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**English  
for  
Science &  
Technology**

**Plus  
TOEFL Tips**

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# Англійська мова

для науковців

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Книга призначена для науковців, студентів старших курсів, аспірантів та пошукувачів, що мають складати кандидатський іспит з англійської мови, а також тих, хто готується до іспиту TOEFL.

Одинадцять розділів підручника містять тексти для читання з примітками та вправами на розуміння прочитаного, опанування лексики; граматичний матеріал (із зазначенням відмінностей американського та британського варіантів англійської мови), матеріали для розвитку навичок усного мовлення та реферування. Система вправ і тестів, а також графічна форма подачі матеріалів сприяють їх ефективному засвоєнню.

Усі розділи присвячені актуальним тенденціям розвитку сучасної науки і містять велику кількість неологізмів, які широко використовуються у науковому обігу США, але ще не зареєстровані у словниках.

Пізнавальний характер матеріалів та відсутність вузькофахової тематики мають зацікавити не лише зазначене коло фахівців, але й усіх, хто поглиблено вивчає англійську мову, в тому числі і самостійно.

## Від автора

У 1993 р. Міністерством освіти та ВАК України була запропонована нова програма підготовки до кандидатського іспиту з англійської мови, призначена для аспірантів, стажувальників, пошукувачів вченого ступеня кандидата наук. Характерною особливістю вказаної програми є перегляд окремих положень і змісту курсу англійської мови з тим, щоб він відповідав сучасним вимогам до науковців, які повинні мати високий рівень теоретичних знань, а також навички читання, письмового перекладу, анування, співбесіди іноземною мовою з питань наукового дослідження і фаху. Орієнтиром рівня володіння англійською мовою для науковців, аспірантів і студентів є вимоги загальновідомого тесту TOEFL, елементи якого включені до структури кандидатського іспиту.

Дана книга має допомогти науковцям, аспірантам та студентам у підготовці до складання кандидатського іспиту на рівні зазначених вимог. Книга є певною мірою експериментальним підручником. За структурою кожен розділ містить матеріали для читання, відомості з граматики, вправи на розуміння прочитаного, тести з граматики і лексики, вправи на переклад та особливості словотвору. Частина граматичного матеріалу написана за функціонально-семантичним принципом із широким залученням графічної форми викладу матеріалу. Для розвитку навичок усного мовлення пропонується низка вправ у формі проблемних запитань та тем для обговорення. Книга містить 11 розділів та додаток, у якому подаються рекомендації щодо написання анотацій наукової літератури, матеріали для участі у наукових конференціях тощо.

При створенні книги було використано матеріали періодичних видань США «The Sciences» (Нью-Йоркська Академія наук), «Spectrum», «The Institute» (IEEE) та інші.

При викладі матеріалу автор намагався уникнути вузькофахової лексики. Відтак відсутність вузькоспеціальних термінів дозволяє використовувати цю книгу фахівцям різних спеціальностей. Завдяки системному підходу при викладі змісту, а також використаним актуальним матеріалам загальнонаукового характеру книга може зацікавити не лише зазначене коло фахівців, але й більш широку аудиторію. Матеріали книги було апробовано автором на протязі декількох років у Центрі наукових досліджень та викладання іноземних мов Національної Академії наук України.

Автор вважає приємним обов'язком висловити подяку своїм вчителям — професору Жлуктенку Ю.О., члену-кореспонденту НАН України Акуленку В.В., професору Стариковій О.М., які на різних етапах плідно сприяли формуванню автора як фахівця англійської мови.



# To my Parents

## Позначення, які зустрічаються у книзі

- \* ідіоми та фразеологічні звороти
- У книзі подається *орфографія* американського варіанту англійської мови, наприклад:

### *American English*

program  
favorable  
color  
traveling  
story (поверх)

### *British English*

programme  
favourable  
colour  
travelling  
storey

- При необхідності подаються обидва варіанти англійської мови.

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## **Chapter 1**

*Focus on:*

**Science and Scientists  
Steps to Better Reading**

**Grammar: Articles and Their Usage**

## Text A

Read the texts and be ready to answer the questions that follow.

(1)

The word *science* originates from the Latin word «scientia», meaning knowledge. Science is simply a way of looking at the world. It consists of asking questions, proposing answers and testing them against the *available evidence*.

A popular astronomer Carl Sagan wrote: «Science invites us to let the facts in, even when they don't *conform* to our *preconceptions*. It *counsels* us to carry alternative hypotheses in our heads and see which best match the facts». Science is a human construct and human ability.

**science** — knowledge which can be made into a system  
укр. наука

**available** — укр. наявний

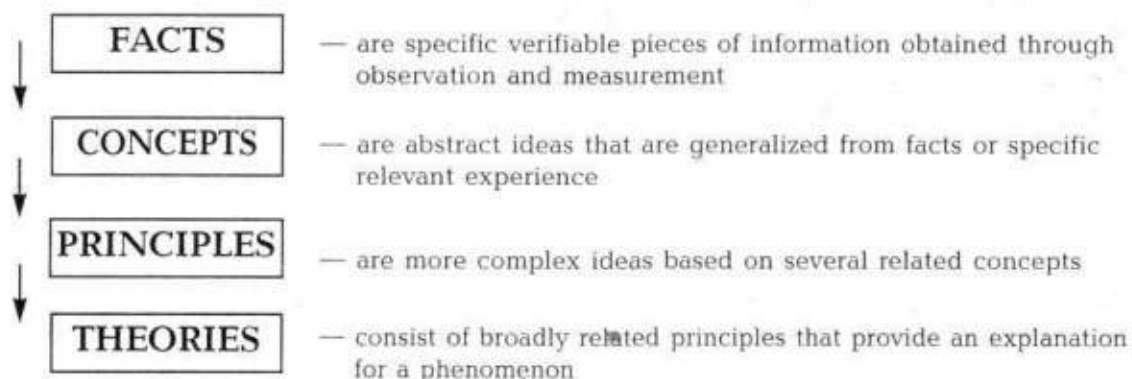
**evidence** — something, such as a fact, sign or object that gives proof or reasons to believe or agree with something  
укр. свідчення, факти

**to conform** — to obey or be in accordance with established rules  
укр. підкорятися

**preconception** — an opinion formed in advance, without actual knowledge  
укр. упереджене уявлення

**to counsel** — to advise as suitable course of action  
укр. радити

## Types of Science Products



The purpose of a theory is to provide the best explanation based on evidence. Theories are used to explain, relate, and predict.

1. What is the origin of the word «science»?
2. What is specific about science according to Carl Sagan?
3. What basic types of science products do you know?

(2)

Students of science *major in* various *fields of science*. They take part in *R&D* at their institutions. *The faculty and staff* at the universities and institutes will help the students as they fulfill their academic and professional *goals*.

*Research advisors* — well-known *scientists* will help their students with *research*.

Graduate students spend most of their time in independent study and original research. For example, graduate studies in the USA can be divided into two phases:

**to major (in)** — to study as the chief subject(s) when doing a university degree  
укр. спеціалізуватися

**field of science** — a branch of knowledge or area of activity. *Synonyms:* sphere, area, branch, domain, realm  
укр. галузь, сфера

**R&D** — research and development  
укр. науково-дослідна робота

**faculty and staff** — all of teachers and other professional workers of a university or college  
укр. професорсько-викладацький склад

**goal** — one's aim or purpose — укр. мета

*Compare:* objective — an aim that must be worked towards over a long period  
укр. стратегічна мета

**research advisor** — укр. науковий керівник

**well-known** — укр. відомий *Synonyms:* famous, prominent, eminent, renowned, celebrated

**research** — serious and detailed study of a subject. укр. дослідження  
*Synonyms:* study, investigation

**scientist** — a person who works in science  
укр. науковець, вчений  
*Compare:* scholar — a person with great knowledge of, and skill in studying the subject

Phase I leads to Master's *degree* and consists of lecture-type coursework. This degree is usually *required* in fields such as engineering, library science etc. The MBA, or Master of Business Administration usually takes two years.

These degrees are considered stepping stones toward a PhD. Normally few, if any laboratory courses are offered. A thesis, calling for significant research and/or design effort may be required.

Phase II leads to doctoral degree — PhD (doctorate). Students who are enrolled in a doctoral program are known as PhD candidates. They will spend some time in class, but the most important work is spent in first-hand research. It may take three years or more *to earn* a PhD Degree. This degree normally requires four to six years of study beyond the Bachelor's degree, culminating in lengthy, *in-depth*, original research of a specific topic, which may be both theoretical and applied, or purely theoretical.

Usually, doctoral studies *focus* very heavily on developing advanced scientific *skills*.

A PhD dissertation is considered a unique, original contribution to human knowledge. This paper must contain views, research or designs that have not been previously published.

The best and the most suitable *methods, techniques, approaches* and *procedures* should be used.

Several research publications on *issues relevant* to the investigation should be prepared. Most universities awarding the PhD Degree also require doctoral candidates to have a reading knowledge of two foreign languages, to pass a qualifying examination that officially admits candidates to the PhD program, and to pass an oral examination on the same topic as the dissertation.

If the dissertation *meets all the requirements* it will be accepted and approved by a special *board* of academics after oral defense.

Most scientists spend many years studying and working in laboratories. Scientists can work individually or in a team. *In many cases*, scientists are *devoted* to their work and may find little time to do other things. Usually scientists *are involved* in studying various aspects of their fields,

**degree** — a title given by a university to a student who has completed a course of study укр. ступінь Bachelor's Degree (baccalaureate) — ступінь бакалавра (бакалаврат) Master's Degree — ступінь магістра PhD — ступінь доктора філософії

**to require** — to demand by right with the expectation that it will be obeyed укр. вимагати; **requirement** — укр. вимога

**required** — укр. обов'язковий *Synonyms:* — mandatory, obligatory required reading — обов'язкова література.

**to earn** — to get, to gain, to obtain — укр. отримати

**in-depth** — a thorough and giving careful attention to detail укр. глибокий, детальний

**to focus (on)** — to direct one's attention to something укр. зосереджувати увагу

**skill(s)** — special ability to do something well, esp. as gained by learning and practice укр. навички

**technique** — method of doing something that needs skill укр. методика, метод

**procedure** — a set of actions necessary for doing something укр. методика

**approach, way** — a method of doing something or dealing with the problem укр. підхід, метод.

**method** — a planned way of doing something укр. метод

**methodology** — the set of methods used for study of a particular subject укр. методологія

**issue** — a subject to be talked about, argued about, укр. питання, проблема

**relevant** — directly connected with the subject *Synonyms:* pertaining to (pertinent), dealing with, regarding, concerning, relating to, touching upon, having bearing on, bearing relation to укр. релевантний, той, що має відношення, стосується

**to meet the requirements** — укр. відповідати вимогам

**board** — an official body or group that has responsibility for a particular organization or activity укр. рада

**in many cases** — often укр. у багатьох випадках, часто-густо

**devoted** — showing great fondness, caring a great deal. *Compare:* dedicated — very interested in or working very hard for an idea, purpose; committed укр. відданий

**to be involved** — to take part, to be engaged in, to participate укр. бути залученим, брати участь

**aspect** — a particular side of many-sided idea, plan etc. укр. аспект, бік *Synonym:* facet укр. грань



and work on one or two major projects at one time.

A good example of a dedicated scientist and researcher is U.S. neurosurgeon Benjamin Carson. Speaking to young people around the country, Carson always concludes with the same message: «Think big!» He explains the meaning of each letter:

**T** — is for talent. Recognize your God-given talent.

**H** — is for hope. *Anticipate* good things and watch for them.

**I** — stands for *insight*. Learn from people who have been where you want to go.

**N** — is for nice. Be nice to people — all people.

**K** — represents knowledge. Knowledge is the key to your dreams, hopes and *aspirations*.

**B** — is for books. We develop our minds by reading.

**I** — equals in-depth learning, where *acquired knowledge* becomes part of you.

**G** — stands for God. Never drop God out of your life.

«If you can learn to think big, nothing on earth will keep you from being successful in whatever you choose to do», says Carson. And eminent American astronomer Vera Rubin has given the following piece of advice to young scientists: «Don't *give up*. Remember that science is ever so *vast*; learn one thing very well. Doing so ... gives you great confidence, *allows* you to *share* knowledge with colleagues. It helps if you know what you really want to do. Work hard. Learn to give good talks. Be imaginative. If you are interested in science you must have a fundamental *curiosity*».

**to anticipate** — to expect, to guess or imagine in advance укр. очікувати, передбачати, передчувати

**insight** — the power of using one's mind to see or understand the true nature of a situation укр. проникливість

**aspiration** — a strong desire to do something or have something, esp. something great or important. *Synonym*: longing укр. прагнення, поривання

**\*to give up** = to give in укр. здаватися

**vast** — very large and wide, great in amount укр. широкий, величезний

**to allow** — to permit, to enable укр. дозволяти

**to share** — to have use, pay or take part in (something) with others or among the group укр. розділяти, ділитися

**curiosity** — the desire to know or learn укр. допитливість

**curious** — eager to know or learn. *Synonym*: inquisitive укр. допитливий

1. What is the subject under discussion?
2. What are primary responsibilities of graduate students?
3. What is specific about each phase of graduate studies?
4. Why is it important to «think big»?
5. Why is Vera Rubin's message important specifically for young scientists?

#### NOTE

\*as for...

When it comes to...

As far as ... is/are concerned...

що стосується

As for

When it comes to | me — Що стосується мене (щодо мене)

As far as science is concerned, ... — що стосується науки, ...

**to be about**

It is about the new method. Це стосується нового метода.

**to have to do (with)** — стосуватися, мати відношення

The issue has little to do with science — Це питання не стосується (не має відношення до) науки.

**Exercise 1.** Give English equivalents for:

спеціалізуватися у галузі науки; науковий керівник; стратегічні цілі; досягати мети; відомий науковець (вчений); самостійне дослідження; детальне вивчення; теоретичні та прикладні аспекти; навички наукової роботи; Вчена Рада, унікальний внесок; питання, що стосуються дослідження; оригінальна методика; брати участь у науково-дослідній роботі; одночасно працювати над кількома проектами; бути відданим науці; не здаватися; ділитися знаннями з колегами, бути надзвичайно допитливим.

**Exercise 2.** Identify characteristics of a scientist by matching the two columns. The first one is done for you: 1-F.

- I.**
- |                |     |  |
|----------------|-----|--|
| 1. intelligent | ✓ F | having a high degree of mental capacity  |
| 2. objective   | ✓ C | making observations and decisions based upon evidence, not personal opinion or hearsay     |
| 3. creative    | ✓ E | producing new and original ideas and things, inventive                                     |
| 4. open-minded | ✓ A | receptive of arguments and ideas   |
| 5. curious     | ✓ D | very interested in working very hard, devoting a lot of time to complete a task or project |
| 6. talented    | ✓ G | having or showing special abilities for a particular type of work                          |
| 7. dedicated   | ✓ B | remaining at a task for a long amount of time to complete a task or project                |
| 8. persistent  | ✓ H | eager to know or learn   |
- II.**
- |                   |     |  |
|-------------------|-----|--|
| 1. decision-maker | ✓ B | being able to make important choices or/and judgements   |
| 2. communicator   | ✓ D | making opinions and information known and understood by others, sharing and exchanging opinions. |
| 3. designer       | ✓ C | creating new models or designs   |
| 4. inventor       | ✓ A | searching for new discoveries  |

**Exercise 3.** Give Ukrainian equivalents for:

a positive approach to failure; open-mindedness, cooperation with others; tolerance for other opinions, explanations, or points of view; avoidance of broad generalizations when evidence is limited; demand for verification, longing to know and to understand; respect for logic; consideration for consequences.

**Exercise 4.** Prepare an oral presentation about characteristics of true scientists based on Text 1 and Exercises 1-3. Tell your colleagues about yourself (see Appendix II).

**Exercise 5.** Place steps of scientific research in correct order.

- Deciding how to solve a problem
- Choosing a topic
- Selecting an approach
- Identifying a problem
- Choosing the best solution of those available
- Expressing all ideas clearly
- Presenting materials and information correctly and clearly
- Developing a plan and time line
- Evaluating good and bad points
- Carrying out the plan on schedule
- Sharing the results with other people
- Generating ideas and methods
- Arriving at conclusions

**Exercise 6.** Translate Ukrainian sentences into English. Then match the two columns.

- |  |  |
|--|--|
| 1. Я не фахівець у цій галузі.                             | A What field of science are you interested in?           |
| 2. Яка мета вашого дослідження?                            | B This issue deals with your investigation.              |
| 3. Вона спеціалізується у галузі прикладного мовознавства. | C His dissertation meets all the necessary requirements. |
| 4. Якою галуззю науки ви цікавитесь?                       | D What science are you doing?                            |
| 5. Це питання стосується вашого дослідження.               | E That's outside my field.                               |
| 6. Якою наукою ви займаєтесь?                              | F She majors in linguistics.                             |
| 7. Його дисертація відповідає усім необхідним вимогам.     | G What is the objective of your research?                |
| 8. Вони беруть участь у науково-дослідній роботі.          | H My research advisor is a well-known scientist.         |
| 9. Мій науковий керівник - відомий вчений.                 | I They've arrived at interesting conclusions.            |
| 10. Вони дійшли цікавих висновків.                         | J They are involved in R&D.                              |

## GRAMMAR: ARTICLES AND THEIR USAGE

There exist definite (the), indefinite (a, an) and zero (Ø) articles in English.

The definite articles «the» are used with specific nouns (when the listener or reader knows what specific thing or person the speaker is talking about: Where is the dictionary? (that I gave you). Де словник? (той, що я вам дав). The method was used before. Цей метод використовувався раніше. «The» is used when the noun is unique — «only one»: The sun is shining» (There is only one sun).

The indefinite articles «a», «an» are used with singular countable nouns that are non-specific: I need a pencil — Мені потрібен олівець.

For plural count and non-count nouns that are indefinite, we use «some» instead of «a»: I need some pencils. — Мені потрібні олівці. Would you care for some coffee? Чи хочете кави?

Ø is used for plural count and non-count nouns that are indefinite and when the speaker talks about the things in general: When Ø people can communicate with each other they get along better. Коли люди спілкуються, їм легше порозумітися.

It is useful to remember three so-called «golden rules» (with some exceptions to them):

<p>1. Do not use the definite article «the» with non-count nouns denoting substances, abstract nouns, or when you talk about things in general: Ø Life is hard. Життя важке. Ø Tea is popular beverage. Чай популярний напій. Ø Literature and Ø music are called «<u>the</u> fine arts». Література та музика називаються витонченим мистецтвом.</p>	<p><b>But:</b>  <u>The</u> life of the scientist was hard. Життя вченого було важким. They lived <u>a</u> happy life. Вони жили щасливо. <u>The</u> tea I drank today was Chinese. Сьогодні вранці я пив китайський чай. Please, pass <u>the</u> salt. Будь ласка, передайте сіль.</p>
<p>2. Use either definite or indefinite articles with singular countable nouns: He is going to buy <u>a dictionary</u>. Він збирається придбати словник. Where is <u>the dictionary</u> you spoke about? Де той словник, про який ви згадували?</p>	
<p>3. Use indefinite article with the names of professions: He is <u>a mathematician</u>. Він математик. She is <u>an engineer</u>. Вона інженер.</p>	<p><b>But:</b>  They are Ø doctors. Вони лікарі. They are Ø engineers. Вони інженери.</p>

### GENERAL USAGE OF ARTICLES:

Nouns	Articles		
	a	the	Ø
single countable	a book	the book	—
plural countable	—	the books	books
uncountable	—	the water	water

## ARTICLES USED WITH CERTAIN EXPRESSIONS

a	the	∅
a couple of a dozen a pair of	at/to the office to the movies to the theater	at work at home at/to school
a lot of a great deal a great many a host of	the first the second(...) the last the ...est (the best, the biggest; the most...)	part of  in stable condition according to contract in rush hour
a hundred a thousand two times   a day   an hour		by bus/car/train on foot
what   such   a + countable noun		face to face  arm in arm
Such   What   a promising approach!	(the) so-called	from beginning to end

## ARTICLES WITH PROPER NAMES

	∅	the	a
cities, states	Paris, London, New Jersey, Ohio	<u>Exception:</u> the Hague	
streets, squares, avenues, roads, boulevards	Green Street, First Avenue, Peach Boulevard	<u>Exception:</u> the Strand	
countries (use «the» when they have a plural name and are viewed as unions)	Canada, France, Ukraine	the Philippines, the United Kingdom	
geographic areas (regions)		(the) USA®	
continents	Europe, Asia, South America, Africa	the Orient, the Middle East, the Crimea	
mountains, mountain peaks mountain ranges	Mount Everest	<u>Exception:</u> the Matterhorn the Rocky Mountains, the Alps	
lakes	Lake Michigan		
lakes when they form a set		the Great Lakes	
rivers		the Danube	
oceans and seas		the Atlantic Ocean, the Black Sea	
gulfs		the Gulf of Mexico	
bays	San Francisco Bay		

canals		the Erie canal	
planets	Mars, Venus	<u>Exceptions:</u> the Sun, the Moon, (the) Earth	
separate islands	Jamaica		
chains of islands		the Canary Islands	
deserts		the Gobi desert	
parks	Central Park		
tourist attractions, famous buildings, monuments, museums, libraries	<u>Exception:</u> Disneyland	the White House, the National Gallery, the Library of Congress	
with universities, colleges, schools beginning with a proper noun	Harvard University, Lambton college		
with universities, colleges, schools beginning with «university», «school», «college»		the University of Virginia, the college of arts and sciences	
names of magazines	Time magazine		
names of historic documents		the Treaty of Geneva	
names of wars (except World Wars)	World War I	the War of Independence	
names of ships, trains, airplanes		the Orient express	
names of scientific methods: a) well-known and established (the) b) those still not recognized by everyone (∅)	Green method	the Montessori method	
proper names a) denoting family as a whole (the) as opposed to separate name (∅) b) specifying maiden name (a)	Ann Johnson	the Johnsons	She was a Brown before marriage.

**Exercise 7.** Fill in the blanks with «the», «a», «an», or leave blank.

- May I have a look at \_\_\_ book that I brought yesterday?
- She is \_\_\_ chemist.
- John likes \_\_\_ rice.
- Ann has decided to become \_\_\_ engineer, while Mike and Andrew would rather become \_\_\_ geographers.
- Where is \_\_\_ coffee that we bought last week?
- \_\_\_ teachers want \_\_\_ students to succeed.
- \_\_\_ water is essential for life.
- Please pass \_\_\_ pepper.
- \_\_\_ word processors can check \_\_\_ spelling.
- In 1816 a Scottish natural philosopher invented \_\_\_ kaleidoscope.



**Exercise 8.** Insert correct article or leave blank.

\_\_\_ Oriental Art Museum, \_\_\_ Asia, \_\_\_ Great Lakes, \_\_\_ Tampa Bay, \_\_\_ Green Park, \_\_\_ Capitol, \_\_\_ Amazon River, \_\_\_ Andes, \_\_\_ White Street, \_\_\_ Netherlands, \_\_\_ John Hopkins University, \_\_\_ Discovery Park, \_\_\_ Great Salt Lake, \_\_\_ Old Dominion University, \_\_\_ Washington monument, \_\_\_ Mediterranean Sea, \_\_\_ Golden Gate Bridge, \_\_\_ Greece, \_\_\_ California, \_\_\_ University of Washington, \_\_\_ Philadelphia.

**Exercise 9.** Fill in the blanks with appropriate article or leave blank.

- \_\_\_ Coal is second major natural resource found in large quantities.
- \_\_\_ Abraham Lincoln was President of \_\_\_ USA during \_\_\_ Civil War.
- Such mighty rivers as \_\_\_ Mississippi, \_\_\_ Ohio, \_\_\_ Hudson and \_\_\_ Colorado irrigate the croplands.
- Jane wants to study \_\_\_ business at \_\_\_ University of Illinois.
- \_\_\_ Panama Canal was under American control from 1904 to 1978.
- He has graduated from \_\_\_ Ohio State University.
- \_\_\_ Rhode Island is the smallest state in \_\_\_ USA.
- Puerto Rico is an island of about 9,000 square kilometers in \_\_\_ Caribbean Sea.
- Among the University's undergraduate schools are \_\_\_ College of Arts and Sciences, \_\_\_ School of Engineering and Applied Science, \_\_\_ School of Nursing.

**Text B.** Read the text and answer the questions that follow.**Steps to better reading****Step 1. Preview**

Good readers preview the text first, i.e. look over the **whole** passage for a moment. This helps to make them good and fast readers.

**A. Read the title.** The first thing to do when previewing is to read the title. Titles not only announce the subject, but also make the reader think.

**B. Anticipate and predict.** Anticipation and prediction are two basic reading skills that are used to guess or predict how the passage will develop. We anticipate before we read a passage, and we predict after the passage begins. Our anticipation is therefore related to our own personal background knowledge on the subject. After a passage begins we find «**clues**» that help us predict what is going to come next. These clues may be in the meaning or in the grammatical structure of a sentence or its vocabulary.

**whole** — the complete amount, entire укр. увесь, цілий  
**to predict** — to see or describe in advance as a result of knowledge, experience. **Synonyms:** to foretell, to forecast, to foresee, to make prognosis

укр. прогнозувати

**clue** — something, such as an object or a piece of information that helps to find an answer to the question: «I'll never guess the answer — give me another clue!»  
 укр. підказ, ключ, інформація

**C. Read the opening paragraph.** Some writers may announce what they hope to tell you, or why they are writing. Some writers just try to get the reader's attention — they may ask a provocative question.

**D. Read the closing paragraph.** Writers may have something important to say in the end. Some writers repeat the main idea once more, some draw a conclusion or summarize.

**E. Glance through.** Skim and scan the selection. When you're skimming, go through a passage quickly in order to get a general idea of what it is about. When you're scanning you look for specific piece of information (a figure, a date, a name) that you need.

## Step 2. Read for meaning.

Individual words do not tell us much. They must be combined with other words, and readers should see words in meaningful combinations. Read in «thought groups» (or message units) — try to group the words into phrases which have natural relationship to each other.

## Step 3. Grasp paragraph sense.

The paragraph is the basic unit of meaning. If you can understand the main point of each paragraph, you can comprehend the author's message.

A. Find the topic sentence. The topic sentence, the sentence containing the main idea, is often the first sentence of a paragraph. It is followed by other sentences which support, develop or explain the main idea. Sometimes a topic sentence comes at the end of a paragraph (then the supporting details come first). Sometimes following the dominant noun through its repetitions and transformations into synonyms will *eventually* lead you to the main idea. Some paragraphs do not have a topic sentence. Such paragraphs usually create a mood or feeling, rather than present information.

**eventually** — at last, finally, ultimately  
укр. зрештою

B. Understand paragraph structure. Just as readers read for different reasons, writers write for different reasons. What purposes may an author have for writing?

1. Inform — give facts or information about a subject.
2. Define — provide definitions on a subject.
3. Describe — give an account of a subject in words.
4. Persuade — influence a person's opinion or behavior about something.
5. Explain — make plain or understandable, give the reason for or cause of.
6. Entertain — interest or please.
7. Illustrate, compare, contrast and so on.

**to blur** — to make less clear or noticeable  
укр. зливатися, ставати нечітким

**to imply** — to express, show or mean indirectly  
укр. мати на увазі, розуміти під

Sometimes distinctions among these types are *blurred*, but the purpose should always relate to the main idea. If the main idea is not stated somewhere within a paragraph, it must be inferred, or figured out from important details of the paragraph. A good reader is able to infer the things that the author *implies*.

## Step 4. Organize facts.

Understanding how the facts all fit together to deliver a message, is, after all, the reason for reading. Good readers organize facts as they read, they discover the writer's plan by looking for a clue or signal word early in the text which might *reveal* the author's structure. Every writer has a plan or outline which he follows. Sometimes the author gives you *obvious* signals. If he says «There are four reasons...» a good reader looks for a listing of four items. As you read the selection, keep the information in mind and relate it to the title.

**to reveal** — to show, to make known  
укр. виявляти

**obvious** — easy to see and understand, clear  
укр. очевидний

1. What is the subject of the passage?
2. What is meant by anticipation and prediction?
3. What is the difference between skimming and scanning?
4. What is the main idea of a paragraph?
5. What should you look for when you're trying to determine the main idea of a paragraph which is implied?

**Exercise 10.**

Read each passage and answer the questions that follow. Use context clues to determine the meaning of the unknown words.

**NOTE****Some hints for dealing with multiple choice (MC) questions.**

You have to choose the one correct answer out of several options given. Remember that only one of them is fully correct, the other are incorrect, although they may well contain some words or ideas from the passage or sentence, but all incorrect options are either too vague and general, or only partly true, or irrelevant to the question (see Appendix XI).

A. Throughout the history of civilization there have been three great inventions in the field of communication. The first was the invention of writing. It enabled people to communicate with others and also to leave a written record for the future. The invention of printing allowed information to reach a wide audience. The invention of electronic communication devices has enabled people separated by vast distances to communicate. Today people can communicate by telephone to almost anyone in the world via satellite.

1. What is the main idea of the passage?
  - a. The importance of communication
  - b. Three great inventions in communication
  - c. How people communicate
  - d. The invention of the telegraph

B. The largest animal alive is the blue whale. Fully grown, these great creatures reach a length of over 30 meters. The heart of a blue whale is more than a meter in diameter. The blue whale is not a fish, even though it spends its entire life in the sea. While fish are cold-blooded, whales are warm-blooded, and they have lungs and breathe air. For all its size, a blue whale feeds mainly on tiny shrimp.

1. What is the main topic of the passage?
  - a. Shrimp and whales
  - b. Types of whales
  - c. The largest living animal
  - d. The difference between fish and mammals

C. Throughout history, gold has been precious metal, eagerly sought and cherished. It was probably the first metal to be mined because beautiful objects could be made from it — even with primitive tools. The value of gold has always been known, even before gold was used in coinage. It remains the only universally recognized standard of value in international monetary exchange. Most of the world's refined gold is absorbed by governments and central banks to provide backing for paper currency. In addition to its use for jewelry, its special properties have led to many applications in modern science and technology. The largest gold mine is located in South Africa. The largest producing gold mine in United States is the Homestake mine in South Dakota, which yields about 570,000 ounces of gold each year. Often mines throughout the world produce even larger amount of this highly prized metal.

1. With what topic is the passage mainly concerned?
  - a. The value of gold
  - b. Primitive tools
  - c. Arts and industry
  - d. Beautiful minerals
2. The author implies that
  - a. the United States is the largest producer of gold in the world
  - b. governments control the production of gold
  - c. the production of gold increased rapidly
  - d. ancient people mined gold in large quantities

3. We can conclude that
- gold supplies are coming to the end
  - most of world's gold is used for circulating coinage
  - gold has always been considered valuable
  - more gold is used for expensive jewelry

**Exercise 11.** Choose the correct word and fill in the blanks.

product (próduce)	producer (s)
production	productive
to produce	productivity

- We had a very \_\_\_\_ meeting last week.
- The two lasers combine \_\_\_\_ a powerful cutting tool.
- The country's main \_\_\_\_ is oil.
- New \_\_\_\_ methods have led to increased \_\_\_\_.
- This country is one of the world's leading oil \_\_\_\_.
- The wine bottle was marked « \_\_\_\_ of France».

to predict	prediction	predictable
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- The economists \_\_\_\_ an increase in the rate of inflation.
- You're so \_\_\_\_ !
- It is hard \_\_\_\_ when it will happen.
- His \_\_\_\_ turned out to be correct.

science	scientific	scientist
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- I'm fond of reading \_\_\_\_ fiction.
- He is a famous \_\_\_\_.
- I don't need any \_\_\_\_ proof.

to apply	applied	application(s)
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- This rule does not \_\_\_\_ in your particular case.
- A new discovery has a number of industrial \_\_\_\_.
- Her research is both theoretical and \_\_\_\_.

(to) require	requirement(s)	required
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- To carry out this plan would \_\_\_\_ increasing our staff by 20 %.
- This monograph is \_\_\_\_ reading for our course.
- Candidates who fail to meet these \_\_\_\_ will not be admitted to the university.

curious	curiosity
---------	-----------

- There was an intense \_\_\_\_ about their plans.
- I'm \_\_\_\_ about what happened.

(to) imagine	imagination	imaginative
--------------	-------------	-------------

- You can't \_\_\_\_ how surprised I was.
- She has a vivid \_\_\_\_.
- Be \_\_\_\_ !

(to) develop                      development
---

25. This was an important stage in country's \_\_\_\_ .  
 26. I'd like \_\_\_\_ my idea.

**Exercise 12.** Read the text and answer the questions about it.

Alfred Nobel, the famous Swedish chemist, was born in a family where research and experimentation were almost second nature. His father tested the theories of explosives in a laboratory setup in their house. He was out of work, down and out, and he failed to apply his inventive spirit to establishing a prosperous endeavor.

Alfred Nobel acquired his father's knowledge of and enthusiasm for chemistry. Aside from developing dynamite commercially, Alfred claimed 355 patents including nitrocellulose and substitutes for leather and rubber, developed new methods for the production of synthetic silk. Alfred Nobel was a dedicated scientist who became very rich applying his knowledge of chemistry. He founded the Nobel prize, just two weeks before his death, because he preferred not to be remembered as an inventor of a potentially deadly material — dynamite. So he left some of his money to reward individuals who made substantial and valuable contribution to certain areas of science, and to the good of humanity. The Nobel prizes are awarded annually in six different fields: physics, chemistry, physiology, medicine, literature, economics (which was added later), and the cause of world peace. Nobel had set up a fund of over nine million dollars and from its interest every year on December 10, the anniversary of Nobel death, prizes of about \$40,000 are awarded for important inventions and discoveries.

1. What is the best title for the passage?
  - a. Alfred Nobel's heritage.
  - b. The history of great inventions.
  - c. Awards presented to the winners.
  - d. Important contributions to chemistry.
  
2. It can be inferred from the passage that Alfred Nobel later viewed his invention of dynamite
  - a. as the most valuable achievement
  - b. with much concern for its negative effects on humanity
  - c. as his father's contribution to chemistry
  - d. as a natural result of studying explosives
  
3. According to the passage, why was Nobel prize established?
  - a. to save money
  - b. to recognize worthwhile contributions to science
  - c. to unite scientists
  - d. to lay emphasis on individual research
  
4. It can be inferred from the passage that originally the prizes were awarded in how many fields?
  - a. 6
  - b. 7
  - c. 5
  - d. 8

**Exercise 13.** Choose the one word or phrase that best keeps the meaning of the original sentence if it is substituted for the underlined word or phrase.

