)	کامپیوتر کیفی
number (*n*)	عدد، شماره
number (*v*)	شماره‌گذاری کردن
numeric	عددی
numerical	عددی
numerous	متعدد

O

object	شیء
oblique	مایل، اریب
obvious	واضح، روشن
occasional	گاه و بی‌گاه
occupy	اشغال کردن، گرفتن
offer	ارائه دادن، ارائه کردن
once	۱. هنگامی‌که
	۲. یک بار
operate	کار کردن، عمل کردن
operations	عملیات
optical	نوری
option	انتخاب، گزینه
order	۱. ترتیب
	۲. سفارش
in order to	برای این که، تا
ordinary	معمولی
organization	سازمان
organize	سازمان‌دهی کردن، مرتب کردن
organizer	سازمان‌دهنده، گرداننده
origin	منشأ
original	نخستین، اولیه
otherwise	در غیر این صورت
overall	روی‌هم‌رفته، در مجموع
overcome	غلبه کردن بر
overview	دید کلی

P

package (*n*)	بسته
package (*v*)	بسته‌بندی کردن
paintbrush	قلم‌مو
palette	تخته‌شستی، پالت
panic	وحشت کردن، هول کردن
participant	شرکت‌کننده
participate	شرکت کردن
particular	ویژه، خاص
partly	تا اندازه‌ای، نسبتاً
pattern	طرح، شکل
payphone	تلفن عمومی
PC	کامپیوتر شخصی

per	به‌ازای هر، در
- *per month*	*در ماه*
perform	انجام دادن، اجرا کردن
performance	کارآیی، عملکرد
performer	اجراکننده
peripherals	لوازم جانبی
permanent	دائمی، همیشگی
personal	شخصی
phrase	عبارت
pilot	خلبان
place (*v*)	قرار دادن، گذاشتن
place (*n*)	جا، مکان
plan	طرح‌ریزی کردن
play	پخش کردن
play back (*v*)	پخش کردن
playback (*n*)	پخش
plug	به برق زدن، وصل کردن
plus	به علاوه‌ی
pocket-sized	جیبی
polygon	چندضلعی
popular	محبوب، پرطرفدار
portable	قابل حمل
position (*n*)	۱. رتبه، مقام، جایگاه ۲. موقعیت
position (*v*)	قرار دادن
possible	ممکن
potential	توانایی، امکان
power	نیرو، قدرت
power supply	نیرو
powerful	نیرومند، قوی
practice	تمرین کردن
precise	دقیق
pre-defined	از پیش تعریف شده
prefix	پیشوند
present (*v*)	ارائه دادن، ارائه کردن
presentation	ارائه‌ی مقاله، ارائه‌ی مطلب
press	[کلید] فشار دادن، زدن
press room	اتاق خبرنگاران
prevent	جلوگیری کردن از
previous	پیشین، قبلی
printer	چاپگر
printout	نسخه‌ی چاپی
problem	مشکل، مسأله
procedures	روال کار، رویه
process (*n*)	فرایند، جریان، روند
process (*v*)	پردازش کردن
produce	۱. تولید کردن ۲. به بار آوردن
product	محصول
program developer	برنامه‌نویس
programmer	برنامه‌نویس
pronounce	تلفظ‌کردن
pronunciation	تلفظ
proofreading	نمونه‌خوانی
proper name	اسم خاص
properly	به درستی
protect	محافظت کردن
protecting	محافظت
protection	حمایت، حفاظت
protective	محافظ
provide	فراهم کردن
publish	منتشر کردن

purpose هدف

Q

questionnaire پرسش‌نامه
quickly به سرعت
quite نسبتاً

R

race مسابقه
radar رادار
radiation تشعشع
radiation field میدان تشعشع
radiation guard محافظ نمایش‌گر، فیلتر
radio station ایستگاه رادیویی
ranging from . . . to از . . . تا
rapidly به سرعت
rate سرعت، میزان
rather than درعوضِ، به‌جایِ
reach رسیدن به
realistic واقعی
real-time بی‌درنگ، بلادرنگ
reason دلیل
recall بازیافتن، بازیابی کردن
receive دریافت کردن
recent اخیر
reception دریافت
rechargeable قابل شارژ، شارژی
recognition شناسایی، تشخیص
recognize تشخیص دادن
recognize تشخیص دادن
recommend توصیه کردن

record (*n*) سابقه
record (*v*) ثبت کردن، یادداشت کردن
recording (*n*) ضبط
recover ۱. بازیافتن ۲. بهبود یافتن
recovery ۱. بازیابی ۲. بهبودی
rectangle مستطیل
redesign دوباره طراحی کردن
reduce کاهش دادن، کم کردن
refer دلالت داشتن، اشاره داشتن
- *be referred to* *نامیده شدن، گفته شدن*
reference مرجع
reflection انعکاس، بازتاب
reflector بازتابنده
reformat دوباره فرمت کردن
refuse ۱. امتناع کردن از، خودداری کردن از
۲. قبول نکردن، نپذیرفت
- *refuse to open* [پرونده] *باز نشدن*
regular عادی، معمولی
regulate ۱. اداره کردن
۲. کنترل کردن
related مرتبط
relation ارتباط
relationship رابطه
relax استراحت کردن
release رها کردن، ول کردن
reliable قابل اطمینان، مطمئن
rely ۱. اعتماد کردن ۲. متکی بودن
remain باقی ماندن
remote دور
remove ۱. کنار گذاشتن، برطرف کردن
۲. از بین بردن

revolutionize	متحول کردن
right	۱. راست ۲. صحیح، درست
risk	احتمال خطر، احتمال زیان
roll	۱. چرخیدن ۲. چرخاندن
root	ریشه
rotate	۱. چرخیدن ۲ . چرخاندن
routine	جریان یا برنامه عادی، روند عادی
run	۱. کار کردن ۲. اجرا شدن، اجرا کردن ۳. به کار اندختن

