

*Special language computer pamphlet*  
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*<http://jsmcomputer.professora.ir>*

*Course evaluation:*

*Translate on classroom-----8*

*Absent/present-----2*

*Final exam -----10*

# Contents

**Publisher's Preface**

**vi**

**Author's Preface**

**viii**

Unit	Title	Reading	Language Focus	Quiz
<b>1</b>	<b>Computer Applications</b> <i>Page 1</i>	<ul style="list-style-type: none"> <li>• Computer Applications</li> <li>• Computer Users</li> <li>• Computers vs. Human Beings</li> <li>• What can computers do?</li> </ul>	Collocation	Quiz 1
<b>2</b>	<b>What is a computer?</b> <i>Page 14</i>	<ul style="list-style-type: none"> <li>• What is a computer?</li> <li>• Types of Computer Systems</li> <li>• What's inside a PC system?</li> <li>• Units of Memory</li> </ul>	Function of an Item	Quiz 2
<b>3</b>	<b>Hardware</b> <i>page 28</i>	<ul style="list-style-type: none"> <li>• What is hardware?</li> <li>• Magnetic Disks and Drives</li> <li>• Input Devices</li> <li>• Buying a Computer</li> </ul>	Comparison and Contrast	Quiz 3
<b>4</b>	<b>Operating Systems</b> <i>page 43</i>	<ul style="list-style-type: none"> <li>• The Functions of Operating Systems</li> <li>• Common Operating Systems</li> </ul>	Prefixes and Suffixes	Quiz 4
<b>5</b>	<b>The Graphical User Interface</b> <i>page 58</i>	<ul style="list-style-type: none"> <li>• GUI</li> <li>• Microsoft Windows</li> </ul>	Instructions and Advice	Quiz 5

<b>6</b>	<b>Software</b> <i>page 73</i>	<ul style="list-style-type: none"> <li>• Word Processors</li> <li>• Database Programs</li> <li>• System Utilities</li> </ul>	Guessing Meaning from Context	Quiz 6
<b>7</b>	<b>Multimedia</b> <i>page 85</i>	<ul style="list-style-type: none"> <li>• What is multimedia?</li> <li>• Multimedia Magic</li> <li>• File Formats</li> <li>• A Word or Two about MP3</li> </ul>	Meaning Markers	Quiz 7
<b>8</b>	<b>Programming Languages</b> <i>page 99</i>	<ul style="list-style-type: none"> <li>• Program Design</li> <li>• Programming Languages</li> <li>• Visual BASIC</li> <li>• Java</li> </ul>	<ul style="list-style-type: none"> <li>• Prefixes: <i>de-</i> and <i>re-</i></li> <li>• Negative Makers: <i>un-</i> and <i>dis-</i></li> </ul>	Quiz 8
<b>9</b>	<b>Networking</b> <i>page 112</i>	<ul style="list-style-type: none"> <li>• LAN</li> <li>• WAN</li> <li>• The World Wide Web</li> <li>• The Internet</li> </ul>	Blending	Quiz 9
<b>10</b>	<b>New Technologies</b> <i>page 128</i>	<ul style="list-style-type: none"> <li>• New Technologies, New Devices</li> <li>• Laptops and Palmtops</li> <li>• Voice-input Technologies</li> <li>• Wearable Computers</li> </ul>	Compound Adjectives	Quiz 10

<b>Glossary of General English</b>	<b>144</b>
<b>Glossary of Computer-related Terms</b>	<b>160</b>
<b>Abbreviations and Acronyms</b>	<b>174</b>
<b>Abbreviations Used in Emails</b>	<b>178</b>
<b>Common Emoticons</b>	<b>180</b>
<b>Webliography</b>	<b>181</b>





# Unit 1

## Computer Applications

**Topic:** Different uses of computers

**Learning Objective:** ⑤ 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, design,  
display, document, email (electronic mail), interact,  
microchip, personal computer, real-time, technology

## A. Warm-up

Computers have many applications in a wide variety of fields. Look at these pictures 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 rapidly. 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 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

1. \_\_\_ workstation
2. \_\_\_ store
3. \_\_\_ automatic
4. \_\_\_ monitor
5. \_\_\_ information
6. \_\_\_ connected

#### Column B

- a. data processed by a computer
- b. display screen
- c. self-acting
- d. linked
- e. keep, save
- f. a computer or terminal that is part of a network

### 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 computer to do the usual office things like write memos, letters, emails, 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, using the words in the box.

electrical engineer	secretary	librarian
---------------------	-----------	-----------

<i>Speaker</i>	<i>I use my computer . . .</i>	<i>I'm a /an . . .</i>
<b>1</b>	to do the usual ..... things.	
<b>2</b>	to design ..... installations.	
<b>3</b>	to find ..... 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 carry out 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 data. 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 probably 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. \_\_\_\_ Computers can work endlessly without having to stop to rest unless there is a breakdown.
3. \_\_\_\_ A computer’s mechanical “brain” works exactly like the brain of a human being.
4. \_\_\_\_ Human beings can work much faster than computers if they want to.

## Activity 4

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

### Column A

1. \_\_\_\_ solution
2. \_\_\_\_ dull
3. \_\_\_\_ task
4. \_\_\_\_ appropriate
5. \_\_\_\_ carry out

### Column B

- a. do
- b. suitable
- c. answer
- d. boring
- 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 almost 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

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

1. \_\_\_\_ Microchips are not part of our daily lives.
2. \_\_\_\_ TVs and VCRs use chip technology.
3. \_\_\_\_ PCs can 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

1. \_\_\_\_ microchip
2. \_\_\_\_ switch on
3. \_\_\_\_ e.g.
4. \_\_\_\_ VCR
5. \_\_\_\_ allow
6. \_\_\_\_ personal
7. \_\_\_\_ enable

#### Column B

- a. permit
- b. very small chip
- c. turn on
- d. belonging to a person
- e. make able
- f. video cassette recorder
- 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 computer games*

*to write a computer program*

Pay attention to the collocations in the following sentences.

*Examples:*

*Have you ever **sent an email**?*

*Most children like **playing computer games**.*

*I have never **written a computer program**.*

### Activity 7

The following collocations are frequently used in computer texts.

Match the verbs in Column A with the phrases in Column B.

#### Column A

1. \_\_\_\_ make
2. \_\_\_\_ insert
3. \_\_\_\_ run
4. \_\_\_\_ surf
5. \_\_\_\_ send
6. \_\_\_\_ click on
7. \_\_\_\_ highlight

#### Column B

- a. an email
- b. an icon
- c. the Internet
- d. a floppy disk
- e. a program
- f. part of the text
- 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 have made my own* \_\_\_\_\_.

or

**B:** *No, I have never made my own* \_\_\_\_\_.

### 2. to play computer games

**A:** Have you ever played any computer games?

**B:** *Yes,* \_\_\_\_\_.

or

**B:** *No,* \_\_\_\_\_.

### 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.edzone.net/~mwestern/101computeruses.html>  
(shows just a few things you can do with your computer)
- <http://pclt.cis.yale.edu/pclt/>  
(answers to questions from the new personal computer user)
- <http://www.videogames.yahoo.com>  
(information on computer games, reviews, downloads, and links to gaming sites)
- <http://www.pbs.org/nerds/>  
(a timeline of the development of the personal computer and other resources)
- <http://www.buzzle.com/articles/uses-of-computer.html>  
(describes various uses of computer for modern man today)
- [http://www.help2go.com/Tutorials/Computer-Basies/Uses\\_For\\_Your\\_Computer.html](http://www.help2go.com/Tutorials/Computer-Basies/Uses_For_Your_Computer.html)  
(provides free computer help, advice, and tutorials)

# Unit 2

## What is a computer?

**Topic:** The components of a computer system

**Learning Objectives:**

- ⑤ To understand the basic structure of a computer system
- ⑤ To recognize differences between types of computers
- ⑤ 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 components of the computer system in *Figure 1*. Then check your answers with other students.

monitor

keyboard

disk drive

printer

mouse

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.