1. There are obvious disadvantages to this plan.
  - a. well-known
  - b. serious
  - c. clear
  - d. fundamental
2. I tried to anticipate the kind of questions they were likely to ask me at the interview.
  - a. solve
  - b. guess
  - c. remember
  - d. discuss
3. The problem would interest the entire community.
  - a. whole
  - b. large
  - c. engineering
  - d. small
4. It is not easy to predict this trend.
  - a. cause
  - b. create
  - c. forecast
  - d. test
5. The author discusses all facets of most engineering fields.
  - a. prospects
  - b. aspects
  - c. issues
  - d. forms
6. Eventually, they have worked out the basic concepts.
  - a. lately
  - b. spontaneously
  - c. finally
  - d. gradually
7. Most of our meetings were devoted to discussing scientific problems.
  - a. dedicated
  - b. confined
  - c. conformed
  - d. introduced
8. The vast land stretches for hundreds of miles.
  - a. very small
  - b. narrow
  - c. very large
  - d. spectacular
9. Is there any evidence for believing that?
  - a. proof
  - b. tendency
  - c. opposition
  - d. chance



10. He employed the one basic technique.
- a. process
  - b. procedure
  - c. task
  - d. objective
11. She is very dedicated to her work.
- a. interested in
  - b. committed to
  - c. tired of
  - d. disappointed with
12. They devoted a lot of time for the in-depth study of botany.
- a. independent
  - b. individual
  - c. thorough
  - d. careful
13. He made no endeavor to help us.
- a. effort
  - b. decision
  - c. plan
  - d. prediction
14. Human beings are much more intelligent than animals.
- a. invaluable
  - b. realistic
  - c. curious
  - d. clever
15. Hopefully, I'll earn this degree in a year.
- a. discuss
  - b. get
  - c. contain
  - d. study
16. How is your study progressing?
- a. topic
  - b. investigation
  - c. attempt
  - d. procedure
17. The issue deals with international cooperation.
- a. demands
  - b. touches upon
  - c. anticipates
  - d. allows

## ***Noteworthy***

*Choose a job you love, and you will never have to work a day in your life.*

*(Confucius).*

## **Chapter 2**

*Focus on:*

**The Importance of Science  
Scientific Prefixes**

**Grammar: Expression of Quantity**

## Text A

Read the text be ready to answer the questions that follow .

Thinking about science, Goethe once said, «To one man it is the highest thing, a heavenly goddess; to another it is a productive and proficient cow who supplies them with butter.» The **results** of science and the motives for doing it are **diverse**.

Curiosity is the most powerful **motivation** for research professionals — and for many amateurs, too. Science clarifies, explains and **occasionally** predicts. Understanding a piece of universe can bring **satisfaction** and excitement to anyone.

Science serves the missions of **improving** health, national security, energy, the environment and communications, it creates new products, meets the demands of **emerging** markets and satisfies social needs. But even strong **faith** in science may crack in **strained circumstances**.

When it comes to future justification for curiosity-driven and mission-oriented research, we **encounter** three **related undertakings**.

First, we have to rethink the case from inside the scientific **community**. Government, businesses and universities must demonstrate that investments in science are the only way of fulfilling **long-range goals**. Research executives will have to document the **ample** returns from past investments and then outline future paths. Setting priorities will not be easy, and **stern** management to ensure excellence will be **essential**.

Second, we should broaden the dialogue. Society must be engaged in continuing exchange about national goals and research priorities. The press, industry, nonprofit organizations must participate.

Finally, we must **expand** the **accessibility** of knowledge.

The entire professional community must pay more attention to building a scientifically literate society. Support for science, and for the **benefits** of technology, increases with educational level.

To be successful in the twenty-first century, we need more science, not less.

**result** — something that happens because of an action or event. **Synonym:** outcome; укр. результат, наслідок

**diverse** — different (from each other), showing variety укр. різноманітний

**motivation** — need or purpose. **Synonyms:** incentive, stimulus, motive укр. стимул, мотивація

**occasionally** — укр. час від часу, інколи

**to satisfy** — to give enough for укр. задовольняти

**to improve** — to make better укр. поліпшувати

**to emerge** — to come or appear from inside or from being hidden укр. з'являтися, виявлятися

**faith** — firm belief, trust, complete confidence укр. віра

**strained circumstances** — difficult because lacking money. **Synonym:** money is short укр. фінансова скрута

**to encounter** — to meet or have to deal with (esp. something difficult) **Synonym:** to be faced with укр. стикатися

**related** — connected in some way укр. суміжний, пов'язаний

**undertaking** — a job, a piece of work or anything needing effort укр. нелегка справа

**community** — a group of people living together and/or united by shared aims and interests укр. спільнота

**long-range** — covering a long distance or time укр. довгостроковий

**ample** — enough or more than enough укр. достатній

**stern** — firm, strict, severe укр. суворий

**essential (to, for)** — completely necessary for the existence, success of something. **Synonyms:** most important, notable, fundamental. **Also:** indispensable — too important or too useful to do without укр. нагально необхідний, суттєвий, дуже важливий

**to expand** — to increase in size, number, volume, degree; to grow larger, to broaden укр. збільшувати, розширювати

**accessible** — easy to reach, enter or obtain. **Synonym:** obtainable укр. доступний

**accessibility** — доступність

**access** — доступ

**benefit** — anything that brings help, advantage or profit укр. перевага, користь

## NOTE

переваги	недоліки
advantage(s)	disadvantage(s)
merit(s)	demerit(s)
plus(es)	minus(es)
	weakness(es)
	shortcoming(s)
	limitation(s)
	pitfall(s)

1. What are the motives for doing science? What is the most powerful motivation?
2. What are the missions of science?
3. Are there any problems concerning scientific development?  
What are possible ways of solving them?
4. What can be done to build a scientifically literate society?
5. What major conclusions does the author arrive at?
6. Why did the author mention «the goddess» and «the cow»?
7. What was the author's purpose for writing this passage (to inform, to describe, to persuade, to explain, to entertain or something else)? What is the author's opinion on the subject?

**Exercise 1.** Give English equivalents to:

сильний стимул; професіонали та аматори; різноманітні мотиви; поліпшувати; слугувати меті; час від часу, фінансова скрута; довкілля; задовольняти потреби; довгострокові цілі; наукова спільнота; некомерційні організації; розширяти доступність знань; приділяти більше уваги; переваги науки та техніки; національна безпека; встановлювати пріоритети.

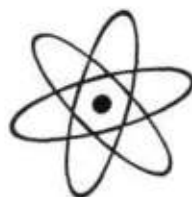
**Exercise 2.** Discuss the following point. Use an example provided below as possible response to the issue raised.

**Problem:** Around the world science is both indispensable and *vulnerable*. Indispensable because the world has goals that can be reached only with deeper understanding. Vulnerable because money is short and patience with research is running short, too.

**Sample answer:** Why support science? For hundreds of years one justification has been that research fulfills a passionate human *quest* for knowledge. But these days curiosity is not enough. Most people support science and think research leads to practical benefits: economic growth, better health, labor saving devices. The challenge is to integrate the drive for knowledge with the delivery of useful outputs.

**vulnerable** — weak, not well protected, sensitive, easily harmed  
укр. уразливий

**quest** — a long search, an attempt to find something



## GRAMMAR: EXPRESSION OF QUANTITY.

## I. LARGE QUANTITY

With count nouns	With both	With non-count nouns
<p><b>MANY</b> (<i>more, the most</i>)</p> <p>There are <b>many</b> books in our library. У нашій бібліотеці багато книг</p>	<p><b>A LOT OF</b></p> <p>a lot of   books             time</p> <p>            книг багато   часу</p>	<p><b>MUCH</b> (<i>more, the most</i>)</p> <p><b>Much</b> time is needed to solve this problem. Для розв'язання цієї задачі треба багато часу</p>
<p><b>A GREAT NUMBER (OF) LARGE</b></p> <p>a great number of students багато студентів (велика кількість)</p> <p>*not a few *quite a few *(a) host (of)</p> <p>There are <b>not a few</b> universities in the U.S. У США багато університетів They have <b>a host of</b> friends. У них багато друзів.</p>		<p><b>A LARGE AMOUNT (OF)</b></p> <p>a large amount of   water (велика кількість води)</p> <p>                            information                             knowledge                             evidence                             significance</p>

## OTHER EXPRESSIONS DENOTING LARGE QUANTITY:

a great deal of	a great deal of money — багато грошей
a great variety of	a great variety of reasons (багато причин)
a wide range of	a wide range of different opinions (багато різних думок)
abundant = plentiful	The country has abundant supplies of oil and gas. У цій країні великий запас нафти та газу.
myriad(s)	a myriad stars — велика кількість зірок, міриади зірок
plethora	a plethora of suggestions — достаток, надмір пропозицій

## II. SMALL QUANTITY

With count nouns	With non-count nouns
<p><b>FEW</b> (<i>fewer, the fewest</i>)</p> <p>They asked <b>few</b> questions. Вони поставили мало запитань</p> <p>*a few — трохи, невелика кількість I may be <b>a few</b> minutes late. Я можу трохи запізнитися.</p>	<p><b>LITTLE</b> (<i>less, the least</i>)</p> <p>We paid <b>little</b> attention to the proposal. Ми майже не звернули уваги на пропозицію</p> <p>*a little — трохи, невелика кількість I have <b>a little</b> money У мене є трохи грошей.</p>

minute, tiny, infinitesimal — крихітний

a bit — трохи. I'm a bit tired. Я трохи втомився

scarce — мало, обмаль. This winter snow was scarce. Цього року взимку було обмаль снігу.

Use some in affirmative sentences — I have some time. У мене є трохи часу.  
 Use any in negative and interrogative sentences — I don't have any information.  
 У мене немає ніякої (бодай найменшої) інформації.  
 Are there any letters for me? Чи є для мене (якісь) листи?

sufficient		достатня кількість
enough		
ample		
(a) plenty of		

We have plenty of time — У нас досить часу.  
 We have enough seats for everyone — У нас досить місць для усіх.  
sufficient information — достатня інформація.  
ample money — досить грошей.

a bunch of		декілька	a bunch of		students	група студентів
several			flowers		букет квітів	
a number (of)			articles.			
a couple (of)						

He wrote several a number of articles.  
 Він написав декілька (низку) статей.

**BUT:**

the number (of) — кількість      The number of students in our group is 12.  
 В нашій групі 12 осіб.

**Approximators:**

approximately		2 hours — приблизно (майже) 2 години.
nearly		
about / around / some		
almost		
roughly		

relatively rather | good — відносно добрий.

**Succession:**

The first, the second ... the last — перший, другий ... останній

\*the former — перший за переліком  
 \*the latter — останній за переліком      |      серед двох згаданих.

Of the two possibilities the former seems more interesting (than the latter).  
 З двох можливостей перша здається більш цікавою (ніж друга).  
 (Also: former — колишній, the former president — колишній президент)

\*every other — через одного  
 every other year — кожні два роки (раз на два роки).

\*in succession — поспіль, підряд

\*the last but one | передостанній

\*the last but not least — останній за переліком, але не за значенням (важливістю)

**NOTE**

<b>the last</b> останній	<b>the latest</b> найновіший, найсвіжіший (про новини, інформацію, тощо)
Have you read <u>the last</u> book by academician Vernadsky? Ви читали останню книгу академіка Вернадського? <u>The last</u> chapter presents conclusions. В останній главі наводяться висновки.	Have you read <u>the latest</u> article by our professor? Ви читали нову статтю нашого професора? The author provides the reader with <u>the latest</u> information. Автор надає найновішу інформацію.

Also: the late — покійний; the late president — покійний президент



the most найбільш	most більшість
This is <u>the most</u> interesting article I have ever read. Це найбільш цікава стаття серед тих, що я читав.	<u>Most</u> scientists usually work on one or two projects at one time. Більшість вчених звичайно працює над одним або двома проектами одночасно.

- Also:
- \*for the most part = mainly — головним чином
  - \*to make the most of — використовувати найкращим чином  
Make the most of your studies!
  - \* another, a second, one more — ще один
  - \* other — ще один, інший (з декількох)
  - \* the other — останній, що залишився

leftover, remainder vestige(s)		залишки
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### OTHER EXPRESSIONS:

a dozen = 12
a score = 20
a quarter = 1/4
a half = 1/2

1,2,3... 80... 100... 300...	percent Ø hundred Ø million Ø	<b>BUT:</b>	hundreds of millions
	billion Ø dollars		10 dollar Ø bill(s)

\* billion — мільярд —  $10^9$

two times — двічі  
three times — тричі

\* **-fold** There has been a **twofold** increase in company's business.  
Прибуток компанії збільшився вдвічі

twice		as little	вдвічі		менший
		as much			більший

### NOTE

Mind such phrases as: «as much as», «as small as», «as early as»  
as early as 1970 — (ще) у 1970 році

IS or ARE?

time (5 minutes, 3 years)  
 money (40 dollars)  
 distance (50 miles)

the number

a word of

a pair of

1+2, 12+80 (...)

«Great Expectations»

(and similar titles of books)

news

**data**

evidence

everything / each / everyone / anything

somebody / anybody / everybody

physics (and all other subjects)

**statistics** (as a science of dealing with and explaining a collection of numbers which represent facts or measurements)

police  
 goods

a number

several

**IS**

thanks

**data**

**ethics**

**statistics**

(as a collection of numbers which represent facts or measurements)

**ARE**

Also

Chinese (as a language)  
 Chinese **is** a difficult language.

the Chinese (as people)  
 The Chinese **are** famous for their cuisine.

there + to be

There is (was) 1 professor and 2 (...) students.

There are (were) 2 students and 1 (...) professor(s).

**WITH COLLECTIVE NOUNS:**

committee  
 faculty  
 class  
 team  
 audience  
 public

**IS** having their meeting (as a group)

**ARE** going back to their homes (separately)

**MIND OTHER EXPRESSIONS:**

a flock of birds — птишина зрjа

a swarm of bees

a school of fish

a pack of wolves

a colony of ants

a herd of cows

a pride of lions

**Exercise 3.** Choose the correct variant:

1. After the negotiations they made many / much changes in their preliminary proposal.
2. German is / are spoken in parts of Switzerland.
3. The number of / the amount of working women are / is increasing nowadays.
4. Professor Johnson did not give many / much information.
5. No news are / is good news.
6. Mathematics are / is an interesting subject.
7. They informed us of much / many important decisions.
8. Many thanks were / was given.
9. «Gulliver's Travels» are / is a popular book.
10. The latest statistics is / are not reliable enough.
11. All of the money were / was spent.
12. A word of gratitude was / were very pleasant.
13. The Japanese is/are known for their traditions.
14. A number of students has / have improved their English.
15. Someone have / has forgotten to put the name on the list.
16. There is / are several documents missing.
17. Statistics are / is a branch of mathematics.
18. There is/are no question of postponing the meeting.

**Exercise 4.** Read the text and try to appreciate its humor. Discuss the point with your colleagues.

Marion Eppley, developer of the standard cell that bears his name, was credited with the following anecdote:

A young high school student returned one afternoon to the small retail store his father operated in conjunction with a partner.

«Dad,» asked the student, «what are ethics? My teacher said that tomorrow we are going to discuss them.»

«Well,» said the father, «I'll illustrate. Imagine that a man comes into the store to buy a carton of cigarettes. I give him the cigarettes, and he gives me the money. Then, after I've given him his change, he turns to leave and I discover that the \$20 bill he gave me seems thicker than usual. On closer examination I find that there are two \$20 bills stuck together.

Here, my son, is the whole question of ethics. Do I or don't I tell my partner?»

I'm sure you see Eppley's point.

**BORROWED PLURAL FORMS:**

on → a um → a	phenomenon — phenomena феномен (явище) феномени (явища)	Also possible: symposia symposiums
	medium — media засіб — засоби	criteria criteria criteria
is → es a → ae	analysis — analyses аналіз — аналізи formula — formulae формула — формули	formulae formulas

us → i ix → ices ex → ices	nucleus — nuclei ядро — ядра index — indices індекс — індекси (показчик — показчики)	indices indexes
----------------------------------	--	--------------------

singular	plural
man woman child tooth goose mouse ox person, human being	men women children teeth geese mice oxen people, human beings, humans
a piece of information a piece of news a piece of advice a piece of furniture	information news advice furniture
<div style="border: 1px solid black; padding: 5px; display: inline-block;">           aircraft encyclopedia equipment         </div>	

**Exercise 5.** Pluralize the following words:

radius, crisis, antenna, appendix, criterion, stimulus, encyclopedia, prognosis, sanatorium, axis, aircraft, medium, matrix, nebula, phasis, optimum, syllabus, supernova, synthesis, spectrum, thesis, equipment, maximum, hypothesis, equilibrium, millennium, oasis, curriculum, phenomenon, analysis.

**Exercise 6.** Translate the following sentences.

1. There are infinitely many bases to choose from.
2. You may first wish to try a few examples to illustrate that formula.
3. There are many interesting results concerning matrices.
4. Unfortunately, formulas like the ones above do not come easily.
5. There did not remain any questions.
6. This is the least acceptable variant.
7. The latter procedure is much more complicated than the former one.
8. There are a lot of differences among languages.
9. Elevator makers believe that their cars can carry passengers up to at least 180 floors.
10. We do not have enough information at present to offer sound answers to these questions.
11. They have sufficient information from which to draw a conclusion.
12. The reaction accelerated fivefold.
13. These features are also important in a wide variety of applications.

### Text B. Scientific prefixes

Let's meet zetta, yotta, zepto and yocto. They are not fundamental particles, they are prefixes on the scientific scale of quantities denoting, *respectively*, a billion trillions, a trillion trillions, a billionth of a trillionth, *respectively* — укр. відповідно and a trillionth of a trillionth. Nobody has found much practical use for them yet, but they exist if you need them, according to decisions of the *Conférence Générale des Poids et Mesures*, the international body that meets every four years to govern the realm of scientific units.

$10^1$ deka or deca (da), from Greek <u>deka</u> ten,	$10^{-1}$ deci (d), from Latin <u>decimus</u> , tenth
$10^2$ hecto (h), from Greek <u>hekatón</u> , hundred,	$10^{-2}$ centi (c), from Latin <u>centum</u> , hundred
$10^3$ kilo (K),, from Greek <u>chilioi</u> , thousand	$10^{-3}$ milli (m), from Latin <u>mille</u> , thousand
$10^6$ mega (M), from Greek <u>megas</u> , large ,	$10^{-6}$ micro ,from Latin <u>micro</u> - (Greek <u>micros</u> ), small
$10^9$ giga (G), from Greek <u>gigas</u> , giant,	$10^{-9}$ nano (n),, from Latin <u>nanus</u> (Greek <u>nanos</u> ), dwarf
$10^{12}$ tera (T), from Greek <u>teras</u> , monster,	$10^{-12}$ pico (p),, from Spanish <u>pico</u> or Italian <u>piccolo</u> , small
$10^{15}$ penta (P), from Greek <u>pentē</u> , five	$10^{-15}$ femto (f),, from Danish-Norwegian <u>femten</u> , fifteen
$10^{18}$ exa (E), from Greek <u>hex</u> , six	$10^{-18}$ atto (a), from Danish-Norwegian <u>atten</u> , eighteen
$10^{21}$ zetta (Z), from Latin <u>septem</u> , seven	$10^{-21}$ zepto (z), from Latin <u>septem</u> , seven
$10^{24}$ yotta (Y), from Greek or Latin <u>octo</u> , eight	$10^{-24}$ yocto (y), from Greek or Latin <u>octo</u> , eight

By learning the prefixes you will understand the meaning of words.

Prefix	Meaning
a - , ab -	not having
ambi -	both
anti -	against
bi -	having or involving two, coming or occurring twice
mono -, uni -	single, one
tri -	having or involving three, coming or occurring three times
by -	secondary
co -, com -, col -, con -, cor -	together with
dis -, mis -, mal -	not, bad, wrong,
ex-	out, from
extra -	beyond, outside
fore -	before (in time or order)
pre -, ante -	before, prior
contra -,	against
in -, im -, ir -, il -, un -	not
inter -	between
micro -	small
multi -, poly -	more than one or two, many
octo -, octa -	eight
out -	to do better than
post -	after
pseudo -	not real, false
quadra -	four, one-fourth
retro -	backward
semi -, hemi -, demi -	half
sept-	seven
sub -	under, below, beneath, underneath, lower
syn -	same, together
trans -	across
over -	too much
under -	too little

**Exercise 7.** Match the two columns:

- |                   |   |
|-------------------|---|
| 1. to coexist     | A. speaking two languages                         |
| 2. to postpone    | B. a period of ten years                          |
| 3. overpopulation | C. not logical                                    |
| 4. illogical      | D. having two meanings                            |
| 5. miscalculation | E. to make later                                  |
| 6. to underpay    | F. not typically                                  |
| 7. trilingual     | G. to exist together at the same time             |
| 8. to rewrite     | H. wrong calculation                              |
| 9. unfair         | I. too many people                                |
| 10. ambiguous     | J. speaking three languages                       |
| 11. bilingual     | K. not fair                                       |
| 12. atypically    | L. to write again in a better way                 |
| 13. decade        | M. to perform better than somebody                |
| 14. to outperform | N. to pay too little                              |
| 15. malfunction   | O. someone greater than a human but less than God |
| 16. demigod       | P. a fault in operation                           |

**Exercise 8.** Try to guess the meaning of the following words. If necessary, consult the dictionary.

contradict, uniform, combine, decade, antecedent, byproduct, international, foresee, impossible, ambivalent, unknown, collaborate, transportation, disorder, monologue, unilateral, bimonthly, semiannual, microscope, subterranean, cooperate, unusual, monopoly, synthesis, bicycle, antipathy, polyglot, reaffirm, demigod, triangle, intermediate, predict, dislike, overestimate, multimillionaire, illegal, infinity, misinform, bilateral, retrospect, preview, hemisphere, outplay, undervalue.

**Exercise 9.** Read the text concentrating on «quantity» words. Render it into Ukrainian.

Although the beginning of «electronics» is usually dated around the 1920s, this represents a myopic view of technology. We can now see that the telegraph and the telephone are the first two landmarks of the electronic age. After Alexander Graham Bell had sent his voice from one room to another in 1876, society could never be the same again.

Electron, this invisible, **ubiquitous**, weightless object has given us power over nature of which our ancestors never dreamed. Until the closing years of the nineteenth century, people used electricity without knowing what it was. One of the most dramatic events was the invention of the X-ray tube — the ancestor of vacuum **ubiquitous** — existing tubes which followed. X-rays were discovered in 1895 — the electron or being everywhere itself just one year later. It was then realized that an electric current consists of myriads of these submicroscopic particles, each carrying a minute negative charge. Until 1948, electronics was almost synonymous with the vacuum tube. By the late 1940's, the vacuum tube had shrunk from the object as large as an electric bulb, to a cylinder not much



bigger than a man's thumb. Then three scientists at the Bell Telephone Laboratories invented the transistor and we moved from the Paleoelectronic to the Neoelectronic Age. But a really efficient, reliable and universal communications system can be achieved only with the aid of satellites. With the improvement of communications the role of cities as meeting places and centers of social interaction will become obsolete, as people will be able to meet face to face (individually or in groups) without even leaving their homes.

**Exercise 10.** Choose the correct word and fill in the blanks.

(to) improve                      improvement

1. Your work shows considerable \_\_\_\_ .
2. I want to \_\_\_\_ my German.
3. Your English is getting better, but there is still room for \_\_\_\_ .

(to) benefit                      beneficial

4. He had the \_\_\_\_ of a first-class education.
5. The fall in prices will be \_\_\_\_ to our business.
6. He is most likely \_\_\_\_ .

technology      technological      technologist

7. The system uses advanced computer and satellite \_\_\_\_ .
8. We witness the rapid pace of \_\_\_\_ change.
9. A specialist in technology is called \_\_\_\_ .
10. We use the latest \_\_\_\_ .

**Exercise 11.** Read the passage and answer the questions about it.

When colonists from Europe first arrived in America, they had to decide what to preserve of their cultural heritage, and what to discard. They also had to decide upon a means to preserve and build upon their legacy. Their answer was the town school. Within 30 years of the founding of the first settlement in Massachusetts (1620), all towns were required to hire a schoolmaster to teach reading, writing and arithmetic, as well as religion; larger towns were required to establish grammar schools to prepare children for the university. In 1787 the Continental Congress required every new township in the Northwest Territory to preserve one plot and land for public schools.

At the university level, Harvard (Massachusetts) was founded in 1636, and William and Mary (Virginia) in 1693. By 1776, on the eve of its revolution, America had 14 colleges in the new country and another score were founded by 1800. By that time schooling meant not only preserving parts of the classical education, but also teaching skills necessary to build a new North American Nation. Americans freely borrowed from English, French and German precedents.

1. Which of the following is the best title for this passage?
  - a. European colonists in America
  - b. American educational system
  - c. Grammar schools and universities
  - d. The first steps of American education

2. Which of the following is NOT mentioned in the passage as a subject?
  - a. religion
  - b. reading
  - c. astronomy
  - d. arithmetic
3. How many colleges were founded by 1800?
  - a. 14
  - b. 34
  - c. 20
  - d. 30
4. In line 2 the word «heritage» could be best replaced by which of the following?
  - a. pride
  - b. example
  - c. criterion
  - d. legacy
5. The author implies that
  - a. public schools were the first to appear
  - b. there were quite a few universities
  - c. William and Mary established town schools
  - d. there was a tendency towards linking theory to practice

**Exercise 12.** Choose the one word or phrase that best keeps the meaning of the original sentence if it is substituted for the underlined word or phrase.

1. He was given ample money for the journey.
  - a. enough
  - b. little
  - c. some
  - d. no
2. The program deals with diverse subjects.
  - a. all
  - b. interesting
  - c. challenging
  - d. different
3. Good timing is essential to our plans.
  - a. useful
  - b. important
  - c. realistic
  - d. interesting
4. With strong motivation it is easier to learn a foreign language.
  - a. problem
  - b. will
  - c. prediction
  - d. need
5. What was the outcome?
  - a. result
  - b. issue
  - c. question
  - d. occasion

- 
6. This machinery is obsolete.
- new
  - universal
  - outdated
  - good
7. The theory has myriads of followers.
- some
  - a great number of
  - a plenty of
  - few
8. We were faced with a lot of problems.
- found
  - renewed
  - resolved
  - encountered
9. Several approaches have emerged in recent years.
- appeared
  - lost importance
  - formed
  - disappeared
10. They made a minute improvement.
- instant
  - very small
  - considerable
  - very important
11. We have carried out several experiments.
- the number of
  - a lot of
  - few
  - a number of
12. At present we do not have enough information.
- sufficient
  - pertinent
  - updated
  - important
13. Electron is a ubiquitous object.
- valuable
  - infinitesimal
  - omnipresent
  - weightless
14. Computer is a reliable tool.
- dependable
  - sophisticated
  - expensive
  - common
15. Water is the most abundant resource on the Earth, and one of the most important.
- rare
  - useful
  - significant
  - plentiful

16. The article concerns huge woodland areas.
- concluded by
  - denies
  - provides
  - regards
17. A second, more rigorous course may be offered as an elective.
- the other
  - another
  - the second
  - other
18. A telephone is an indispensable piece of equipment in any office.
- beneficial
  - compatible
  - very reliable
  - extremely important
19. It was one of the most dramatic events.
- usual
  - exciting
  - sad
  - obvious

## *Noteworthy*

The name «quark» was coined by Irish poet and novelist James Joyce in the 1930s, and adopted by quantum physicist Murray Gell-Mann in 1964. Gell-Mann took it from the novel «Finnegan's Wake» in which a flock of seaswans sings this song to one of the characters:

«Three quarks for Muster Mark!

Sure he hasn't got much of a bark

And sure any he has it's all beside the mark».

Although «quark» had no relevance to physics, it was probably as good a name as any for a mysterious building block of matter.

## **Chapter 3**

*Focus on:*

**Science and Society  
Using Graphics**

**Grammar: System of Tenses (Review)**

**Text A**

Read the text and be ready to answer the questions that follow.

In industrial countries, there is a close correlation **between** the rate of increase in the number of graduate engineers and the level of industrial productivity.

The speed at which new knowledge is **transferred** to industry is a key factor in preserving economy's **competitive** position vis-a-vis **tough** rivals.

The modern world is facing several disturbing **trends** in human resources. In quantitative terms, we will have **to cope with** the **consequences** of an aging population, a decline in the working population. In more qualitative terms, there is a **mismatch** between the supply of young graduates and the needs of industry **resulting** in skills shortage. For that matter, continuing vocational training and retraining in a constantly changing industrial and technological context need **radical** improvement. It has been shown that intellectual capital depreciates by 7% every year if it is not **maintained**.

To improve the situation, some recommendations have been <sup>made</sup>. Most of these are what one would expect — attract more young people into science, more science in schools, better contact between industry and education, investment in continuing education to make labor mobility **respond** to regional needs, and to avoid a **brain drain**.

The United States, Japan and Germany each employ between roughly fifty and seventy-five scientists and engineers for every 10000 workers in the labor force. In developing countries the number is between five and ten. By emphasizing education at all levels and by selectively entering globally competitive markets, countries **prosper**. That prosperity then **enables** higher investments in R&D required for economic development. **The very dynamics** of R&D institutions is changing. Universities create hybrid academic-industrial centers, often with partial government funding, to accelerate the transfer of scientific results to commercial applications.

**between & among:** when you are talking about only two things use **between**. укр. серед (двох) If you are talking of three or more things use **among**. укр. серед (трьох та більше)

**to transfer** — to move from one place to another укр. переносити, переміщати

**competitive** — based on competition укр. конкурентоспроможний

**competitor** — Synonym: rival укр. конкурент, суперник

**tough** — difficult to do or deal with, not easy, needing effort укр. складний

**trend** — a general tendency or direction in the way a situation is changing or developing укр. тенденція

**to cope with** — to deal successfully with a difficult situation укр. справлятися, переборювати

**consequences** — results, outcome укр. наслідки, результати

**mismatch** — укр. невідповідність

**to result in** — to have as a result; to cause; укр. спричиняти, призводити (до)

**vocational training** — укр. професійно-технічна підготовка

**retraining** — Synonym: in-service укр. перепідготовка Also: staff development — підвищення кваліфікації

**radical** — having wide and important effects.

Synonym: drastic укр. радикальний

**to maintain** — to continue to have (do) as before, to keep up, to take care (of), to support укр. підтримувати

**to respond** — to do something in answer, to react укр. відповідати, реагувати

**brain drain** — a movement of large number of highly skilled or professional people from the country where they were trained to other countries where they can earn more money укр. відплив спеціалістів/фахівців

**to prosper** — to become successful and rich. Synonyms: to thrive, to flourish укр. процвітати

**to enable** — to permit, to allow укр. дозволяти

**the very dynamics** — укр. власне динаміка (сама динаміка) Compare: the very fact — сам факт

1. What is a key factor in preserving economy's competitiveness?
2. What is meant by disturbing trends in human resources?
3. Why is it necessary to maintain intellectual capital?
4. What is a brain drain?
5. What are the new forms of linkages between science and industry?

**Exercise 1.** Give English equivalents to:

сильний суперник, тривожна тенденція, справлятися з наслідками, професійно-технічна освіта, перепідготовка, радикальне поліпшення, залучати молодь до науки, подовжена освіта, реагувати на потреби, уникати відпливу спеціалістів, процвітати, прискорювати процес.

**Exercise 2.** Give Ukrainian equivalents of:

industrial countries; modern world; disturbing trend; to cope with the consequences; the very dynamics; brain drain; skills shortage; mismatch; competitive.

**Exercise 3.** Translate Ukrainian sentences into English. Then match the two columns.

- |  |   |
|--|---|
| <p>1. У них є багато зарубіжних конкурентів.</p> <p>2. Вони наголошують на важливості освіти на всіх рівнях.</p> <p>3. Професійна освіта допоможе вам пристосуватися до нових умов.</p> <p>4. Внески (інвестиції) у науку дають велику соціальну віддачу.</p> <p>5. Які показники результативності науково-дослідної роботи?</p> | <p>A. Investments in science generate high rates of social return.</p> <p>B. What are the output indicators of R&amp;D?</p> <p>C. They emphasize education at all levels.</p> <p>D. Vocational education will help you to adjust to new industrial context.</p> <p>E. They have a lot of foreign competitors.</p> |
|--|---|

**Exercise 4.** Discuss the following point with your colleagues.

Scientists think globally and act competitively. International competition is the norm. But scientists also have a tradition of global cooperation, just as corporations now seek global alliances and share the costs of research and development to reach new markets. By blending competition and collaboration, the international scientific system works. As many Asian nations have shown, the patient building of national base of technology and education flourishes when linked to global networks of research.





## GRAMMAR: SYSTEM OF TENSES

Simple Present (Present Indefinite) (Present Indefinite) «now»	Present Progressive (Present Continuous) «already in progress now»
<b>Express:</b>	
<p>1. <u>General relationships and timeless truths:</u></p> <p>Time <u>changes</u> everything. Час змінює усе.</p>	<p>1. <u>Actions in progress:</u></p> <p>He <u>is studying</u> for an exam <span style="display: inline-block; vertical-align: middle; border-left: 1px solid black; padding-left: 5px;">now at the moment</span> Зараз він готується до іспиту. This device <u>is becoming</u> more and more popular. Цей прилад набуває (зараз) все більшої популярності.</p>
<p>2. <u>Permanent states:</u></p> <p>Ann <u>likes</u> mathematics. Енн любить математику.</p>	<p>2. <u>Uncompleted actions:</u></p> <p>She <u>is still looking for</u> a job. Вона все ще шукає роботу. John <u>is making</u> dinner. Джон готує вечерю.</p>
<p>3. <u>Habitual and recurring actions:</u></p> <p>John <u>jogs</u> every morning. Джон бігає щоранку.</p>	<p>3. <u>Repetition and duration:</u> <u>temporary states and activities:</u></p> <p>He <u>is taking</u> English classes this year. Цього року він відвідує заняття з англійської мови. She <u>is living</u> with her parents this month. Цього місяця вона мешкає разом з батьками.</p>
<p>4. <u>Mental perception and emotions:</u></p> <p>He never <u>worries</u>. Він ніколи не хвилюється.</p>	<p>4. <u>Emotional comment on present habit:</u></p> <p>She <u>is always cracking</u> jokes! Завжди вона шуткує!</p>
<p>5. <u>Definite future plans or schedules:</u></p> <p>She <u>completes</u> her studies in a month. Через місяць вона закінчить навчання.</p>	<p>5. <u>Future events:</u></p> <p>I'm <u>leaving</u> at 7 a.m. tomorrow. Я їду завтра о 7 годині ранку. The delegation <u>is coming</u> tomorrow. Завтра прибуває делегація.</p>
<p>6. <u>Events with future time adverbials:</u> <u>before, after, when, if, unless.</u></p> <p>After she <u>completes</u> her studies, she plans to stay here for good. Після закінчення навчання вона планує залишитись тут назавжди.</p>	
<p>7. <u>Future events with verbs open/close, begin/end, come/leave:</u></p> <p>The class <u>begins</u> at 8 a.m. Заняття починаються о 8 годині ранку. The store <u>closes</u> at 10 p.m. Крамниця зачиняється о 10 годині вечора. He <u>comes</u> tomorrow. Він прибуває завтра.</p>	

Tense markers	
usually/generally/as a rule sometimes/from time to time rarely/seldom/hardly ever never/almost never often/ frequently always every   day   morning   other day	now/right now/at the moment still today this year/week these days always
NOTE	
Use ONLY Simple Present with <u>stative</u> verbs:	
understand know believe like remember need want/wish mean prefer appear seem sound smell	I <u>know</u> it. Я знаю це. I <u>understand</u> what you <u>mean</u> . Я розумію, що ви маєте на увазі. This idea <u>sounds</u> nice. Ця ідея звучить непогано.
look taste have	<b>BUT:</b> I'm <u>looking</u> at you. He's <u>tasting</u> food. We're <u>having</u> a party next Sunday.
Projects <u>look</u> OK on paper. Food <u>tastes</u> delicious. I <u>have</u> two dictionaries.	