S

safe	ایمن
safeguard	حفاظت
safety	ایمنی
salary	حقوق
sales	فروش
sample (*n*)	نمونه
sample (*v*)	نمونه‌برداری کردن، نمونه برداشتن
satellite	ماهواره
save	ذخیره کردن
save (time and money)	(در وقت و پول) صرفه‌جویی کردن
scale (*v*)	بزرگ‌نمایی یا کوچک‌نمایی کردن
science center	مرکز علمی
scientific	علمی
scratch from scratch	از صفر، از هیچ
screen	صفحه (نمایش)
repair (*n*)	ترمیم
repair (*v*)	ترمیم کردن، درست کردن
replace	جایگزین کردن
report (*n*)	گزارش
report (*v*)	گزارش کردن
represent	۱. نشان دادن ۲. دلالت داشتن بر
request (*v*)	درخواست کردن
request (*n*)	درخواست
require	نیاز داشتن، خواستن
required	مورد نیاز
requirement	نیازمندی
rescuer	نجات‌دهنده
researcher	پژوهشگر
re-sequence (*v*)	ترتیب صحنه‌ها را تغییر دادن
reservation	رزرو
make a reservation	رزرو کردن
resources	منابع
rest, the	بقیه
restore	به حال اول برگرداندن، درست کردن
restricted	محدود
result	نتیجه
as a result	در نتیجه
results	نتایج
résumé	تاریخچه‌ی شغلی، سوابق
retrieve	بازیافتن، بازیابی کردن
retype	دوباره تایپ کردن
reverse	وارونه کردن، برعکس کردن
revolution	دور، گردش

search	دنبال (چیزی) گشتن، جستجو کردن
secondly	دوم این که، ثانیاً
section	قسمت، بخش
secure	مطمئن، ایمن
security	امنیت، ایمنی
segment	قسمت، بخش
select	انتخاب کردن
selector	انتخاب‌کننده
sending	ارسال
separate	جدا
sequence	۱. سکانس ۲. توالی
series	مجموعه، سری
set	تنظیم کردن
set up	برقرار کردن
set-top computer box	گیرنده‌ی اینترنت مخصوص تلویزیون
several	چند، چندین
shade (*v*)	سایه زدن، سایه‌دار کردن
shade (*n*)	سایه
shadow	سایه
shape	شکل
share	۱. تقسیم کردن، قسمت کردن ۲. به اشتراک گذاشتن
shine - *lamp shining into the eyes*	[نور] توی چشم زدن *نوری که توی چشم بزند*
shoulder	شانه
show	نشان دادن
side	کنار، پهلو
sign	علامت
signal	علامت، پیام
significantly	به‌طور قابل ملاحظه
similar	مشابه
simulation	شبیه‌سازی
single	مجرد
single	به‌خصوص، خاص
slant	مایل کردن، کج کردن
slightly	اندکی، کم
smart card	کارت هوشمند
smoothly	روان
snail	حلزون
snail mail	پست حلزونی (اشاره به پست غیر الکترونیکی)
so that	تا این‌که
so-called	به‌اصطلاح
software	نرم‌افزار
solution	راه حل
solve	حل کردن
soon	به زودی
sophisticated	پیچیده، پیشرفته
sore - *My eyes feel sore.*	دردناک *چشمانم درد می‌کند.*
sort (*n*)	نوع
sound	به نظر رسیدن
space	فاصله
special	ویژه، مخصوص
specific	به‌خصوص
specify	مشخص کردن
speed	سرعت
spend	۱. [پول] خرج کردن ۲. [وقت] صرف کردن

spider	عنکبوت
spider web	تار عنکبوت
spin	۱. چرخاندن
	۲. چرخیدن
square	مربع
stack	توده، کپه
staff	کارکنان، کارمندان
stand for	خلاصه‌ی (چیزی) بودن، به معنی (چیزی) بودن
stare	خیره شدن، زل زدن
state	حالت، وضعیت
stopover	توقف (بین راه)
storage capacity	ظرفیت نگه‌داری، حافظه
store	ذخیره کردن، نگه‌داشتن
strength	۱. قدرت
	۲. برتری
stretch	کشیدن
strip out	درآوردن
structure	ساختار
style	سبک
subject	موضوع
successful	موفق
such as	از قبیلِ، مانندِ
suffer	رنج بردن
suffix	پسوند
suggest	پیشنهاد کردن
suitable	مناسب
sum	حاصل‌جمع
superhuman	فوق انسانی، اَبَرانسانی
support (*n*)	توانایی اجرا
support (*v*)	حمایت کردن
suppose	فرض کردن
sure	مطمئن
surely	حتماً
surf	۱. موج‌سواری کردن
	۲. جست و جو کردن
surface	سطح
switch on	روشن کردن
symbol	نماد، علامت
symbolic	نمادین
synthesizer	ترکیب‌گر، سینتِ‌سایزر