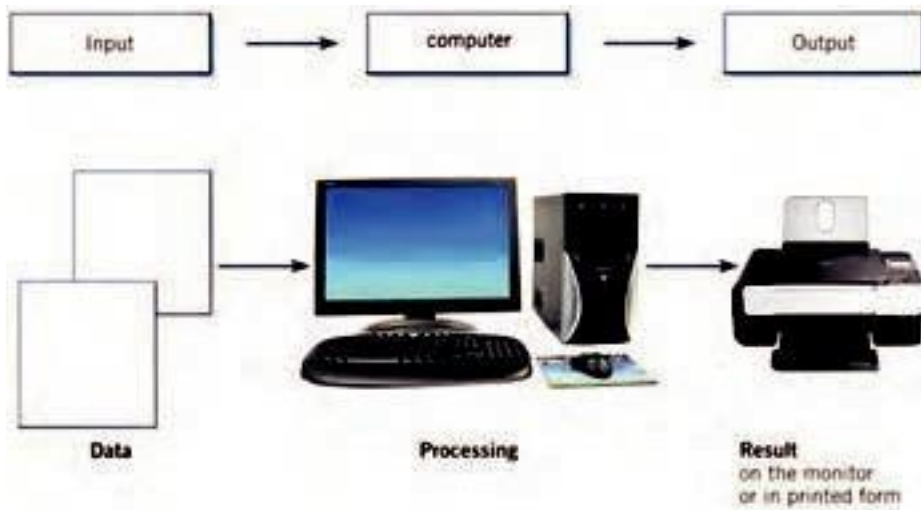
## What is a computer?

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 as information. 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*).

A set of instructions that directs the computer to perform some functions is known as **software**, and the electronic and electro-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. **Disk drives** are used to handle floppy, hard, or optical disks. **Input devices** enable data to go into the computer's memory. The most common input devices are the mouse and the keyboard. **Output devices** enable us to extract the finished product from the system. For example, the computer shows the output on the monitor or prints the results onto paper by means of a printer.

On the rear panel of the computer, there are several ports into which we can plug a wide range of peripherals – external modems, printers, 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.

- |                       |                    |                       |                  |
|-----------------------|--------------------|-----------------------|------------------|
| <b>a.</b> software    | <b>b.</b> monitor  | <b>c.</b> input       | <b>d.</b> port   |
| <b>e.</b> floppy disk | <b>f.</b> hardware | <b>g.</b> peripherals | <b>h.</b> 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. \_\_\_\_ the visual display unit
7. \_\_\_\_ a 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. desktop PCs and portable PCs
  - b. laptops and minicomputers
3. What are the smallest computers called?
  - a. palmtops
  - b. laptops
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** (with one or more cores) 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 instructions 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 to load the operating system.

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 3,200 MHz (3,200 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 clock 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 (**binary** + **digit** → **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 /ˈæski:/ “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.

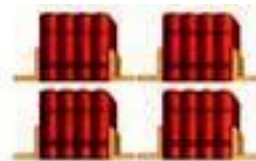
## Activity 4

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 _____              | 2. One _____  | 3. One _____  | 4. One _____  |
| represents one character. | represents 1,024 characters (about a small page of text). | represents 1,000,000 characters (about the text of a book). | 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	is used to	a. read DVD-ROMs.
2. ___ RAM		b. input data through keys like a typewriter.
3. ___ Monitor		c. access the Internet.
4. ___ CPU		d. control the cursor.
5. ___ 3.5" floppy drive		e. read and write to removable magnetic disks.
6. ___ Keyboard		f. hold data read or written to it by the processor.
7. ___ ROM		g. execute all the operations in a computer.
8. ___ Modem		h. control the timing of signals in the computer.
9. ___ DVD-ROM drive		i. display the output from a computer on a screen.
10. ___ Clock		j. hold instructions which are needed to start up the computer.

## D. Quiz

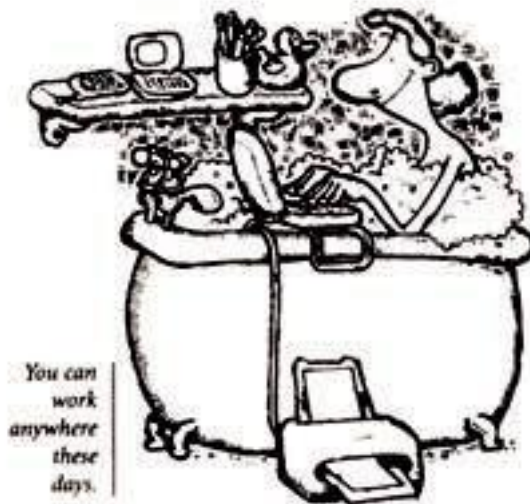
Fill in the blanks in the following sentences with the words in the box to check your understanding of this unit.

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.

## Portable Computers



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

- <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 electromechanical parts of a computer system

**Learning Objectives:**

- ⑤ To understand the structure of the CPU and the functions of its different elements
- ⑤ To distinguish between main memory and secondary storage devices
- ⑤ To distinguish between different types of magnetic disks and drives
- ⑤ To recognize different input devices

**Language Focus:** Comparison and contrast

**Abbreviations and Acronyms:** CD, DVD, HD, 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 parts 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 parts: (a) the central processing unit or **CPU**, (b) the memory unit, (c) the input unit, and the out put unit.

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.

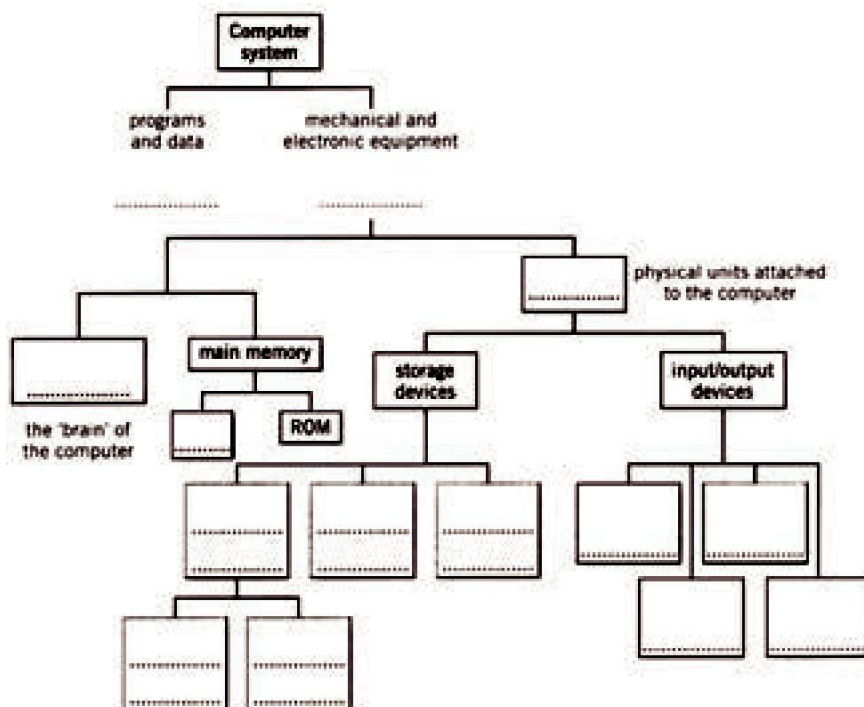
In a way, it is the “brain” of the computer. The main memory of a computer holds the instructions and data which are processed by the CPU. It is usually composed of two sections: **RAM** (random access memory) and ROM (read only memory).