**Exercise 5.**

Choose the correct form of the verbs from the parentheses:

1. I (understand / am understanding) now.
2. This melody (is sounding / sounds) nice.
3. Barbara always (goes / is going) to work at 7 a.m.
4. Coffee (is smelling / smells) good.
5. She usually (phones / is phoning) in the evening.

## SIMPLE FUTURE

(Future Indefinite)

«at a certain time in the future»

1. probable future events:

I will call you\*  
Я подзвоню тобі

I will help you  
Я допоможу тобі  
I'll get the phone  
Я підійду до телефону

later
tomorrow
in 2 hours
next month
tonight
soon
<b>one of these days</b>
(цими) днями
(по відношенню до майбутнього)
5 years from now
the day after tomorrow

← Tense markers

**NOTE**

I/we		will	(American English)
s/he			
they			

I/we		shall	(British English)
s/he			
they			

2. mental perception and emotions:

You'll		like it!	Тобі це обов'язково сподобається!
love		love	

**NOTE**

DO NOT use Future Tense in a sentence where there are two clauses, one of which is time clause beginning with *when; before; until; after/as soon as; unless; should* (as equivalent of *if*).

I will do it		if		you come.
		when		
		before		
		after		
		as soon as		

**Unless it rains**, the competition will be held outside.

Якщо не буде дощу, змагання будуть проведені надворі.

**Should you come**, I will meet you.

Якщо ти прийдеш, я тебе зустріну.

3. to be going to future:a. future plans, intentions:

She is going to study at the university.

Вона збирається навчатися в університеті.

I'm going to do it no matter what!

Я збираюся це зробити (зроблю це) будь-що!

b. probable and immediate future events:

The class is going to start in a minute.

За хвилину почнуться заняття.

Also: The laboratory is (just) about to close.

Лабораторію вже майже зачинили.

**NOTE**

Talking about the future you may well use the following expressions:

\* **in the long run** — in the distant future, укр. у далекому майбутньому, на перспективу.

\* **in the short run** — in the near future, soon, укр. незабаром

— Why are you learning Spanish?

— I think it will be useful in the long run.

Past Progressive (Past Continuous)	Future Progressive (Future Continuous)
<u>Express:</u>	
«in progress at a time in the past»	«in progress at a certain time in the future»
<p>1. <u>events in progress at a specific time</u>: He was studying at 10 p.m. Вчора о 10 годині вечора він вчився.</p>	<p>1. <u>events that will be in progress at a time in the future</u>; will last for a period of time in the future: I <u>will be delivering</u> a lecture on philosophy from 9 a.m. till 11 a.m. tomorrow. She <u>will be working</u> on her paper for the next two weeks. Вона працюватиме над статтею два наступні тижні.</p>
<p>2. <u>interrupted actions</u>: I <u>was reading</u> when she came. Я читав у той момент, коли вона прийшла.</p>	<p>Tense markers</p> <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p>from 5 a.m. till 7 a.m.</p> <p>this time   tomorrow</p> <p>                    next year</p> <p>10 years from now</p> <p>still</p> <p>for 2   hours</p> <p>            days</p> <p>at 8 a.m. tomorrow</p> <p>when X come(s)</p> </div>
<p>3. <u>two actions in the past continued at the same time</u>: He <u>was reading</u> while I <u>was writing</u> my essay. Він читав у той час, коли я писав твір.</p>	
<p>4. <u>repetition and iteration</u>: I <u>was reading</u> all day long. Я читав цілий день.</p> <p style="text-align: center;">Tense markers</p>	
<div style="border: 1px solid black; padding: 5px; margin: 5px auto; width: fit-content;"> <p>yesterday   at 5 p.m.</p> <p>                    from 3 p.m. to 10 p.m.</p> <p>all day long</p> <p>while</p> </div> <p><b>NOTE</b> Use <u>while</u> with Past Progressive, and <u>when</u> with Simple Past</p>	

**Exercise 6.** Choose the correct form of the verb from the parentheses:

1. When Melissa arrived everyone (was studying / studied).
2. At three o'clock she (was studying / studied).
3. At this time tomorrow we (will be taking / will take) the test.
4. I (will call / am calling) you one of these days.
5. John (was reading / read) while Mary (was watching / watched) TV.

<p align="center"><b>Simple Past</b></p> <p align="center">«at a certain time in the past»</p>	<p align="center"><b>Present Perfect</b></p> <p align="center">«in the past but related in some way to the present»</p>
Express:	
<p>1. <u>events that took place at a definite time in the past:</u>            We <u>discussed</u> it yesterday.            Ми обговорили це учора.</p> <p align="center">tense markers</p> <div style="border: 1px solid black; padding: 5px;"> <p>in 1990              when X was 20              as a child              yesterday              last year / month              the day before yesterday              long ago              once upon a time  <b>the other day</b> (цими днями)              (по відношенню до минулого)              this morning (the morning is over)              eventually / finally              at that time              2 hours ago / later              (for the) first / last time</p> </div>	<p>1. <u>actions happened at an indefinite time in the past:</u>            We <u>have already discussed</u> it.            Ми вже обговорили це (колись раніше).</p> <p align="center">tense markers</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>lately / recently / of late / in recent years</b> (останнім часом)              up to now              so far              already              never              ever              since              in the past              yet              during the past 2 days</p> </div>
<p>2. <u>events that lasted for a time in the past:</u>            He <u>taught</u> at Harvard for 10 years before he came here.            Він викладав у Гарварді протягом 10 років перед тим, як переїхав сюди (він більше там не викладає).</p>	<p>2. <u>situations that began in the past, continue to the present:</u>            He <u>has attended</u> the university for 3 years.            Він навчався в університеті протягом 3 років (і зараз продовжує навчатися там).            He <u>has lived</u> in Germany since 1992 (he still lives there).            Він проживає у Германії з 1992 року (і зараз також).  <b>MIND:</b> <i>since</i> is used to indicate the beginning of the time period; <i>for</i> is used to indicate duration of time.</p>
<p>3. <u>habitual or repeated events:</u>            She <u>studied</u> English every day until she passed the test.            Вона вчила англійську щодня, доки не склала іспит.</p>	<p>3. <u>actions completed in the past but related to the present:</u>            John <u>has applied</u> for several job openings and now he's waiting for the results.            Джон подав заявку на кілька вакансій і зараз очікує на результати.</p>

<p>4. <u>past mental perceptions or emotions</u>: She <u>always knew</u> what she wanted. Вона завжди знала, чого прагне.</p>	
<p><b>NOTE</b> <b>used to and be used to ...ing/noun</b></p>	
<p><b>*used to</b> describes habits, regular activities, states in the past that no longer exist now; <b>*be used to ...ing/noun</b> means «be accustomed to», «have a habit» He <u>used to work</u> at the university. Раніше він працював в університеті. He <u>is used to working</u> at the university. Він звик працювати в університеті. or: He <u>is used to his present job</u>. Він звик до своєї теперішньої роботи.</p>	

**Exercise 7.** Choose the correct form of the verb from the parentheses:

1. They (bought / have bought) a dictionary the other day.
2. Laura (has taken / took) the test.
3. During the last week I (read / have read) 2 books.
4. They (have translated / translated) the article already.
5. We (didn't finish / haven't finished) the project yet.
6. He (arrived / has arrived) the day before yesterday.
7. I (haven't seen / didn't see) him recently.

**Exercise 8.** Choose the one option that is closest in meaning to the original sentence.

1. John used to travel a lot.
  - a. He traveled a lot in the past, now he doesn't.
  - b. He is accustomed to traveling.
2. Doris isn't used to working so hard.
  - a. In the past she worked very much but now she doesn't.
  - b. She isn't in the habit of working so hard.
3. Marilyn is used to this climate.
  - a. Marilyn is accustomed to this climate.
  - b. In the past Marilyn liked this climate.
4. These students are used to studying for exams in the library.
  - a. They always study for exams in the library.
  - b. In the past they went to the library to study.
5. He used to jog every other day.
  - a. He always jogs every other day.
  - b. He doesn't jog every other day anymore.

Past Perfect	Future Perfect
2 actions (or more) occurred	
before a certain time in the past	before a certain time in the future
Express:	
<u>action(s) or state(s) that took place before other event(s) in the past:</u> He <u>had studied</u> very hard Action 1 <u>before he passed</u> the exam. Action 2 Він наполегливо вчився перед тим, як склав іспит.	<u>future event(s) happening before other future event(s):</u> <u>By the time you come,</u> Action 2 we <u>will have finished</u> the experiment. Action 1 Коли ви прийдете, ми вже закінчимо експеримент. <u>I will have finished</u> translation by 9 p.m. Я закінчу переклад до дев'ятої години вечора.
Tense markers	Tense markers
before after when hardly ... when never ... before	before tomorrow by 5 p.m. by the year...

### NOTE

The **Present Perfect Progressive** (Continuous), the **Past Perfect Progressive** (Continuous), the **Future Perfect Progressive** (Continuous) are used mainly to emphasize the duration of activity expressed by Present Perfect, Past Perfect, and Future Perfect, respectively:

He | has taught | mathematics for 2 years.  
    | has been teaching |

He | had studied | very hard before he passed the test.  
    | had been studying |

By the end of the year | we will have worked/lived/taught | here for 5 years.  
                               | we will have been working/living/teaching |

### Exercise 9. Choose the correct tense of the verbs from the parentheses.

- By the time you come, he (study) for two hours.
- He (say) yesterday that he (publish) his first book in 1995.
- I (know) him for many years.
- Carol (be) to France.
- He (study) since 8 o'clock this morning.
- They (finish) the project already.
- By the time we (arrive) the conference had already begun.



## Sequence of Tenses (Reported Speech)

He <b>says</b> that he Він каже, що	is studying studies вчиться	today	here	
		now	this/those	
	studied вчився	yesterday		
		last year		
	will study буде вчитися	tomorrow		
		two days from today		
	could might would	could study	three days ago	
			next month/year	
He <b>said</b> that he Він казав, що	was studying studied вчиться	that day	there	
		then	that/those	
	had studied вчився	the day before (on the previous day)		
		the year before the previous year		
	would study буде вчитися	the next day the following day		
		two days from then		
	could might would	could study	three days earlier	
			the following month / year	

**NO tense changes are required when you mention**1. things that are always true:

Cavendish discovered that water consists of hydrogen and oxygen.

2. statements that occurred only a very short time ago:

He told me, «I can't understand your idea».

He said that he can't understand my idea.

**NOTE**

Questions in reported speech:

«Am I right?» asked X.

X		asked		if		she/he was right
		wondered		whether (or not)		

**Exercise 10.** Decide whether tense changes are required or not if the sentences are changed to reported speech. State the reason why.

1. My friend said, «English and French are the two official languages in Canada».
2. Shakespeare once observed, «Love is blind».
3. Yesterday morning my teacher said, «The results of your test will be here two days from today».
4. My father always told me, «To learn is never too late».
5. Last week my cousin told me, «I have already completed the essay for my classes this week».
6. When I saw Paula last month she told me, «I received John's letter two months ago».
7. Elisabeth told me, «I couldn't come earlier».
8. Michael said, «I would get the tickets».

**Exercise 11.** Complete the following sentences:

1. The cordless telephone ... available to the professional and general public in the years between 1970 and 1980.
  - a. is becoming
  - b. became
  - c. has become
  - d. had become
2. Recently, there ... considerable discussion about technology investments.
  - a. is
  - b. has been
  - c. was
  - d. is going to be
3. If you ... role in leadership, you are going to develop special skills.
  - a. take on
  - b. took on
  - c. will take on
  - d. were taking on
4. They ... that they had completed the task.
  - a. have reported
  - b. report
  - c. are reporting
  - d. reported
5. For many years the Academy ... science education in the schools.
  - a. promoted
  - b. has promoted
  - c. promotes
  - d. is promoting
6. She will go to the university when she ... her paper.
  - a. finishes
  - b. will finish
  - c. finished
  - d. had finished

7. We can talk about it after he ...
- will leave
  - is leaving
  - leaves
  - has left
8. This theory is popular ... scientists.
- along
  - between
  - where
  - among
9. The quality of education from elementary school through college ... a subject of special interest in recent years.
- has become
  - became
  - will become
  - becomes

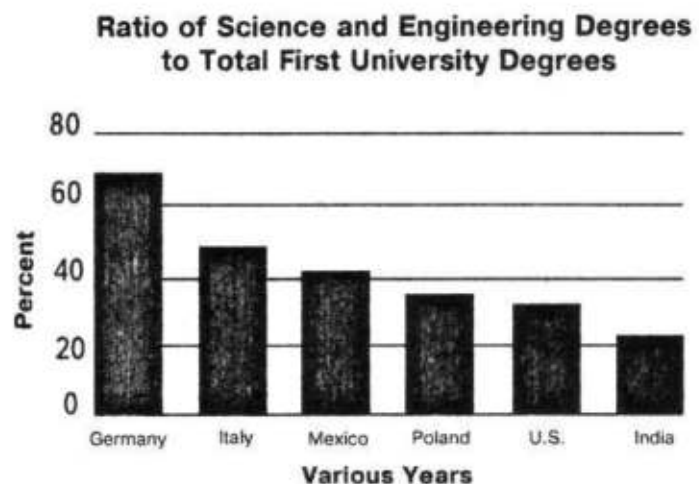
**Text B** Read the following passage, paraphrase it. Discuss the ways graphics affects people in workplace.

As we move into the technological age, we witness the increasing use of graphics all around us, and the *influence* that graphics has on the way everyone thinks. The visual world in which we live reminds us that graphics has *enormous* impact on our lives.

Computer users, for example, use graphic design within the texts they prepare on a word processor. Some researchers believe that graphics will *actually* help people communicate more effectively whether on a computer screen or a printed page. The goal of graphic design is to present information that can be understood easily and quickly. Graphic designs usually mean headlines, charts, graphs, tables, diagrams, symbols and pictures.

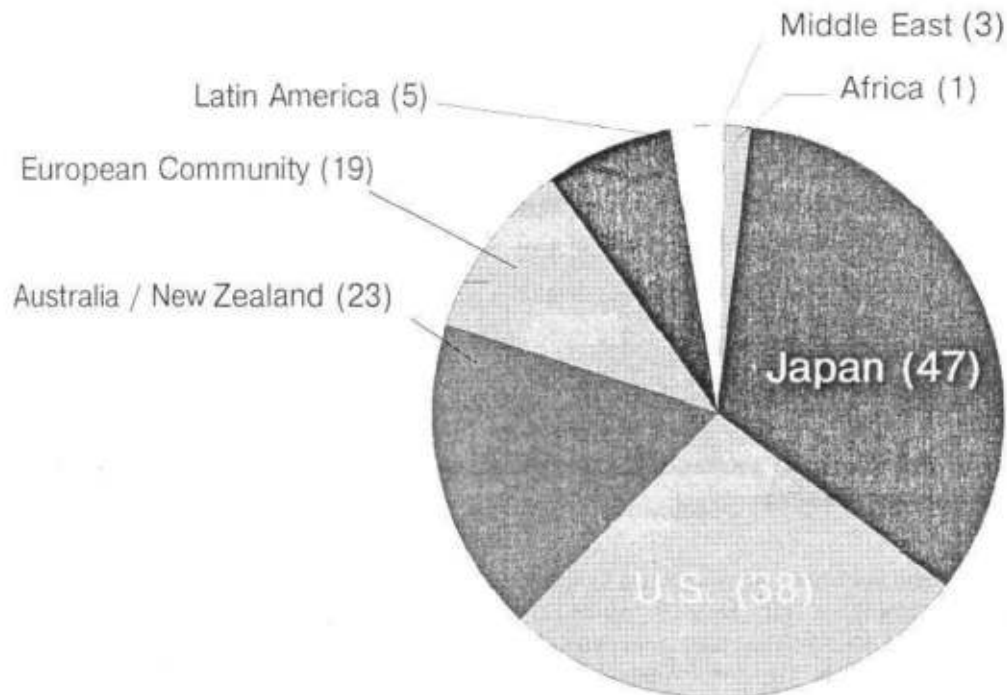
**GRAPHS** are a visual way of presenting information, especially statistical data. The three most important types of graphs are:

line graphs		are useful in showing changes and trends (general tendencies or directions in the way a situation is changing or developing) involving quantities or amounts over time
bar graphs		



# R&D Scientists and Engineers

Per 10,000 Population, 1995



circle graphs

sometimes called pie graphs, show percentage, and whole is divided into parts

*When analyzing information in a line or bar graph, note time periods and increases or decreases in amounts. In a circle graph, note the relationship of each part to the whole. Rank the percentages from the greatest to the least.*

## Comment on these graphs:

The present stock and flow of human resources engaged in the global discovery and application of science and technology are critical to the future pace of innovation. Historically, the world's largest reservoirs of scientists and engineers have rested in the Western economies. Over time, however, Asia, especially Japan, has begun to build equivalent **pools of scientists** and engineers in the labor force, and emerging economies are showing signs of producing relatively high proportions of scientists and engineers among their university graduating **cohorts**. As the global economy expands and nations become ever more interconnected, there may be reason to hope for a smoothing out of at least some aspects of global **S&T** human resources capacity.

**pool of scientists, reservoir of scientists**

укр. кадри (резерв) вчених

**cohort** — any group of people who share some common quality (same age etc.)

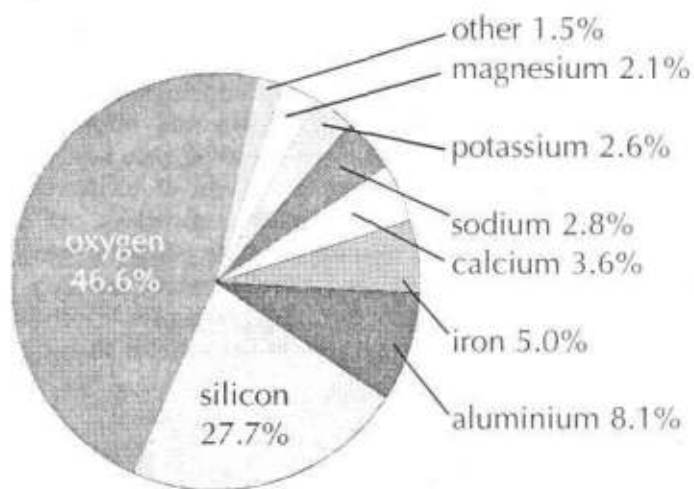
укр. когорта, група

**S&T** — Science and Technology

укр. наука і техніка

**Exercise 12.** Study the following graph and answer the questions about it:

### Elements that make up the earth's crust



1. What elements make up the fourth largest percentage of the earth's crust?
2. Does oxygen make up more, less, or about the same percentage of the earth's crust as compared to all the other elements together?
3. What three elements make up almost equal percentage of the earth's crust?
4. Do sodium and calcium together make up a larger percentage than aluminium?

**Exercise 13.** Choose the correct word and fill in the blanks.

(to) increase                      increasingly

1. I find it \_\_\_\_\_ difficult to work with them.
2. The population of this country has \_\_\_\_\_.

competition    competitor(s)    competitive

3. The two companies are in direct \_\_\_\_\_.
4. Anyone wanting to enter the computer business faces tough \_\_\_\_\_.
5. They lost the contract to their \_\_\_\_\_.
6. We've discussed the \_\_\_\_\_ nature of private industry.

(to) invest                      investment(s)

7. The government is trying to attract \_\_\_\_\_ into this industry.
8. He will advise you how \_\_\_\_\_ money.
9. I've \_\_\_\_\_ a lot of time and effort into this project.

(to) prosper    prosperity    prosperous

10. Their business \_\_\_\_\_.
11. We wish you health, happiness, and \_\_\_\_\_.
12. This is a new and \_\_\_\_\_ city.

innovation(s)                      innovative

13. The article dealt with \_\_\_\_\_ printing techniques.
14. Recent \_\_\_\_\_ in this field are very promising.

**Exercise 14.** Read the text and answer the questions about it.

William Rathje, a professor of anthropology at the University of Tucson, Arizona, has created an entirely new field of science called garbology. He conducted a scientific study of garbage left for collection, inspected and categorized some 120 tons of **garbage** and has arrived at some interesting conclusions. If you ask professor Rathje about trash, his answers might **garbage** — **Synonyms:** litter, trash, junk укр. сміття **surprise you. Garbage, he points out, is an unavoidable fact** of life, produced by all societies since the dawn of civilization. One of his findings is a real composition of the American waste: not plastic, not glass, not metal — but paper, which makes up more than 40 percent of the volume of waste. Another result is that middle-income families waste more food than lower or upper-income families. Rathje's research also reveals some facts about American habits of consumption. For example, lower-income households tend to throw away hazardous car-care items, middle class households discard paint, furniture, plant fertilizers.

1. What does the passage mainly discuss?
  - (A) The creation of archaeology
  - (B) Methods of paper recycling
  - (C) William Rathje's biography
  - (D) Results from work in the field of garbology
2. According to the passage, who is William Rathje?
  - (A) a university student
  - (B) a sanitation engineer
  - (C) an anthropology professor
  - (D) a chemist
3. According to the passage, who wasted more food?
  - (A) lower-and middle income families
  - (B) upper-income families
  - (C) middle-income families
  - (D) lower-income families
4. It can be inferred from the passage that
  - (A) problems with garbage appeared only recently
  - (B) garbage has been produced since ancient times
  - (C) Americans produce more garbage than other nations
  - (D) plastic is the most common waste
5. It can be inferred from the passage that the science of garbology is important because it
  - (A) provides insights into lifestyles of American families
  - (B) offers work opportunities for students
  - (C) is the most promising trend in science
  - (D) studies modern methods of food processing

**Exercise 15.** Choose the one word or phrase that best keeps the meaning of the original sentence if it is substituted for it.

1. He responded to my suggestion promptly.
  - (a) agreed
  - (b) reacted
  - (c) objected
  - (d) understood

- 
2. These two companies are rivals.
- (a) innovators
  - (b) companions
  - (c) competitors
  - (d) investors
3. It's a tough problem.
- (a) disturbing
  - (b) enormous
  - (c) radical
  - (d) difficult
4. The computer has made a great impact on our lives.
- a. decision
  - b. reaction
  - c. influence
  - d. help
5. We are to face these radical changes.
- a. drastic
  - b. minor
  - c. relevant
  - d. constant
6. We start off with trends in global communications.
- a. tendencies
  - b. data
  - c. priorities
  - d. partnerships
7. It is difficult to predict possible consequences.
- a. chances
  - b. results
  - c. improvements
  - d. trends
8. As soon as you arrive home, phone me.
- a. after
  - b. before
  - c. until
  - d. unless
9. He seldom comes on time.
- a. often
  - b. always
  - c. sometimes
  - d. rarely
10. I hope you will maintain your recent improvement.
- a. give up
  - b. transfer
  - c. realize
  - d. keep up
11. The project will become effective in the short run.
- a. later
  - b. in the distant future
  - c. soon
  - d. at the moment



12. Actually, IBM was world's seventh largest company in 1983.

- a. essentially
- b. on the whole
- c. finally
- d. in fact

13. Walking on the grass is not allowed.

- a. prohibited
- b. permitted
- c. proclaimed
- d. proposed

## *Noteworthy*

The science of graphology tries to establish relationship between handwriting and personality. Such relationship was first noticed by the Chinese in the eleventh century, and then in 1622 a man called Camillo Baldi *maintained* that each person has a characteristic handwriting. At the end of the nineteenth century graphology became a proper science. Now even aimless *doodles* are of interest to graphologists. Like dreams, doodles are products of the unconscious and can reflect a person's state of mind. Check out your recent doodles (for example, in memo pads) and find out what they could mean:

**to maintain** — to assert

укр. наполягати, стверджувати

**to doodle** — to draw lines, figures etc. while thinking about something

1. Faces: It's your personality you're showing. If features are faint, you tend to be withdrawn and self-conscious; when dark or overemphasized, you may be domineering but insecure. Small or closed eyes could mean you are introspective, even self-absorbed, while large eyes represent a suspicious or hypersensitive nature.
2. Geometric shapes: Circles signal affection. Three-dimensional boxes indicate frustration, but also a desire to solve problems. A triangle stands for aggression, high energy, and ambition; stars are symbols of hope and achievement.
3. Lines: Very short, sketchy strokes show you're anxious or uncertain, while long, straight ones convey determination.
4. Loops: Loosely spaced — you're feeling relaxed or lazy, but tightly drawn — you're a bit anxious.
5. Animals: Domestic pets reveal a tame personality, while birds represent high-flying ideas or the wish to escape.

## Chapter 4

Focus on:

**Hackers**

**Grammar: Structure of English  
Sentence.  
Logical Connectors**

**Text A** Read the text and be ready to answer the questions that follow.

Who are hackers? What is hacking? Imagine that you had a properly working program that performed one task, and you needed another program to do something slightly different. Modifying the first program to create the second one was much faster than writing a new one *from scratch*. In other words, that led more to an *ax-hewn* bench than to a piece of finely crafted furniture. Taking an ax to a program to turn it into something else became the basis of the term *to hack*.

Whereas programming is like cooking in your own kitchen — a personal act of creation — hacking is like cooking in a stranger's kitchen in the dead of night. Hacking is not for the beginners.

As one might guess, The New Hacker's Dictionary, a collection of «in crowd» terms compiled at MIT, is full of definitions of the term «hacker»:

1. A person who enjoys exploring the details of programmable systems and how to stretch their capabilities, as opposed to most users who prefer to learn only the minimum necessary.

2. One who programs enthusiastically (even *obsessively*) or who enjoys programming rather than just theorizing about programming...

6. An expert or enthusiast of any kind. One might be an astronomy hacker, for example.

In «Hackers» (1984), one of the best books on the subject, Steven Levy noted in *early* 1960's, «a project undertaken or a product built not *solely* to fulfill some constructive goal, but with some wild pleasure taken in *mere* involvement, was called a «hack». «Secrets of Super Hacker» (1994) by Nightmare, pseudonym for Dennis Fiery (which is itself another pseudonym) offers this: «A hacker is a person with an intense love of something, be it computers, writing, nature or sports. A hacker is a person, who, because he or she has this love, also has a deep curiosity about the *subject in*

*question*... For a computer hacker that means he respects the ability of computers to put him in contact with a universe of information and other people, and it means he respects those other people, and does not *intentionally* use knowledge of computers to be destructive. Such a definition differs a lot from the final definition in the dictionary mentioned above:

8. A *malicious meddler* who tries to discover sensitive information by *poking around*. Hence *password hacker*, *network hacker*.

But many people really forget that hacking is *pretty harmless* as long as the hacker avoids the *temptation* to cross the line and become a «malicious meddler».

In order to counteract the bad press, the hacking community tried to divide itself into good guys and bad guys. In general, those people who just liked to play and learn tried to retain the name HACKER by creating the term CRACKER for the bad guys. For crackers a major motivating force is definition number eight of «The New Hacker's Dictionary» — breaking into systems

\* **from scratch** (informal) — starting from the beginning or with nothing

**to hew** — to cut using an ax or other cutting tool укр. рубати (сокирою)

**to hack** — to cut, especially roughly, violently or in uneven pieces. укр. рубати

MIT — Massachusetts Institute of Technology

**obsession** — a fixed and often unreasonable idea with which the mind is continually concerned

укр. нав'язлива ідея

**early** — happening towards the beginning of a period of time укр. на початку. **Compare:** **late** — happening towards the end of a period of time укр. наприкінці

**solely** — only, not including anything else

укр. лише, виключно

**mere** — nothing more than; only

укр. просто, не більш ніж

**subject in question** — under consideration, being talked about укр. питання, що розглядається

**intentional** — done on purpose, deliberate

укр. навмисний

**to meddle** (in, with) — to take too much interest or take action about other people's private affairs. **Synonym:** to interfere (in) укр. утручатися

**malicious meddler** — укр. той, хто зловмисно утручається

\* **to poke around** — to nose about, to search (in or for something) by examining other people's business укр. вишукувати

**pretty harmless** — укр. досить безпечний, нешкідливий

**to tempt** — to persuade or attract (someone) to do something that seems pleasant or advantageous but may be unwise or immoral. Noun — **temptation** **Synonyms:** entice, lure, allure, seduction укр. спокуса

without authorization and with malicious intent. **In any event**, the distinction has failed **to catch on** outside the hacking community. All are still known as hackers.

The culture that we live in is being **threatened** by an oversimplified image of hackers as criminals or vandals. Anyhow, a computer hacker needs to understand how computers work, to study them, to learn programming. To hack means to be on the **frontier**, to be on the border. In computer science and technology this border is constantly being pushed back, and at a tremendous **pace**. As science becomes more and more computational, we need **to come up with** a better understanding of the nature of human activity in the information age.

**in any event** — in any case укр. у будь-якому разі (випадку)

\* **to catch on** — (informal) to become popular укр. набувати популярності

**threat** — an expression of an intention to hurt, punish, cause pain etc., **Synonym**: menace укр. загроза

**frontier** — the border, the limit or edge укр. край

**pace** — rate or speed укр. швидкість, темп

\* **to come up with** — to have an idea about укр. спадати на думку

1. What is the subject of this passage?
2. Longman Dictionary of Contemporary English provides the following definition of the word «hacker» — *someone who is able to use or change the information in other people's computers without their permission*. Do you agree with this definition? Why?
3. What is the difference between hackers and crackers?
4. What are the positive and the negative sides of hacking? Express your opinion.
5. What is specific about subculture of hackers?
6. Why hackers are sometimes called «every security manager's worst nightmare»? Give your reasons.
7. Why is the word «hacker» sometimes used as honorable connotation of the word «lawyer»? Give your reasons.



**Exercise 1.** Give English equivalents of:

виконувати одне завдання; трохи відмінний; розширяти можливості; лише, виключно; питання, що розглядається; поважати; навмисне використовувати; втручатися; набувати популярності, загрожувати; надто спрощений образ; величезна швидкість; краще розуміння; на початку 19 століття, наприкінці травня.

**Exercise 2.** Translate Ukrainian sentences into English. Then match the two columns:

- |   |   |
|---|---|
| <p>1. На жаль, ця ідея не набула популярності.</p> <p>2. Сподіваюся, вам спаде на думку кращий план.</p> <p>3. Цей прилад з'явився наприкінці 20 століття.</p> <p>4. Він зробив це навмисне.</p> <p>5. Про це (питання) не йдеться (це питання не розглядається).</p> | <p>A. That is not the point in question.</p> <p>B. He did it on purpose.</p> <p>C. I hope you can come up with a better plan (than this).</p> <p>D. Unfortunately, this idea failed to catch on.</p> <p>E. This device appeared in late 20th century.</p> |
|---|---|

**Exercise 3.** Render the following passage into Ukrainian.

A new philosophy of conceiving scientific theory is about to be born in the so-called computer laboratory, which, so to speak, stands half-way between theory and experiment.

Supercomputers will allow a whole new methodological research approach dealing with reformulation of the basic principles of economic and social systems. Thanks to these «artificial brains», it will soon be possible to model present and future reality with a degree of accuracy previously unseen.





**Exercise 4.** Fill in the blanks with one of the variants.

1. ... he is speaking about is exciting.
  - a. that
  - b. what
  - c. while
  - d. when
2. You might know a person ... has gotten a job like this.
  - a. which
  - b. whom
  - c. who
  - d. how
3. I don't know ... to go.
  - a. after
  - b. that
  - c. because
  - d. where
4. ... we need more information is obvious.
  - a. before
  - b. while
  - c. that
  - d. what
5. ... you go to Italy, you should visit Rome.
  - a. after
  - b. as
  - c. when
  - d. unless
6. No one is sure ... makes him think so.
  - a. when
  - b. why
  - c. what
  - d. how
7. ... the introduction of the washing machine people spent much more time cleaning their clothes.
  - a. after
  - b. prior to
  - c. at present
  - d. during
8. Scientists are still uncertain about ... this phenomenon occurs.
  - a. which
  - b. how
  - c. about
  - d. with



## LOGICAL CONNECTORS

Logical connectors are essential for connecting clauses, and are essential for good writing. We will classify logical connectors (or transitions) according to the function they fulfill. Mind that some logical connectors belong to more than one category (depending on the context and the speaker's intention).

and  
also  
too, as well  
as well as  
and so ... X  
також  
either  
(expresses  
negation)  
також (ні)

in addition,  
additionally,  
moreover  
what is more  
further, furthermore  
до того ж,  
більше того  
besides окрім (того)

both ... and  
як ..., так і

not only ... but also  
не тільки, але й

together with,  
along with  
alongside  
разом з, поруч

another, one more,  
a second  
ще один

the next наступний

not to mention  
не кажучи вже про

'the listing goes on —  
перелік можна продовжити  
'in order to supplement, ... —  
для того, щоб додати/доповнити ...

## Additional Information

John likes physics and **also** chemistry.  
Джон любить фізику, а також хімію.

Alan likes physics, **too**.  
Алану також подобається фізика.

Alan likes physics **as well as** John.  
Алан любить фізику **and so does** John.  
Алану, як і Джону, подобається фізика.

Helen doesn't like astronomy. Mary doesn't like it, **either**.  
Хелен не подобається астрономія. Мері також.

The procedures in question can be used in physics.

**Moreover**  
**In addition** | some of them can be used in astronomy.  
**Besides**

Методи, що розглядаються, можуть бути використані у фізиці. До того ж (окрім того), деякі з них можуть використовуватись в астрономії.

The course gives **both** general introduction to computers **and** provides practical experience.

Курс надає як загальну інформацію про комп'ютери, так і можливість набуття практичного досвіду.

The method is **not only** easy, **but also** accurate.  
Метод не лише легкий, але й надійний.

This problem | **together with**  
| **along with**  
| **alongside**  
mentioned above is of prime importance.

Ця проблема разом з зазначеними вище є надзвичайно важливою.

**Another** question is to be answered promptly.  
Треба швидко дати відповідь ще на одне питання.

**The next** step is to make an experiment.  
Наступний крок — зробити експеримент.

Word processors are very useful — they can help writers rearrange word order, **not to mention** checking spelling.

Текстові редактори дуже корисні — вони можуть допомогти змінити порядок слів, не кажучи вже про виправлення помилок.

### IS or ARE?

I. Subjects joined by «and», «both ... and» take a **plural** verb:

Professor **and** his students **are** coming. **Both** professor **and** his students **are** coming.

II. The following phrases take a **singular** verb:

<b>Professor</b>	together with along with accompanied by as well as in addition to	his students <b>is</b> coming.
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III. Expression «not only ... but also» takes **either singular or plural verb** depending on the **subject nearest** to it:

Not only the professor, but also his **students are** coming.

Not only the students, but also their **professor is** coming.

### EXEMPLIFICATION

The steps for saving your computer file are quite simple.

**To illustrate**

**For example**

**For instance**

I will show you how to save the file  
you have just created.

for example  
for instance  
to illustrate  
an example of this  
a case in point  
e.g.  
наприклад

Зберегти файл у комп'ютері дуже просто.

Наприклад, зараз я покажу вам, як зберегти щойно створений файл.

He is very difficult to get along with.

**A case in point** occurred today.

З ним дуже важко порозумітися.

Наприклад, сьогодні трапився такий випадок.

specifically  
especially  
particularly  
in particular  
зокрема

We still need to arrange several details.