T

take	۱. برداشتن
	۲. طول کشیدن
take care of	رسیدگی کردن به
take time	طول کشیدن
talking machine	دستگاه سخنگو
task	وظیفه، کار
telecommunication	ارتباطات راه دور، مخابرات
teletext	پیام‌نما
term	اصطلاح، کلمه
terminal	پایانه، ترمینال
test	آزمایش کردن، امتحان کردن
text	متن
text-based	متنی
that is	یعنی، به این معنی که
then	سپس
therefore	بنابراین
thread	رشته
three-dimensional (3-D)	سه‌بعدی

through	همه‌ی، سراسرِ
thus	بنابراین، بدین ترتیب
time	زمان
- *at the same time*	*به‌طور همزمان*
together	با هم
too	بیش از حد
tool	ابزار، وسیله
topic	موضوع
touch-sensitive	حساس به تماس، تماسی
track	رد، اثر
- *keep track*	*جریان (کاری را) دنبال کردن*
traditional	سنتی
traffic	۱. عبور و مرور، ترافیک ۲. تبادل اطلاعات
train	۱. آموزش دادن، تربیت کردن ۲. آماده کردن، آشنا کردن
transactions	کارها، معاملات
transfer (*n*)	انتقال
transfer (*v*)	انتقال دادن، منتقل کردن
transform	تغییر شکل دادن، دگرگون کردن
transformation	تغییر شکل، دگرگونی
translate	۱. ترجمه کردن ۲. تبدیل کردن
translation	۱. ترجمه ۲.تبدیل
transmission	انتقال
transmit	۱. پخش کردن ۲. منتقل کردن، انتقال دادن
travel agency	آژانس مسافرتی
travel agent	مدیر یا کارمندِ آژانس مسافرتی
TV set	تلویزیون
type	نوع
typewriter	ماشین تحریر
typical	۱. نمونه ۲. عادی، معمولی
typically	نوعاً، معمولاً
typographical	تایپی

U

underneath	زیر
understandable	قابل درک، قابل فهم
unfortunately	متأسفانه
unique	منحصر به فرد، خاص
unless	مگر این‌که
unreliable	نامطمئن
unused	استفاده‌نشده
update	به‌روز کردن
up-to-the-minute	دقیقه به دقیقه، تازه‌ترین
use (*v*)	استفاده کردن از
use (*n*)	استفاده
useful	مفید، سودمند
user	کاربر
user-defined	تعریف‌شده به وسیله‌ی کاربر
user-friendly	کاربرپسند
usual	عادی، معمول

V

value	ارزش
variety	۱. متنوع، مختلف ۲. تنوع
various	مختلف
version	نسخه

vertical	عمودی
vest	جلیقه
via	از طریقِ
view (*n*)	۱. دید، دیدگاه
	۲. منظره
view (*v*)	دیدن
viewing area	بخش دیدنی، بخشی که دیده می‌شود
virtual	مجازی
virtual reality	واقعیت مجازی
virus	ویروس
virus detector	ویروس‌یاب
virus protection	محافظت در برابر ویروس
visual	۱. دیداری، بصری
	۲. ظاهری
visually	به‌طور بصری
voice-activated device	وسیله‌ای که با صدا فعال می‌شود
vs.	در مقابلِ، در برابرِ

W

waist-mounted	کمری
wave	موج
wear	پوشیدن
weigh	وزن داشتن
well-designed	خوب طراحی شده، با طراحی عالی
well-known	مشهور
whereas	در حالی که
wide	گسترده، پهناور
wide range of	متنوع، مختلف
widely	به‌طور گسترده
wink	چشمک
wire	سیم
wireless	بی‌سیم
word formation	واژه‌سازی
worry (*v*)	نگران بودن

Y

yet	هنوز
you	۱. تو، شما
	۲. آدم، انسان

Z

zoom in	کوچک‌نمایی، کوچک کردن
zoom out	بزرگ‌نمایی، بزرگ کردن

Glossary of Computer-related Terms

A

acceleration card a board that increases the speed of the processor

ADA a programming language developed for the US Department of Defense, named after Lord Byron's daughter Augusta Ada, who worked with Charles Babbage and is not unjustly called the first programmer

algorithm a series of instructions or a step-by-step procedure for the solution of a problem

animation the process of creating and recording images that change over time

applets small applications written in Java. When you display a web page with Java links, a Java applet is executed automatically

AltaVista name of a well-known search engine website

applications program a computer program which executes a particular task, such as word processing or database management

architecture the general specification of a system

arithmetic logic unit (ALU) a component of the CPU which performs the actual arithmetic and logical operations asked for by a program

arrow keys direction or cursor keys that allow the user to move the insertion point around the screen

assembler a special program that converts a program written in a low-level language into machine code

assembly language a low-level computer language in which instructions are the mnemonic equivalent of the code understood by the machine.

attachment a file that has been included as part of an email message

attributes characteristics that affect the visual representation of lines and polygons, e.g. line styles, rectangle color, etc.

B

backup *(n)* a copy of data or software, usually kept in case the original disk is damaged

back up *(v)* to store a copy of data on a storage device to keep it safe
bandwidth the range of frequencies that can be transmitted over a communications channel
binary a number system that only uses two digits, i.e. 1 and 0
binary digit the smallest unit of information in the binary system, i.e. 1 or 0; also called *bit*
bookmark *(n)* a saved link that takes users directly to Web address; bookmarks are also called *hotlist entries* or *favorites*
bookmark *(v)* to store a link to a web page to make it easier to find in the future
bit a blend of *b*inary dig*it*
Bluetooth the name of a high-speed microwave wireless network system, used with portable equipment
boot to start up a computer
bridge a device used to connect groups of computers
broadcast to transmit signals that can be picked up by a large number of receivers
browser a program designed to fetch and display web pages on the Internet, e. g. Internet Explorer
bug an error in a program
bulletin board an electronic notice board system that enables users to display messages for others to read
burn to write data or files onto a recordable CD using a hardware device called a CD burner
buffer an area in memory used for temporary storage
bus a channel which carries signals between units in the CPU
byte a unit of storage capacity; a byte is made up of eight bits and stores one character, i.e. a letter, a number, a space, or a punctuation mark