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 storage devices in *Figure 1* and find out:

1. the size of a floppy disk: \_\_\_\_\_
2. the storage capacity of a high-density diskette: \_\_\_\_\_
3. the most popular portable drive: \_\_\_\_\_
4. the most popular storage device inside a PC: \_\_\_\_\_
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: \_\_\_\_\_

### 3.5 inch Diskette

A high-density (HD) floppy disk can store 1.44 MB of data.



### **Hard Disk**

Most PCs have one hard drive. It's used to keep software and files organized in a convenient way. A hard disk can hold several gigabytes of data.



### **Portable Hard Drive**

A disk drive that is plugged into an external port a computer such as USB or FireWire. Typically used for backup, but also as secondary storage, such units rival internal drives in capacity.



### **Tape Drive**

A tape drive stores data on tape cartridges. It's used for backup purposes. A Digital Audio Tape (DAT) drive can hold up to 10 GB data.



### **Flash Memory Card**

A flash memory card is a small card for digital cameras, PCs, and audio players, and computers. It can be connected to a PC using a RAM reader.



### **USB Flash Drive**

USB flash drives are the most popular portable drives today. They used USB port to be connected to PCs.



*Figure 1: Some storage devices*

## 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 disk     | 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 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 operating system 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. However, 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 3,600, 5,400, 7,200, or 15,000 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, a graphics tablet, 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 pointer and selecting items on the screen. In the past, this device used a ball, but nowadays it uses a light-emitting diode and photodiodes to detect movement. 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 2.5 gigahertz, and the portable *iBook*, which has a processor running at 1.5 gigahertz.

**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 512 megabytes of RAM, which can be expanded up to 2 gigabytes, and the *iBook* has 256 megabytes, which can be expanded up to 1 gigabyte. 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 160 gigabytes, and the portable *iBook* has a hard disk of 80 gigabytes.

**Customer:** And how much are they?

**Shop Assistant:** The *iMac* is \$1,850, and the *iBook* is \$1,600.

**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 I 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.*

*PDA's 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 1 gigabyte, while the iMac's/iBook's RAM can be expanded up to 2 gigabytes.
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.

## Disk Drives



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

- <http://www.coolnerds.com/newbies/Hardware/hardware.htm>  
(explains the components of a personal computer)
- <http://www.devhardware.com/>  
(introduces reviews about computer hardware and relevant sites)
- <http://www.dmoz.org/Computers/Hardware/Components/>  
(directory of useful hardware resources)
- [http://en.wikipedia.org/wiki/Computer\\_hardware](http://en.wikipedia.org/wiki/Computer_hardware)  
(explains what a computer is made up, including pictures, diagrams, and furthers information)

# Unit 4

## Operating Systems

**Topic:** Operating systems

**Learning Objectives:** ⑤ To understand the functions of operating systems  
⑤ To learn the terminology related to operating systems

**Language Focus:** Prefixes and suffixes

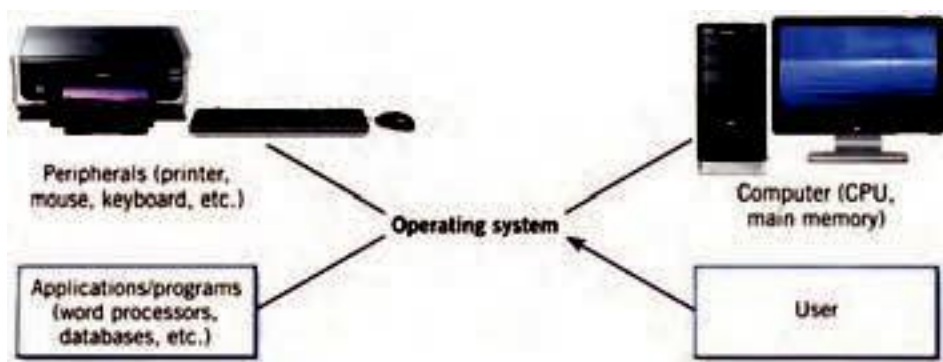
**Abbreviations and Acronyms:** IBM, MS, OS, USB

**Key Words:** activate, antivirus, applications software, command, delete, develop, directory, 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?

### The Functions of Operating Systems

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  
software

operating system  
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 Windows



Most 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.
- **Windows Vista** contains many changes and new features, including an updated graphical user interface and visual style, improved searching features, new multimedia creation tools such as Windows DVD Maker, and redesigned networking, audio, print, and display subsystems.

There are a number of security and safety features new to Window Vista, most of which are not available in any prior Microsoft Windows operating system release.

### **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.

**Linux**

Linux is a Unix-like computer operating system, in which its underlying source code can be freely modified, used redistributed by anyone. The name "Linux" comes from the name of its creator, Linus Torvalds, and it was started in 1991.

Linux derives much of its basic design from principles established in Unix during the 1970s and 1980s. Linux uses a kernel, which handles process control, networking, and peripheral and file system access. Device drivers are integrated directly with the kernel. Much of Linux's higher-level functionality is provided by separate projects which interface with the kernel.

Linux can be controlled by one or more of a text-based command line interface (CLI), graphical user interface (GUI) (usually the default for desktop), or through controls on the device itself.

**Activity 4**

Read the text again and find:

1. the latest version of MS Windows: \_\_\_\_\_
2. the OS designed for handheld computers: \_\_\_\_\_
3. the term which means several programs  
are executed at the same time \_\_\_\_\_
4. the OS written in C language and used on  
minicomputers and workstations: \_\_\_\_\_
5. The name of the creator of Linux: \_\_\_\_\_

## C. Language Focus: *Prefixes and Suffixes*

### 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
<b>Quantity &amp; Size</b>		
bi-	two	<i>bidirectional, bidimensional, binary</i>
deci-	ten	<i>decimal, decibel</i>
giga-	$10^9$ (1,000,000,000)	<i>gigahertz, gigabyte</i> *
kilo-	$10^3$ (1,000)	<i>kilohertz, kilogram, kilobyte</i>
macro-	large	<i>macrochip</i>
mega-	$10^6$ (1,000,000)	<i>megahertz, megabyte</i>
micro-	very small	<i>microcomputer, microchip</i>
milli-	$10^{-3}$ (-1,000)	<i>millisecond, millimeter</i>
mini-	small	<i>minicomputer, minibus, minimum</i>
mono-	one	<i>monochrome, monolingual</i>
multi-	many	<i>multimedia, multitasking</i>
tri-	three	<i>triangle, trilingual, tricycle</i>
uni-	one	<i>unidirectional</i>

\* To indicate the capacity of storage devices, the exact number is: kilobyte ( $2^{10}$  bytes), megabyte ( $2^{20}$  bytes), gigabyte ( $2^{30}$  bytes).



<b>Others</b>		
anti-	against	<i>antivirus, anticlockwise</i>
auto-	by itself	<i>autorun, autoplay, autosave, automatic, automation</i>
cyber-	relating to computers, esp. the Internet	<i>cyberspace, cybercafé, cybersickness, cybercrime, cyberwidow</i>
hyper-	above, beyond	<i>hyperlink, hypertext, hypermedia</i>
infra-	below	<i>infrared, infrastructure</i>
inter-	between	<i>the Internet, international</i>
intra-	within	<i>intranet</i>
super-	higher in quantity or degree	<i>supercomputer, superstar, superhuman, superconductor</i>
tele-	distant, far	<i>telephone, television, teleconference, telecommunications</i>

### 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 two digits, 0 and 1.*

**1. a microchip**

A microchip is a very \_\_\_\_\_ chip.