**Specifically**

**In particular**

we have to get all the necessary  
information.

Нам все ще треба з'ясувати декілька деталей.

Зокрема, нам треба отримати всю необхідну інформацію.

i.e. = that is  
тобто  
in other words  
to put it another way  
інакше кажучи  
namely  
а саме

The book dealt with travelling.

**That is**

**Namely**

**In other words**

it discussed climate, language, food in  
Japan.

Книга була присвячена подорожам.

Інакше кажучи (а саме) у ній розглядалися питання клімату, мови, їжі в Японії.

## SUMMARY

to sum up  
in summary  
summing it (all) up  
in sum  
to summarize  
to conclude  
in conclusion  
підсумовуючи

**In summary**  
**Summing it up**  
**In conclusion**  
**To summarize**

the findings of the research to date suggest that not all answers have been found.

Підсумовуючи результати дослідження, можна сказати, що знайдені ще не всі відповіді на запитання.

on the whole  
all in all  
in general  
generally speaking  
загалом

**On the whole**  
**In general**  
**All in all**

the new approach can be beneficial in several ways.

Загалом, новий підхід може бути корисним з декількох точок зору.

in brief  
briefly  
in short  
in a word  
\*in a nutshell  
коротше кажучи

**In brief**  
**In a word**  
**In a nutshell**

we had to start it all over again.

Коротше кажучи, треба було починати все знову.

## CONTRAST

but  
yet  
however  
nevertheless  
nonetheless  
still  
але, зате, проте

Human soon will be able to travel through space.

**However**  
**But**  
**Still**  
**Nevertheless**

he will never be able to conquer it.

Людина скоро зможе подорожувати у космічному просторі. Однак (але) вона ніколи не зможе його підкорити.

on the one hand ...  
з одного боку  
on the other hand  
з іншого боку ...

Although urban development destroys the ecological balance, it **on the other hand** provides needed employment for many **on the contrary** people.

on the contrary  
alternatively  
(yet) conversely  
однак, з іншого боку,  
навпаки

Хоча урбанізація руйнує екологічний баланс, однак (з іншого боку) вона створює необхідні для багатьох людей робочі місця.

unlike  
на відміну

**Unlike** Paul, Tom always comes on time.  
На відміну від Пола, Том завжди приходить вчасно.

rather than  
а не

The decision was taken for ecological **rather than** economic reasons.  
Рішення було прийняте виходячи з екологічних, а не економічних міркувань.

otherwise  
протилежний

He says he is right but I think **otherwise**.  
Він каже, що правий, але я так не думаю (маю протилежну думку).

rather  
скоріш(е), радніш(е)

Professor didn't imply that science is in perfect state. **Rather**, he said, the task is to think how to maintain commitment to it.

Професор не мав на увазі, що наука у бездоганному стані. Скоріше, він казав про те, що треба добре подумати про те, як зберегти відданість цій справі.

to be | opposed to  
as |  
протиставляти

The former method **is opposed to** the latter one.  
Перший метод протиставляється другому.

though (at the end of a  
clause) = nevertheless  
однак, проте

It's a tough job. I like it, **though**.  
Це складна робота, однак вона мені подобається.

vs. = versus  
проти/протиставлення

The debate was on environment **vs.** industrial development.  
Дискусія була присвячена питанням охорони довкілля у протиставленні розвитку промисловості.

pros and cons  
за та проти

It is necessary that we consider all **pros and cons**.  
Необхідно взяти до уваги усі за та проти.

## PURPOSE

to  
in order to  
in order that  
для того щоб, аби, задля

We've done it | **to** | save time.  
| **in order to** |  
Ми зробили це для того, щоб зекономити час.

for для  
for ... to щоб, аби

They used this technique **for** convenience.  
Вони використали цей метод для зручності.  
It will be useful **for** you **to** know how to operate the device.  
Вам буде корисно знати, як користуватися приладом.

for the purpose of  
with the aim of  
for the sake of  
for the reason of  
in behalf of  
with the view of  
з метою, заради

You should not miss this opportunity | **for the reason of**  
| **in behalf of**  
| **for the sake of**  
your future.  
Ви не повинні втрачати таку можливість заради вашого майбутнього.

lest  
щоб не  
аби не

Write down the number **lest** you forget it.  
Запишіть номер, щоб не забути його.

## CONCESSION

though  
although  
even though  
albeit  
хоча

Attitudes to this problem are changing

<b>although</b> <b>though</b> <b>albeit</b>	slowly.
---	---------

Відношення до цієї проблеми змінюється, хоча й поступово.

yet  
while  
whereas  
хоч, хоча

It is difficult, yet rewarding.

Це складна, але вдячна справа.

<b>While</b> <b>Whereas</b>	I understand what you say, I can't agree with you.
--------------------------------	--

Хоч я розумію, що ви кажете, але не можу з вами погодитися.

in spite of  
despite  
regardless of  
notwithstanding (the fact that)  
незважаючи на

<b>In spite of</b> <b>Despite</b>	the delay, we arrived on time. Незважаючи на затримку, ми прибули вчасно.
--------------------------------------	--

whether  
незалежно від  
незалежно чи

The results are to be recorded, **whether** successful or not.

Результати треба записати незалежно від того, чи будуть вони успішними, чи ні.

with (all)  
незважаючи на

**With all** its limitations, the procedure is still applicable.

Незважаючи на усі недоліки, методику все ж можна використовувати.

no matter  
незважаючи на

I'll finish the experiment, **no matter** how long it takes.

Я закінчу експеримент незважаючи на те, скільки часу для цього буде потрібно.

for all (that)

**For all** his efforts, he failed.

Незважаючи на усі зусилля, йому це не вдалося.  
It's a victory, **for all that**.

І все ж це перемога.

as ... may seem

Strange **as it may seem**, I like it.

(Хоча) це може видатися дивним, проте мені це подобається.

whatever що б не  
whoever хто б не  
whenever коли б не  
wherever де б не

It is a good project, **whatever** you may say.

Що б ви не казали, це добрий проект.



**Exercise 5.** Render the following passage into Ukrainian. Pay special attention to logical connectors.

Various educational traditions have always laid emphasis on the learning of other languages. One effect of knowing a second language is that a person can experience first hand the great literature of other people, the power and subtleties of the original. The ability to read in another language reinforces one more effect: the gaining of knowledge about other cultures. Through reading and speaking a foreign language one can gain insight into the life of a different culture. Perhaps the most powerful effect of learning other languages is communication. With a second — or third — or fourth language one can make contact with other human beings. Many people study foreign languages because of more practical reasons for acquiring a new language. However, the effects are considerable. Since greater understanding of other cultures and communication with other people are so important, we would all do well if we studied at least one more language.

### EXPRESSION OF COMPARISON

#### I.



as  
as ... as  
similar to  
alike  
такий же, як і  
подібний, аналогічний

Nobody does it **as well as** you do.  
Ніхто не зробить цього краще ніж ви (так добре, як ви).

This method is **similar to** the previous one.  
Цей метод подібний (аналогічний) до попереднього.

equally  
in the same way  
similarly  
likewise  
in an identical manner  
аналогічно, подібно

We must pay a lot of attention to general secondary education, but **equally** we shouldn't forget higher education.

Ми повинні приділяти багато уваги загальній середній освіті, аналогічно, ми не повинні забувати і про вищу.

the same такий самий  
quite the same  
almost the same  
very much the same  
майже такий самий  
exactly / precisely / just the same  
такий самий, однаковий

American English and Canadian English are

<b>almost</b>		the same.
<b>very much</b>		

to have much in common  
мати багато спільного

Both theories **have much in common**.  
Обидві теорії мають багато спільного.

to resemble — to look like  
бути подібним



**NOTE****LIKE or AS?**

Use **like** before nouns or pronouns, but if nouns or pronouns are followed by verbs, use **as**:  
 He behaves **like you**. He behaves **as you often do**.

**II.**

to be different from  
 відрізнятись від  
 not as ... as  
 not so ... as  
 не такий, як  
 less (than)  
 менше ніж  
 more (than)  
 більше ніж

much many		more (less)
far markedly		more (less)
значно більше (менше)		

somewhat  
 a bit  
 slightly  
 дещо

Our department is **different from** theirs.  
 Наш відділ відрізняється від їхнього.  
 John is **not as** careful **as** Ann.  
 Джон не такий уважний, як Енн.  
 My experiment is **less** important **than** yours.  
 Мій експеримент менш важливий, ніж ваш.

This article is **far more** informative.  
 Ця стаття значно більш інформативна.  
 This method is **markedly less** efficient.  
 Цей метод значно менш ефективний.

The new device is		a bit somewhat	smaller.
Новий прилад дещо менший за розмірами.			

**III.**

the ...-est (of all)  
 the most (the least)  
 найбільш (найменш)  
 by far the ...-est  
 мабуть, най-...

She translates **the best** (of all).  
 Вона перекладає найкраще (від усіх).  
 He is **by far the brightest** student.  
 Мабуть, він найбільш талановитий студент.

## DOUBLE COMPARATIVE

the ... the  
чим ... тим

The **more** we learn, the **more** we know.  
Чим більше ми вчимося, тим більше ми знаємо.

less and less  
усе менше і менше  
more and more  
усе більше та більше

He became **less and less** interested in the subject.  
Він виявляв усе менше і менше зацікавленості.

well | over  
| above  
значно більше

The level is **well above** average.  
Рівень значно перевищує середній.

**NOTE**

Comparatives and superlatives of adjectives:

1. Adjectives of one syllable:

add **...-er** and **...-est**

big - **bigger**, -**the biggest**

2. Adjectives of three or more syllables:

use **more** and **the most**

interesting - **more** interesting, - **the most** interesting

3. Adjectives of two syllables ending in:

**...-y, ...-ly, ...-ow, ...-le, ...-er, ...-ure**, take **...-er** and **...-est**

- easy - **easier**, - **the easiest**

4. Adjectives of two syllables that end in

**...-ful, ...-less, ...-re, ...-ic, ...-ate, ...-ish, ...-ent, ...-ous, ...-ing, ...-gn, ...-mn**, and also adjectives «guilty» and «eager» take **more** and **the most**.

## IRREGULAR FORMATION

## Positive

## Comparative

## Superlative

good

better

the best

bad

worse

the worst

little

less

the least

many

more

the most

much

far

farther  
further

the farthest (about distance)  
the furthest

old

older  
elder

the oldest  
the eldest (especially about siblings)

**Exercise 6.** Complete the following table:

	Positive	Comparative	Superlative
1.	sophisticated	more sophisticated	the most sophisticated
2.	...	less intelligent	...
3.	famous	...	...
4.	...	worse	...
5.	comfortable	...	...
6.	careful	...	...
7.	...	...	the brightest
8.	useful	...	...
9.	guilty	...	...
10.	...	harder	...

**Exercise 7.** Render the following passage into Ukrainian. Pay special attention to logical connectors.

John F. Kennedy and Abraham Lincoln lived in different times and had very different family and educational backgrounds. Kennedy was born in 1917, whereas Lincoln was born more than a hundred years earlier than Kennedy, in 1809. Kennedy came from a very rich family, but Lincoln's family, on the other hand, was not wealthy at all. Kennedy graduated from Harvard University, while Lincoln had only one year of formal schooling. In spite of this fact, he became a well-known lawyer.

Despite these differences between Kennedy and Lincoln, some interesting similarities between the two are evident. For example, take their political careers. Lincoln began his political career as a congressman. Similarly, Kennedy also began his political career as a congressman. They were both elected to the U.S. House of Representatives — Lincoln in 1847, and Kennedy in 1947 — just one hundred years apart. Another interesting coincidence is that Lincoln and Kennedy were elected presidents of the U.S. in a year ending with the number 60 — Lincoln in 1860, Kennedy in 1960, respectively. Furthermore, both men were presidents during the years of civil unrest in the country.

There are some similarities between the two first ladies — Jacqueline Kennedy and Mary Todd Lincoln. For example, both were socially prominent women. Another interesting similarity between Kennedy and Lincoln was the fact that both presidents had vice-presidents named Johnson. Lincoln's vice-president was named Andrew Johnson, and Kennedy's — Lyndon Johnson.

These are only a few similarities in the destinies of these two men who had a tremendous impact on social and political life in the USA.

**Exercise 8.** Select the appropriate logical connector from the word list, and insert it in the passage: however; by contrast; like; while

Postmodernism, ... modernism before it, is a term covering several different tendencies, directions, and styles. Postmodernism is more populist, ... modernism is more elitist and exclusive. Postmodernism has brought about a renewed partnership between the old and the new. Postmodernism recognizes that a work of art can reflect many aspects of life. Modernism ... was more puritanical. Postmodernism, ... , saw the need to face openness and cultural diversity.

**Exercise 9.** Fill in the blanks with one of the variants.**A.**

1. John turned off the radio ... he could study.
  - a. so that
  - b. now that
  - c. due to
  - d. while
2. Some substances are hard, ... others are brittle.
  - a. if
  - b. when
  - c. unless
  - d. but
3. ... the procedures of science can appear very precise, the means of making scientific discoveries are far from perfect.
  - a. although
  - b. because
  - c. owing to
  - d. because of
4. Scientists and engineers, ... become more productive, need both easy to use and very flexible software.
  - a. rather than
  - b. therefore
  - c. in order to
  - d. in order of
5. This will probably continue ... the recession goes worldwide.
  - a. unless
  - b. again
  - c. but
  - d. for

**B.**

1. Both literature and music .. the fine arts.
  - a. is
  - b. are
2. When in Rome, do ... the Romans do.
  - a. as
  - b. like
3. John isn't much ... his brother.
  - a. as
  - b. like
4. Not only Mary, but also her parents ... leaving tomorrow.
  - a. is
  - b. are
5. The new director, together with his colleagues, ... arriving today.
  - a. are
  - b. is

**Exercise 10.** Find the one synonym to the underlined word:

1. In spite of the delay, we arrived on time.
  - a. because
  - b. despite
  - c. due to
  - d. because of
2. The debate has nonetheless enlarged our knowledge on the issue.
  - a. alternatively
  - b. nevertheless
  - c. notwithstanding
  - d. also
3. This problem together with mentioned above is of prime importance.
  - a. rather than
  - b. moreover
  - c. besides
  - d. alongside
4. In brief, we had to start it from scratch.
  - a. finally
  - b. in summary
  - c. in a word
  - d. in conclusion
5. These two methods are almost the same.
  - a. not always
  - b. very much
  - c. sometimes
  - d. never
6. The experiment has valuable implications.
  - a. reasons
  - b. indications
  - c. prospects
  - d. consequences
7. The experiment resulted in no success.
  - a. followed
  - b. realized
  - c. caused
  - d. accounted for

**Exercise 11.** Translate the following sentences:

1. There are far more possibilities for those who have a good command of English.
2. Our teacher is different from theirs.
3. This is by far the best approach.
4. This is the most sophisticated device I've ever seen.
5. He became more and more interested in the project.
6. This invention has brought about many changes in our lives.
7. Why did you do it? Was it on account of what I said yesterday?
8. They have considered all pros and cons.
9. He says it's a genuine coin, but I think otherwise.
10. They proposed that we discuss theoretical aspects rather than applied.
11. Unlike his students, professor Smith always comes on time.
12. Although Denmark is an agricultural country it is also modern and industrialized.
13. The new edition is not so expensive as the old edition.
14. This observation leads us to the following definition.
15. We don't prove the theorem here, but rather, we illustrate it with two examples.
16. To prove things Euclid made certain assumptions which he called axioms.
17. They have markedly different approaches to the problem.
18. Try not to talk too much in conversations, but don't be silent, either.

**Text B** Study some terms from «The New Hacker's Dictionary» mentioned in Text A, and try to appreciate the humor.

**angry fruit salad:** n. A bad interface design that uses too many colors.

**baud barf:** /bawd barf/ n. The garbage one sometimes gets on the monitor when encountering *spurious* data, caused, for example, by an incorrect protocol setting.

**spurious** — wrong, false

**beige toaster:** n. A Macintosh PC.

**bit rot:** n. The hypothetical disease of unused programs or features that stop working after enough time has passed, even if «nothing has changed». The theory explains that bits decay as if radioactive.

**bletcherous:** /blech-(e)-rus/ adj. Disgusting in design or function; esthetically unappealing

**bulletproof:** adj. Descriptive of an algorithm or implementation considered extremely *robust* and capable of correctly recovering from any imaginable exception condition. This is a rare and valued quality.

**robust** — strong, effective

**chrome:** n. Showy features contributing little or nothing to the power of a system.

**glork:** /glork/ interj. Term of surprise, uttered when, say, trying to save the results of two hours of editing, you find that the system has crashed.

**guru:** n. An expert, implying not only the possession of wizardly skill but a history of being a knowledge resource for others.

**demigod:** n. Hacker with a national reputation and a major role in the development of a design, tool, or game known to over half of the hacker community.

**face time:** n. Time spent interacting with somebody face-to-face (as opposed to over an electronic link).

**New Testament:** n. The second edition of K&R's (Brian Kernighan and Dennis Ritchie's) «The C Programming Language» (Prentice-Hall, 1988), describing ANSI Standard C. The first edition is referred to as the Old Testament.

**to debug** — to search for or remove bugs (faults) in a computer program

**programming:** n. 1. Classically, the art of *debugging* a blank sheet of paper. 2. A pastime *akin* to banging one's head against a wall, but less rewarding.

**a bug** — (informal) a fault or difficulty in a machine, system, computer program

**softy:** n. Hardware hackers' term for a software expert ignorant of hardware.

**akin** — similar, having the same character or nature

**spaghetti code:** n. Code with a complex and *tangled* control structure, especially one using many GOTO's, exceptions, or other unstructured branching constructs.

**tense:** adj. Of programs, very clever and efficient.

**troglydye mode:** n. Programming with the lights turned off, sunglasses on, and the terminal inverted (black on white) because your eyes hurt.

**vaporware:** Products announced far in advance of any release (which may or may not actually take place).

**wedged:** adj. Stuck, incapable of proceeding without help (whereas crashing describes total nonfunctioning). The system may be capable of doing a few things, but is not fully operational.

**WIMP environment:** [acronym of Window, Icon, Menu, Pointing device] n. A graphical user-interface-based environment, as described by a hacker who prefers command-line interfaces for their superior flexibility and extensibility. Macintoshes and Microsoft Windows use WIMP interfaces.

**wizard:** n. A person who knows how a complex piece of software or hardware works and can find and fix bugs quickly in an emergency.

**tangle** — confused, disordered mass/state

**wizard** — a person with unusual, almost magical abilities

**Exercise 13.** Choose the correct word and fill in the blanks.

(to)create    creation    creativity    creative

1. His designs are always \_\_\_\_\_.
2. You should use your \_\_\_\_\_.
3. The project will \_\_\_\_\_ a sensation.
4. The report proposed is the \_\_\_\_\_ of an independent committee.

(to be) capable of    capability

5. We are not \_\_\_\_\_ improving it.
6. They will not doubt her \_\_\_\_\_ for the job.

(to) modify    modification(s)

7. A few \_\_\_\_\_ to the plan will \_\_\_\_\_ it.
8. The design has been \_\_\_\_\_.
9. Scientists \_\_\_\_\_ their views in the light of new evidence.

**Exercise 14.** Read the passage and answer the questions about it.

The world of telecommunications is changing rapidly. New devices become invaluable for both professionals and general public. Consider business travelers who must be able to maintain contact with the office, no matter what the time or place, since negotiations often involve decisions based on the latest figures. New telecommunications products and services on the market make staying in touch easier than ever before.

Personal portable products include calculators, portable radios and pocket telephones. The pocket telephone is really remarkable. The possibility to call or be called anyplace and any time permits the pocket telephone to be often considered as almost magic personal item. Another widespread device is cellular telephone. Car phones have proven indispensable for emergencies as well as for routine business. Pocket-size organizers — tiny computers that can store all kinds of information — may serve as phone and address directories, calculators and calendars. They help businessmen with heavy and hectic schedules.

Smaller, lighter fax machines allow instantaneous transmission of data to any location having a compatible fax machine. Faxing is becoming the primary means of sending and receiving short documents.

In the future we will see the explosive growth of communication services.



1. What is the best title for the passage?
  - a. The business traveler
  - b. New telecommunications products and services
  - c. Everyday communications
  - d. Business negotiations
2. It can be inferred from the passage that business travelers need to maintain contact with the office because
  - a. there are many new products
  - b. they have to do it every day
  - c. they must have the latest information for negotiations
  - d. it is a company's requirement
3. According to the passage, mobile phone service
  - a. is very useful in case of accidents
  - b. costs too much
  - c. is not yet available on the airplanes
  - d. will soon appear on the market
4. It can be inferred from the passage that pocket-size computers are especially useful for businessmen who
  - a. have no cellular phones
  - b. have few/many clients
  - c. contact the office frequently
  - d. have very busy itineraries
5. It can be inferred from the passage that fax machines
  - a. cannot be used with phone service
  - b. will soon replace mail delivery of short documents
  - c. are of little use nowadays
  - d. are not small and light enough

**Exercise 15.**

1. These plants look like small roses.
  - a. resemble
  - b. turn into
  - c. behave
  - d. appear
2. Unfortunately, this property is almost completely lost.
  - a. very slightly
  - b. nearly entirely
  - c. not so much
  - d. forever
3. I'm at a loss for I don't know what to do.
  - a. that is
  - b. since
  - c. as if
  - d. when
4. These devices are extremely accurate.
  - a. safe
  - b. original
  - c. versatile
  - d. precise

5. Because there is no exact definition for biological aging, it is difficult to determine when the phenomenon begins.
- while
  - though
  - due to
  - since
6. Roget's Thesaurus, a collection of English words and phrases, is arranged by the ideas they express rather than by alphabetical order.
- as well as
  - unless
  - together with
  - instead of
7. She got the job in that she was the best candidate.
- although
  - as soon as
  - because
  - while
8. I succeeded because of your help.
- since
  - in spite of
  - nevertheless
  - thanks to
9. Another indicator is provided by our committee.
- a different
  - one more
  - other
  - the other
10. Despite our efforts, we failed.
- because of
  - owing to
  - as opposed to
  - in spite of
11. These two concepts are different, even though they use the same word.
- because
  - although
  - however
  - therefore
12. In an identical manner, we see that this law holds.
- regularly
  - similarly
  - finally
  - gradually
13. In general, it is possible to be more specific.
- furthermore
  - in short
  - for instance
  - on the whole

14. The evidence is compelling, albeit indirect.
- hence
  - although
  - on the other hand
  - because
15. The scope of application of photographic techniques has expanded tremendously.
- diversely
  - obviously
  - gradually
  - enormously
16. He expressed it either with deliberate intent, or spontaneously.
- on purpose
  - by contrast
  - with respect
  - on the other hand
17. This technique should be differentiated from the previous one.
- be compared with
  - be opposed to
  - not be confused with
  - not be replaced by
18. Like everything else in office technology, telephone systems are getting smaller and more powerful.
- smarter
  - more space-saving
  - cost-effective
  - less expensive
19. In a broad sense, this application is quite possible.
- alternatively
  - in general
  - on the contrary
  - from now on
20. I'm concerned solely for your future.
- solitary
  - not only
  - somehow
  - only
21. For all its many problems, the United States system of education has achieved much.
- still
  - as opposed to
  - in spite of
  - by turns

## *Noteworthy*

*«When we begin the study of any science, we are in a situation similar to that of children; and the course by which we have to advance is precisely the same which nature follows in the formation of their ideas».*

***Antoine Laurent Lavoisier***

***Antoine Laurent Lavoisier*** (1743 — 1794) in the preface to «Elements of Chemistry». (Lavoisier originated the oxygen theory of combustion and is considered the father of modern chemistry).

## Chapter 5

Focus on:

**Of Truth and Theories  
Avoiding Sexist Language**

**Grammar: Mood.  
Expression of Conditions**

**Text A** Read the text and be ready to answer the questions that follow.

We regard as «true» the simplest explanation that satisfies all the data we have about any given thing. This principle is known as Occam's *razor*; it is named after a 14th century British philosopher who originally proposed it. Without this rule, we would always be *subject to* such *complicated doubts* that we would accept

nothing as known. Occam's razor sometimes called the Principle of Simplicity, is a razor in a sense that it is a cutting edge that allows distinction to be made among theories.

Science is based on Occam's razor, though we don't usually think about it. Sometimes, something that we call «true» might be more accurately described as a theory. The scientific method is based on hypotheses and theories. A hypothesis is an explanation of why something happens or happened. When it is shown that the hypothesis actually explains most of the facts known, then we may call it a theory. We usually test a theory by seeing whether it can predict things that were not previously observed, and then by trying to *confirm* whether the predictions are *valid*.

An example of a theory is the Newtonian theory of gravitation, which for many years explained almost all the planetary motions. Only a small discrepancy in the orbit of Mercury remained unexplained. In 1916, Albert Einstein presented a general theory of relativity as a better explanation of gravitation. The theory explained the *discrepancy* in Mercury's orbit. When his predictions were verified, his theory was widely accepted.

Is Newton's theory «true»? Yes, in most regions of space. Is Einstein's theory «true»? We say so, although we may also think that one day a new theory will come along that is more general than Einstein's in the same way that Einstein's is more general than Newton's.

**razor** — укр. бритва

**subject to** — tending or likely (to have), causing to experience укр. зазнавати

**complicated** — difficult to understand or deal with укр. складний

**doubt** — (a feeling of) uncertainty of belief or opinion, lack of confidence укр. сумнів

**to confirm** — to give support or certainty to (a fact, statement etc.) e.g. by providing more proof or by stating that something is true or correct

**Synonyms:** to verify, to prove, to corroborate

укр. підтверджувати, стверджувати

**valid** — firmly based on what is true or reasonable укр. дійсний. **Antonym** — invalid

**discrepancy** (between) — difference, lack of agreement or similarity — укр. розбіжність, розходження, невідповідність

1. What is specific about «Occam's razor»?
2. What is the correlation between the hypothesis and the theory?
3. What are possible ways of testing a theory?

**Exercise 1.** Give English equivalents of:

сумніви; найпростіше пояснення; вперше запропонувати принцип; невелика розбіжність; більш точний опис; краще пояснення; широко визнавати; загальна теорія відносності; підтверджувати; фактично пояснювати; дійсний.

**NOTE**

**Probability** may be expressed in English in many different ways (see Expression of Conditions (chapter 5), Modal Verbs (chapter 6)).

Mind several linguistic devices that usually express probability (for a more detailed list see appendix X).

(It is) possible/probable (that)

possibly/probably

можливо, ймовірно

(It is) likely (that)

схоже

There is

strong

high

definite

дуже ймовірно

probability

possibility

that

(It is) impossible (that)

(It is) unlikely (that)

несхоже

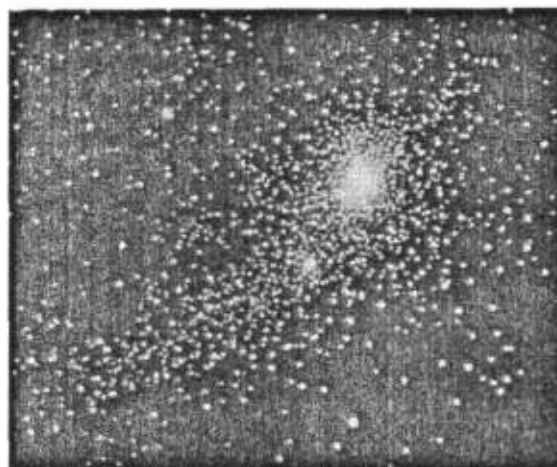
**Exercise 2.**

Read the text. Find linguistic devices expressing probability and hypotheses. Render the passage into Ukrainian.

In 1705, the English astronomer Edmond Halley applied the new theory of gravity developed by his friend Isaac Newton to determine the orbits of comets from observations of their positions in the sky. He reported that the orbits of the bright comets that had appeared in 1531, 1607, and 1682 were about the same. He was troubled, though, that the intervals between appearances were not quite equal. The scientist resolved this difficulty by analyzing the effect on the comet's orbit by the gravity of Jupiter and Saturn. Halley said that we were possibly observing a single comet orbiting the sun. He predicted that it would return in 1758. The reappearance of this comet on Christmas night of that year, 16 years after Halley's death was the proof of Halley's hypothesis; the comet has since been known as Halley's comet. It seems probable that the bright comets reported every 74 to 79 years since 240 B.C. were earlier appearances. The comet will be back in the inner solar system in 2061, but only in May 2134 will we have a spectacular view from the Earth's surface, though we may not be *limited* to the Earth's surface by that time.

**to limit** — to keep within a certain area, size, amount, number, limits.

**Synonyms:** to restrict, to confine





## GRAMMAR: MOOD. EXPRESSION OF CONDITIONS

Mood is any of three special forms of verbs that express:

**a fact or action** — Indicative Mood — дійсний спосіб

He	is studying	studied	will study.
	studies		
Він	вчиться	вчився	буде вчитися

**a command** — Imperative Mood — наказовий спосіб

Do as most men do, then most men will think well of you.

Робіть, як більшість людей, і тоді про вас будуть думати добре.

**a wish, a doubt** — Subjunctive Mood — умовний спосіб

What would you do in my place?

(May) success attend you!

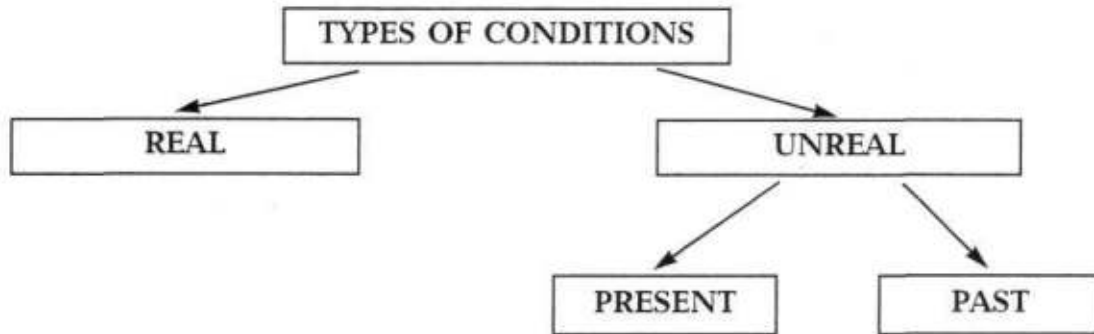
Хай щастить!

If only I knew!

Якби ж я знав!

### SEMANTIC TYPES OF CONDITIONAL SENTENCES

<p><b><u>FACTUAL</u></b> express relationships that are true and unchanging</p>	<table style="border-collapse: collapse; margin-left: 20px;"> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">If when(ever)</td> <td style="padding: 0 5px;">the temperature gets to 0° C, water freezes.</td> </tr> </table> <p>Коли температура сягає 0° C, вода замерзає. If it is 11 p. m., the library is closed. Якщо зараз 11 година вечора, бібліотека зачинена. If it is September, 13, it's my father's birthday. Якщо сьогодні 13 вересня, це день народження мого батька.</p>	If when(ever)	the temperature gets to 0° C, water freezes.	
If when(ever)	the temperature gets to 0° C, water freezes.			
<p><b><u>FUTURE (PREDICATIVE)</u></b> express future plans</p>	<table style="border-collapse: collapse; margin-left: 20px;"> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">If I</td> <td style="padding: 0 5px;">may might ... ... should happen to should happen to</td> <td style="border-left: 1px solid black; padding: 0 5px;">have the time, I'll call you.</td> </tr> </table> <p>Якщо у мене буде час, я вам зателефоную.</p>	If I	may might ... ... should happen to should happen to	have the time, I'll call you.
If I	may might ... ... should happen to should happen to	have the time, I'll call you.		
<p>→ <b><u>HYPOTHETICAL</u></b> express unlikely yet possible events</p> <p><b><u>IMAGINATIVE</u></b> ↳ <b><u>COUNTERFACTUAL</u></b> express impossible events or states</p>	<p>If she had the possibility she would visit Toronto. Якби у неї була можливість, вона б відвідала Торонто (може у неї ще буде нагода).</p> <hr/> <p>If Newton were alive, he would live in England. Якби Ньютон був живий, він жив би в Англії.</p>			



### REAL CONDITIONS

if якщо  
 even if навіть якщо  
 only if тільки якщо  
 on condition (that) за умови  
 in case, in the event  
 якщо, в разі, за умови

provided (that), providing (that)  
 за умови

suppose / imagine  
 assuming (that) ...  
 припустимо  
 What if ... ?  
 а якщо  
 Should (as equalent of «if»)  
 якщо, якщо трапиться

unless якщо не

lest щоб не, аби не

if ... would  
 якщо (захочете)

If you study hard, you will pass the exam.  
 Якщо ви будете наполегливо вчитися, то зможете скласти іспит (зміст: ви можете вчитися зараз, тобто ця умова є реальною).

I will go **provided that** you go too.  
 Я їду за умови, що й ви також підете.

**Suppose** it rains, what shall we do?  
 Припустимо, піде дощ — що ми будемо робити?  
**What if** we change the approach?  
 А якщо змінити підхід? (що відбудеться, якщо ... )  
**Should** you be interested, I have a book on the subject.  
 Якщо (трапиться, що) ви зацікавитесь, у мене є книга з цього питання.

**Unless** you study hard, you won't pass the exam.  
 Якщо ви не будете наполегливо вчитися, ви не зможете скласти іспит.

Write down the rule **lest** you forget it.  
 Запишіть це правило, аби не забути його.

If you **would** let me come ...  
 Якщо ви дозволите (захочете дозволити) мені прийти ...

### UNREAL CONDITIONS

Present	Past
<p>If you <b>studied</b> hard, you <b>would pass</b> the exam.            Якби ви наполегливо вчилися, то склали б іспит. (зміст: зараз ви не вчитеся наполегливо, тобто зараз умова є нереальною).</p>	<p>If you <b>had studied</b> hard, you <b>would have passed</b> the exam.            Якби ви наполегливо вчилися, то склали б іспит. (зміст: ви не вчилися наполегливо раніше, тобто умова є нереальною у минулому).</p>
<p><b>If only I knew</b> it!            Якби я тільки знав про це! (зараз)            (зміст: я не знаю про це)</p>	<p><b>If only I had known</b> it!            Якби я тільки знав про це! (раніше, колись, у минулому) (зміст: я не знав про це)</p>

**I wish I were there.**  
Як би я хотів бути там (зміст:  
я жалкую, що мене там немає).

**I wish I had been there.**  
Як би я хотів бути там (зміст: я шкодую,  
що мене там не було).

**Also:** \* It's a pity / I regret

Even if he **were** here, he **wouldn't help** us.  
Навіть якщо б він був тут (зараз),  
він би нам не допоміг.

Even if he **had been** here, he **wouldn't have helped** us.  
Навіть якщо б він був тут (тоді), він би  
нам не допоміг.

Even if I **had** a dictionary,  
I **wouldn't use** it.  
Навіть якщо б у мене був зараз  
словник, я б не скористався ним.

Even if I **had had** a dictionary, I **wouldn't have used** it.  
Навіть якщо б у мене був словник (тоді), я  
б не скористався ним.