C

Cable modem a modem designed to operate through a cable TV line; it offers much greater bandwidth than a telephone line
cathode ray tube (CRT) a display device that uses an electron gun to fire a beam of electrons at a phosphor-coated screen
cell an intersection of a column and a row in a table
cellphone see *mobile phone*
central processing unit (CPU) the electronic processor or "brain" of the computer; its function is to execute programs stored in the main memory by fetching instructions, examining them, and then executing them one after another
character a symbol on a keyboard (letter, number, or blank space)
chat a real-time interactive conversation on the Internet
chip a common name for a *microchip*; a small piece of silicon containing complex electronic circuits
click to press and release the left-hand button on a mouse
client a network computer used for accessing a service on a server
client-server a system in which various client programs all connect to a central server to obtain information or to communicate
Clipboard a holding place for text or graphics that you have just cut or copied
clock the set of electronic circuits used to control the timing of signals and synchronize different parts of a computer system
code *(n)* a piece of program text written in a computer programming language

code *(v)* to write the text of a program using a computer language
coding the process of writing instructions for a computer
color palette the collection of colors available in a system
command an order which the computer can obey; synonymous with "instruction"
communications port a socket at the back of your computer for a modem
compact disk (CD) a storage device which uses optical laser techniques and which provides mass storage capacity
compatible able to operate in the same type of system or run the same software
compile to convert a program written in a high-level language into machine code using a compiler
compiler a program that converts the whole of a program into machine code before the program is used
compress to reduce to a smaller size
compression the process which makes computer data smaller so the information takes less space and may be transmitted in less time
computer a general purpose machine that can be programmed to process data in a variety of ways
computer engineer a person who designs and develops computer systems
computerized changed so that it can be operated or controlled using a computer
computer lab a room full of computers used for study
computer language a language used for writing computer programs
computer operator a person whose job is to operate part of a computer system
computer programming the process by which a set of instructions is produced for a computer to make it perform a task
computer science the study of computers and their use
configuration the way the physical units of a computer system are put together
cookies small files used by web servers to know if you have visited their site before
crash If a computer crashes, it suddenly stops working.
cursor a symbol on the monitor that indicates the point on the screen that is being used
cybernetics the study of control and communication in animals and machines; it is used in the design of robots
cyberspace a term originated by William Gibson in his novel *Neuromancer*, now used to refer to the Internet

D

data the information processed by a computer
database a file of structured data
database program an applications program used to store, organize, and retrieve a large collection of data; data can be searched, sorted, and updated
data transfer rate the average speed required to transmit data from a disk system to the main memory
debug to find and fix errors or "bugs" in a program or system
debugger a tool which helps to find errors or "bugs"
default an initial setting that can be changed by the user

desktop the main graphical user interface background screen that displays icons for other programs
desktop PC a personal computer that is designed to be used on an office desk
desktop publishing (DTP) the use of a computer system for all steps of document production, including typing, editing, graphics, and printing
dial-up networking a communications system that allows computers to connect together using a telephone line
digital an electronic system that has only two states, on or off
digitize the process of converting information into number code that can be processed by computers
directory a storage area used for grouping files so that they can be easily located; a directory is sometimes called a folder
disk a storage device made of flat circular plates with magnetizable surfaces
disk drive a storage device for reading from and writing to disks
diskette see *floppy disk*
diskette drive see *floppy disk drive*
dithering the process of mixing two colors to produce an approximation to another color; by using this shading technique, the human eye will blend the colors, increasing the number of colors on the screen
domain name Internet sites are usually identified by a domain name , which consists of two or more parts separated by dots, e.g. *http://www.ibm.com*. The part on the left, a subdomain, is the most specific (e.g. ibm). The part on the right, a primary domain, is the most general; this can be a country (e.g. es for Spain), or the type of organization (e.g. com for commercial, org for organization). An IP address (e.g. 194.179.73.2) is translated into a domain name (e.g. sendanet.es) by a domain name system.
domain name system a system of associating the name of a device on a network such as the Internet with its numerical address so that the name can be used by the user and the numerical address can be used by the network system
download to transfer a file from one computer to another over the telephone

E

ebook electronic book
edit to make changes and corrections to text and graphics; well-known editing techniques are select, undo, copy, cut and paste a portion of text
edutainment a system that has both educational and entertainment value; a blend of *edu*cation and enter*tainment*
email electronic mail
email address the unique address code used to contact someone using electronic mail
email attachment a file that is attached to an email message
emoticon a special sign that is used to show an emotion in email and on the Internet, often by making a picture; e.g. the emoticon :-) looks like a smiling face when you look at it sideways and means you have made a joke; a blend of *emoti*on and i*con*; also called *smiley*
encode to write information in a coded form
encoder a computer program that

converts WAV files into MP3 files or vice versa
execute to run (a program)
expansion card an electronic circuit board used to add facilities to a computer
expansion slot a connector that is used to add expansion boards to improve the computer's performance