**2. a multi-user configuration**

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

**3. a bidimensional chessboard**

A bidimensional chessboard is a chessboard which has \_\_\_\_\_ dimensions.

**4. the decimal system**

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

**5. a monochrome monitor**

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

**6. a document of 3 kilobytes**

A document of 3 kilobytes is a document which is \_\_\_\_\_ bytes.

**7. 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 two 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)

### Suffixes

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...

- ⑤ to make a noun:

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

- ⑤ to make a verb:

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

- ⑤ to make an adjective:

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

- ⑤ 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.

For further information on the subject, you can visit our website.

***-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**

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
Reliable	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. Windows Vista has Many new Features, such as an updated graphical user interface and visual style. It's more secure and \_\_\_\_\_.
9. Windows XP is a /an \_\_\_\_\_ to Previous Windows versions, with a new visual design.
10. Pocket PC OS is 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/>  
(information about various versions of the Microsoft Windows operating system)
- [http://g.msn.com/OENNAW/weblink\\_winxp](http://g.msn.com/OENNAW/weblink_winxp)  
(resources for the Windows XP operating system, including upgrade, an XP tour, and a user forum)
- <http://www.linux.org/info/index.html>  
(general information and resources about the Linux operating system)
- <http://www.microsoft.com/windows/products/windowsvista/default.aspx>  
(official product homepage: contains features, showcase, and information for various types of users)

# Unit 5

## The Graphical User Interface

**Topic:** The graphical user interface (GUI)

**Learning Objective:** ⑤ To recognize the characteristics of a typical GUI

**Language Focus:** Instructions and advice

**Abbreviations and Acronyms:** ELF, GUI, LCD, WIMP

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

## 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

### GUI

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**

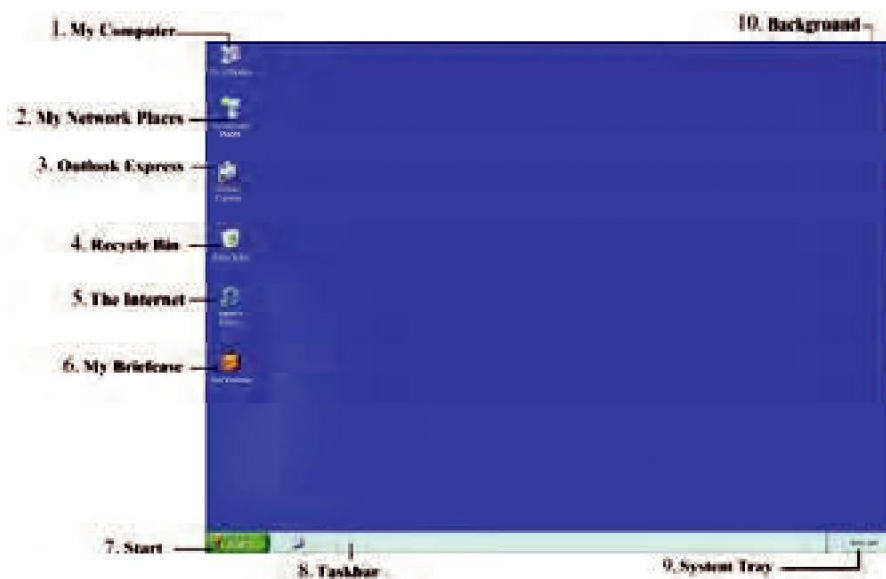
Use the information in the interview to complete this fact file.

<i>Why is it so popular?</i>	<i>Windows versions</i>	<i>Other features</i>	<i>Internet connections</i>	<i>Windows programs</i>
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

Read the explanations of the items 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*

#### 1. My Computer

This lets you browse the files stored on your PC. Move the mouse pointer over this icon and double-click the left mouse button: a new window shows your hard disk, floppy disk, CD-ROM drive and DVD-ROM, as well as special Printer and Control Panel folders.

## **2. My Network Places**

For office PCs, this lets users see other computers connected to the PC. Most home PC users will not need to use this icon.

## **3. Outlook Express**

This starts Microsoft Outlook Express, which lets you send electronic mail if you have internet access.

## **4. Recycle Bin**

When you delete files they go here, so you can easily retrieve them if you make a mistake. To delete the files permanently, you can empty the Recycle Bin.

## **5. The Internet**

The Internet Connection Wizard is a special program that helps you get on the Internet. You may also have an icon for the Microsoft Network – an Internet service you can subscribe to.

## **6. My Briefcase**

If you often take files and documents to and from a PC at work, My Briefcase helps you to keep them organized and up-to-date.

## **7. Start**

This button is the main starting point for most of your actions. Click once and you'll see a list of programs and your most recently used documents.

## **8. Taskbar**

The Taskbar shows you the programs that you are currently running and the windows you have opened. To switch between different windows, click on their buttons on the Taskbar.

## **9. System Tray**

This box normally displays the current time, but it can also display other information. Pause the mouse pointer over the time for a moment and a pop-up box tells you the date. The box is also used very often by programs to show the status of tools such as the printer, modem or – on a notebook (a portable computer) – it might display the amount of battery power you have left.

## 10. Background

The background of the Desktop can be a solid color, a pattern or even a picture. Most new PCs have a solid green-blue background, while some may show the logo of your PC maker.

### 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.*

*You **should look** down at the monitor; you **shouldn’t look** up at it.*

### Activity 4

Fill in the blanks in the sentences about health and safety using *should/shouldn’t*. Follow the example.

*Example:*

Keep the screen clean to prevent distorting shadows.

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



1. Position your keyboard at the same height as your elbows.  
\_\_\_\_\_ your keyboard at the same height as your elbows.
2. Don't look up at the monitor.  
\_\_\_\_\_ at the monitor.
3. Buy a protective filter that cuts down the ELF emissions.  
\_\_\_\_\_ a protective filter that cuts down the ELF emissions.
4. Don't stare at the screen for long periods of time.  
\_\_\_\_\_ at the screen for long periods of time.

## Activity 5

**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

**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.

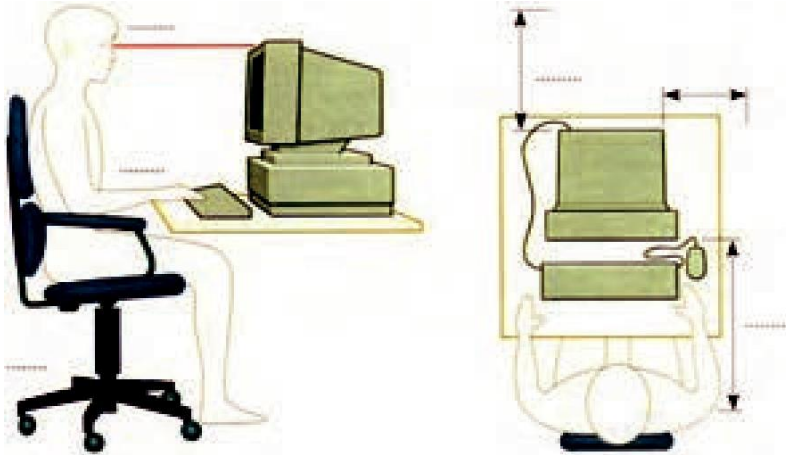
**Student:** Often my eyes feel really sore and tired after I use a computer for a few hours. How do I stop that happening?