**Also:**

\*If I were in your place /shoes =  
\*Were I in your place / shoes  
(Якщо б я був на вашому місці ... )  
If I had this book ... = Had I this book ...  
(Якби в мене була ця книжка ... )

\*but for якби не  
transforms into «if it were not for»  
(Present Unreal)  
and «if it had not been for» (Past Unreal)

**But for** your help, I'd fail.  
Якби не ваша допомога, я б не досяг  
успіху.

### OTHER EXPRESSIONS DENOTING CONDITIONS:

Conditions permitting, ... Якщо дозволять умови ...  
It being the case, ... Якщо це саме той випадок  
if so, ...якщо так  
if not, ...якщо ні  
if any, if anything, ... якщо хоч щось ...  
if anybody якщо хтось  
if at all якщо взагалі

#### NOTE.

#### Forms of Subjunctive

Present	Past
<b>be</b>	<b>were</b>
infinitives WITHOUT to	

The rules of the sequences of tenses are NOT observed after:

It	is was has been	necessary необхідно important / vital важливо desirable бажано essential суттєво, важливо	that you	know it
				be here
				<i>American English</i>
				should know it should be here <i>British English</i>

It is important that they **be** present at the meeting.

Важливо, щоб вони були присутні на зборах.

Compare:

It is important that they **are** present at the meeting.

Важливо, що вони присутні на зборах.

I	suggest(ed) (make/made a suggestion) propose(d) пропонувати insist(ed) наполягати order(ed) наказувати recommend(ed) рекомендувати demand(ed) require(d) (it is/was a requirement) вимагати	that you	do   it
			know   it
			be here  <i>American English</i>
			should do   it should know   it should be here <i>British English</i>

We **insist (insisted)** that the meeting **be** held tomorrow.

Ми наполягаємо (наполягали), щоб засідання відбулося завтра.

**But:** **Indicative Mood (and therefore regular rules of sequence of tenses) are used with the following expressions:**

It is | strange/curious/surprising/astonishing (дивно)  
 | possible/probable/likely (ймовірно, схоже)  
 | unlikely (несхоже)  
 | wonderful (чудово)  
 | natural (природно)

It **is** strange that they **know** about it.

Дивно, що вони про це знають.

It **is** strange that they **knew** about it.

Дивно, що вони про це знали.

It **was** strange that they **had known** about it.

Видавалося дивним, що вони про це знали.

**Memorize the following useful expressions with conditionals:**

So be it. Нехай буде так.

Let it be so.

Be that as it may, ... Як би то (там) не було, ...

As | luck | would have it, ... За | щасливим | збігом обставин ...  
 | ill luck | | нещасливим |

Come | what | may Що б там не було; що трапиться, то трапиться  
 Happen | | will

Suffice it to say (that) ... досить сказати, (що)...

Far be it from me to ... Я далекий від того, щоб/аби ...

\* If things were to be done twice, all would be wise. Мудрий по шкоді.

**Exercise 3.** Choose the correct option:

1. I wish you would have called.
  - a. You called.
  - b. You didn't call.
2. If I have money, I buy English books.
  - a. I always do this.
  - b. I do this when I have money.
3. If she had studied for her test, I'm sure she would have done quite well.
  - a. She didn't study.
  - b. She studied.
4. If Mary had been at the office, she would have helped you.
  - a. Mary helped you.
  - b. Mary didn't help you.
5. You could have gotten a higher score.
  - a. You didn't get a high score because you didn't study.
  - b. You got a high score because you studied.
6. They could have finished the project on time.
  - a. They had the ability to be quicker.
  - b. They finished the project on time.
7. Let's pretend that we have this opportunity.
  - a. We have the opportunity.
  - b. We don't have the opportunity.
8. I wish you had come back.
  - a. You did not come.
  - b. You came.
9. If you had done your homework, you would have gotten an excellent mark.
  - a. You didn't get an excellent mark because you didn't do your homework.
  - b. You did your homework, and so you got an excellent mark.
10. You could have brought a friend to the party.
  - a. You came alone.
  - b. You came with a friend.
11. I wish that you liked the meeting.
  - a. You didn't like the meeting.
  - b. You liked the meeting.
12. I hope that you enjoyed the party.
  - a. You didn't enjoy the party.
  - b. There is actual possibility that you liked the party.

**Exercise 4.** Make up microdialogues with your colleagues. Work in pairs.

What would you do if you were

10 years old again  
a writer  
a millionaire  
head of your department

**Example:**

**A.** I wonder, what would you do if you were a millionaire?

**B.** If I were a millionaire, I would give all my money to my teacher!

**Exercise 5.** Translate Ukrainian sentences. Then match the two columns.

- |   |  |
|---|--|
| <p>1. Якби тут був мій науковий керівник, він би, безсумнівно, усе пояснив.</p> <p>2. Без води не було б життя.</p> <p>3. Бажано, аби результати були опубліковані.</p> <p>4. Якби був використаний цей новий метод, ми отримали б кращі результати.</p> <p>5. Життя не могло б існувати на землі, якби не тепло та світло, яке вона отримує від сонця.</p> <p>6. Головна вимога — щоб наш експеримент закінчився вчасно.</p> <p>7. Більшість сучасних винаходів була б неможливою без наукового прогресу.</p> <p>8. Важливо, аби він ретельно виконав свою роботу.</p> <p>9. Якби у мене була ця книга, я б дав її вам.</p> <p>10. Необхідно, аби вони зазначили методи, які б можна було використати надалі.</p> <p>11. Якби він знав теорію, він би пояснив цей феномен.</p> <p>12. Я хотів би сказати декілька слів.</p> <p>13. Якби вчора у нього був час, він би прийшов.</p> | <p>A. The main requirement is that our experiment be finished in time.</p> <p>B. There would be no life without water.</p> <p>C. Most of the present-day discoveries would not have been possible without progress in science.</p> <p>D. If I had this book, I would give it to you.</p> <p>E. Were my research advisor here, he would undoubtedly explain everything.</p> <p>F. It is necessary that they indicate methods that might be developed further.</p> <p>G. He would have come, if he had had time yesterday.</p> <p>H. Had he known the theory, he would have explained this phenomenon.</p> <p>I. It is desirable that the results be published.</p> <p>J. Life could not exist on the Earth but for the heat and light which it receives from the Sun.</p> <p>K. If this new method were applied, we would obtain better results.</p> <p>L. It is essential that he perform his work carefully.</p> <p>M. I would like to say a couple of words.</p> |
|---|--|

**Exercise 6.** Complete the following sentences.

1. Galileo proposed the hypothesis that all falling bodies ... at the same constant speed.
  - a. dropped
  - b. will drop
  - c. drop
  - d. would drop
2. It was natural that they ... us of the decision.
  - a. inform
  - b. had informed
  - c. informed
  - d. will inform
3. In 1913, Niels Bohr made the suggestion that electrons ... around the nucleus in orbits.
  - a. spinned
  - b. will spin
  - c. are spinning
  - d. spin

4. It is necessary that they ... the book.
  - a. are publishing
  - b. published
  - c. publish
  - d. will publish
5. They insisted that all the students ... the meeting.
  - a. will attend
  - b. had attended
  - c. attended
  - d. attend

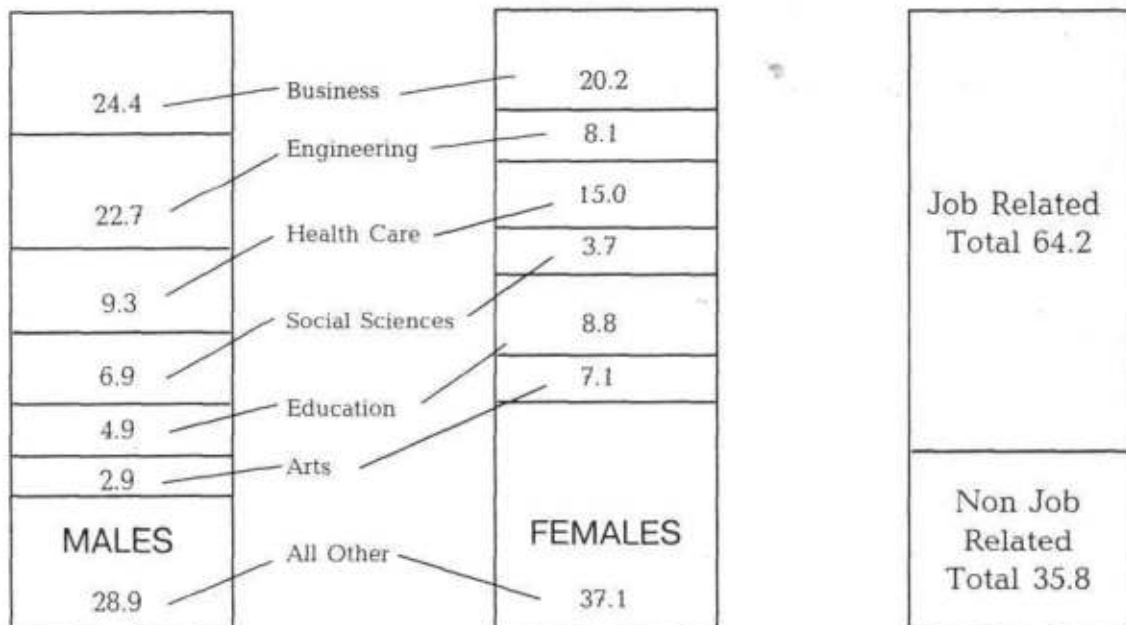
**Exercise 7.** Translate the following sentences into Ukrainian.

1. If we assume nothing, we can prove nothing.
2. If we generalize these facts, we can prove the following results.
3. Had we only known, we would have attended the conference.
4. It would be a mistake to think that they are unaware of this fact.
5. Should this not be the case, we may try another approach on the basis of an alternative hypothesis.
6. In any event, it is essential that the students know this law.
7. Far be it from me to contradict you.
8. Come what will, I'll carry out this experiment.
9. Suffice it to say that this idea lacks originality.
10. As luck would have it, I performed the experiment.

**Exercise 8.** Comment on the following graphs. Make some predictions about adult education courses if present trends continue.

*Adult education courses taken by males and females  
(with percentages)*

*Reasons and objectives for taking adult  
education courses (with percentages)*





**Text B** Read the text and be ready to answer the questions about it.

Women form more than 9 percent in the U.S. engineering workforce. Still, engineering is a male-dominated profession. Even so, many customs and habits that once seemed OK in all-male workspace, now are no longer viewed that way. Among these, the use of *sexist* language, either intentionally or unintentionally, is a growing source of *anger* in the office.

One of the issues is the general use of the masculine gender *to denote* both male and female subjects. In many Indo-European languages, gender marks words as masculine, feminine or neuter.

This is not always accurate, however. Perhaps the most *ridiculous* example is the German word for girl, «das Mädchen», which is neuter. But the English language does not *utilize* gender. Instead, the sex of a person is designated by using the appropriate pronoun or possessive adjective. Traditionally, «he» has been used to denote a sexless person, making it a neuter pronoun. A growing *consensus*, though, no longer accepts this view, so that the way people communicate is changing. In «The Elements of Nonsexist Usage» (1990), Val Dumond writes that pronouns present one of the greatest challenges for avoiding sexism in language. As a first choice, Dumond suggests *omitting* the pronoun whenever possible. A sentence such as «An engineer should never trust his computer» can be rewritten as «An engineer should never *trust* a computer». Alternatively, the plural form may be employed, generating in this case «Engineers should never trust a computer».

Even in traditional correspondence the use of «Dear Sir(s)» as a universal form of address to an organization, or to an individual when (his? her? their?) sex is not known has come under fire. Some suggest that the salutatory «Dear» has itself become an archaism, and should be dropped. Letters to organizations, which are usually *formal* could use a «To:» line with the name of organization or department, such as «Customer Service Manager».

The most useful rules are to avoid the generic use of **man** to refer to both **men** and **women**, and not to imply gender when it is unnecessary to do so. Make your language inclusive, always give equal treatment to both men and women. If the sex of the subject is not relevant to the matter, it should be omitted.

For dealing with titles and job descriptions, a non-gender-specific form of the word can usually be found. Luckily, the most common terms, such as «scientist», «engineer», or «technician» are already grammatically neuter.

**sexism** — the belief that one sex is not as good, clever, etc. as the other, esp. when this results in unfair treatment of women by men

**anger** — strong feeling of displeasure  
укр.—гнів

**to denote** — to be a name of; mean.

укр. позначати, виражати.

**ridiculous** — silly or unreasonable  
укр. нісенітний, безглуздий

**to utilize** — to use, to make use of (to employ)  
укр. використовувати

**consensus** — a general agreement, the opinion of most of the people in a group  
укр. згода, однастайність

appropriate pronoun or possessive adjective.

making it a neuter pronoun.

so that the way people communicate is changing.

As a first choice, Dumond suggests

omitting the pronoun whenever possible.

A sentence such as «An engineer should never

trust his computer» can be rewritten as «An engineer should never

trust a computer».

Alternatively, the plural form may be employed, generating in this case

«Engineers should never trust a computer».

**to omit** — to leave out (by mistake or purpose)  
укр. пропускати

**to trust** — to believe in the honesty and worth of (someone/something), to have confidence in  
укр. довіряти

**formal** — based on or done according to correct or accepted rules, e.g. social behavior or official business. Also: official

укр. офіційний, формальний

1. What is the subject of the passage?
2. What is one of the tendencies in language usage?
3. What are the strategies of avoiding sexism in language?
4. Give examples of some grammatically neuter terms denoting titles and job descriptions.



**Exercise 9.** A. The following sentences contain stereotypes of male and female roles. Propose your options to avoid stereotyping:

1. A secretary should be familiar with her duties.
2. Every member of congress will cast his vote.
3. When everyone contributes his ideas, the workshop will be very stimulating.
4. A professor should meet his students regularly.
5. A director will bring his draft.

B. Avoid sexist language by choosing the appropriate options:

spouses                      to have a career              lay people              the average person/ordinary people  
 assistant                      humanity                      chairperson              police officer

1. This problem concerns the whole mankind.
2. My girl will inform committee members of the meeting.
3. Alexandra is a career woman.
4. The policeman arrested the criminal.
5. The common man will suffer most.
6. The professors and their wives attended the meeting.
7. Who is a chairman?
8. To laymen the jargon that hedges such words as WIMP can seem impenetrable.

**Exercise 10.** Draw a graph based on the following data. Make some predictions for the future if present trends continue.

Women-scientists in the USA (mid 1990s)

Percentage of physics PhD's to women — 8  
 Percentage of mathematics PhD's to women — 19  
 Percentage of chemistry PhD's to women — 25  
 Percentage of biology PhD's to women — 38  
 Percentage of psychology PhD's to women — 56

**Exercise 11.** Choose the correct word and fill in the blanks.

(to) explain      explanation      explanatory

1. My assistant will \_\_\_\_\_ the diagram.
2. There is no \_\_\_\_\_ for her absence.
3. There are some \_\_\_\_\_ notes at the end of each unit.

intention                      intentional

4. I had no \_\_\_\_\_ of changing my mind.
5. His absence was quite \_\_\_\_\_.

accurate                      accuracy

6. His report is \_\_\_\_\_ in every detail.
7. To be on the safe side, pay special attention to the \_\_\_\_\_ of calculations.

(to) avoid                      avoidance

8. I tried \_\_\_\_\_ answering these questions .
9. We are discussing possible ways of \_\_\_\_\_ of danger.

theoretical	theoretically	(to) theorize	theorist (theoretician)
-------------	---------------	---------------	-------------------------

10. First, I'll explain how it works \_\_\_\_\_, then I'll give you a practical demonstration.
11. He is our leading \_\_\_\_\_.
12. It's easy \_\_\_\_\_ about it.
13. She majors in \_\_\_\_\_ physics.
14. It's a \_\_\_\_\_ possibility, but I don't suppose it will happen.

**Exercise 12.** Read the passage and answer the questions about it.

What is culture? Culture is knowledge, beliefs, and behavior shared by a group of people that is learned and passed on from generation to generation.

It is not possible to say that all Americans share the same culture. It is more accurate to speak about the many cultures of Americans — the U.S. is often described as a «culture of cultures». Yet, even though it is not possible to speak of a single American culture, Americans talk about a «mainstream» U.S. culture that is shared by a majority of Americans.

When Americans describe their culture they may describe an ideal and not a real culture. For example, the following are often given as values of mainstream American culture: independence, hard work, honesty, equality of all persons. While many Americans show these values, there are also times when they do not, i.e. such values often describe an ideal way of living. The history of the USA shows Americans trying to change the values from ideal to real ones, for example, today Americans are continuing their efforts in the area of equality of women's and men's rights.

Sometimes one may overgeneralize particular features of a culture. For example, in southern U.S. «Sir» and «Ma'am» are used more frequently than in other regions, but if you have been only to southern U.S. you may think that this is true for all Americans. Overgeneralizations, called stereotypes, can create a false view of another culture. Some overgeneralizations are positive, such as «Americans are hardworking and honest», other are negative, such as «Americans appear friendly, but don't really want to have deep relationships». Any stereotype, whether positive or negative, describes a group of people, but not individuals in that group.

Sometimes culture learning, like language learning can be tiring. This tired feeling, or culture fatigue is normal when you adapt to a different culture and language. Sometimes due to fatigue and frustration, some people become too critical of the new culture. The important thing, however, is to remember that adapting to a culture does not mean accepting everything in that culture.

1. What is the best title for the passage?
  - a. Real and ideal values.
  - b. Cultural stereotypes.
  - c. Culture learning.
  - d. Mainstream culture.
2. The U.S. can be called «a culture of cultures» because
  - a. Americans are very interested in cultures
  - b. there are many different cultures in the USA
  - c. all Americans share the same culture
  - d. American culture is a single culture
3. Independence, hard work, honesty, equality are:
  - a. examples of ideal culture for all people
  - b. examples of ideal American culture
  - c. examples of real American culture
  - d. examples of real culture for all people
4. An example of stereotype is
  - a. most Americans live in the U.S.
  - b. some Americans say «Ma'am» and «Sir» frequently
  - c. Americans are friendly, but don't want to have deep relationships
  - d. many people visit U.S. every year

5. When people are adapting to a new culture they can criticize this culture because:
- they have to accept everything in the new culture
  - they overgeneralize this culture
  - when people are tired, they may say things they don't really mean.
  - they feel homesick

**Exercise 13.** Choose the one word or phrase that best keeps the meaning of the underlined word or phrase if it is substituted for it:

- It's rather complicated to explain.
  - easy
  - boring
  - difficult
  - interesting
- The evidence confirms our predictions.
  - tests
  - proves
  - challenges
  - confines
- Can we reach a consensus on this issue?
  - solution
  - agreement
  - conclusion
  - decision
- I have omitted all minor details.
  - brought about
  - added
  - revised
  - left out
- We need a formal invitation.
  - valid
  - official
  - regular
  - confirmed
- This fact is impossible to verify.
  - to corroborate
  - to overestimate
  - to understand
  - to accept
- Don't apply for the job unless you qualify.
  - if you don't
  - if only
  - in case
  - provided that
- It is essential that he perform his work carefully.
  - required
  - importable
  - important
  - desirable

9. Should they invite you, bring all the papers.
- unless
  - if
  - after
  - would
10. It is highly desirable that we solve this problem.
- slightly
  - usually
  - somewhat
  - very
11. The economists predicted an increase in the rate of inflation.
- made an assumption —
  - made prognosis —
  - made effort —
  - made decision —
12. Assuming that you are right about this, what shall we do?
- even if
  - suppose
  - only if
  - unless
13. Please confine yourself to the subject in question.
- conclude
  - combine
  - extend
  - restrict
14. Provided (that) there is no opposition, we'll hold the meeting tomorrow.
- now
  - so
  - as
  - if

## ***Noteworthy:***

*To women who wish to become professional scientists I am also suggesting that they remember, ... «If you are not for yourself, who will be? And if not now, when?»*

*Fay Aizenberg-Selove (a professor of physics, USA)*

## UNscientifically speaking...

### LET'S LOOK AT A TEST FROM A STUDENT'S POINT OF VIEW

## Chronology of a test

- 8:30 a.m. The student writes down the name and hopes for logical answers in the test.
- 8:35 a.m. *After reading the first problem, curses himself or herself for having skipped that drill exercise the night before.*
- 8:40 a.m. Mental block. The hallucinations begin.
- 8:43 a.m. Phrases like: «That isn't coming in the test!» start tormenting the student.
- 8:47 a.m. Something tells him or her how to answer the questions; takes the pencil out of the mouth and starts hopelessly filling out an answer sheet.
- 9:00 a.m. Those were 10 easy points, s/he proudly pats herself/himself on the back.
- 9:06 a.m. Reality check. Cold sweat. Hallucinations.
- 9:10 a.m. Only 5 minutes left, the last problem has the most dreadful word one has yet to encounter in a test.
- 9:13 a.m. Shamelessly starts guessing the answers to the questions that s/he is unsure about. Uses the last minutes to review the known answers, the rest is pointless. Recognizes it's never too late to pray.

## Chapter 6

Focus on:

**INTERNET  
Acronyms and Initialisms**

**Grammar: Modal Verbs and Their  
Equivalents**

**Text A** Read the text and be ready the answer the questions that follow.

The terms INTERNET, World Wide Web (WWW), the information highway refer to a dynamic new way that people around the world are using for communication and accessing vast amounts of computer related information. Today, we are integrated in an electronic communications world that *spans* the globe and offers a myriad of services — some for payment, some free.

The Internet was born from roots of military secrecy and academic researchers engaged in *hush-hush* projects.

Electronic mail *evolved* spontaneously in mid-1960s. These early mail systems were written by a programmer or two, often as a weekend project, and had no uniformity. Then in 1969, the Advanced Research Project Agency Network (Arpanet) was begun by the U.S. government so that researchers at universities and other facilities might electronically *ship* computer data to each other and

*remotely launch* computer programs. A year later, Raymond Tomlinson, a principal scientist at BBN, the main Arpanet contractor, wrote a program employing Arpanet's file transfer protocol. The software let BBN's local mail system communicate with independent mail systems at the other Arpanet sites. An additional influence came from the U.S. Department of Defense, which in 1978 *endorsed* the Transmission Control Protocol/ Internet Protocol (TCP/IP) as a data communications standard, and made it a requirement on Arpanet and Milnet (a government military network) in 1983. The result: e-mail quickly became a key means of communication among Arpanet users, as well as a *vehicle* for transmitting other information such as data files, packaged as e-mail messages. Today e-mail reaches many millions of people around the globe.

Obviously, e-mail has many elements present in other forms of communication — body language, monogrammed notes etc. that give paper mail a personal touch. A few examples of «emoticons» or «smilies» that may be used in messages in a host of ways:

:-)	A joking comment
;-)	A flirtatious or sarcastic comment
:-(	A frown, the user is upset or depressed
:-D	A laugh
:-@	A scream
%-)	Confused
:-X	My lips are sealed
:-*	A kiss

Improvements in electronic mail services are on their way. Portable notebook computers with built-in wireless modems will enable users to send and receive e-mail anywhere. The advantages of electronic mail are many. Besides the obvious *boon* of avoiding telephone time-zone dissonance, e-mail gives companies unprecedented *flexibility*.

This flexibility may let companies operate with a smaller workforce — a specialist may work part-time with several project teams many hundred kilometers away. When one runs into a problem, e-mail can broadcast «does anybody know» request throughout the network. A person can say «Help» to 10000 people (which a person cannot do on the telephone), and the next morning s/he may have 15 answers to the problem, of which 13 are wrong. But s/he has answers!

**to span** — to include in space or time укр. охоплювати  
**hush-hush** (informal) — of plan, arrangement, etc. hidden from other people's knowledge, Synonym: secret укр. таємний, секретний

**to evolve** — to develop gradually укр. розвиватися

**to ship** — to send to a distant place укр. транспортувати

**remote** — distant in space or time

укр. віддалений, далекий

**to launch** — 1) to send; 2) to begin, to start

укр. 1) посилати 2) починати

**to endorse** — to express approval or support укр. ухвалити

**vehicle** — something by means of which something else can be passed on укр. засіб

**NOTE ALSO:**

vehicle — укр. будь-який транспортний засіб

**boon** — something very helpful or useful укр. благо

**flexible** — that can change or be changed to be suitable for new needs укр. гнучкий



With e-mail, months or years no longer pass between a researcher's completion of experiments, and the *dissemination* of results. Now, scientific papers are «published» on the network, commented on, and often revised and «republished» several times before they appear in traditional journals or are delivered at conferences. A drawback of electronic mail, though, is that the ability to move fast is not always positive. Anytime there is rush, there is less time to *contemplate* the results. We all make mistakes, and the increased rapidity in communications is *depriving* the scientist of the time to think, and talk to colleagues, and change things before they are made public. Electronic mail has some limitations. Everybody knows that it is very hard to reach a decision about something that is complex and multifaceted. Many scientists noticed that in course of lengthy and deep technical discussions carried on by means of e-mail it is hard to summarize the data presented and guide the group toward a solution — a usual result of a face-to-face meeting. But e-mail is great for collecting information, for helping people have contacts with many other people.

### FIDONET

Unlike the Internet, FidoNet is a telephone-based relay network, requiring people to make calls using existing public phone lines, ideally at regular intervals, to forward e-mail.

### INTERNET GOPHER



Internet Gopher is a communications application designed by the University of Minnesota which allows users to access more than 5,000 Gopher servers worldwide.

#### NOTE

Назва *Gopher* власне походить від:

«go fer» → «go for» («... принеси») → gopher (ховрах)

### WORLD WIDE WEB

WWW is a *hypertext-based* system for accessing Internet resources. Though an efficient way to share information, the Internet had a drawback. There was no problem sharing text, because everyone could use *ASCII* format for text files. But no such commonly agreed format existed for graphical, video, or audio data. In 1989, a London-born physicist and computer scientist, Tim Berners-Lee solved these problems while working at CERN, the European Laboratory for Particle Physics near Geneva. To help the physicists throughout the facility share information, he *contrived* a simple means of transmitting all kinds of data — graphical, video, audio. Berners-Lee with his associates developed the Web by modifying and combining common software protocols. The fundamental Web protocols are the hypertext mark-up language (html) and the hypertext transport protocol (http, based on TCP/IP).

Berners-Lee described his creation as an Internet-based hypermedia initiative for global information sharing. For short, he called it the World Wide Web.

Now we have a lot of new technology with the potential to help us communicate widely, quickly, and efficiently.

**hypertext:** internally cross-referenced written information that allows a user to jump from topic to related topic

**ASCII** — American Standard Code for Interchange; a set of 128 letters, numbers etc. used for easy exchange of information between a computer and other data processing machinery (вимовляється «ескі»)

**to contrive** — to make or invent in a clever way, esp. because of a sudden need укр. винаходити, вигадувати, вимудрувати.



1. What is the subject of the passage?
2. What are the roots of Internet?
3. What is specific about «smilies» or «emoticons»?
4. What are the obvious advantages of e-mail? Are there any limitations?
5. What is specific about FidoNet?
6. What is specific about the World Wide Web?

**Exercise 1.** Give English equivalents of:

світ електронних комунікацій; велика кількість послуг; безкоштовні послуги; секретний проект; програмне забезпечення; апаратне забезпечення; електронна пошта; засіб передачі інформації; ухвалити стандарт; портативні комп'ютери; запит; розповсюджувати результати; обмірковувати; багатогранна проблема; гіпертекст; вигадати простий засіб.

**Exercise 2.** Render the following passages into Ukrainian. Discuss the points with your colleagues.

**A.**

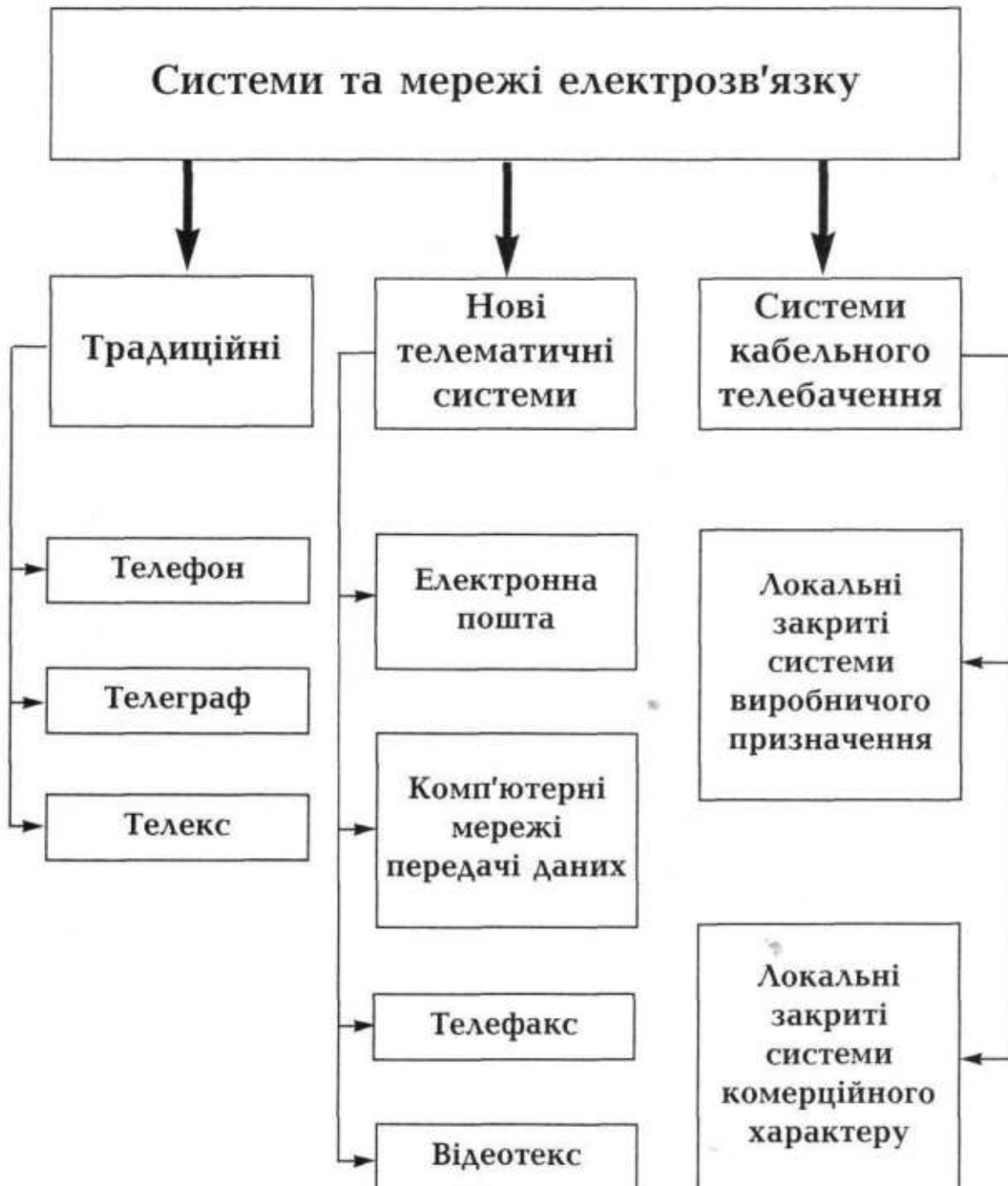
The age of the so-called information highway is beginning. This highway starts with computer operators in the 50s who begin to communicate among themselves using specialized languages and protocols. Today we think that electronic communications world (since it is digital) must be accurate, reliable, and low cost. Perhaps. In some cases. At times. Yes, e-mail is transferred across the Internet in seconds. However, if it crosses a boundary between the Internet and a relatively restricted network there can be delays of seconds, minutes or hours — just like leaving a superhighway and encountering road construction or customs checkpoint.

Perhaps, your e-mail is delivered promptly. Who will read it? Maybe that person is busy, out of town, or simply doesn't know what is needed to answer you. We need to distinguish between our expectations of the communications technology and our expectations of the people with whom we communicate.

**B.**

Historians of technology often tell us how long it takes for technological innovations to enter widespread use. They say that 25 years is the expected interval. The telephone, television, and fax machine, for example, all took 25 years to reach popularity. But what about the Web? It became ubiquitous all of a sudden, and this ubiquity is growing, changing our view of information, society, and business. Is another Web-like thing on its way? \*all of a sudden = suddenly

Exercise 3. Translate the following table.



## GRAMMAR:

## MODAL VERBS AND THEIR EQUIVALENTS (PHRASAL MODALS)

Modal verbs are used when we say that we expect things to happen, or that events are possible (necessary, improbable, impossible), or when we say that things did not happen, or when we are not sure whether they happened.

Modal verbs have no -s ending for the third person singular, they are followed by the infinitive WITHOUT to (except for *ought to*).

Modal verbs can be used with perfect infinitives to talk about things that did not happen, or which we are not sure about in the past.

Modal verbs make *questions* and *negative forms* WITHOUT using *do/did*.

Modal verbs are: **can, could, may, might, shall, should, will, would, must, ought to, dare**. In *British English* need can be both a modal verb and an ordinary verb. In *American English* it is NOT used as a modal.