F

field a unit of information in a record; in a database, information is entered via fields
file 1 a computer program or data stored on a storage device **2** a collection of records (in a database)
file compression the encoding of a file into a more compact format so that it occupies less disk space
file server a main computer that provides a storage area for data files on a network
finger a program that helps you find people on other Internet sites
firewall a software and hardware device used to control the data going into and out of a network; it is used to prevent unauthorized access to the network by hackers
flame an angry or insulting comment on a discussion group (on the Internet)
floppy (disk) a disk made of a flexible plastic material on which data is stored on magnetic tracks; also called *diskette*
floppy (disk) drive a magnetic storage device that reads and writes data on a floppy disk; also called *diskette drive*
flowchart a diagram used by programmers to show the logical steps in a computer program
folder see *directory*
font the shape, style, and size of a particular typeface, e.g. Times Bold at 12pt
format *(n)* the layout of a document, including page numbers, line spaces, margins, paragraph alignment, headers and footers, etc.
format *(v)* to prepare a disk for use; the operating system marks tracks on its surface
fragmentation when the operating system cannot find enough contiguous space to store a complete file, the file is divided into several separated fragments; as disk fragmentation increases, disk efficiency starts decreasing
freeware software that is available free of charge for public use
freeze If a computer screen freezes, the computer will not accept any instructions and everything on the screen is fixed in position.
function key a key on a computer keyboard which causes a specific operation to take place
futurologist a person who studies and predicts what technology will be like and what effects it will have in the future

G

gateway a device used to interconnect different types of networks
gigabyte 1,024 megabytes
gigahertz a unit of 1,000 megahertz, used to measure processor speed
global positioning system a system that determines the user's location by comparing radio signals from several satellites
graphical user interface (GUI) an operating environment based on graphics (windows, icons, pop-up

menus), mouse, and pointer, e.g. Microsoft Windows

graphics package software that allows the user to create and run graphics programs

H

hack to gain unauthorized access to a network system

hacker a skilled programmer who attempts to gain unauthorized access to a network system

handheld (computer) a small portable computer that can be held in one hand; also called *palmtop computer*

hard disk a disk made from a solid magnetic material used as a storage device

hardware the physical units of a computer system

head the part of a disk drive that reads and writes data to the disk

help desk/helpline a telephone service for helping users solve problems that occur on computer systems

high-level language a programming language closer to human language than low-level computer languages such as machine code or assembly language

high-level program a computer program written using a high-level language

highlight to select by marking on the display screen

Home button the button icon on a web browser program that takes you to the starting web page

home page the main start page of a website

host the computer which you contact to access the Internet

humanoid a robot with human characteristics

hyperlink text, image, or button that connects to other destinations on the Web; it is like an embedded Web address that you can click

hypermedia a hypermedia document integrates different formats (text, graphics, sound, and video) and contains links that take you to other resources

hypertext text that contains links to other documents; the codes used to create hypertext documents are called HTML

I

icon a small picture used in a WIMP system to represent a program folder or file

image map a clickable image that sends you to different web pages depending on the area you click

inbox the folder in an email program where emails are stored when they are first received

input *(n)* data put into a system

input *(v)* to put data into a system

input devices units of hardware which allow the user to enter information into the computer, e.g. the keyboard, mouse, lightpen, etc.

interactive allows two-way communication so that the user can respond or interact with the system

interface the hardware or software that connects two systems and allows them to communicate with each other

internal memory see *main memory*

Internet, the the connection of computer networks across the world

Internet Relay Chat (IRC) an Internet service that allows users to have a conversation by sending text messages to each other in real time

Internet telephone a system that allows people to make phone calls via the Internet
Internet TV a TV set used as an Internet device
interpreter a programming environment that executes statements directly, avoiding the need for compilation
intranet an internal computer network which uses public Internet software but makes the website only accessible to employees and authorized users
IP address a number which identifies a computer on the Internet; every machine on the Internet has a unique IP address, e.g. 194.179.73.2

J

Java an object-oriented computer programming language used for developing interactive applications for the Internet
joystick an input device with a vertical lever used in computer games to move the curser around the screen
junk email unwanted email that is normally advertising or trying to sell something

K

key pals pen pals (pen friends) that exchange email messages
keyboard an input device with typewriter keys for letters, numbers, and line controllers
kilobit a unit of signal speed equal to 1024 bits every second; a more common form is *kbps*
kilobyte a unit for measuring the memory or disk space in thousands of bytes; also called *k* = 1,024 bytes

L

laptop (computer) a type of portable computer; also called *notebook (computer)*
lightpen a highly sensitive photo-electric input device; the user can pass the pen over the surface of the screen to draw or modify images displayed on the screen
link a common term used for a hyperlink, i.e. the connection of a web page to another web page or file
load to copy a program from a storage device into the computer's memory
local area network computers connected together in a small area such as a company department
login the act of identifying yourself when entering a network; you usually type your user name and password
log off to disconnect from a network or online system
log on to connect to a network or online system
low-level language a computer language such as machine code or assembly language that is closer to the form that a computer understands than to that of a human language