**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*

### Activity 6

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.

### 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.

## Menu Options



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.en.wikipedia.org/wiki/Repetitive\\_strain\\_injury](http://www.en.wikipedia.org/wiki/Repetitive_strain_injury)

(information on repetitive strain injury and advice on prevention, including clues about its treatment)

– <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](http://kidshealth.org/parent/firstaid_safe/home/ergonomics.html)

(information on protection from repetitive strain injuries, including ergonomically correct guidelines for working at a computer)

# Unit 6

## Software

**Topic:** Programs or instructions executed by the computer

**Learning Objective:** ⑤ 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, retrieve, screen saver, search, software, store (*v*), system utilities, virus

## 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   |
| 3. ____ proofreading | system   |
| 4. ____ retype       | c. show  |
| 5. ____ retrieve     | d. save; keep  |
|                      | 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.

	<p><b>Name</b> Sohrab Ferdosi</p> <p><b>Address</b> 12, Sasani St.</p> <p><b>Marital status</b> Single</p> <p><b>Identification</b> 0994989</p> <p><b>Job</b> Software Engineer</p> <p><b>Home phone</b> 45636728</p> <p><b>Department</b> Data processing</p>
<p><b>Salary</b> 10,000,000 rls</p>	

*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 800,000 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 text, 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 and suffixes (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 /an \_\_\_\_\_.
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.



*"A virus ate my homework."*



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

– <http://www.microsoft.com/downloads/en/default.aspx>

(free software downloads from Microsoft)

– <http://www.packardbell.com/>

(free software downloads from Packard Bell)

– <http://www.howstuffworks.com/virus.htm>

(an explanation of computer viruses and how they function; protection information and links)

– <http://www.software.com/>

(free software downloads, featuring security software, audio programs, network tools, and utilities)

– <http://www.pcmag.com/>

(PC Magazine is your complete guide to personal computers, peripherals, and upgrades)

# Unit 7

## Multimedia

**Topic:** Multimedia technology

**Learning Objectives:**

- ⑤ To understand the main components and applications of multimedia systems
- ⑤ To learn the basic terminology related to multimedia technology
- ⑤ To recognize file formats
- ⑤ To understand MP3

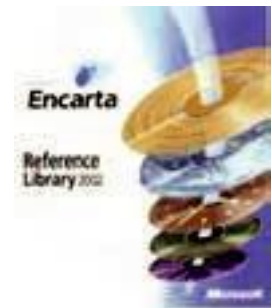
**Language Focus:** Meaning markers

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

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

## 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 or video 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.

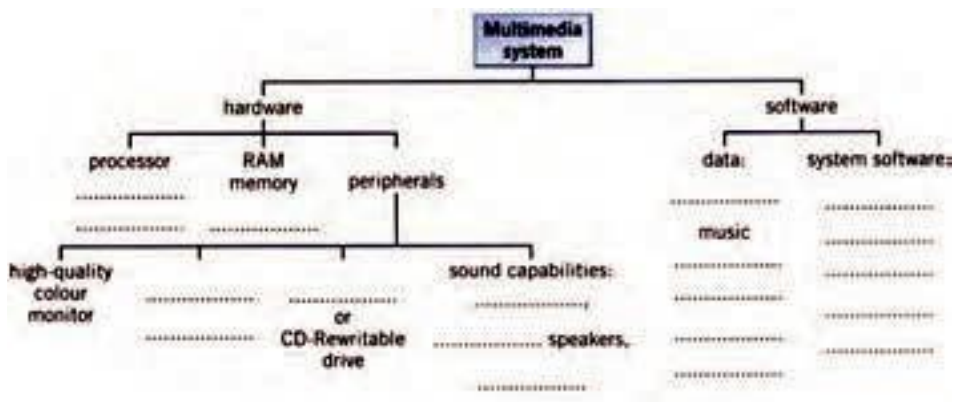
**Instructor:** Yes, of course. Modern PCs come with a sound card, stereo speakers, and a microphone.

**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 is 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

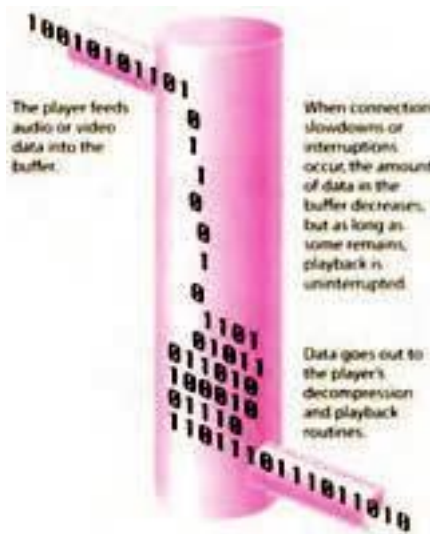


Figure 1: Video buffering

## 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 *Figure 1*. 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 formats 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 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 usually three-letter suffix) is usually added to the file name when it is saved on disk.

### Text



The most common extensions for text files 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 extensions are **.gif** (for 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. Videos are usually stored in files with **.avi**, **.mov**, and **.mpg** (or **.mpeg**) extensions. 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 may be compressed. Windows compressed files usually 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 an audio CD, but which is much smaller.

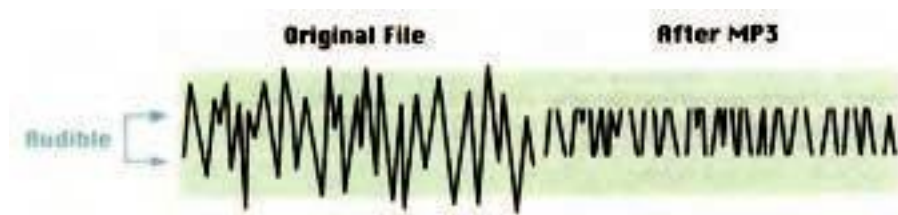


Figure 2: Understanding how MP3 works

### 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 in order 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.

⑤ Add new information:

*and, also, in addition, moreover, furthermore, similarly, in other words*

⑤ Compare and contrast: *but,*

*yet, however, whereas*

⑤ Show a result:

*as a result, therefore, thus, so, so that*

⑤ Emphasize a point:

*as a matter of fact, in fact*

⑤ Show different steps:

*first, firstly, first of all*

*second, secondly, then, next*

*finally*

⑤ 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. \_\_\_\_\_

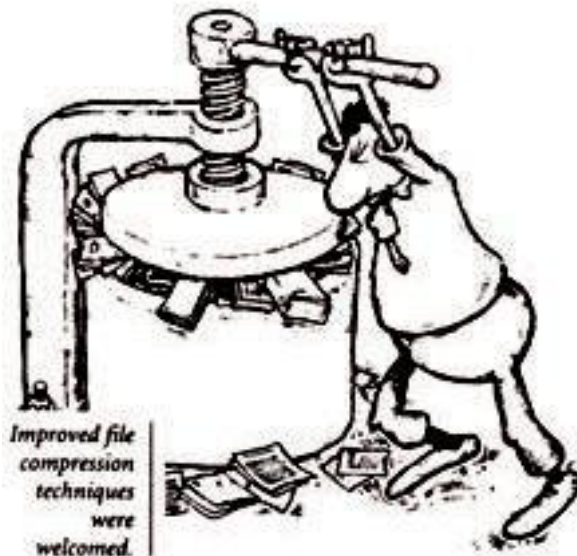
## D. Quiz

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. The technique of playing sound and video files as a continuous stream, while they're downloading is called \_\_\_\_\_.
7. \_\_\_\_\_ allows electronic musical instruments to communicate with computers.
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 /An \_\_\_\_\_ is an area in a computer's memory where information can be stored for a short time.