## MODAL VERBS

can, could, 1. can't, couldn't, could have	meaning	equivalents (phrasal modals)
<u>can</u>	<u>present ability</u> теперішня можливість	<u>to be able to</u>
I <u>can</u> drive. Я можу (вмію) водити машину.		Ann is <u>able</u> to type. Енн може (вміє) друкувати.
I <u>could</u> speak German when I was a child. У дитинстві я вмів розмовляти німецькою.	<u>past ability</u> можливість у минулому	I <u>was able</u> to speak German when I was a child. У дитинстві я вмів розмовляти німецькою.
—	<u>future ability</u> можливість у майбутньому	He <u>will be able</u> to pass the exam. Він зможе скласти іспит.
You <u>can/could</u> use my phone. Можете скористатися моїм телефоном.	<u>permission</u> дозвіл	
The dictionary <u>can</u> be on this shelf. Словник може знаходитись на цій полиці. <u>Could</u> he be there? Може, він там? (напевне це невідомо)	<u>possibility</u> можливість	
They <u>could have written</u> the letter if they wanted to. Якби вони схотіли, то написали б листа (могли б написати). He <u>could have done</u> it. Можливо, він це і зробив (але напевне невідомо).	<u>past possibility</u> (uncertain if the action occurred) можливість у минулому (невідомо, чи дія відбулась)	
I <u>can't</u> understand. Я не можу зрозуміти. He <u>couldn't</u> speak. Він не міг говорити.	<u>impossibility</u> неможливість	
<u>Could</u> you wait? Чи не могли б ви зачекати?	<u>polite request</u> ввічливе прохання	

2. may, might, might have	meaning	equivalents (phrasal modals)
He <u>may/might</u> be in the library. He <u>might have</u> read this book. Можливо, він прочитав цю книгу.	<u>probability</u> ймовірність, можливість	
You <u>may</u> ask any questions. Можете ставити будь-які запитання. <u>May</u> I speak to professor Johnson? Чи можу я поговорити з професором Джонсоном?	<u>permission</u> дозвіл	<u>to be allowed to</u> <u>to be permitted to</u>  You're <u>allowed to</u> bring dictionaries. Можете принести словники.
He <u>may</u> go to the library. Може, він піде до бібліотеки (але це не дуже ймовірно). He <u>might</u> go to the library. Можливо, він і піде до бібліотеки (але я особисто вважаю, що це не так).	<u>uncertain possibility</u> малоймовірна можливість	
They <u>may/might have</u> arrived in the morning. I'm not quite sure. Можливо, вони приїхали вранці. Я не дуже впевнений у цьому.	<u>past possibility</u> можливість у минулому про яку невідомо, чи вона відбулася	

3. must, must, have must not	meaning	equivalents (phrasal modals)
All students <u>must</u> attend these classes. Усі студенти повинні відвідувати ці заняття	<u>necessity and obligation</u> необхідність та обов'язковість	<u>to be to</u> <u>to have to</u> You <u>have to (are to)</u> come on time. Вам доведеться прийти вчасно. <u>to have got to</u> I've <u>got to</u> go to the university. Мені треба (я повинен) йти до університету.
You <u>must</u> read it. It's marvellous. Ви повинні прочитати — це чудова річ!	<u>advisability</u> порада	<u>to advise</u> <u>«it's a good idea»</u>
John <u>must</u> be ill. Мабуть, Джон захворів. I <u>must have</u> lost my book somewhere. Мабуть, я десь загубив свою книгу.	<u>probability</u> ймовірність, можливість	

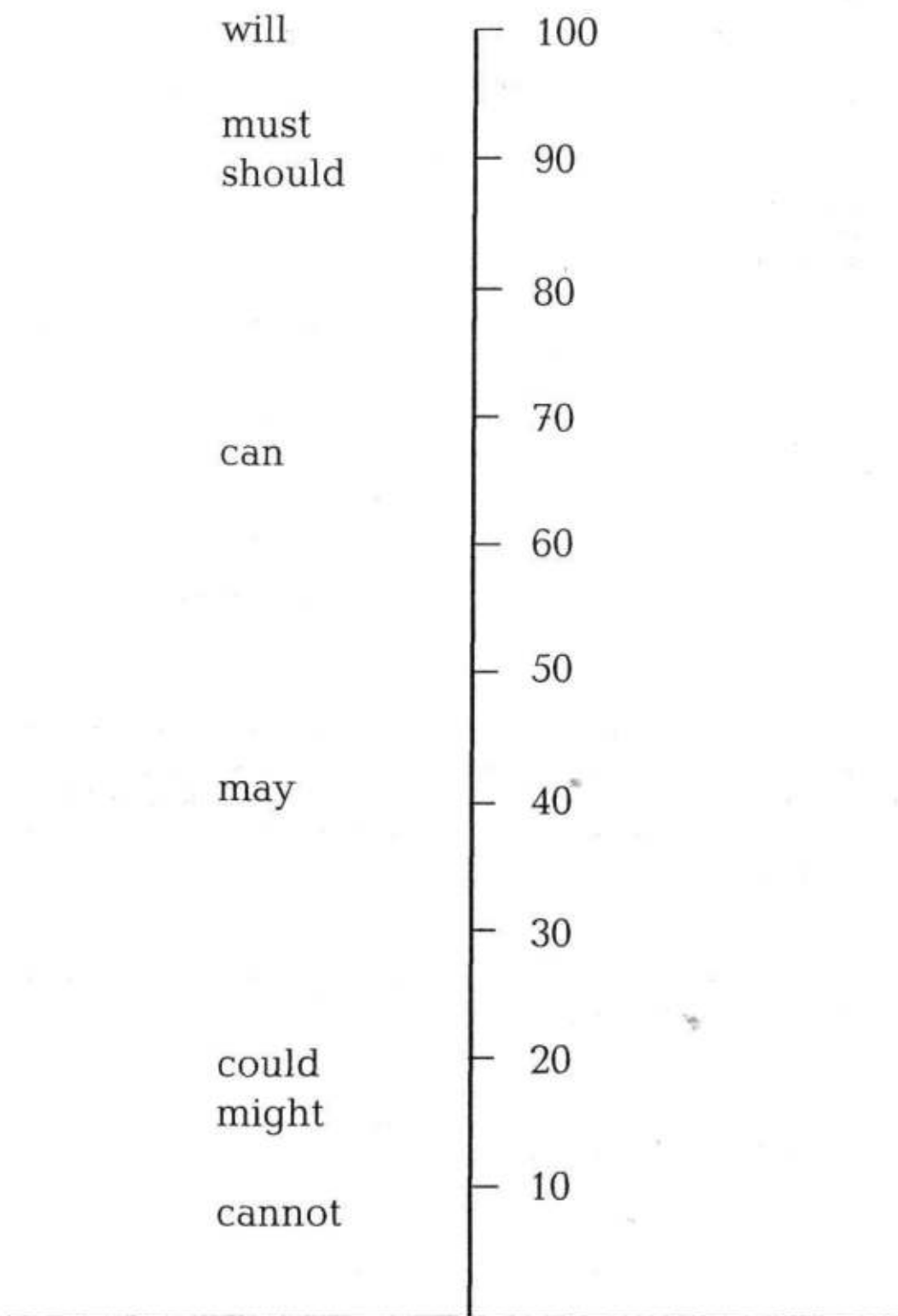
<p>You <u>mustn't</u> drive fast. There is a speed limit here. Ви не повинні їхати швидко. На цій дорозі обмеження швидкості. <u>You must not</u> = <u>it is forbidden</u></p> <p><b>Compare:</b></p> <p>You <u>needn't</u> drive fast. We've plenty of time. Не треба їхати швидко — у нас досить часу.</p> <p><b>Also:</b></p> <p>— Must I read? Я повинен читати? — No, you <u>needn't</u>. Ні, не треба. — No, you <u>mustn't</u>. Ні, не повинні.</p>	<p><u>absence of obligation</u> відсутність необхідності</p>	<p><u>You don't have to</u> = <u>it is not required</u></p>
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<p><b>shall, should, should have;</b> <b>4. will, would, would have;</b> <b>ought to</b></p>	<p>meaning</p>	<p>equivalents (phrasal modals)</p>
<p>Candidates <u>should be</u> prepared to answer questions. Кандидати повинні бути готові дати відповіді на запитання. You <u>ought to</u> study every day. Ви повинні вчитися щодня.</p> <p>MIND <b>negative form</b> for <u>ought to</u>: You <u>ought to</u> translate this article, but she <u>shouldn't</u>.</p>	<p><u>necessity and obligation</u> необхідність та обов'язковість</p>	<p><u>to be supposed to</u></p> <p>You are <u>supposed to</u> study every day. Ви повинні вчитися щодня.</p>
<p>This theory <u>shall</u> be referred to. На цю теорію треба (обов'язково) послатися.</p>		
<p>You <u>should</u> study harder. Було б непогано, якби ви вчилися більш наполегливо.</p> <p>Perhaps, you <u>should have called</u> him earlier. Можливо, треба було зателефонувати йому раніше. You <u>ought to have given</u> your phone number. Треба було дати свій номер телефону.</p>	<p><u>advice</u> (порада)</p> <p><u>advisable action (unfulfilled)</u> порада, що не була здійснена</p>	<p><u>to advise</u></p>

It <u>should</u> rain. Здається, зараз піде дощ (логічно припустити, що піде дощ).	<u>logical conclusion</u> логічний висновок	
<u>Shall</u> I help you? Вам допомогти?	<u>offer</u> пропозиція	
Ice <u>will/would</u> melt at 0° C. Льод тоне при нульовій температурі. This procedure <u>would</u> not be used in this case. У цьому випадку така методика звичайно не використовується.	<u>habitual action</u> звичайна дія	
I <u>would</u> like to comment it. Мені хотілося б це прокоментувати.	<u>wish</u> бажання	
<u>Would</u> you wait? <u>Would</u> you mind waiting? Ви б не зачекали, будь ласка? He <u>would not</u> agree. Він не погодиться (не схоче погодитися).	<u>polite request</u> <u>or refusal</u> ввічливе прохання або відмова	

5. <u>had better</u> ; <u>would rather</u> ; <u>dare</u>	meaning	equivalents (phrasal modals)
You're pressed for time, you <u>had better</u> go. У вас обмаль часу, краще вам зараз піти.	<u>advisability</u> порада	
I <u>would rather</u> not say what I think. Краще я не буду казати про те, що думаю.	<u>preference</u> надання переваги	<u>to prefer</u>
Did he <u>dare</u> (to) criticize the boss? І він насмілювався критикувати начальника?	<u>challenge</u> виклик	

## Probability Scale of Modals (%)



**NOTE**

\* **a must** - something which is necessary or very important

Renovation of the laboratory is **a must**. Реконструкція лабораторії є конче необхідною.

\* **able** - clever or skillful, competent

She is an **able** teacher. Вона — здібний вчитель.

**Exercise 4.**

What does it mean to be «a fluent speaker of a foreign language»? Decide what a person must/should/can/may/might be able to do. Then study the numerical rating system developed by one of the departments of U.S. State Department. How would you rate your own abilities in English? If you speak other languages, rate yourself as well.

**1 — Elementary proficiency**

- ✓ able to satisfy routine travel needs (hotels, prices etc.);
- ✓ able to ask, answer, and understand questions and statements about simple topics related to daily life;
- ✓ frequent errors in grammar and vocabulary.

**2 — Limited working proficiency**

- ✓ able to satisfy routine social demands and basic work requirements;
- ✓ able to speak with confidence, but not easily, on such topics as current events, personal information, daily job requirements;
- ✓ can understand the general meaning of most conversations and speak clearly enough to be understood by all native speakers;
- ✓ can use simple basic grammar accurately, but may require help to express more complex ideas.

**3 — Minimum professional proficiency**

- ✓ able to satisfy all normal social and work requirements with fluency and accuracy, as well as professional discussions in a special field;
- ✓ can understand all conversations at normal speed;
- ✓ vocabulary is broad enough;
- ✓ errors in grammar and vocabulary are infrequent and never interfere with understanding;

**4 — Full professional proficiency**

- ✓ can handle any conversation with a high degree of fluency and precision;
- ✓ errors in grammar and pronunciation are extremely rare, but still listeners would not assume one to be a native speaker;
- ✓ can do informal interpreting to and from the language;

**5 — Bilingual proficiency**

- ✓ complete fluency in the language equivalent to that of an educated native speaker.



**Exercise 5.** Choose the correct option.

1.

A: Where's Ann?

B: I'm not sure. She \_\_\_\_ at the meeting.

- a. is
- b. might be +
- c. must be
- d. could have been

2.

A: How does Andy get to the University?

B: I don't really know. He \_\_\_\_ the bus.

- a. might take
- b. takes
- c. must take →
- d. will take

3.

A: It's really cold in here today.

B: Yes, somebody \_\_\_\_ the window open.

- a. must leave
- b. might leave
- c. must have left ·
- d. will leave

4.

A: Have you heard the weather forecast?

B: No, but look at those clouds in the sky! I think it \_\_\_\_ rain.

- a. could
- b. is going
- c. should
- d. ought to

5.

A: Did Mr. Brown call while I was out?

B: I'm not sure. He might have

- a. might have ✓
- b. might
- c. did +
- d. didn't ✓

6.

A: Are you coming with us?

B: I'm not sure. I \_\_\_\_ go the library instead.

- a. must
- b. will
- c. might
- d. shall

7.

A: Can I speak to professor Johnson?

B: She's not in her office, and she doesn't have any more classes today, so she \_\_\_\_ home.

- a. might go
- b. must have gone
- c. will probably go
- d. would probably go

**Exercise 6.** Render the following passage into Ukrainian. Pay special attention to linguistic devices denoting probability.

The word «dinosaur» means «terrible lizard». About 150 million years ago there were many kinds of dinosaurs. Dinosaurs have been extinct for 65 million years. Several theories have been proposed about why the dinosaurs disappeared from the face of the Earth.

One theory is the climatic change theory. This theory says that millions of years ago the climate of the world gradually became colder. The cold weather finally resulted in a severe shortage of food for the dinosaurs. The disappearance was directly caused by a shortage of food, and indirectly — by climatic changes. According to this theory, the dinosaurs may have disappeared slowly and gradually.

Evidence has recently been accumulated that this extinction was sudden and was caused by a huge asteroid that hit the Earth. Among the signs is the element iridium released from the asteroid in the impact. The impact would have raised so much dust into atmosphere that sunlight could have been shut out for months. Many species of plants and animals would not have been able to survive. In particular, large animals like dinosaurs could not have taken refuge in caves the way the smaller ones may have.

A still newer idea is based on possible periodicity of 28 million years between mass extinction on the Earth: an undiscovered companion to the Sun comes to the inner part of its orbit, and its gravity then sends a number of comets towards the Earth. Fortunately, the star — for which the name «Nemesis» is unofficially waiting — isn't due back for 15 million years even if it exists.

Scientists continue to debate these theories. In the future, evidence may be found for a new theory.

**Exercise 7.** Translate the following sentences into Ukrainian.

1. This, of course, does not prove the statement, but it may help to persuade you of its truth.
2. You've got to do your homework.
3. Nobody will dare deny that this is possible.
4. This might make the computations simpler, but this also reduces the usefulness of the theory.
5. Max would rather study languages than biology.
6. You could have at least sent an invitation.
7. A lecturer must be able to explain things clearly.
8. Must you leave so soon?
9. Anything is possible if you dare.
10. Often what is needed has to be greatly modified in the light of what is possible.

**Text B** Read the following passage and paraphrase it.

### Acronyms and Initialisms

Acronyms and initialisms are very common in English. Acronyms are words that are formed from the first letters of words in a phrase. For example, the word «laser» is an acronym for light amplification by stimulated emission of radiation. Acronyms are pronounced as words.

Initialisms, on the other hand, are not pronounced as words: each letter in an initialism is pronounced as a letter, e.g. IBM, which stands for the company International Business Machines.

More examples: avionics — aviation electronics, WORM — write once, read many, descriptive of a memory combining magnetic and laser-based recording on which the user (not a vendor) records data but cannot later modify it.

#### Radar

The word radar comes from **radio detection and ranging**. Radar is a detection device that uses radio waves to detect objects in the air.

#### Sonar

The word sonar comes from **sound navigation and ranging**. Sonar is a detection device that uses sound waves to detect objects.

#### REM

Most people need between six and eight hours of sleep a night. Some need more, and some need less. All of us, however, need a certain amount of REM sleep. REM means «Rapid-Eye-Movement». REM sleep happens mostly during dreams, for short periods about four to five times per night.

**VIP** — very important person

— висока посадова особа

**CEO** — chief executive officer

**TBA** — to be announced (about any event — a lecture, a meeting etc.)

**PLA** — prior learning assessment (and recognition)—екстернат

**dept** — department

**Acad.** — Academy

**Assn.** — Association

**s/he** — she or he

**UN** — United Nations (Organization) — ООН

**MP** — Member of Parliament

**\*TGIF** —Thank God it's Friday - нарешті настала п'ятниця (скоро вихідні)

Each of fifty United States has postal abbreviations for addresses in correspondence, and characteristic creeds. Study them and answer the following questions:

1. Are there any states that share a common motto? How many?
2. What state is known as «Gopher State»?

Alabama	AL	Heart of Dixie
Alaska	AK	Great Land
Arizona	AZ	Grand Canyon State
Arkansas	AR	Land of Opportunity
California	CA	Golden State
Colorado	CO	Centennial State
Connecticut	CT	Constitution State
Delaware	DE	First State
Florida	FL	Sunshine State
Georgia	GA	Empire State of the South
Hawaii	HI	Aloha State
Idaho	ID	Gem State
Illinois	IL	Land of Lincoln
Indiana	IN	Hoosier State
Iowa	IA	Hawkeye State
Kansas	KS	Sunflower State
Kentucky	KY	Bluegrass State
Louisiana	LA	Pelican State
Maine	ME	Pine Tree State
Maryland	MD	Old Line State
Massachusetts	MA	Bay State
Michigan	MI	Great Lakes State
Minnesota	MN	Gopher State
Mississippi	MS	Magnolia State
Missouri	MO	Show Me State
Montana	MT	Treasure State
Nebraska	NE	Cornhusker State
Nevada	NV	Silver State
New Hampshire	NH	Granite State
New Jersey	NJ	Garden State
New Mexico	NM	Land of Enchantment
New York	NY	Empire State

North Carolina	NC	Tar Heel State
North Dakota	ND	Flickertail State
Ohio	OH	Buckeye State
Oklahoma	OK	Sooner State
Oregon	OR	Beaver State
Pennsylvania	PA	Keystone State
Rhode Island	RI	Ocean State
South Carolina	SC	Palmetto State
South Dakota	SD	Sunshine State
Tennessee	TN	Volunteer State
Texas	TX	Lone Star State
Utah	UT	Beehive State
Vermont	VT	Green Mountain State
Virginia	VA	Old Dominion
Washington	WA	Evergreen State
West Virginia	WV	Mountain State
Wisconsin	WI	Badger State
Wyoming	WY	Equality State

DC — District of Columbia

**Exercise 8.** What do the following abbreviations stand for? If necessary, consult the dictionary.

e.g., i.e., etc., R&D, 9 a.m., vs., S&T, TBA, info, ib. (ibid.), NASA, et al., ASCII, TCP/IP, VCR, WIMP, MIT, IQ, 7 p.m., Washington DC, Aug., Apr., Dec., Nov., Sept., s/he.

**Exercise 9.** Match the two columns.

- Sometimes natural phenomena are reported as UFO.
- Many students used BASIC when they first began to learn programming.
- Most personal computers are now DOS-based.
- TGIF is an expression of gratitude that the work week is almost over and that the weekend is about to begin.
- The PLA process helps you identify learning gained from life and work, and may enable you to receive a diploma or certificate in less time, and with less cost.

- disk operating system
- thank God it's Friday
- prior learning assessment
- unidentified flying object
- beginner's all-purpose symbolic instruction code

**Exercise 10.** Choose the correct word and fill in the blanks.

(to) collect    collection    collective

1. Our department usually \_\_\_\_\_ this information.
2. This museum houses a magnificent art \_\_\_\_\_.
3. We all bear \_\_\_\_\_ responsibility for this decision.

(to) experiment    experimental    experimentation

4. They carried out this \_\_\_\_\_ last week.
5. They \_\_\_\_\_ with the new materials.
6. This model is purely \_\_\_\_\_.
7. After much \_\_\_\_\_ they understood the nature of the phenomem.

( to) assess    assessment

8. It's too early \_\_\_\_\_ the effects of the decision.
9. What we need is a good \_\_\_\_\_ of our chances.

**Exercise 11.** Read the passage and answer the questions about it.

Millions of visitors year round find their way to Niagara Falls. They are soon captivated by the natural beauty of the Falls themselves and the surrounding parklands that lie parallel to the Niagara River from Lake Erie to Lake Ontario. The Niagara River between Lake Erie and Lake Ontario is really a body of water flowing between the two lakes. Located on the Niagara River along the border between the United States and Canada, Niagara Falls actually consists of two falls, the American Falls and the Horseshoe Falls. The former is on the U.S. side of the border, in the State of New York, while the latter is on Canadian side. About 85% the water in the Niagara River flows over the Horseshoe Falls, which is more impressive of the two falls.

Skylon Tower is one of Niagara's most famous landmarks where the «yellow bug» elevators glide the visitors smoothly to the Observation Deck, 775 feet above the Falls. Sightseers can also ride steamers «The Maid of the Mist» that come close to the boiling water of the Falls, or view them from parks on both sides of the river.

Rainbows can always be seen in the mist at Niagara Falls on bright sunny days. About 10 million people visit the Falls each year, most during the summer tourist season.

1. What is the best title for the passage?
  - a. Popular Attractions
  - b. Natural Wonders of the World
  - c. National Parks
  - d. Two Spectacular Waterfalls
2. Which of the following is entirely on the U.S. side of the border with Canada?
  - a. Horseshoe Falls
  - b. Niagara Falls
  - c. American Falls
  - d. the Niagara River
3. It can be inferred from the passage that Horseshoe Falls
  - a. is less impressive fall
  - b. is the larger of the two falls
  - c. has 15% of the Niagara River flowing over it
  - d. is in the state of New York

4. According to the passage, where can people watch the falls?
  - a. From parks, boats, and Skylon
  - b. From airplanes
  - c. From trains
  - d. From cars
5. It can be inferred from the passage that Niagara Falls
  - a. generates very hot water
  - b. is only impressive during the summer tourist season
  - c. can be viewed from only one side of the Niagara River
  - d. is a unique place of the world

**Exercise 12.** Choose the one word or phrase that best keeps the meaning of the original sentence if it is substituted for it.

1. His interests spanned a wide range of subjects.
  - a. concerned
  - b. included
  - c. excluded
  - d. connected
2. You have to consult the dictionary first.
  - a. may
  - b. had better
  - c. might
  - d. must
3. Walking on the grass is not allowed.
  - a. prohibited
  - b. permitted
  - c. proposed
  - d. discussed
4. Our bus is supposed to come in 15 minutes.
  - a. will
  - b. might
  - c. should
  - d. would
5. Language is constantly evolving.
  - a. developing
  - b. disappearing
  - c. regulating itself
  - d. emerging
6. We ship our products anywhere within North America.
  - a. produce
  - b. develop
  - c. package
  - d. send
7. I'm sure he'll contrive some way of dealing with the situation.
  - a. coordinate
  - b. invent
  - c. discuss
  - d. predict
8. WWW is a simple means of transmitting graphical, video and audio data.
  - a. technology
  - b. vehicle
  - c. device
  - d. approach



9. He may have forgotten about the appointment.
- a. has
  - b. has definitely
  - c. has totally
  - d. has probably
10. In the distant future people may live on other planets.
- a. near
  - b. happy
  - c. remote
  - d. uncertain

## Noteworthy

*«Hence we must believe that all the sciences are so interconnected, that it is much easier to study them all together than isolate one from all the others. If, therefore, anyone wishes to search out the truth of things in serious earnest, s/he should not select one special science, for all the sciences are cojoined with each other and interdependent».*

**Rene Descartes**

*in his 1629 text, «Rules for the Direction of the Mind».*

A mathematician and philosopher, Descartes (1596-1650) systematized analytical geometry and is sometimes called the father of modern philosophy.



You have  
covered  
half the course!

## **Chapter 7**

*Focus on:*

**Interactive Multimedia  
English Suffixes**

**Grammar: Passive Voice**

**Text A** Text A Read the text and be ready to answer the questions about it.

The computer is becoming more fun and more useful the less abstractly it can represent things. Television is becoming more entertaining and educational thanks to microprocessors and compact-disc ROMs (**CD ROMs**). Multimedia is another technology that is sure **to boost** personal computers. This technology combines the usual text and graphics with digitized voice and music. With multimedia programs computers will be able **to handle** files of sound and full-motion video images as easily as they handle text. The computers will play voice and music in high-fidelity digital audio stereo, and will show movie-quality images. In a nutshell, multimedia is the perfect marriage of print and broadcast news. What makes it possible is rapidly evolving digital technology, and the efficiency it offers in manipulating, **storing**, and **retrieving** information.

Multimedia can mean various things. It can be an encyclopedia on a CD ROM, a multimedia electronic mail sent over the Internet. Standard reference books on computer are becoming more accessible and **livelier**: dictionaries pronounce words, and historical figures deliver quotes. Multimedia **repository** — the library of the future exists in Madison Building of the Library of Congress in Washington, D.C. This «library without walls» collections are the original multimedia. The library keeps the largest **stockpile** of knowledge in the world, the nearest thing to the library of Alexandria, which held the knowledge of the time in antiquity. Among the library's 100 million items are books in 470 languages, movies, television shows, maps, cartoons, and software. Some 1.8 million items are added each year — and the rate is accelerating. The library has foreign offices around the world, and document exchange with all foreign countries that have diplomatic relations with United States.

Some believe that text may become a more important force because of many multimedia applications. Although no **comprehensive** study exists on the effect of interactive multimedia on learning, some **claim** that interactive technologies speed up learning, and often test scores rise, too. The reasons may be self-paced personalized instruction, immediate interaction and **feedback**. One-on-one instruction can mean that a student is not **embarrassed** about asking questions. Or consider built-in tests — when a user makes a mistake, s/he is taken directly back to the passage involved (all the mistakes can be monitored, too). Some studies **suggest** that multimedia can improve learning. The history of educational reform, though, has shown that «innovative» technologies that use different from paper medium, have done little to

**CD ROM** — compact disc read-only memory, a laser encoded disc that stores megabytes of randomly accessible text, imagery, and/or sound data.

**to boost** — to help to advance or improve укр. удосконалювати, покращувати, підтримувати

**to handle** — to deal with, control укр. поводитися з, керувати (управляти), маніпулювати

**to store** — to put or keep something while not in use for future use укр. зберігати, накопичувати

**to retrieve** — to find and bring back, to regain укр. шукати, поновлювати

**lively** — full of activity укр. жвавий

**repository** — a place where things are stored укр. сховище

**stockpile** — a large store of something укр. запас, резерв

**comprehensive** — thorough, broad, including a lot of everything укр. вичерпний, всебічний, всеосяжний

**to claim** — to declare to be true, to maintain укр. твердити, заявляти

**feedback** — remarks about or an answer to an action, process, etc.; response укр. зворотній зв'язок, відгук

**to embarrass** — to cause to feel anxious and uncomfortable укр. непокоїти, бентежити

**to suggest** — to indicate, to make clear (perhaps indirectly) укр. наводити на думку

**NOTE**

**Also: to suggest** — to propose, to mention as possibility, state as an idea for consideration. Any suggestions? Чи є ще пропозиції? укр. пропонувати

benefit learning. Critics claim that such *fads* include radio in the 1940s, TV and audio tapes in the 1960s, and computer-assisted instruction in the late 1970s and early 1980s. The *content* of instruction, not the means of its *conveyance*, such researchers claim, is what influences performance results. The study performed at Massachusetts Institute of Technology (MIT) demonstrated that the medium — computer or paper — did not significantly influence overall *aptitude* scores, although those students who used computers had significantly higher scores in such area as analogical reasoning. Women and *novices* who used the computer got somewhat higher overall scores than their counterparts who used text. For men and experienced students, text or computer was not a significant factor. In a post-test questionnaire, however, majority of students reported they preferred the computer medium to paper. Although interactive multimedia may teach certain portion of a *curriculum* well and others poorly, it might help us solve some educational problems. We should keep one thing in mind: to be *appreciated*, interactive multimedia must be experienced.

**fad** — an interest or activity that is followed very keenly but usually only for a short time  
укр. швидкоплинне захоплення

**content(s)** — the subject matter  
укр. зміст

**to convey** — to make (ideas, thoughts) known

укр. передавати, повідомляти; виражати

**aptitude** — natural ability or skill, especially in learning  
укр. здібність, обдарованість

**novice** — a person with no experience in a skill or subject, beginner  
укр. початківець, новачок

**curriculum** — a course of study offered in a school, college, etc.  
укр. курс навчання, навчальний план

**to appreciate** — to recognize and enjoy the good qualities or worth of  
укр. оцінювати, цінувати

1. What is the subject of this passage?
2. What is specific about interactive multimedia?
3. Why are multimedia applications important?
4. Why is multimedia repository called «library without walls»?
5. What are the obvious merits of interactive multimedia as far as learning is concerned?
6. Would you like to have access to various multimedia resources? State the reasons why.

**Exercise 1.** Give English equivalents of:

розвага; управляти; поєднувати графічне зображення та звук; технологія, що швидко розвивається; довідники; бібліотека майбутнього; сховище; мультфільм; покращувати; всебічне дослідження; твердити; зворотній зв'язок; бентежити; деякі дослідження наводять на думку; приносити користь; пропозиція; так звані новаторські технології; швидкоплинне захоплення; впливати на загальні результати тестування; початківці; анкета; віддавати перевагу комп'ютеру над іншими засобами; випробувати.

**Exercise 2.**

Sometimes the words *to solve* and *to decide* are misused.

*To solve* means to find a solution to; укр. розв'язувати (вирішувати).

*To decide* means to reach a decision about; укр. вирішувати.

Translate Ukrainian sentences, then match the two columns:

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. Ви можете розв'язати це рівняння?</li> <li>2. Ми вирішили погодитися з вами.</li> <li>3. Цю проблему буде нелегко вирішити (розв'язати).</li> <li>4. Вони вирішили перенести збори.</li> <li>5. Ось вирішення усіх наших проблем.</li> <li>6. Це наше остаточне рішення.</li> </ol> | <ol style="list-style-type: none"> <li>A. It will be no easy matter to solve this problem.</li> <li>B. They've decided to postpone the meeting.</li> <li>C. This is the solution to all our problems.</li> <li>D. Can you solve this equation?</li> <li>E. This is our final decision.</li> <li>F. We've decided to agree with you.</li> </ol> |
|---|--|



They discuss the issue	The issue is discussed
They are discussing the issue	The issue is being discussed
They discussed the issue	The issue was discussed
They had discussed the issue	The issue had been discussed
They have discussed the issue	The issue has been discussed
They were discussing the issue	The issue was being discussed
They will discuss the issue	The issue will be discussed
They must discuss the issue	The issue must be discussed

Mind specific passive constructions and the ways of translating them into Ukrainian:

### 1. Indirect Passive:

- a. She gave her sister a book.

object 1    object 2  
(indirect)    (direct)

A book was given to her sister. (direct passive)    Her sister was given a book. (indirect passive)

Scientists were invited to the conference.

Вчених запросили на конференцію.

They were shown brand-new equipment.

Їм показали найновіше обладнання.

### 2. Prepositional Passive

- a. The terms were **insisted on**.

На строках наполягали.

The lecture was **followed by** a discussion.

За лекцією йшла дискусія.

The lecture was **succeeded by** another one.

За однією лекцією йшла інша.

The conference was **preceded by** preliminary arrangements.

Конференції передувала попередня підготовка (або: перед конференцією було проведено підготовку).

All manufacturing processes are **subject/subjected to** change.

Усі технологічні процеси зазнають змін.

The resolution was **objected to** by almost everyone. Проти резолюції були майже усі.

- b. They make use  
object of a device  
object

Use is made of a device.

A device is made use of.

Прилад використовують.

They take steps  
object to improve the situation.

Steps are taken to improve the situation.

Вживають заходів для поліпшення ситуації.

## Other ways of expressing passive:

Suffixes **-able, -ible**:

Much of our work is predicted in theory, which is **demonstrable** but not **provable**.

Значну частину нашої роботи було передбачено у теорії, яку можна продемонструвати, але не довести.

Suffix **-ee**:

nominee — той, кого призначають

attendee — той, хто має бути присутнім

## Phrases:

to be exposed to — зазнавати

under consideration  
in question — (те), що розглядається

The issue **under consideration** — питання, що розглядається

The problems **in question** — проблеми, що розглядаються

The passive is usually found with the following verbs and set phrases:

to answer	відповідати
to promise	обіцяти
to offer	пропонувати
to invite	запрошувати
to affect	впливати (на)

to follow	іти слідом (за)
to succeed	

to allow	дозволяти
to permit	

to join	з'єднувати, поєднувати
to connect	
to link	

to influence	впливати
to tell	казати
to speak	говорити
to report	повідомляти
to watch	спостерігати
to precede	передувати

to ask	питати, ставити питання
to ask a question	
to pose a question	

to depend on	покладатися (на)
to rely on	

to object to	заперечувати
to think of/about	думати (про)
to call for	вимагати
to agree upon	погоджуватися
to comment on	коментувати
to insist on/upon	наполягати (на)



to do away with to get rid of	покінчити (з)
----------------------------------	---------------

to send for to account for	посилати (за) пояснювати, ураховувати (зважати)
-------------------------------	--

to use — to make use of to refer — to make reference to to mention — to make mention of to contribute — to make contribution to consider — to give consideration to to pay/give/draw/call attention to to take notice/note of to make attempt to make effort to lay/place emphasis (on)	використовувати посилатися (на) здавати (про) робити внесок розглядати приділяти увагу звертати увагу робити спробу робити зусилля наголошувати (на)
--	---

to take advantage of to take opportunity of to take steps to take care of	скористатися (перевагою) скористатися (можливістю) вживати заходів турбуватися (про), вживати застережних (запобіжних) заходів
--	--

The **Get-Passive** is used in spoken and informal English. The **get-passive** is used with verbs denoting ONLY actions and processes, NOT states. The **get-passive** is more common with animate subjects (usually actively involved in a process):

The President **was** elected last year.

The President **got** elected last year.

**Compare:**

They will get married next week.  
(action, process)

They have been married for 7 years.  
(state)

**Exercise 3.**

Translate Ukrainian sentences. Then match the two columns:

- Цю проблему треба вирішити (розв'язати).
- Всі спостереження зробила група відомих вчених.
- Професору поставили багато запитань.
- Експеримент провели минулого тижня.
- Відвідувачів приймають щодня.
- Проект критикувало багато людей.
- Проблему вперше усвідомили декілька років тому.
- Йому не треба казати двічі.
- Фармацевтичній промисловості приділяють багато уваги.
- Про цю нову теорію багато говорять та пишуть.
- Пішли чутки, що йому запропонували фінансову підтримку.
- У Канаді розмовляють англійською та французькою мовами.
- Нас попросили прийти якомога раніше.

- English and French are spoken in Canada.
- Visitors are received every day.
- He doesn't need to be told twice.
- The problem was first recognized several years ago.
- Professor was asked a lot of questions.
- Pharmaceutical industry is paid great attention to.
- This new theory is much spoken and written about.
- The project was sharply criticized by many people.
- It was rumored that he was offered financial support.
- The problem must be solved.
- This experiment was made last week.
- We were asked to come as early as possible.
- All observations were made by a team of well-known scientists.

**Exercise 4.** Complete the sentences.

1. The observed phenomena ... into generalized statements.
  - a. organized
  - b. are organized
  - c. organizing
  - d. are organizing
2. A lot of universities ... in the university towns in the USA.
  - a. locating
  - b. to locate
  - c. are located
  - d. is located
3. They ... how to operate the equipment last month.
  - a. are shown
  - b. have been shown
  - c. will be shown
  - d. were shown
4. Our TV set ... yet.
  - a. was not repaired
  - b. is not repaired
  - c. is not being repaired
  - d. has not been repaired
5. A new edition of this encyclopedia ... .
  - a. is printing now
  - b. is now printing
  - c. is being printed now
  - d. now prints
6. His works ... all over the world.
  - a. is widely known
  - b. widely known
  - c. to be widely known
  - d. are widely known
7. An attempt ... to find a pattern of consistency in all observations of the system under study.
  - a. is made
  - b. made
  - c. are made
  - d. to be made
8. His later works were ... .
  - a. took notice of
  - b. taken notice of
  - c. taking notice of
  - d. take notice of
9. This new instrument can really ... .
  - a. is relied upon
  - b. was relied upon
  - c. be relied upon
  - d. has been relied upon

10. This book ... by a famous writer.
- was written
  - were written
  - was writing
  - to be written
11. All contributions ... by a board of reviewers next month.
- were revised
  - will be revised
  - are being revised
  - have been revised

**Exercise 5.** Translate the following sentences into Ukrainian.

- The paper is concerned with three questions.
- We were informed of the meeting.
- Only a few examples will be given here.
- The theory is being much spoken about.
- The negotiations will not be finished until Monday.
- I was paid cash.
- Heating was followed by cooling.
- This method was done away with many years ago.
- They were asked whether the laboratory would be provided with the necessary equipment.
- This problem is being investigated by our team, and the results will be published soon.
- They were shown new tools.
- This problem was not even thought of a couple of years ago.
- A new exhibition has been organized by our company.
- The problem was dealt with in a number of papers.
- A large amount of research is being conducted in the field of telecommunications.
- It is unbelievable that he should have made such a mistake.
- Of course, the issue in question will play an important role.
- The new evidence cannot be accounted for by existing theories.
- It is thought that this equipment can be relied upon.
- They have been given sufficient information.
- As recently as the 1950s blacks and whites were not allowed to get married in many southern states in the U.S.
- The merits of new technology have been taken notice of.
- It is known that care must be taken of fundamental research.
- These facts play an important role in the process under study.
- What method should be chosen in any particular case depends on a number of factors.
- Provided certain basic requirements are met, the work may be completed in time.
- The necessity of applied research is insisted upon.
- There is little doubt that in the course of further development of all sciences extensive use will be made of a wide range of computers.
- It is hoped that the technique may be significantly improved.
- The assistant was sent for.
- The new data have been obtained, presented, and discussed recently.
- The result of our experiment is greatly affected by laboratory conditions.
- I was told to wait.