M

machine code binary code numbers, 1s and 0s; the only language that computers can understand directly
Mac OS the family of operating systems used on the Apple Macintosh range of computers
mainframe the largest and most powerful type of computers, after supercomputers
main memory also called *internal memory*
megabit a unit of signal speed equal to 1,048,576 bits every second

megabyte 1,024 kilobytes
megahertz a unit of 1 million cycles per second, used to measure processor speed
memory the electronic part of a computer system that is used for temporarily storing the programs and data that are being used by the processor
menu bar the area at the top of the screen which allows access to the various menus
microchip see *chip*
microprocessor the main electronic chip in a computer; it can be thought of as the "brain" of the computer because it does the main processing and controls the other parts of the computer; sometimes called the *CPU*
Microsoft the common name for the Microsoft Corporation; the company founded by Bill Gates that developed the MS-DOS and Windows operating systems and a variety of software commonly used on desktop computers
minicomputer a computer that is slightly less powerful and a little smaller than a mainframe
mobile phone a wireless telephone that operates over a wide area; also called *cellphone*
modem a device attached to a computer and the telephone line allowing access to wide networks; standard telephone lines carry analog signals, so the digital signals used by computers must be converted into the correct form by means of a modem; a blend of *mo*dulator/*dem*odulator
monitor the main output device used to display the output from a computer on a screen
motherboard the main electronic circuit board inside a computer that holds and connects together all the main electronic components
mouse an input device used with a graphical user interface to specify the position of the cursor or make choices from the menu; it commonly has two or three button switches on top and a ball underneath that is rolled on a flat surface
mouse pointer a cursor image in the shape of an arrow that is controlled by a mouse and is used for pointing and selecting icons on the screen
multimedia the integration of text, graphics, animation, sound, and video with computing
multitasking the execution of several tasks at the same time

N

netiquette rules of etiquette (good manners) when sending messages to a mailing list or newsgroup; a blend of Inter*net* and et*iquette*
network a combination of a number of computers and peripheral devices connected together
node a network terminal or point where a computer is connected to a network
notebook (computer) see *laptop (computer)*

O

object language a language or set of instructions into which a source language is translated by a compiler
object-oriented programming a programming technique that allows the creation of "objects" which can be reused, or used as the foundation of others; used to develop complex programs, especially GUI programs
offline not connected to the Internet

online connected to the Internet
operating system the set of programs that control the basic functions of a computer and provides communication between the software and the hardware of a computer system
optical character recognition (OCR) technology that allows computers to recognize text input into a system with a scanner
optical disk a storage device in which data is recorded as microscopic "pits" by a laser beam
optical fiber a common name for glass fiber cable used in high speed networks; it enables data signals to be transmitted using laser light
Outlook Express a free graphical interface email program integrated into the Internet Explorer browser developed by the Microsoft Corporation
output *(n)* the processed data or signals that come out of a computer system
output *(v)* to transfer information from a CPU to an output device
output devices the units of hardware which display the results produced by the computer (e.g. monitors, printers, plotters)

P

pager a small radio receiver which beeps to alert the wearer of messages or telephone calls; it displays the telephone number of the caller so the wearer can call back
palmtop (computer) see *handheld computer*
Pascal a high-level computer language named after the mathematician Blaise Pascal
password a secret code used to control access to a network system
paste to insert a copy of data held in a computer's memory at a chosen position
patterns a menu or palette from which the user can pick the required pattern to fill shapes and draw borders
pen-based computer a small computer that has a pen input device instead of a keyboard
peripherals the units connected to the CPU of a computer system, i.e. input devices, output devices, and storage devices
personal computer a computer designed to be used by one person at a time
piracy the illegal copying of programs
pixel the smallest element of a display surface; a blend of *pic*ture and *el*ement
platform a type of computer system that needs software to be written specifically for it, e.g. IBM PC, Apple Mac
plotter a graphics output device which is used to make various types of engineering drawings
plug-ins special programs which extend the capabilities of a browser so that it can handle audio, video, 3-D, and animation
pointer an arrow-shaped cursor
port a socket or channel in the rear panel of the computer into which you can plug a wide range of peripherals: modems, fax machines, hard drives, etc.
portable (computer) a computer that is small and light enough to be carried from place to place
primitives the basic shapes used to construct graphical objects: lines, polygons, etc.
printer an output device used for

printing the output of a computer on paper; the output from a printer is referred to as a printout

processor the part of a computer that processes the data

program a set of instructions written in a computer language that control the behavior of a computer

programmer a person who writes computer programs

programming the process by which a set of instructions is produced for a computer to make it perform a specified task; the task can be anything from the solution to a mathematical problem to the production of a graphics package

programming language a computer language used for writing computer programs

protocol a set of rules which determine the formats by which information may be exchanged between different systems

proxy a special server which controls the traffic between the Internet and a private network; because of this server all the computers of an internal network can access the Internet simultaneously

pull-down menu a list of choices that appear below a menu title on a display screen when the user clicks on the menu title using a mouse

R

random access memory (RAM) the part of the main memory which is used for storing programs and data being used

read only memory (ROM) chips of memory containing information which is present and permanent

real-time involving the processing of data input to a system at almost the same time as the event which generates the data

reboot to restart the computer

record a section of a database made up of related database fields

Recycle Bin the folder in Microsoft Windows operating systems where deleted files are stored

resolution the maximum number of pixels in the horizontal and vertical directions of the screen; also refers to the number of pixels per inch

restore to put data back to its original location

right click to press and release the right-hand button on a mouse

rip to extract songs from a CD and turn them into WAV files

ripper a program that extracts songs from a CD and turns them into WAV files

robot a mechanical device controlled by a computer

robotics the study of robot systems

route the path that is used to transfer data in a network

router an electronic device used to connect various LANs; it determines the path that a signal should take to reach its destination