## MP3 Revolution



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

– <http://www.brainpop.com/>

(a multimedia-rich site with information about activities, videos, games, and much more)

– <http://www.pearsonlongman.com/ae/multimedia>

(multimedia English courses for beginners and advanced students)

– <http://www.encyclopedia.msn.com>

(an online encyclopedia, offering information on almost any subject)

– <http://www.computer.org/portal/site/multimedia>

(magazine covering technical information on a broad range of issues in multimedia systems and applications)

– [http://dir.yahoo.com/Computers\\_and\\_Internet/Multimedia/](http://dir.yahoo.com/Computers_and_Internet/Multimedia/)

(sites devoted to news, tutorials, and other resources about multimedia technologies)

# Unit 8

## Programming Languages

**Topic:** Computer programming

**Learning Objectives:** ⑤ To understand basic concepts in computer programming  
⑤ To learn about Visual BASIC and Java

**Language Focus:** ⑤ Prefixes: *de-* and *re-*  
⑤ Negative makers: *un-* and *dis-*

**Abbreviations and Acronyms:** AI, BASIC, COBOL, FORTRAN

**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

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

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

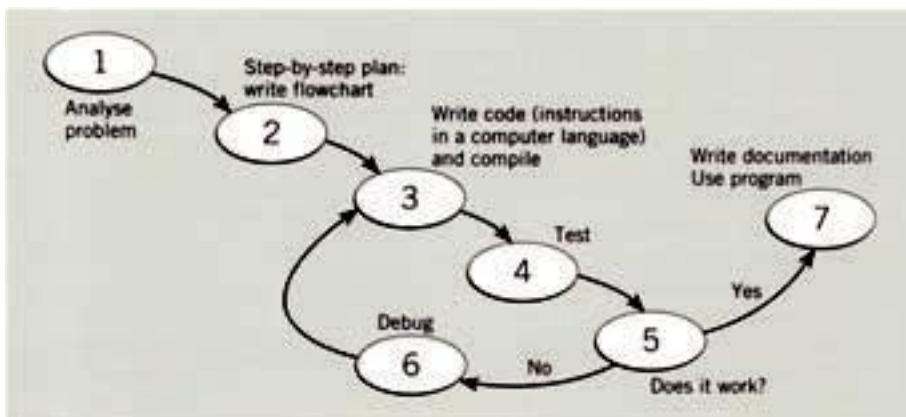
1. **flowchart:** a diagram showing the logical order between  
\_\_\_\_\_
2. **coding:** the translation of the logical steps into a programming  
\_\_\_\_\_
3. **machine code:** the basic instructions understood by computers;  
the processor operates on codes which consist of  
\_\_\_\_\_
4. **debugging:** the techniques of detecting, diagnosing, and  
correcting errors or “bugs” which \_\_\_\_\_

b. 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 symbolic languages.  
b. \_\_\_\_ Computers understand human languages.
2. a. \_\_\_\_ High-level languages are machine-oriented.  
b. \_\_\_\_ High-level languages are problem-oriented.
3. a. \_\_\_\_ BASIC and Pascal are high-level languages.  
b. \_\_\_\_ BASIC and Pascal are low-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

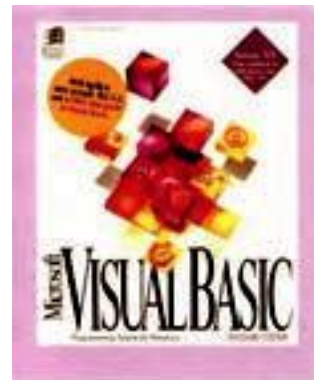
What do you know about Visual BASIC? Why is it called Visual? Discuss them with other students. Then read the following text and check your answers.

## 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.

**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. 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.

redo	undo	unzip	unplug
decodes	reformat	unlock	restart
uninterrupted	disconnect		

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 numeric keypad is locked, you should press the *Num Lock* button on the 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	detect	documentation	runs
flowchart	plan	high-level	source code
debugging	machine code		

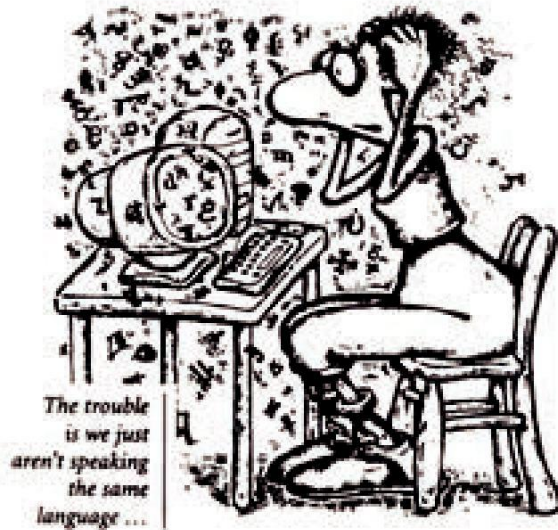
To write a program, software engineers usually carry out the following steps:

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 /an (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 /an (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.

# Writing Software



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

- <http://www.ibm.com/developerworks/java>  
(articles, online tutorials, and other technical resources on Java standards and technologies)
- <http://javaboutique.internet.com/>  
(information on the Java programming language, including tutorials, news, and a collection of applets for downloading)
- <http://www.levenez.com/lang/>  
(timeline chart, 1945 to today; links to sites about the history of the development of various programming languages)
- [http://en.wikipedia.org/wiki/List\\_of\\_programming\\_languages](http://en.wikipedia.org/wiki/List_of_programming_languages)  
(includes information on all notable programming languages)
- <http://www.engin.umd.umich.edu/CIS/course.des/cis400/>  
(includes history, description, code examples, and references for each entry)

# Unit 9

## Networking

**Topics:** Computer networks and Internet tools

**Learning Objectives:** ⑤ To understand the components and functions of a computer network

⑤ To learn about Internet tools

⑤ To recognize different parts of Web addresses

**Language Focus:** Blending

**Abbreviations and Acronyms:** HTML, http, IP, IRC, ISP, kbps, LAN, URL, WAN, WWW

**Key Words:** account, browse, browser, domain name, fiber-optic, home page, the Internet, intranet, log on, modem, navigate, the Net, network, node, online, password, protocol, surf, topology, transceiver, transfer, transmit, username, the Web, web page, web server, website

## 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.

#### LAN

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.

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. The physical distribution of devices and their circuits is known as network “topology” or “architecture.”

In *Figure 2*, 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.

The software required for communication consists of **protocols**, that is, the rules which determine the formats by which information may be exchanged between different systems. The transceiver (**transmitter** + **receiver** → **transceiver**) is the hardware that sends

and receives network signals. We could say that cables and transceivers allow the computers to “hear” one another, while the software is the “language” that they use to “talk” to one another over the network.

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.

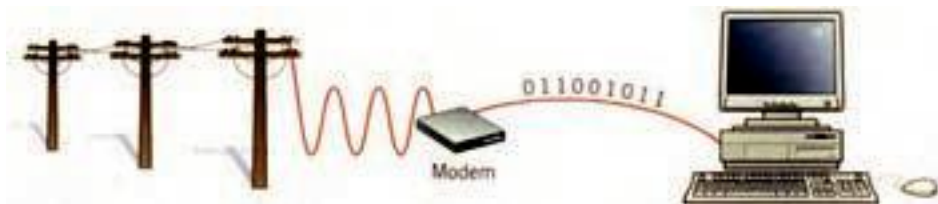


Figure 1

## 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 **modulator** (digital to analog) and **demodulator** (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).*

## Activity 1

Use the information in the text and label the different elements in Figure 2.