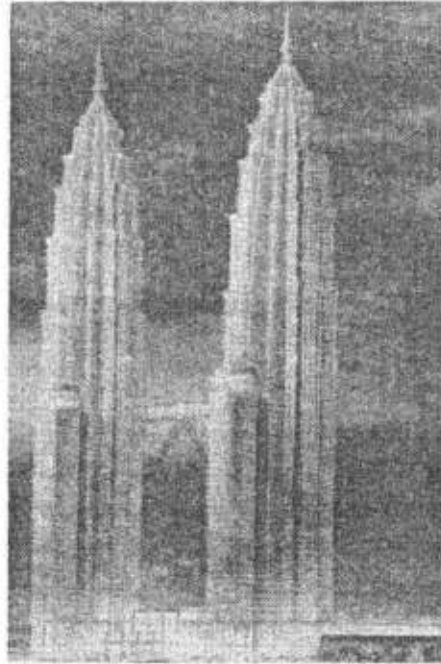
**Exercise 6.**

Prepare a report on one of the famous constructions in the world, i.e. The Empire State Building, the Golden Gate Bridge, the Eiffel Tower, the Statue of Liberty, Pyramids of Egypt etc.

**Sample answer:**

The first Seven Wonders of the World, cataloged 23 centuries ago, comprised massive piles of cut stone that marked the dawn of civil engineering. Even a 1930s list of Modern Wonders honored such civil engineering *feats* as the Empire State Building and the Golden Gate Bridge. Today, electronics is indispensable to these Wonders, consuming such massive quantities of labor, money and resources that they can be called «megaprojects».

An example of such spectacular projects is Kuala Lumpur City Center (KLCC) in Malaysia, a city-within-a-city that contains the 450-meter-high Petronas towers, named after national petroleum company. The Petronas towers include 436000 m<sup>2</sup> of floor space. The twin towers are joined half way up — at the 41 and 42 floors by a 58.4-meter-long sky bridge. In addition, the towers have 44-story side towers. The skyscrapers rize from a six-story retail *mall*.



*feat* — an action needing strenght, skill, or courage  
*mall* — a large shopping center

**Text B ENGLISH SUFFIXES**

A suffix is a combination of letters added at the end of a word. Suffixes help us recognize the function of words:

**ADJECTIVE SUFFIXES**

-able, -ible,  
 -ant, -ent  
 -ish  
 -ary, -ory  
 -like  
 -some  
 -ous  
 -ly  
 -y  
 -worthy  
 -ful  
 -less  
 -proof

verifiable, compatible  
 important, fluent  
 childish  
 auxiliary, obligatory  
 sunlike  
 awesome  
 harmonious  
 lively  
 steady  
 noteworthy  
 careful  
 careless  
 waterproof

**VERB SUFFIXES**

-ate  
 -en  
 -ize  
 -fy, -ify

translate  
 thicken  
 theorize  
 magnify

## NOUN SUFFIXES

-er, -eer	teacher, engineer
-or	professor
-ee	employee
-ist	scientist
-ian	historian
-age	storage
-ance, -ence	acceptance, difference
-ism	realism
-ity	simplicity
-ment	development
-ness	softness
-ion, -tion, -sion	division, hibernation, conclusion
-ship	friendship
-dom	freedom
-hood	neighborhood

The suffix *-aholic* has been applied to many things recently. The original word *alcoholic* was used to describe a person addicted to alcohol. Now we use such words as *workaholics* (people who love their jobs, «addicted» to them), *shopaholics* (addicted to shopping), *sportaholics* (addicted to sports), *TVaholics* (addicted to watching television), and other *somethingaholics*.

**Exercise 7.** Translate the following words into Ukrainian. If necessary, consult the dictionary.

autonomous, tireless, periodicity, criticize, optimism, physician, criticism, thankworthy, foliage, nominate, yellowish, reformer, justify, courage, satisfactory, verifiable, advantage, simplicity, shortage, probability, darken, classify, mandatory, believable, heritage, integrate, trustee, rechargeable, amendment, friendlike, boredom, provable, quoteworthy, geographer, simplify, fellowship, competent, grantee, girlhood, resistant, vendor, workaholic, astronomer, relationship, visible, disputable, parenthood, volunteer, memorize, memorable.

**Exercise 8.**

**1. Make nouns from these words:**

occur, leader, fit, absent, report, design, develop, free, tender, select, depend, agree, require.

**2. Make verbs from these words:**

symbol, false, strength, active, soft, normal, fresh, valid, signal, legal, individual.

**3. Make adjectives from these words:**

praise, afford, present, wash, reuse, hazard, noise, use, trust, faith, salt, adjust, flaw.

**Exercise 9.** Read the passage and answer the questions about it.

Archaeology is the recovery and interpretation of objects and information that together provide clues to the past. These clues are often thought of as coming solely from the objects that have remained from the culture of past times. The challenge is to discover evidence without destroying it. An archaeologist should know how to recover evidence carefully, what to observe, how to preserve what is found. The precise location of everything that is found, together with identification of soils is often of crucial importance in the efforts to interpret and understand what has happened in the past. Archaeology requires many skills. Below ground archaeology must be attempted only by trained and skilled people who work carefully and scientifically. Archaeology should never be done simply for fun or simply to collect objects. Many archaeologists spend years

researching an area before even attempting to excavate and dig at an archaeological site.

Archaeology is not limited to remote ages. It is a technique for discovering and conserving evidence of all times and places.

1. The author's purpose is to
  - a. provide historical report
  - b. define archaeology
  - c. discuss excavation sites
  - d. explain essentials of museum conservation
2. According to the passage, archaeologists must be careful about
  - a. collecting objects
  - b. digging on historic locations
  - c. having fun
  - d. preserving evidence
3. It can be inferred from the passage that an archaeologist must be an expert in recognizing
  - a. pottery
  - b. coins
  - c. soils
  - d. metal objects
4. According to the author, archaeology should not be attempted simply for
  - a. research
  - b. fun
  - c. learning
  - d. writing reports
5. The author stresses the archaeologist's need for
  - a. sense of humor
  - b. determination
  - c. punctuality
  - d. skills

**Exercise 10.**

Choose the one word or phrase that best keeps the meaning of the original sentence if it is substituted for it.

1. This computer can retrieve stored information in a matter of seconds.
  - a. remove
  - b. regain
  - c. relate
  - d. rewrite
2. The latest figures suggest that the situation is improving.
  - a. deny
  - b. propose
  - c. indicate
  - d. clearly demonstrate
3. I'd like to suggest an alternative plan.
  - a. propose
  - b. discuss
  - c. discard
  - d. indicate

- 
4. We appreciate this technology.
- experience
  - recognize
  - approve
  - improve
5. They know how to handle the setup.
- install
  - enhance
  - dismantle
  - control
6. The dictionary consists of 1,804 pages — an indication of completeness and dependability.
- accuracy
  - reliability
  - readability
  - viability
7. The newspaper provides comprehensive coverage of world affairs.
- cursory
  - interesting
  - brief
  - thorough
8. All sorts of reference books are available here.
- affordable
  - obtainable
  - presentable
  - understandable
9. It is necessary that we boost our industry.
- handle
  - appreciate
  - improve
  - computerize
10. Even if a person is fluent in a foreign language, s/he may still have communication problems.
- knowledgeable
  - comfortable
  - involved
  - normal
11. Our call for new suggestions produced very little response.
- feedback
  - concern
  - discussion
  - liveliness
12. We use incinerators to get rid of waste products.
- to collect
  - to identify
  - to regulate
  - to do away with
13. This road links several villages.
- depends on
  - disconnects
  - puzzles
  - joins



## *Noteworthy*

*«... geometry, arithmetics, music, physics, medicine, architecture, and all the science subject to experiment and reason must be added to if they are to become perfect. The ancients found them merely sketched by their predecessors, and we'll leave them to our successors in a more perfected state than we received them.»*

**Blaise Pascal**

in his «Preface to the Treatise on the Vacuum.» A French mathematician and philosopher, Pascal (1623—1662) formulated the theory of probability together with Pierre de Fermat.

## Chapter 8

Focus on:

**Virtual Reality  
Classifying Techno-Types**

**Grammar: Verbals  
Participle**

**Text A** Read the text and be ready to answer the questions that follow

**Virtual reality** is a combination of various interface technologies that enables a user to intuitively interact with an **immersive** and dynamic computer-generated **environment**. Some people prefer the term virtual environment. Virtual reality (VR) has an ability to immerse users in the interactive three-dimensional (3-D) world. Another approach, called **augmented** reality is the use of computer-generated visuals to **enhance** a **perception** of his or her physical environment, providing a combination of the virtual and real world. In general, a VR system consists of a display, a tracking device for interactivity, a computer image generator, a three-dimensional database, and application software. There exist several types of displays. The greatest sense of immersion is provided by the head-mounted display (HMD) that blocks out the real world. A head-coupled display (HCD) is like a **huge** pair of binoculars supported by a movable robot-like arm; HCD can offer better quick entry and exit. Of the various input devices used in VR, the wired glove (a glove wired with sensors and connected to a computer for gesture recognition enabling interaction with objects in three-dimensional virtual environments) is often the most useful. Its user can touch both virtual and real objects without difficulty.

VR has all sorts of entertainment possibilities, like immersive video games, and many practical ones, too. VR has the potential of revolutionizing design and manufacturing. Some predict savings in time and money, better market response, and better products. Virtual prototyping may **reduce** or **eliminate** the need for costly **mock-ups**. Moreover, it will permit the direct **involvement** of human beings in performance and ergonomic studies, providing immediate feedback. For instance, passengers will be able to comment on the **convenience and look of a virtual car's interior**. Engineering analysis will become more efficient through the integration of **simulation** results with virtual prototypes. Eventually, it will be possible **to alter** designs and see the immediate effects. Virtual simulation of assembly, production and maintenance tasks will reveal possible problems at an early stage of the design process. There are numerous scientific VR visualizations, from atoms to galaxies that may be used for educational and research purposes. Virtual reality applications in medicine include at least two trends in health care: the extensive use of ultrasound and magnetic resonance imaging (MRI) and minimally invasive surgery (such as endoscopic procedures, in which the doctor looks not at the patient but at a video screen to guide an optical fiber, light **probe**). Entertainment uses for VR have received the most attention, and experts agree that this large market will be a driving force in VR technology development.

**Mature** enough, virtual reality still needs a lot of work and **assessment** before it can become a

**virtual reality** — віртуальна (уявна) реальність

**to immerse** — to cause (oneself) to enter deeply into activity; absorb укр. занурюватися, заглиблюватися

**environment** — physical, social and natural conditions in which people live

**Synonyms:** surrounding(s), milieu укр. навколишній (оточуючий) світ; середовище

**to augment** — (to cause to) become bigger, more valuable, better укр. збільшувати

**to enhance** — to increase in strength or amount укр. посилювати

**to perceive** — to have knowledge of (something) through one of the senses or through the mind, to understand

**perception** — укр. сприйняття, відчуження

the head-mounted display (HMD) that blocks out the real world. A head-coupled display (HCD) is like a **huge** pair of binoculars supported by a movable robot-like arm; HCD can offer better resolution, a wider field of view, and a benefit of

**huge** — extremely large

**Synonyms:** enormous, tremendous, gigantic укр. величезний

**to reduce** — to make less in size, amount, price, degree etc. укр. зменшувати

**to eliminate** — to remove or get rid of completely укр. ліквідувати

**mock-up** — a full-size model of something planned to be made or built укр. макет, модель

**involvement** — укр. залучення

**simulation** — representation, imitation, model укр. імітація, відтворення, моделювання

**to alter** — to make or become different, but without changing into something else укр. змінювати

**probe** — укр. зонд

**mature** — fully grown and developed укр. зрілий

**to assess** — to judge the quality, importance or worth of; **Synonym:** to evaluate укр. оцінювати

common tool for industry. Building synthetic environment usually means hard work. When perfected, virtual reality systems may enhance people's activities, *enliven* and accelerate education and scientific modeling, in addition to *devising* new forms of *recreation*.

**to enliven** — to make more active, cheerful, or interesting  
укр. поживляють

**to devise** — to plan or invent cleverly укр. вигадувати, розробляти

**recreation** — way of spending free time

Also: leisure, free time укр. відпочинок, дозвілля

1. What is specific about virtual reality?
2. What are principal parts of a VR system?
3. What are possible applications of virtual reality?

**Exercise 1.** Give English equivalents of:

посадання різних технологій; віртуальне (уявне) середовище; візуальний; посилювати сприйняття; широке використання; складання, виробництво та обслуговування; комп'ютерне зображення; змінювати конструкцію; макет; оцінювати; моделювання; рушійна сила; поживляють навчання.

**Exercise 2.** Discuss the following point with your colleagues.

One cannot deny the positive impact that personal computers with *elaborate* graphical environments have had on modern engineering practice. However, one unfortunate result has been the encouragement of a type of engineering characterized as «cosmetic». «Cosmetic» engineering is more concerned with appearance than substance. It is performed by engineers whose first priority is to create things that look good: content and performance are of secondary importance. In other words, an engineering effort is «cosmetic» if it produces pleasing and professional-looking outputs whose content is, however, trivial or invalid. «Cosmetic» engineers enjoy their work. They produce things that look good and make the customer feel happy. Real engineering involves complex and intellectually demanding tasks. «Cosmetic» engineering, by contrast, is relatively easy. Prerequisites for the job include knowledge of how to use a PC plus familiarity with one or more graphics packages. This is not to deny appearance, but an automatic washing machine should be able to wash clothes in addition to attractive surface smoothness. Still many people are good at making money with *gimmicks*!

Cosmetic engineering *jeopardizes* the success of any project to which it is applied and corrupts the intellectual integrity of the people in organizations that *foster* it. Just imagine a demonstrable project that has only one fault: it produces *erroneous* results.

**elaborate** — full of detail, carefully worked out and with a large number of parts

**gimmick** — a trick or object which is used only to attract people's attention, especially in attempt to sell something

**to jeopardize** — to put at risk or in danger

**to foster** — to help to develop; to nurture

**erroneous** — incorrect, mistaken

## GRAMMAR: VERBALS (Non-Finite Forms of the Verbs) PARTICIPLE

There exist the following types of **verbs** in English:

— <b>notional</b> verbs СМИСЛОВІ	They <b>study</b> English.
— <b>auxiliary</b> verbs ДОПОМІЖНІ	<b>Do</b> you like the book? I <b>haven't</b> decided yet. We <b>will</b> see you later.
— <b>modal</b> verbs МОДАЛЬНІ	I <b>can</b> do it.
— <b>link</b> -verbs ДІСЛОВА-ЗВ'ЯЗКИ	He <b>is</b> a scientist.
— <b>substitutes</b> ДІСЛОВА-ЗАМІСНИКИ	He likes physics, and so <b>do</b> I.
— <b>emphatic do</b> ДІСЛОВО-ПІДСИЛЮВАЧ	I <b>do</b> need this information.

English notional verbs are characterized by a great variety of **forms** that can be divided into two main groups: **finite** and **non-finite** (verbals).

Особові (finite) форми виражають особу, число, час, стан, спосіб дії, і виступають у реченні присудком.

Безособові (non-finite) форми не мають звичайних форм особи, числа, способу, та не виступають у ролі присудка, хоча й можуть входити до його складу.

**VERBALS** are:

- Participle
- Infinitive
- Gerund

### Participle

Tenses	Active	Passive
Simple (indefinite)	doing	(being) done
Perfect	having done	having been done

#### Participle I

**moving** object  
предмет, що рухається

#### Participle II

the **installed** machines  
or  
the machines **installed**  
встановлені машини (машини, що встановлені)

### Perfect Participle

**Having made**\* the experiment he **left** the laboratory.  
Зробивши експеримент, він залишив лабораторію.

\* Перфектні форми дієприкметника вказують на завершеність дії по відношенню до дії, яку виражає присудок

## Participles in a Sentence (A,B,C)

## A.

Attributes  
Означення

The project **proposed** by professor is very promising.  
Проект, **запропонований** професором, має великі перспективи.  
The paper **presented** attracted a great deal of attention.  
**Прочитана** доповідь привернула багато уваги.  
This is the article **so much spoken about**.  
Ось стаття, **про яку так багато говорять**.  
The scientist **investigating** this problem works at our Institute.  
Вчений, **що (який, котрий) досліджує** цю проблему, працює у нашому інституті.  
This is the best method **known**.  
Це найкращий серед **відомих** методів.

**NOTE**

A few **Participles II** change their meaning according to their position

the people **involved** = the people **concerned**  
the people who were affected by what was happening  
люди, про яких йде мова  
(можливі варіанти перекладу:  
те/ті, що розглядаються/аналізуються,  
дані, пов'язані з)

<b><u>BUT:</u></b>	<b><u>BUT:</u></b>
an <b>involved</b> explanation = a <b>complicated</b> explanation складне пояснення	a <b>concerned</b> expression = a <b>worried</b> expression стурбований вираз
<b>Mind the meaning of the verbs:</b>	
<p><b>to involve</b> <b>включати, залучати</b></p> <p>The experiment <b>involves</b> three stages. <b>involved</b></p> <p>Експеримент <b>включає</b> три стадії. <b>включав</b></p> <p>This is the paper <b>involving</b> the latest data.</p> <p>Ось доповідь, <b>яка залучає</b> останні дані.</p>	<p><b>to concern</b> <b>стосуватися</b></p> <p>The problems <b>concern</b> all of us. <b>concerned</b></p> <p>Ці проблеми <b>стосуються</b> усіх нас. <b>стосувалися</b></p> <p>This is the article <b>concerning</b> the new method.</p> <p>Ось стаття, <b>що стосується</b> нового метода.</p>
<p>* <b><u>ALSO:</u></b></p> <p>I didn't realize that this experiment <b>would involve</b> so much concern.</p> <p>Я не усвідомлював, що цей експеримент <b>здатний викликати</b> таку тривогу.</p>	<p>* <b><u>ALSO:</u></b></p> <p>I <b>concern myself with</b> history = I <b>am interested in</b> history</p> <p>Я цікавлюся історією.</p> <p>*<b>all concerned</b> усі зацікавлені особи</p>

**Exercise 3.** Translate the following sentences into Ukrainian

1. They were very interested in the subject discussed.
2. Methods employed in solving this problem are strongly influenced by the research objectives.
3. The survey concerned synthesized materials.
4. The method used depended upon the material selected.
5. Hydrogen is the lightest element known.
6. The temperature of the substance obtained remained constant.
7. The complexity of the technique involved increased considerably.
8. The procedure proposed provided the required parameters.
9. The questions posed concerned the project.
10. We are involved in a research project on satellite communications.
11. He suggested the best solution to the problem concerned.
12. The exhibition attended by representatives of all the enterprises concerned attracted a lot of attention.
13. The ninety projects exhibited were selected from those entered by 1,460 students participating in the contest.

**B.**

Adverbial  
Modifiers

Обставини

When discussing progress in their work scientists decided to carry  
While

out another experiment.

Обговорюючи (під час обговорення) досягнуті результати, вчені  
вирішили провести ще один експеримент.

Computer is a complex device when viewed as a whole.

if

Комп'ютер — складний прилад, якщо розглядати його в цілому.

Being invited too late, we couldn't attend the conference. Ми не змогли  
відвідати конференцію, бо нас запросили дуже пізно.

When going into reaction, elements change their properties.

Вступаючи у реакцію, елементи змінюють свої властивості.

Having discussed the issue, they went to the library.

Обговоривши це питання, вони пішли до бібліотеки.

Having been discovered this law became known to many scientists.

Після того, як закон було відкрито, він став відомий багатьом вченим.

Considered from this point of view the issue is of little importance.

Якщо розглядати питання з цієї точки зору, то воно не має великого  
значення.

Unless otherwise stated, ... Якщо немає особливих застережень, ...

**NOTE**

Mind the translation of certain set expressions containing participles:

Given — Якщо є; за умови; якщо

Stated — Якщо сформулювати

Seen — Якщо розглядати

Granted — Припустімо, (а далі?)

Let's take it for granted — Давайте вважати, що це доведено / зрозуміла річ

It being so — За таких умов

This being the case — Якщо справи ідуть таким чином (у такий спосіб)



## C.

Parentheses  
вставні слова

frankly speaking — чесно кажучи  
generally speaking — у цілому  
broadly considered — якщо розглядати в цілому  
putting it another way — інакше кажучи  
as already mentioned — як вже було сказано  
as emphasized above — як уже наголошувалося раніше

**Exercise 4.** Translate the following sentences into Ukrainian.

1. If completed, the experiment will make it possible to draw definite conclusions.
2. Given certain conditions, such experiments could be done by almost everyone.
3. When presented at the conference this work caused a lot of interest.
4. Putting it another way, this is as far as we can go.
5. Melting ice keeps the same temperature while melting.
6. Only one of the theories concerned takes it for granted.
7. Unless otherwise stated, follow the usual procedure.
8. When being pure, water is a colorless liquid.
9. Stated in a simple form, the hypothesis runs as follows.
10. Having been tested, the device was recommended to production.
11. While working on this project, we performed many experiments.
12. Translating these sentences I didn't consult the dictionary.
13. Frankly speaking, I don't like the approach proposed.

### PARTICIPAL CONSTRUCTIONS

#### Subjective

The students were seen  
making the experiment.  
Бачили, як студенти  
робили експеримент.

#### Objective

to see We saw the students  
to watch making the experiment.  
to hear Ми бачили, як студенти  
роблять експеримент.

#### NOTE

**to have** (get)     *something done*  
                              *someone do something*

I **had** the letter **translated** (somebody did it for me).

Мені переклали листа.

I **had** John **translate** the letter (John did it for me).

Джон переклав мені листа.

#### Compare:

I **have translated** the letter (I have done it myself).

Я (сам) переклав листа.

## OTHER CONSTRUCTIONS

It being late, we postponed the meeting.

The session was over, with many problems left unsolved.

The first experiment was hard to perform, the other ones causing no trouble.

The results as presented at the conference are very promising.

The phenomenon thus discovered puzzled almost everyone.

Ми відклали збори, бо (тому що) було пізно.

Засідання закінчилось, але (причому, а) багато питань залишилось невирішеними.

Лише перший експеримент було складно провести, усі інші минули без проблем.

Результати у тому вигляді, як їх подано на конференції, є дуже перспективними.

Явище, яке було відкрито таким чином, здивувало майже усіх.

## NOTE

Set-phrases with participles

**standing** committee — постійно діючий комітет

**abstracting** journal — реферативний журнал

**steering** | committee — оргкомітет  
**organizing** |

**learned** society — наукове товариство /nid/

**naked** eye — неозброєне око, /kid/ Also: **unaided** eye

## NOTE

**Presenting** the report is my colleague.  
Доповідь читає моя колега.

Більш детально про такі звороти див. Chapter 11, Emphasis.

**Exercise 5.** Translate the following sentences into Ukrainian.

1. Conditions permitting, we will carry out the experiment tomorrow.
2. (With) the experiment being carried out, we started new investigations.
3. The existing data being limited, no definite conclusion could be made.
4. Technology having reached a high stage of development, new materials became available.
5. We continued the experiment, with our graduate students helping us.
6. The discussion being over, the steering committee continued its work.
7. We watched the laboratory assistants making preparations for our experiments.

**Exercise 6.** Choose the one correct answer from the options provided.

1. I had my cousin proofread my brother's article. Who proofread the article?
  - a. I myself
  - b. my brother
  - c. my cousin
2. The students have finished the project ahead of time to their advisor's delight. Who finished the project?
  - a. somebody else
  - b. the students
  - c. the advisor
3. Since I was pressed for time with nobody helping me, I had my report typed. Who typed the report?
  - a. somebody else
  - b. I myself
  - c. nobody

**Exercise 7.** Complete the sentences.

1. Automobiles ... propane gas emit fewer dangerous pollutants into the atmosphere.
  - a. use
  - b. using
  - c. can use
  - d. when used
2. ... precision instruments require delicate handling.
  - a. Using
  - b. The use of
  - c. When used
  - d. To use
3. The study performed ... complex mechanisms.
  - a. revealed
  - b. reveal
  - c. revealing
  - d. when revealed
4. Choose the phrase that best keeps the meaning of the original sentence if ... for it.
  - a. is it substituted
  - b. substituting
  - c. is substituted
  - d. it is substituted
5. The method previously ... is being widely used.
  - a. mentioning
  - b. if mentioned
  - c. mentions
  - d. mentioned
6. Some issues are mentioned but not ... in full detail.
  - a. discussing
  - b. discussed
  - c. when discussed
  - d. discuss

7. VCR is a sophisticated device ... as a whole.
- when viewing
  - when viewed
  - viewing
  - views
8. Anthropologists work in the branch of social science ... the relationship of human beings and their cultures.
- when involved
  - involved
  - involving
  - involves
9. A complete system can be ... inside.
- installed
  - installing
  - installs
  - install
10. Potatoes, a popular food in Ukraine, are most delicious ...
- when roasting
  - roasting
  - roast
  - when roasted
11. The force ... bodies of matter together is gravity.
- drawing
  - draws
  - when drawn
  - drawn
12. This colorless, tasteless gas does not react instantly ... with other substances.
- mixing
  - it mixed
  - when mixing
  - when mixed
13. This substance is highly explosive if ... to an open flame.
- it exposed
  - exposing
  - exposed
  - is it

**Text B** Read the text and define your techno-type.

Technical professionals sometimes take for granted their ease with electronic **marvels**. Unfortunately, though, **it seems** that there is an ever-widening **gap** between the «knows» and the «know-nots». Recent studies point out that while the hardware is becoming more sophisticated, the users may not be keeping pace. Some people may even be classified as technophobic, and some are **intimidated** by computers and are **afraid** they may damage a PC if they use it without assistance, or would not use a computer unless forced to. Based on these **findings**, Dell Computers has developed a new approach to the computer business: techno-typing. Techno-typing is the key to helping people understand what computers can do specifically for them and how to find their perfect PC match. Dell is using the data to develop computers targeted at specific techno-types:

\* Techno-Wizard: generally a technology expert or hobbyist who wants the hottest technology for the lowest price. Greatest concern is losing the edge.

\* Techno-To-Go: wants a computer that comes ready to go right out of the box. Interested in what a computer can do but not in how it works. Greatest **concern** is being left alone without service and support.

\* Techno-Boomer: wants to look smart; researches and seeks recommendations before making a **purchase**. Greatest concern is making the wrong

\* Techno-Phobe: rejects technology or avoids it whenever possible.

\* Techno-Teamer: uses a computer at work and as part of a network. Productivity is a primary concern for work that is largely team oriented. Greatest concern is network failure.

**NOTE**

CLASSIFYING is an important mental skill.

Usually classifications contain:

- 1) the name of the class
- 2) members of the class
- 3) basis for classification \*\*\*

According to Text B we have:

- 1) technology users;
- 2) Techno-Wizards, Techno-To-Gos, Techno-Boomers, Techno-Phobes, Techno-Teamers;
- 3) attitude toward and aptitude for technology.

While classifying, use the following words and phrases:

**class, group, category, division;**

**to classify, to group, to categorize, to divide;**

**classification, grouping.**

<b>X(s)</b>	can be divided into	types
	belong(s) to	categories
	fall(s) into	groups

**marvel** — something (or someone) that causes wonder and admiration; wonderful thing укр. чудо, диво

**it seems** — укр. очевидно, певно, здається

**gap** — an empty space between two objects укр. розрив

**to intimidate** — to frighten укр. лякати

**afraid** — full of fear, frightened, scared укр. наляканий

**findings** — something learned as a result of an official inquiry укр. отримані дані

**concern** — a matter of interest, importance or worry to someone укр. важливість, турбота

**purchase** — укр. покупка

\*\*\* Sometimes they are not explicitly expressed, but implied.

**Exercise 8.** Read the following text. Find all examples of classifying. Give the name of the class, members of the class, and basis for classification.

The earliest computing device was the abacus used by the ancient Greeks and Romans. Sliding scales date back almost two millennia. In 1642, French philosopher-mathematician Pascal built a mechanical adding machine, and in 1671, German philosopher-mathematician Gottfried Leibniz built a machine to perform multiplication. In 1835, British mathematician Charles Babbage designed the first mechanical computer. The work of another British mathematician Alan Turing, in the 1930s, marked the next major milestone: he developed the mathematical theory of computation (by the way, the name of the test for measuring the success of computer programs that are claimed to have «Artificial Intelligence» is Turing). In 1940s, American mathematician John van Neumann developed the basic design for today's electronic computers. Finally, with the development of the transistor in 1952 and the subsequent microelectronic revolution, the Computer Age started.

A computer is a collection of various components. At the heart is the CPU (central processing unit), which performs all the computations. This is supported by memory which holds current program and data, and «logic arrays», which help move information around the system. Peripheral devices, or add-ons, can be attached. These will normally be keyboards and VDU (visual display unit) screens for user I/O (input and output), disc drive units for mass memory storage, and printers for printed output. The program and data to be manipulated — text, figures, images, or sounds — are input into the computer which then processes the data and outputs the result. The results can be printed out, displayed on VDU, or stored in memory for subsequent manipulation. Whatever the task, a computer can function in only one of four ways: input/output operations, arithmetical operations, logic and comparison operation, and movement of data to, from, and within the central memory of the machine. The programmer devises a set of instructions — algorithms that utilize these four functions in a combination appropriate to the job in question.

There are four «sizes», corresponding roughly to their memory capacity and processing speed. Microcomputers are the smallest, usually single-user machines often referred to as home computers, are used in small business, at home, and in schools. Minicomputers, also known as personal computers are generally larger, and may support up to 30 users at once. They will be found in medium-sized business and university departments. Mainframes, which can often service hundreds of users at once, are found in large organizations. Supercomputers are the most powerful of all. They are mostly used for special highly complex scientific tasks.

**Exercise 9.**

(to) recognize recognition recognized

1. John is a young author struggling for \_\_\_\_\_.
2. Our city has changed so much you wouldn't \_\_\_\_\_ it.
3. He is a \_\_\_\_\_ authority on materials science.

(to) alter alteration(s)

4. There have been a few \_\_\_\_\_ to our proposal.
5. This dress will have to be \_\_\_\_\_.

(to) add addition(s)

6. We should \_\_\_\_\_ some more names to the list.
7. I would like \_\_\_\_\_ something to what you've said.
8. \_\_\_\_\_ are made to the project, of course.
9. In \_\_\_\_\_ to giving a general introduction, the course also provides practical discussion.

**Exercise 10.** Read the passage and answer the questions that follow.

In the middle of Salisbury plain in southern England, a circle of massive stones marks one of the strangest monuments known to humanity. Stonehenge contains a set of giant standing stones weighing 25 tons each. They form a circle surrounding two horseshoe-shaped patterns. The circle is more than 30 meters wide and 4 meters high, raised 4 meters above the ground. Their place of origin is unknown. The discovery that many of the stones were brought from hundreds of miles away to this particular spot, makes the matter even more interesting. «Why» is not the only question. How?

Scientists point out that Stonehenge has been built over a period of many centuries, during three distinct phases. It has been realized since 1771 (after having been forgotten for perhaps thousands of years) that at the summer solstice — the day in the year (currently June 21st) when the Sun is the farthest north and the day is the longest — the Sun rises directly over a particular stone, called the Heelstone (located 60 meters outside the outer circle of stones) as seen from the center of Stonehenge. So probably the people who built Stonehenge must have had substantial astronomical knowledge.



1. What is the best title for the passage?
  - a. Early astronomers
  - b. Salisbury plain
  - c. Gigantic projects
  - d. One of the famous mysteries
2. It can be inferred from the passage that
  - a. the stones were cut from quarries
  - b. it was easy to transport the stones
  - c. the Heelstone is not very heavy
  - d. an incredible amount of work went into making the construction
3. According to the author of this passage
  - a. Stonehenge is located in northern England
  - b. giant monuments have puzzling features
  - c. some stones were put on top of each other
  - d. the stones were not transported from a great distance
4. The author implies that
  - a. nobody knows for sure how the stones got there, and what their exact purpose was
  - b. not many people undertook this construction project
  - c. Stonehenge is not a mystery anymore
  - d. the circle is less than 30 meters wide
5. The passage was most probably written by a specialist in
  - a. astrology
  - b. archaeoastronomy
  - c. biology
  - d. philosophy



**Exercise 11.** Choose the one word or phrase that best keeps the meaning of the original sentence if it is substituted for it.

1. This article concerns archaeological findings.
  - a. is about
  - b. surveys
  - c. overviews
  - d. concludes by
2. We were unable to perceive where the problem lay.
  - a. conclude
  - b. understand
  - c. foresee
  - d. check
3. What is your assessment of her chances of winning?
  - a. prediction
  - b. suggestion
  - c. feeling
  - d. evaluation
4. Some people are scared of sophisticated technology.
  - a. interested in
  - b. informed
  - c. afraid of
  - d. aware of
5. In general, our business plan is OK, but I think we should make some alterations.
  - a. radical improvement
  - b. slight changes
  - c. useful amendments
  - d. important corrections
6. There are many gigantic buildings in New York.
  - a. tall
  - b. modern
  - c. gorgeous
  - d. huge
7. Virtual reality is an electronic marvel.
  - a. wonder
  - b. gimmick
  - c. monitor
  - d. device
8. He decided to buy a new computer.
  - a. sell
  - b. advertise
  - c. purchase
  - d. assess
9. The study revealed an extremely involved mechanism.
  - a. simple
  - b. interesting
  - c. complicated
  - d. strange

10. He concerns himself with astronomy.
- a. is tired of
  - b. is interested in
  - c. doesn't like
  - d. thinks it is necessary to study
11. This theory involves a lot of aspects.
- a. assumes
  - b. studies
  - c. includes
  - d. concludes
12. We really like this pleasant working enviroment.
- a. space
  - b. milieu
  - c. group
  - d. feature
13. You should send your papers to our organizing committee.
- a. working
  - b. standing
  - c. conference
  - d. steering

## ***Noteworthy***

*If you want something done, give it to a busy man ... and he will have his secretary do it.*

## UNscientifically speaking...

## A L C H E M Y

The alchemists tried to change base metals to gold. See how we can change BASE to GOLD in just 4 steps by changing one letter at a time:

BASE  
baLe  
baLD  
bOld  
GOLD

Change :

a) HATE

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

LOVE

b) TAKE

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

GIVE

c) MORE

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

LESS

Clues:

a) possess; bee's home; dwell.

b) body of water; be fond of, enjoy; dwell, have life.

c) female horse; German money; a cover to disguise the face; quantity; disorder or untidiness.