S

save to copy a program or data to a storage device

scale 1 to magnify or shrink a particular font in order to use it at a range of point sizes **2** to make an object larger or smaller in any direction

scan to copy text or graphics using a scanner

scanner an optical input device that uses the reflection of light to copy text or graphics into a computer

screen a computer output device used for displaying text and graphic images

screen saver a program that darkens the screen after you have not worked for several minutes; designed to protect an unchanging image from burning into the screen

scroll to move a document in its window by using scroll bars so that text in another part of the document is visible

scroll bar the part of a graphical user interface window that allows the user to move through a document by clicking or dragging with the mouse

search engine a program designed to find information on the World Wide Web according to data entered by the user; e.g. Yahoo!, AltaVista, Google

sector a formatted section of a circular magnetic track used for storing data on a disk

serial port the connector at the back of the system unit of a personal computer that is used to connect a serial device such as a serial mouse or a modem; two serial ports labeled COM 1 and COM 2 are usually provided on a PC

server a main computer that provides a service on a network

shareware software that is distributed freely and only paid for if the user decides to keep it

shift key the computer keyboard key that is held down to produce uppercase letters

sign up to register with a service

simulation a programmed virtual environment that imitates a real or planned system

site a common name for a website

smiley see *emoticon*

snail mail conventional mail delivered very slowly , in contrast with email

software programs or instructions executed by the computer

source program a program written in a source language, i.e. a programming language which cannot be directly processed by the hardware but requires "compilation" into an "object program"

spell checker a utility to correct typing mistakes

Start (button) an icon on the bottom left corner of Microsoft Windows operating system desktops that allows the user to access programs and data and to close down the system

Start menu the list of choices that opens up on the display screen when the user clicks the Start button in a Microsoft Windows desktop

streaming technique for transmitting sound and video such that it can be processed as a continuous stream; the files are played while they are downloading

style a distinguishing visual characteristic of a typeface, e.g. plain text, italic, bold, etc.

suite a group of related computer programs which make up a set, e.g. *Microsoft Office*

supercomputer the largest and most powerful type of computer

surf to browse web pages on the Internet in an unplanned way

T

tags codes used in an HTML document to mark the start, end, or exact location of a formatting feature or a link on a web page

taskbar a Microsoft Windows desktop component that indicates what programs are currently being used and allows the user to switch between them

technophobe a person who fears and dislikes technology and technological

devices, such as computers, and would prefer to live without them

technophobia the fear and dislike of technology and technological devices, such as computers

telecommunications branch of technology concerned with communications over long distances

teletext a method of communicating information by using TV signals; an extra signal is broadcast with the TV picture and translated into text on the screen by a decoder

terabyte 1,024 gigabytes

terminal a visual display unit where data may be input to or output from a data communications system

thesaurus a utility for searching synonyms and antonyms

token a special unit of data which acts as a key on a Token Ring network; only the adaptor in possession of the token can transmit on the network

tooltip a label that appears on the screen when the user holds the mouse pointer over an icon in a Microsoft Windows system

topology the physical layout of a network

tower chassis a personal computer case that stands on end and can be placed on the floor unlike the normal desktop case that sits flat on a desk under the monitor

track an area marked on the surface of a disk; when a disk is formatted, the operating system divides the surface of the disk into circular tracks, each one containing several sectors; tracks and sectors are used to organize the information stored on disk

trackball an input device that works like a mouse turned upside down; the ball spins freely to control the movement of the cursor on the screen

transceiver a hardware component that sends and receives network signals; a blend of *trans*mitter and re*ceiver*

transformation the manipulation of an object by moving, rotating, or scaling it

troubleshoot to find and fix faults in a system

troubleshooter a person who finds and fixes faults in a system

typeset to set text as type

U

undo to restore a file to the condition it was before the last change was made

update to bring up to date; to correct, add, or delete information in a file and thus ensure that the file reflects the latest version

upgrade to add or replace hardware or software in order to expand the computer's power

upload to copy a file from a client computer to a server in a network

user the person using a computer

user-friendly easy to use

username the network account name given to a particular user

utility a small program designed to improve the performance of the system; e.g. software to back up the hard disk, antivirus programs, etc.

V

videoconferencing a form of communication over a network that uses video cameras so that the people taking part can see and hear each other

virtual reality a computer-generated space in which the user interacts with artificial objects and environments

through three-dimensional computer simulation

virus a piece of software which attaches itself to an application or file; once you run an infected application, the virus quickly spreads to the system files and other software; some viruses can delete files or destroy the contents of hard disks

W

wallpaper the background graphics on a Microsoft Windows desktop

Web, the see *the World Wide Web*

webmaster a person who administers a web server

web page a hyperlinked document in a web network system

web server a server computer that stores and provides access to websites

website a set of related pages on the World Wide Web

wide area network (WAN) a network that extends outside a building or small area; for long-distance communications, LANs are usually connected into a WAN

window a rectangular screen area containing a program folder or file in a WIMP system

window-based refers to an application or program whose interface is based around windows

word processor an application that manipulates text and produces documents suitable for printing

World Wide Web, the a hypertext-based system by which you can navigate through the Internet; by using a special program known as a "browser," you can find news, pictures, virtual museums – any topic you can imagine; also called *WWW* or *the Web*

Abbreviations and Acronyms

A

ADSL Asymmetric Digital Subscriber Line
AI Artificial Intelligence
ALU Arithmetic Logic Unit
AMD Advanced Micro Devices: manufacturer of microprocessors
ASCII American Standard Code for Information Interchange
ASP Application Service Provider
ATM Automatic Teller Machine

B

BASIC Beginner's All-purpose Symbolic Instruction Code
Bcc Blind carbon copy. Addresses in the Bcc: line of an email will receive a copy of the message, but the identity of the recipients will be kept secret
BBS Bulletin Board System
bps bits per second
BUS Binary Unit System