*Figure 2: An example of a LAN*

## 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. ___ transceiver          | b. a network in a small area topology                                 |
| 3. ___ protocol             | c. the arrangement of nodes in a communication system                 |
| 4. ___ nodes                | d. rules that allow the exchange of information over a network        |
| 5. ___ network architecture | e. computer devices interconnected in a network                       |

## Reading 2

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.

### WAN

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

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

1. \_\_\_\_ The Internet is the biggest LAN in the world.
2. \_\_\_\_ Fiber-optic cables avoid electromagnetic interference.
3. \_\_\_\_ Fiber-optic cables are dangerous because they carry electricity.
4. \_\_\_\_ Ordinary telephone lines require more physical space than fiber-optic cables.
5. \_\_\_\_ Fiber-optic cables transmit data faster than ordinary telephone lines.

### Reading 3

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.

#### 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. A **website** has one or more related web pages, depending on how it is designed.

### 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 **Internet Service Provider** (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 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.

The “glue” that holds the Web together is called **hypertext** and

**hyperlinks.** The hypertext words often hint at what you will link to. 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. ISP stands for Internet Service \_\_\_\_\_.
4. A \_\_\_\_\_ usually has more than one web page.
5. Hyperlinks enable you to \_\_\_\_\_ easily from one page to another by clicking on a link.

### Reading 4

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

The format of an email address:

you@ yahoo.ca

1 2 3 4

1. User name or nickname.
2. The @ sign means “at” (and is pronounced “at” /**xt**/).
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 6

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<br>(usually typed) on the Internet        |
| 3. ____ chat program      | c. to send a message to another<br>person via the Internet               |
| 4. ____ videoconferencing | d. to participate in live conversations,<br>using text, audio, and video |

## Activity 7

- a. Look at the web page in *Figure 3* and note the parts of the web address.

**URL** (Uniform Resource Locator) is the address of a file on the Internet. A URL looks like this:

**<http://www.mozilla.com/firefox/index.html>**

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

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

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

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

**index.html** – This is a **web page** inside the folder.



*Figure 3: A sample screen from Firefox web browser  
<http://www.mozilla.com/firefox/index.html>*

**b.** Now find the following features in the web page.

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
3. Clickable image link
4. Clickable hypertext link



## 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** (binary + digit): each 1 or 0 in binary notation

**digicam** (digital + camera): a digital camera

**transceiver** (transmitter + receiver): a hardware component that transmits and receives network signals

**cyborg** (cybernetic + organism): a being that is part machine, part human

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

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

**FORTRAN** (formula + translation): a high-level computing language

**Wi-Fi (Wireless + Fidelity):** a way of connecting computers or other electronic machines to a network by using radio signals rather than wires.

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

**webliography (website + bibliography):** a list of the websites you used to get information when writing something.

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

**emoticon (emotion + 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

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/an (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 a/an (6) \_\_\_\_\_, which is a commercial company that offers connection for a fixed period of time.

**Journalist:** What services are offered by the (7) \_\_\_\_\_?

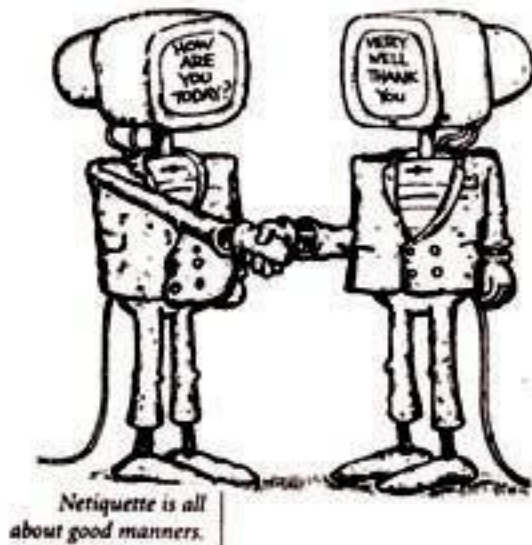
**Professor:** It offers services such as email, file transfer, real-time chats, and information search on the World Wide Web.

**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 and Internet tools, 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.webreference.com/html/>  
(links to tutorials and other materials needed to create HTML documents)
- [http://www.computerhistory.org/internet\\_history/](http://www.computerhistory.org/internet_history/)  
(a timeline of the history of the Internet, including images)
- <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.whatistechtarget.com>  
(an IT encyclopedia which explains computer and Internet terms in layman's language)

# Unit 10

## New Technologies

**Topic:** New technologies

**Learning Objectives:** ⑤ To learn about new computer technologies

⑤ To understand the advantages of handheld computers

**Language Focus:** Compound adjectives

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

**Key Words:** Bluetooth, cybernetics, gadget, hands-free, infrared, Internet-enabled TV, keypad, rechargeable, simulation, smart card, speech-recognition, three-dimensional, touch-sensitive, videoconferencing, virtual reality, voice-input, wireless

## A. Warm-up

Look at the following pictures. What new technologies can you see in them? 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 computer, and try to answer the questions. Compare your answers with other students.



### Handheld Computers

*The handheld computing device attests to the remarkable miniaturization of computer hardware. The early computers of the 1940s were so large that they filled entire rooms. Technological innovations, such as the integrated circuit in 1959 and the microprocessor in 1971, shrank computers' central processing units to the size of tiny silicon chips. Handheld computers are sometimes called personal digital assistants (PDAs).*

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.



*An i-mate JASJAR PDA has a keyboard and a touch-sensitive screen. Although very light weight, it has long-time battery capacity, up to 2 GB of RAM, a version of Microsoft Windows OS for Pocket PCs, a microphone for sound recording, a built-in digital camera, and a full range of applications including those which let you work with Office documents and surf the Web.*



*A **projection keyboard** is a virtual keyboard that can be projected on any surface. The keyboard watches finger movements and translates them into keystrokes in the device.*

## 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  
interact

converts  
recognize

high-quality  
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 wearable computers 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” (**cy**bernetic + **org**anism → **cyborg**), referring to a being that is part machine, part human.



## Wrist-worn Computers

*Wearable computers are computers that are worn on the body. They are especially useful for applications that require computational support while the user's hands, voice, eyes, or attention are actively engaged with the physical environment.*

### 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*, *wrist-worn*, *touch-sensitive*, *waist-mounted*, *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. Therefore, it is important for you to be familiar with this process of word formation in order 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.