C

C A high-level language designed for system programming, usually for software development in the UNIX environment
CAD Computer-Aided Design
CAE Computer-Aided Engineering
CAI Computer-Aided Instruction
CAL Computer-Aided Learning
CALL Computer-Aided Language Learning
CAM Computer-Aided Manufacturing
CBT Computer-Based Training
Cc Carbon copy. Addresses on the Cc: line of an email will receive the same message
CD Compact Disk
CD-R Compact Disk-Recordable
CD-ROM Compact Disk-Read Only Memory
CD-RW CD-Rewritable
COBOL Common Business-Oriented Language
cps cycles per second
CPU Central Processing Unit
CRT Cathode Ray Tube

D

DA Desk Accessory
DAC Digital to Analogue Converter
DAT Digital Audiotape
DD Disk Drive

DivX Digital Video Express: video compression format based on MPEG-4
DNS Domain Name System
DOS Disk Operating System
dpi dots per inch
DS disks double-sided disks
DSL Digital Subscriber Line
DTP Desktop Publishing: a process of designing documents for publishing using a computer system
DVD Digital Video Disk (or Digital Versatile Disk)

E

EAROM Electrically Alterable Read-Only Memory
EDIF Electronic Data Interchange Format
EOD Erasable Optical Disk

F

FAQ Frequently Asked Questions: a file containing answers to questions that Internet users frequently ask
FD Floppy Disk
FDD Floppy Disk Drive
FDHD Floppy Disk High Density
FORTRAN FORmula TRANslation
FTP File Transfer Protocol

G

GB Gigabyte (1,024 megabytes)
GHz Gigahertz (1,000 megahertz)
GIF Graphic Interchange Format
GPS Global Positioning System
GSM Global System for Mobile Communication; it allows transmission of voice and data on mobile phones
GUI Graphical User Interface

H

HD 1 Hard Disk **2** High Density Disk
HDD Hard Disk Drive
HDTV High-Definition Television
HP Hewlett-Packard
HTML Hypertext Markup Language: codes used on web pages
HTTP Hypertext Transfer Protocol: the method by which web pages are transferred from an Internet site to your computer
Hz Hertz (unit of frequency equal to one cycle per second), named after Heinrich Hertz

I

IBM International Business Machines
IC Integrated Circuit
i/f interface
I/O Input/Output
IP Internet Protocol: the basic set of standards for enabling computers to communicate over the Internet
IRC Internet Relay Chat: an Internet service that allows users to have a conversation by sending text messages to each other in real time
ISDN Integrated Services Digital Network
ISO International Standard Organization
ISP Internet Service Provider
IT Information technology

J

JPEG Joint Photographic Experts Group: standard in image compression

K

k 1 kilo (1,000) **2** 1.024 bytes
KB kilobyte (1,024 bytes)
kbps kilobits per second
kHz kilohertz: 1,000 cycles per second

L

LAN Local Area Network
Laser Light Amplification by Stimulated Emission of Radiation
LCD Liquid-Crystal Display
LISP LISt Processing: high-level language used for artificial intelligence research
LQ Letter Quality

M

MB 1 megabyte: 1,000,000 bytes **2** Mother Board
mbps megabits per second
MC Memory Card
MHz megahertz: 1,000,000 cycles per second
MIDI Musical Instrument Digital Interface
MP3 MPEG Audio Layer 3: a Motion Picture Experts Group standard for audio compression
MPEG Motion Picture Experts Group: a standard for compressing and decompressing images
ms millisecond: thousandth of a second
MS-DOS Microsoft Disk Operating System

N

NIC Network Interface Card
NUI Network User Identifier

O

OCR Optical Character Recognition
OOP Object-Oriented Programming
OS Operating System

P

PC Personal Computer
PDA Personal Digital Assistant: includes an address book, a calendar, Internet access, etc.
pdf portable document formatted; it is used to distribute text files over the Internet, and it can be read with Adobe Acrobat
picon picture icon
pixel picture element
ppi pixels per inch
POP Point of Presence: the location you dial into when you want access to the Internet
PPP Point to Point Protocol: allows computers to use modems and to have access to the Internet
PS PostScript

R

RAM Random Access Memory
RF Radio Frequency
RGB Red, Green, Blue
ROM Read Only Memory
rpm revolutions per minute
RSI Repetitive Stress (or Strain) Injury

S

SIMMs Single In-line Memory Modules: circuit boards which contain RAM chips
SMS Short Message Service: allows you to send short text messages with maximum with maximum 160 characters to GSM mobile phones worldwide
SOHO Small Office/Home Office: a room in someone's house with electronic equipment such as a computer and a fax machine, that is used as a place to work

T

TB terabyte (1,024 gigabytes)
TCP/IP Transmission Control Protocol/Internet Protocol: the

language used for data transfer on the Internet
TELEX TELeprinter EXchange
TIFF Tagged Image File Format: the kind of graphics-file format created by a scanner
TFT Thin Film Transistor. In a TFT display, each pixel is produced by three tiny transistors: one each for red, green, and blue. This allows for very clear and stable pictures.

U

UMTS Universal Mobile Telecommunications System: used by 3G mobile phones
UPS Uninterruptible Power Supply
URL Uniform Resource Locator: an address of a website's location on the Internet
USB Universal Serial Bus

V

VB Visual Basic
VCR Video Cassette Recorder
VGA Video Graphics Array
VR Virtual Reality
VRAM Video Random Access Memory: a common type of video card memory for colorful graphics
VRML Virtual Reality Modeling Language

W

WAN Wide Area Network
WAP Wireless Application Protocol: enables mobile phones to access the Internet
WIMP Window, Icon, Menu (or Mouse), and Pointer
WORM Write Once/Read Many
WWW World Wide Web
WYSIWYG What You See Is What You Get

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