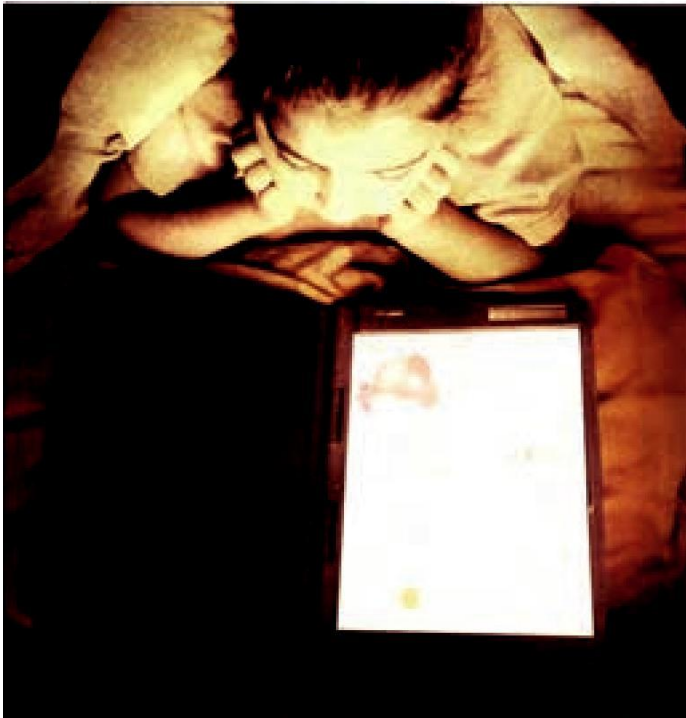


1. *High-speed* Internet access is Internet access that has high \_\_\_\_\_.
2. *Hands-free* operations are operations that are done without \_\_\_\_\_.
3. A *waist-mounted* computer is a computer that is worn on the \_\_\_\_\_.
4. *High-contrast* LCD screens are LCD screens with high \_\_\_\_\_.
5. *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. \_\_\_\_\_
6. By 2040, robots could have rebelled against mankind and made us their servants. \_\_\_\_\_



## 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 /an \_\_\_\_\_ modem.
2. Many types of \_\_\_\_\_ computers have been designed so you can wear them, and send and receive email wherever you are.
3. A /An \_\_\_\_\_ 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 /An \_\_\_\_\_ 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://electronics.howstuffworks.com/gadgets/travel/pda.htm>  
(information about PDAs, including photographs and links)
- <http://www.howstuffworks.com/cell-phone.htm>  
(information on the functioning of cell phones, including diagrams, images, and links)
- <http://www.zypad.com>  
(wearable computers and hands-free solutions for all your computing needs)
- <http://palmtops.about.com/>  
(reviews and tips about PDAs, handheld computers, and cell phones)
- <http://www.ri.cmu.edu/>  
(basic and applied research in robotics)
- <http://www.thetech.org/exhibits/online/robotics/>  
(the history and workings of robotics from the Tech Museum of Innovation)

# 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 *hot list 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 *binary digit*

**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

**cell phone** 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 which is 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 program ed 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** input to be processed by a computer. Data processing is the performing of operations on data to obtain information or solutions to a problem.

**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”

**decompress** to change the information in a computer document back in to a form that can be easily read or used

**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 *education* and *entertainment*

**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 *emotion* and *icon*; 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 which is used to add expansion boards in order 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 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 cursor 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 *cell phone*

**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 *modulator/demodulator*

**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 *Internet* and *etiquette*

**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 *picture* and *element*

**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 *transmitter* and *receiver*

**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, etc. also called *WWW* or *the Web*

## Abbreviations and Acronyms

### A

**ADSL** Asymmetric Digital Subscriber Line: Typically the upstream data flow is between 16 and 640 kilobits per second while the downstream data flow is between 1.5 and 9 megabits per second. ADSL also provides voice channel.

**AI** Artificial Intelligence **AIFF**

Audio Image File Format

**ALGOL** ALGOrithmic Language: a problem-oriented, high-level programming language for mathematical and scientific use

**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

**AVI** Audio Video Interface: a video format

### 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 **bit** binary digit  
**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  
**CLI** Command Line Interface  
**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 Audio Tape  
**DD** Disk Drive  
**DIMM** Dual In-line Memory Module  
**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  
**FORTTRAN** 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  
**ICR** Intelligent Character Recognition **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

**LP** Linear Programming

**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

**modem** MOdulator/DEModulator **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

**NLQ** Near Letter Quality

**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

## R

**RAM** Random Access Memory  
**RF** Radio Frequency  
**RGB** Red, Green, Blue  
**ROM** Read Only Memory  
**rpm** revolutions per minute  
**RSI** Repetitive Strain (or Stress) Injury

## S

**SCSI** Small Computer System Interface  
**SIMM** Single In-line Memory Module:  
 circuit boards which contain RAM  
 chips  
**SMS** Short Message Service: allows  
 you to send short text messages to  
 other cell phones  
**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  
**VDU** Visual Display Unit  
**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  
**Wi-Fi** Wireless Fidelity a way of  
 connecting computers or other  
 electronic machines to a network by  
 using radio signals rather than wires  
**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

## Abbreviations Used in Emails

The following abbreviations are sometimes used in informal messages.

@	at	F2F	face to face
AFAIK	as far as know	F2T	free to talk
AFK	away from the keyboard	FWIW	for what it's worth
AISI	as I see it	FYI	for your information
ASL	age, sex, location	GAL	get a life
ATB	all the best	GR8	great
B	be	HAND	have a nice day
BAK	back at the keyboard	H&K	hugs and kisses
BBL	be back late(r)	H8	hate
BCNU	be seeing you	HSIK	how should I know?
BFN	bye for now	HTH	hope this helps
B4	before	IDK	I don't know
BRB	be right back	IAC	in any case
BTW	by the way	IME	in my experience
C	see	IMHO	in my humble opinion
CUL8R	see you later	IMO	in my opinion
CWYL	chat with you later	IOW	in other words
DIKU?	do I know you?	IRL	in real life
DIY	do it yourself	JAM	just a minute
DK	don't know	JAS	just a second
4	for	JIC	just in case
		JK	just kidding

<b>KISS</b>	keep it simple, stupid	<b>SPK</b>	speak
<b>KIT</b>	keep in touch	<b>TTYL</b>	talk to you later
<b>KWIM</b>	know what I mean	<b>TTFN</b>	ta ta for now ( <i>a very informal way of saying goodbye</i> )
<b>L&amp;R</b>	later		
<b>LOL</b>	lots of luck / laughing out loud	<b>TX</b>	thanks
<b>LY</b>	love you	<b>TVM</b>	thanks very much
<b>MOB</b>	mobile	<b>2</b>	to, too
<b>MSG</b>	message	<b>2DAY</b>	today
<b>MYOB</b>	mind your own business	<b>2MORO</b>	tomorrow
<b>NE1</b>	anyone	<b>2NITE</b>	tonight
<b>NO1</b>	no one	<b>TYVM</b>	thank you very much
<b>NOYB</b>	none of your business	<b>U</b>	you
<b>NRN</b>	no reply necessary	<b>UOK</b>	are you ok?
<b>NW</b>	no way!	<b>WAN2</b>	want to
<b>OTOH</b>	on the other hand	<b>W/</b>	with
<b>OIC</b>	oh I see	<b>WRT</b>	with regard to
<b>PCM</b>	please call me	<b>WDYT</b>	what do you think?
<b>PLS</b>	please	<b>WKND</b>	weekend
<b>PPL</b>	people	<b>WU</b>	what's up?
<b>R</b>	are	<b>X</b>	kiss
<b>RTM</b>	read the manual	<b>XLNT</b>	excellent
<b>ROTF(L)</b>	rolling on the floor (laughing)	<b>XOXOX</b>	hugs and kisses
<b>RUOK</b>	are you okay?	<b>YMMV</b>	your mileage may vary (i.e. your experience may differ)
<b>SIT</b>	stay in touch		
<b>SOM1</b>	someone	<b>YR</b>	your



## Common Emoticons

Nowadays many people use emoticons (or smileys) in their emails and messages. Emoticons are small icons made up of punctuation characters. They are used to show the emotions or attitudes of the writer in a short space.

: - )	happy	> :- <	angry
: -(	sad	; - )	winking /
: - <	really sad		just kidding
: - D	laughing	: ^ D	great! I like it!
: - o	surprised	^ 5	high five
: - V	shouting	^	thumbs up
: - @	screaming	: - X	my lips are sealed
:	bored	: >	what?
: - e	disappointed	-(	sleepy

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