*(after English Teaching Forum, Jan. 1994)*

## Chapter 9

### Focus on:

## Energy Sources Environment

## Grammar: Verbals Infinitive

**Text A** Read the text and be ready to answer the questions that follow.

### Fossil fuels

Coal, petroleum, and natural gas are known as fossil fuels. *Fossil* fuels are believed to have been formed from the remains of prehistoric plants and animals. Coal originates from ancient *swamps*, petroleum and natural gas were formed from ancient marine plants and animals. Coal is still an important *source* of electricity. Along with iron *ore*, it is also used to make steel. Because coal is a solid fuel, it has certain disadvantages, and burning it causes acid rain and air *pollution*. Displaced by cleaner fuels, coal consumption declined *rapidly* during the middle of the twentieth century. But coal reserves are estimated to be enormous, and, assuming that pollution control and clean-burning technologies now being researched are fully *implemented*, coal may still remain a major source of energy.

The main use of petroleum is for liquid *fuels* such as gasoline, diesel and jet fuel, *to say nothing of* heat and electricity generation. Also many chemicals are produced from petroleum. These petrochemicals include chemical fertilizers, explosives, medicines etc. Oil at present accounts for around 45 percent of the planet's total energy consumption, and natural gas a further 25 percent. Natural gas is often found in the same *wells* with oil, but it may also be found separately. Natural gas is the cleanest-burning fuel that can be *shipped* through *pipelines*.

**fossil** — укр. викопний

**swamp** — an area of land which is always full or covered with water укр. болото

**source** — a place from which something comes; means of supply укр. джерело

**ore** — rock, earth etc. from which metal can be obtained укр. руда

**to pollute** — to make (air, water, soil etc.) dangerously impure or unfit for use укр. забруднювати

**rapid** — fast, quick, swift укр. швидкий

**to implement** — to carry out or put into practice укр. впроваджувати, здійснювати

**fuel** — material that is used for producing heat or power укр. паливо

**to say nothing of** — укр. не кажучи вже про

**well** — a place where water (oil) can be taken from underground укр. свердловина

**to ship** — to send to a distant place by post or other means укр. перевозити

**pipeline** — a line of connected pipes, often underground, especially for carrying liquids or gas a long distance укр. трубопровід

### Nuclear energy

The world's first nuclear power plant began producing electricity in Britain in 1956. Originally, nuclear power was seen as a clean, inexpensive power source. Today, however, the nuclear power industry faces two serious problems: nuclear accidents and nuclear *waste*. Since the Chernobyl *accident* public opposition to expansion of nuclear power has grown.

**accident** — something unpleasant or damaging укр. аварія

**waste** — used damaged or unwanted matter укр. відходи

### Alternative (renewable) energy sources

While oil has a *unique* status as an energy source, it is *by no means* without competition. Other fossil fuels, such as coal and gas, are often less *costly* and compete effectively in certain sectors, such as electric power generation. However, there are energy resources (not based on fossil fuels) that are essentially *inexhaustible*, such as solar energy and other kinds of renewable energy. Flowing water is an important energy source. Hydroelectric power, or hydropower, produced by the force of running water is a renewable and relatively pollution-free source of electrical energy.

**unique** — being the only one of its type укр. унікальний

**by no means** — ні в якому разі

**costly** — costing a lot of money укр. дорогий

**to exhaust** — to use up completely укр. виснажувати, вичерпувати

**to deplete** — to lessen greatly in amount укр. вичерпувати, виробляти

As such energy sources as coal, oil, and natural gas become *depleted*, it will prove

advantageous to many countries currently dependent on those sources to develop and make available alternative energy technology. Many countries have favorable natural conditions for developing geothermal, wind, solar, and **tidal** energy sources. Geothermal energy makes use of underground heat which escapes to the surface through hot **springs**. Geothermal power is believed to be of great potential. New Zealand, Iceland, and several other countries now operate successful power plants.

Solar energy involves capturing the sun's light energy and converting it into heat or electricity. The technology exists to **harness** solar power, but solar energy collectors are expensive. Tidal energy could be a source of hydroelectric power in limited areas and has been pioneered in France. Attempts to raise deep ocean water to generate electricity are **under way** in Hawaii and other places. Wind can also be harnessed to produce electricity by the use of machines called aerogenerators. Wind is an unpredictable energy source that requires storage technology to fully use its benefits. **Recycling** or burning industrial and domestic garbage can also be used as a source of energy.

In the oceans, air, land, underground the Earth has **virtually** unlimited energy sources. Many of them are nonrenewable, and may be of short supply in the future. We should **seek** and improve energy sources and use them more efficiently to maintain our energy supply and reduce environmental **hazards**.

**tide** — a current of water caused by the regular rise and fall of the sea caused by the pull of the moon and the sun укр. приплив та відплив

**spring** — a place where water comes up naturally from the ground укр. джерело

**to harness** — to use (a natural force) to produce useful power укр. приборкувати, підоряти

**to be under way** — moving forward укр. (починати) запроваджувати в життя, здійснювати

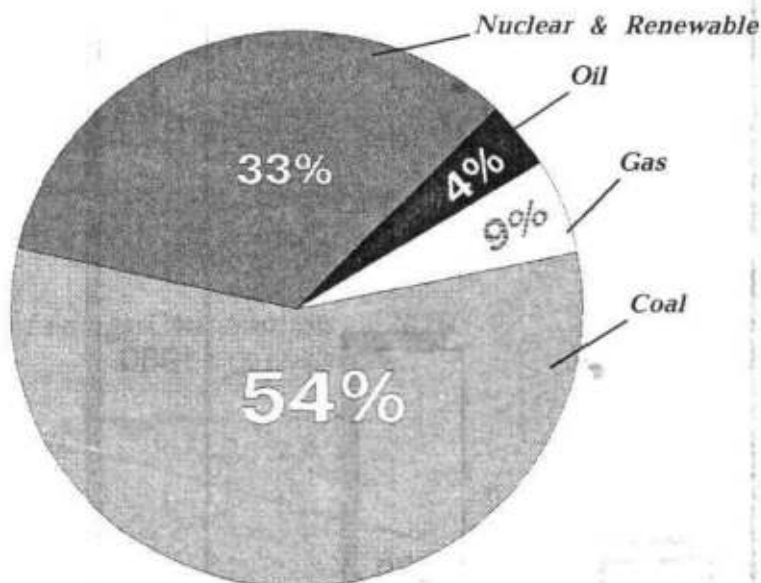
**to recycle** — to treat (a substance that has already been used) so that it is fit to use again укр. переробляти для повторного використання

**virtually** — almost, very nearly, practically укр. практично, майже

**to seek** — to make a search (for); to look for; try to find or get укр. шукати

**hazard** — something likely to cause damage or loss; a danger or risk укр. ризик, небезпека

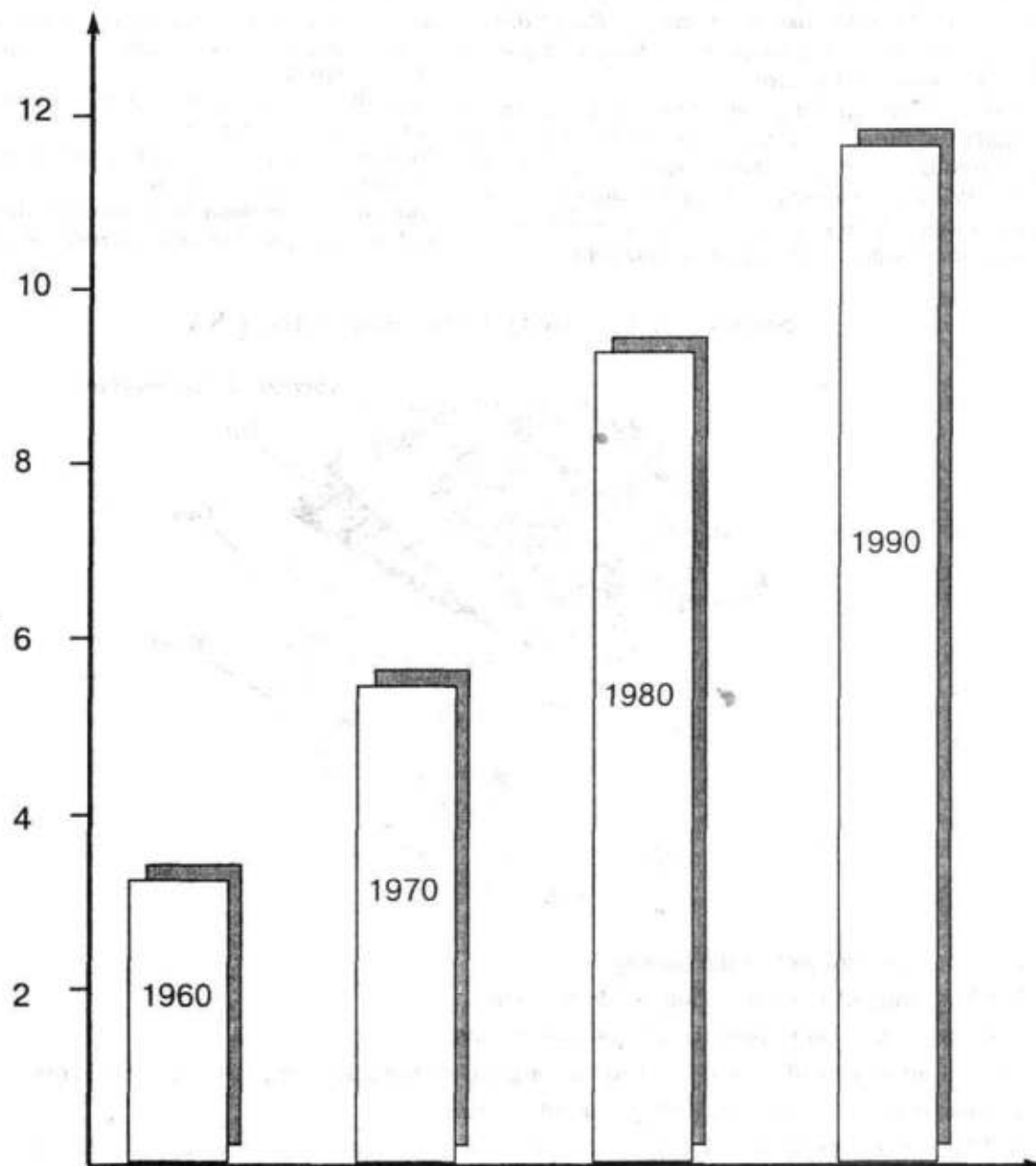
Sources of Electricity Generated in the USA



1. What is the subject of the passage?
2. What kinds of natural resources do you know?
3. What are the main uses of coal, petroleum, and gas?
4. What are the positive and the negative aspects of nuclear energy as a power source?
5. What is specific about renewable energy sources?
6. What are the positive and the negative aspects of various renewable energy sources? Give your opinion. State the reasons why.

**Exercise 1.** Give English equivalents of:

морські рослини та тварини; важливе джерело; поряд з; тверде паливо; кислотний дощ; забруднення повітря; найчистіше паливо; альтернативні джерела енергії; енергія припливу та відпливу; перші спроби починають запроваджуватись у життя; приборкувати; майже необмежені можливості; джерела енергії, що поновлюються; зменшувати небезпеку для довкілля.

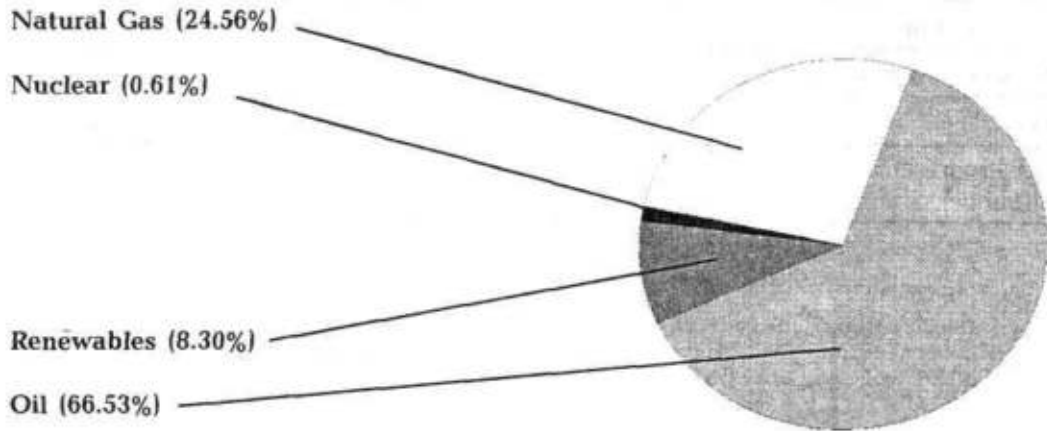
**Exercise 2.** A. Make some predictions about the world electricity consumption if present trends continue.**World Consumption of Electricity ( $10^6$  GWh)**



B. What does comparison of world energy consumption by source reveal?

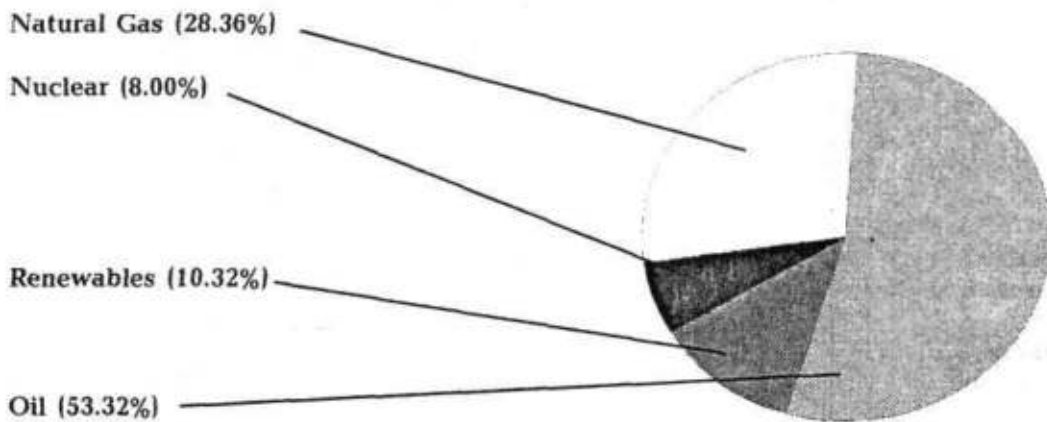
**World Energy Consumption — 1970**

*Total: 206.7 Quadrillion Btu*



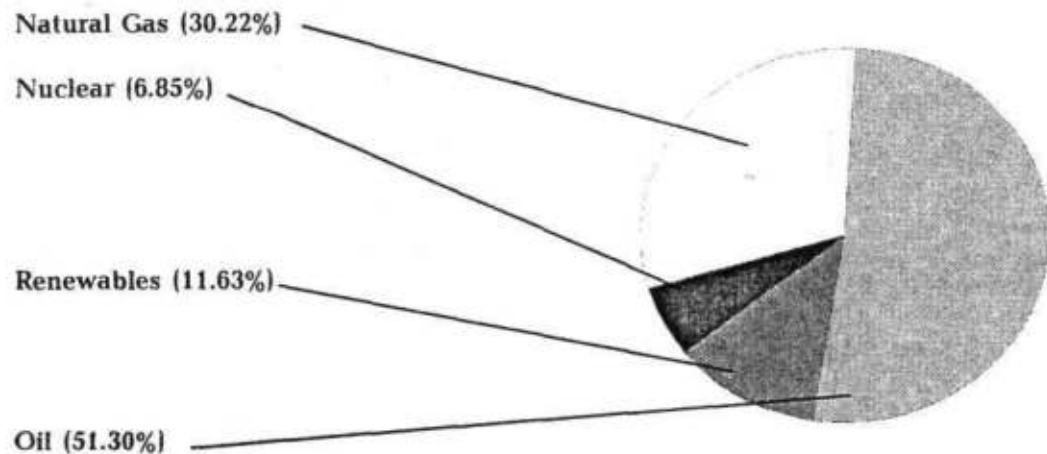
**World Energy Consumption — 1990**

*Total: 345.6 Quadrillion Btu*



**World Energy Consumption — 2010**

*Total: 471.1 Quadrillion Btu*





**Adverbial  
Modifiers**  
Обставини

You must study hard (in order) to excel.  
Ви повинні наполегливо вчитися,  
аби досягти успіху (бути кращим).  
This method is (not) accurate enough to give reliable results.  
Цей метод (не)достатньо точний,  
щоб за його допомоги отримати надійні результати.  
These details are **too** important **to be** neglected.  
Ці деталі надто важливі, щоб ними нехтувати.

	to make	
	to form	
Hydrogen and oxygen unite	to yield	water.
	to bring about	
	to produce	
	to give (rise to)	

Кисень та водень поєднуються, утворюючи  
(з утворенням) води.

**Parentheses**  
Вставні слова

to sum up		підсумовуючи
to summarize		
to begin with		— почнемо з того, що
to be on the safe side		— про всяк випадок
to put it another way		— інакше кажучи
to say nothing of		не кажучи вже про
not to mention		
so to say/speak		— так би мовити
that is to say		— тобто
to put it briefly		— коротше кажучи

**Exercise 3.** Translate the following sentences into Ukrainian.

- It is never too late to learn.
- Newton was the first to realize the universality of gravity.
- The subject is important enough to be discussed in full detail.
- These methods are to be described in the next chapter.
- Jenny was the first architect to use a steel frame in a tall building.
- Water is to be purified to meet our needs.
- The intention of the author is to show some newly developed methods.
- Elisha Otis was the first to demonstrate a steam-powered elevator in New York in 1853.
- These factors combine to make the problem very complicated.
- To be on the safe side, we are to take into consideration everything.
- The two quantities are added to yield the desired result.
- This is the rule not to be forgotten.
- She was the last to join our group.
- The problem is too complex to be solved right away.
- To get the best results, follow the directions carefully.
- To know everything is to know nothing.

### Constructions with the Infinitive

#### Subjective

##### Підмет з інфінітивом

He is known to be a reliable person.

Відомо, що він надійна людина. / Він, як відомо, надійна людина.

The article is said to be very interesting.

Кажуть, що це дуже цікава стаття. / Ця стаття, кажуть, дуже цікава.

She is expected to come.

Очікують, що вона прийде.

to know

to think

to consider

to believe

to suppose

to find виявляти

to say

to report повідомляти

to expect очікувати

to state констатувати

to see

to watch

to observe

вважати

спостерігати

#### Objective

##### Додаток з інфінітивом

I know him to be a reliable person.

Я знаю, що він надійна людина.

We consider this problem to be of great importance.

Ми вважаємо, що це надзвичайно важлива проблема.

They reported him to win the prize.

Повідомили, що він здуб премію.

to be likely ймовірно

to be unlikely малоймовірно

to be sure напевне

та після Participle II

He is (un)likely to come  
sure

(Мало)ймовірно, що він прийде.

Він обов'язково прийде.

Only the methods known from practical experience to be reliable have been used.

Було використано лише ті методи, котрі, як відомо з практичного досвіду, є надійними.

to happen

to chance

to seem

to appear

to prove

to turn out

ставатися

здаватися

виявлятися

He seems to know the rule.

Здається, він знає це правило.

It turned out to be a success  
failure.

Це виявилось успіхом  
невдачею.

to allow

to permit

to enable

ДОЗВОЛЯТИ

This device enables accurate measurements to be carried out.

Цей прилад дозволяє зробити точні виміри.

to want

to wish

to desire

to like

to love

бажати

Do you want me to help?

Ви хочете, щоб я допоміг?

They should be made to

comply with safety regulations. **to make\*** — примушувати;

Їх треба примусити підкоритися правилам безпеки.

зробити так, щоб...

Teachers should make their students study.

Вчителі повинні зробити так, щоб їхні учні вчилися.

\* When the verb **make** is *passive*, its complement is infinitive WITH **to**, when *active* — infinitive WITHOUT **to**.

### For+to+Infinitive Construction

I explain it for you to understand.

Я поясню це, щоб/аби ви зрозуміли.

There is not enough time for this article to be published this year.

Недостатньо часу для того, аби ця стаття вийшла друком цього року.

That was for him to decide.

Це повинен був вирішити він. (Порівняйте: 'It was up to him).

#### NOTE

**Bare Infinitive** (інфінітив без to)

Do NOT use to:

1. after modal and auxiliary verbs:

I don't ∅ understand you.

Я не розумію вас.

If one can't ∅ have what one loves, one must ∅ love what one has.

Якщо не маєш того, що любиш, люби те, що маєш.

2. after let, would rather, had better, make (active), and in the sentences beginning with Why:

Let us ∅ be friends.

Давайте будемо друзями.

I would rather not ∅ do it.

Я ліпше цього не робитиму.

What makes you ∅ think so?

Що примушує вас думати саме так?

Why not ∅ come?

Чому б не прийти?

#### NOTE

**Split Infinitive** (розщеплений інфінітив)

Really, I want to understand you.

Справді, я хочу зрозуміти вас.

I want to really understand you.

Я справді хочу зрозуміти вас.

#### NOTE

Sometimes **to** can be used INSTEAD of the infinitive:

I would not do it even if I wanted **to**.

I would not do it even if I wanted **to do it**.

Я б не зробив цього, навіть якщо б і хотів (це зробити).

— Would you like some tea?

— I'd | love to.

| like to.

— Ви хотіли б випити чаю?

— З задоволенням.

#### BUT:

Mind the verb **try**:

— Can you do this?

— I'll **try**.

— Ви можете це зробити?

— Спробую.

**Exercise 4.** Translate the following sentences into Ukrainian.

1. He is said to have graduated from Princeton University.
2. He appears to be concerned with the problem.
3. The law in question is likely to account for this phenomenon.
5. Science is known to affect the lives of people.
5. He asked for the papers to be brought.
6. One can assume this to be self-evident.
7. The work is unlikely to contribute to the solution of the problem.
8. The research is believed to be of great importance.
9. Everything is ready for the experiment to begin.
10. The data obtained appear to be quite correct.
11. Actually, Stonehenge turns out to have been built over a period of many centuries.
12. A substance known to possess such properties is called water.
13. We suppose this method to be of great practical value.
14. The procedure has proved to be complicated.
15. We want the experimental data to be presented as soon as possible.
16. The conclusion is sure to be of great theoretical interest.
17. The final results turned out to be not what we had expected.
18. They want the scientists to study this problem.
20. Substances thought to possess the properties in question were thoroughly investigated.
21. He appears to mention this fact in his monograph.
22. This approach allows to quickly analyze the data.
23. He was made to come early.
24. All factors likely to affect the accuracy of the experiment should be carefully observed.
25. The results turned out to be extremely interesting.
26. To begin with, investigations seem to appear at times when societies need them.
27. I want to finally know it.

**Exercise 5.** Translate Ukrainian sentences. Then match the two columns.

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. Дозвольте сказати декілька слів.</li> <li>2. Схема здається надто спрощеною.</li> <li>3. Я прийшов сюди першим.</li> <li>4. Проблема досить важлива для того, щоб її розглянути.</li> <li>5. Іноді дуже важко зробити так, щоб інші зрозуміли вашу думку.</li> <li>6. Вони очікують, що ми прийдемо вчасно.</li> <li>7. Нам буде досить легко владнати цю справу.</li> <li>8. Дуже важко уникнути помилок.</li> <li>9. Вам буде цікаво послухати його промову.</li> </ol> | <ol style="list-style-type: none"> <li>A. It will be easy for us to settle this problem.</li> <li>B. They expect us to come on time.</li> <li>C. The problem is important enough to be considered.</li> <li>D. To avoid making mistakes is very difficult.</li> <li>E. Let me say a couple of words.</li> <li>F. It will be interesting for you to listen to his speech.</li> <li>G. The scheme appears to be oversimplified.</li> <li>H. It is sometimes very difficult to make people see your point.</li> <li>I. I was the first to come here.</li> </ol> |
|---|--|

**Exercise 6.** Complete the following sentences.

1. Louise Nevelson is believed by many critics ... the greatest 20th century sculptor.
  - a. to be
  - b. have been
  - c. has been
  - d. being
2. The line where the Earth and the sky ... to meet is the horizon.
  - a. it seems
  - b. seems
  - c. seemingly
  - d. seem
3. The exceptions are too numerous ... any rule to be formulated.
  - a. to
  - b. for
  - c. since
  - d. as
4. To understand is ... deep structure.
  - a. grasping
  - b. to grasp
  - c. having grasped
  - d. grasped
5. ... this work requires great skill.
  - a. Accomplishment
  - b. Having accomplished
  - c. To accomplish
  - d. When accomplished
6. The tendency ... liquids to turn into gases is well-known.
  - a. that
  - b. if
  - c. for
  - d. when
7. Athletes who compete in the Olympic games ... to be amateurs.
  - a. are supposed
  - b. suppose
  - c. they suppose
  - d. supposedly
8. One can be amazed by the variety of life ... in tidal pools.
  - a. seeing
  - b. to see
  - c. when seen
  - d. to be seen
9. Telemarketing and telesales ... as the most cost-effective way of generating new business.
  - a. to be widely recognized
  - b. are widely recognized
  - c. to have been widely recognized
  - d. widely recognized



10. Service hotlines, advice lines, and telephone information service ... vital competitive weapons.
- are seen as
  - to see as
  - to be seen as
  - is seen as
11. This network ... to the technical standards that apply in this country.
- are tailored to conform
  - tailored to conform
  - to tailor to conform
  - is tailored to conform
12. Biomedical research continues ... scientists with new insights into the workings of the human body at the molecular level.
- to be provided
  - to provide
  - provide
  - how to provide

**Text B** Read the following passages and paraphrase them.

### 1. Green Products

Recent polls of citizens of both developing and industrialized countries found that a majority considered environmental protection more important than economic growth. Many European countries already have environmental product-labeling initiatives. In the United States, the U.S. Environmental Protection Agency (EPA) has been working with industry to define environmental goals and **facilitate** cooperation in achieving them. One result is a labeling program for energy-efficient computers. Design-for-the-environment initiatives are growing.

Design-for-environment (DFE) programs call for careful inclusion of environmentally safe attributes in the early design stages of new products, as opposed to re-engineering them later in the product cycle. Implementing DFE is increasingly critical if companies want to be globally competitive. These programs are also proving to be economically **sound**, emphasizing consideration of materials and energy, and, as a result, enhance profit potential. Recycling efforts can reduce the volume of **raw materials**. Maximizing the use of recyclable materials opens up **revenue** possibilities at the end of a product life cycle. Component reliability, a fundamental design goal in the electronics industry, supports the re-use of such parts in new or **refurbished** equipment, again saving raw materials, manufacturing costs, and time. Manufacturing innovations contribute to environmental soundness while boosting manufacturing efficiency. Xerox corporation estimates that its environmental programs already save the company more than \$100 million annually. One initiative at Xerox seeks such complete reuse of recycling of business equipment products that no materials need to be taken to a **landfill**. Another approach is manufacturing involving disassembling a machine, replacing worn-out parts with new, remanufactured or used components. Then machine is cleaned and tested to ensure it meets quality and reliability criteria for a newly manufactured machine.

To meet the challenge of zero waste material, the following issues must be addressed:

- Product simplification.
- Design for disassembly rather than merely assembly.
- Incorporating recyclable materials.

**to facilitate** — to make easy or easier; help

укр. полегшувати, допомагати, сприяти

**sound** — showing good sense **Synonyms:** reasonable, sensible

укр. із здоровим глуздом (розумом), тверезий, розсудливий, розумний

**raw material** — not yet treated for use, in a natural state укр. сировина

**revenue** — income укр. доход

**to refurbish** — to make clean and fresh again. **Synonyms:** to renovate, to overhaul укр. поновлювати

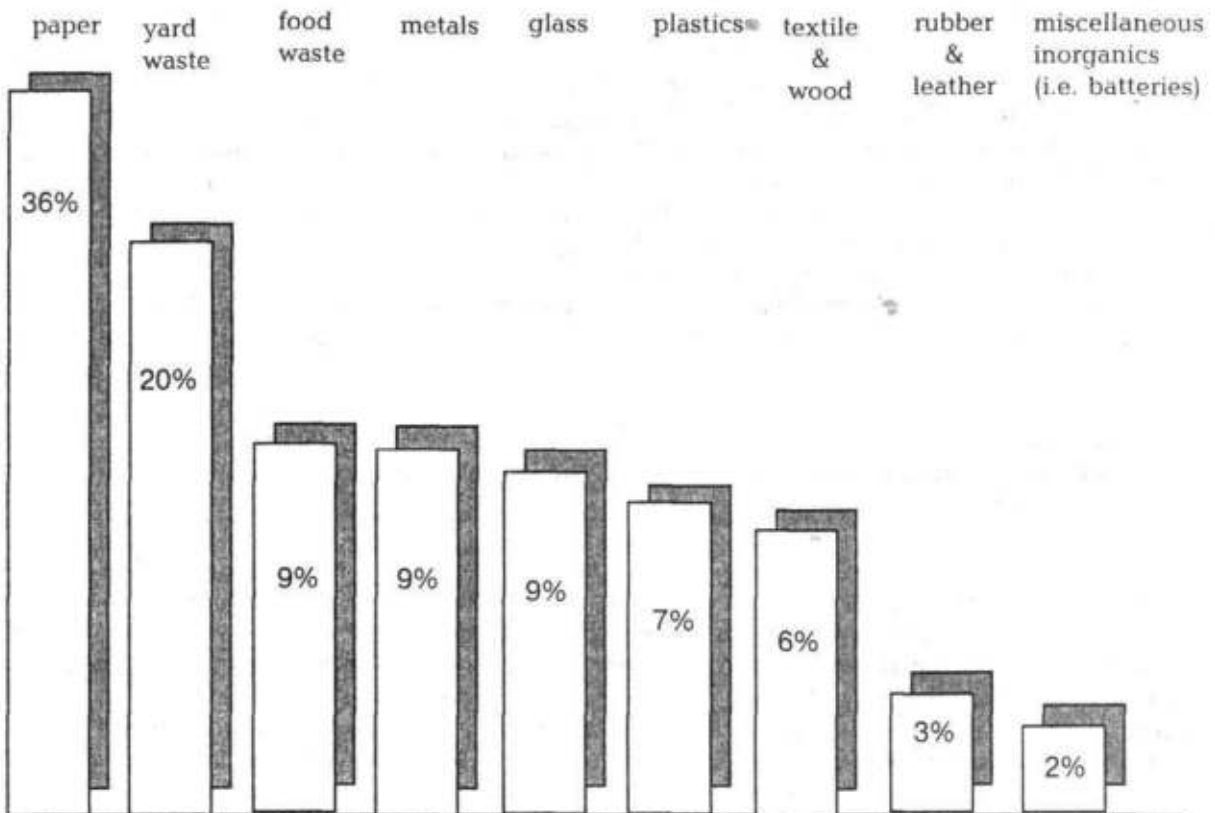
**landfill** — укр. звалище, смітник

**Some labels for environmentally preferred products**

Governments and nonprofit organizations are promoting the use of ecolabels to identify environmentally preferred products for consumers.



**What's in a Landfill?**



## 2. Modeling the World's Climate

Will global warming turn green fields into desert? Will the hole in the atmosphere's ozone layer repair itself? These are among the problems **tackled** by simulations on supercomputers. Climate modelers use numerical simulations and complex calculations. At the **core** of today's simulations of climate are the General Circulation Models (GCM). Used by scientists around the world, this method of modeling the earth's climate is based on a set of fundamental equations. The method involves dividing the atmosphere into a series of three-dimensional boxes (grid-cells or grid-points), and then solving these equations for each box.

Perhaps one of the most far-reaching questions that climate modelers today are addressing is the **greenhouse** effect and its influence on global warming. The greenhouse effect is the tendency of certain gases in the atmosphere, **notably** carbon dioxide, to trap heat below them in the same way that glass traps heat in a greenhouse. This is a key question because it can dramatically affect environment and society.

Climate modeling has its sister science, numerical forecasting of the weather **in terms of** temperatures, winds, and **precipitation**. Most of the basic formulae derive from Newton's laws, and a simple climatic model can be created from just a few equations: e.g. the second law of motion, conservation of mass, the first law of thermodynamics etc. These equations were first used to model the atmosphere in the 1920s by a British scientist, Lewis F. Richardson. He developed «computing forms» to solve them for different locations on the globe. He **envisioned** a large amphitheater representing the world, locations around the hall representing different geographic regions. A sort of «computing amphitheater» came into existence in the 1950s with the birth of the Eniac computer at Princeton University in New Jersey. Weather simulation was one of the first major problems run on this early computer and ever since then climate and weather modeling have been among the first applications transported to the «supercomputer» of each era. A primitive climate model was developed in 1956, and in the early 1960s, the first **full-scale** GCMs were developed. Today, there are well over two dozen of these general circulation models in the world. Researchers would like **to couple** other earth systems with GCM. Topography, ground and surface water hydrology, **terrestrial** ecosystems, **marine** biochemistry are all being modeled separately today and could, if coupled with today's GCMs, improve them greatly.

**to tackle** — to take action in order to deal with укр. працювати над розв'язанням (вирішенням)  
**core (of)** — the most important and central part of anything укр. стрижень, сутність, суть, ядро

**greenhouse** — укр. парник  
**notably** — especially, particularly  
 укр. особливо ж, а надто

**in terms of** — with regard to укр. у термінах; з точки зору; у розумінні; з урахуванням  
**precipitation** — укр. опади (метеорол.)  
**to envision** — to see in the mind as a future possibility **Synonym:** to foresee укр. передбачати

**full-scale** — укр. у повному обсязі  
**to couple** — to join together, connect укр. з'єднувати  
**terrestrial** — укр. наземний  
**marine** — укр. морський

### Exercise 7. Discuss the following point. Give your opinion.

Concern about the way people are damaging the environment is not new. In the USA, for instance, one of the first environmentalists was Henry David Thoreau, who spent several years living in a small hut on the shore of an isolated pond. He wrote a famous book, *Walden*, about his experience. In his book, Thoreau recommended that men and women learn to live more simply. While Thoreau's book was praised by many people, few actually followed his advice.

Another man named John Muir helped launch the first major conservation movement. He urged that Americans set aside some parts of the country so that they would never be farmed. One of such places was one of the first national parks in the U.S. — the Yosemite Valley.

**Exercise 8.**

One result of the U.S. Environmental Protection Agency (EPA) activities is labeling all products made with chlorofluorocarbon (CFC). Do you think such labeling is necessary for our country? Do you think special return and recycle programs (e.g. for batteries) are a must? Discuss these points with your colleagues.

**WARNING**

Manufactured with CFC —  
113 and/or  
1,1,1,Trichloroethane; these  
substances harm public  
health and environment by  
destroying ozone in the  
upper atmosphere.

*U.S. Environmental Protection Agency*

**Exercise 9.**

**Organize a round-table discussion «Put the Earth First». Use the materials provided below as possible guidelines for your discussion.**

**A.**

Scientists are ethically obligated to make sure that his or her work is environmentally sound. It is not possible for a scientist to hide behind the claim that scientists only create things, and others determine when and how they are used. If they can damage our environment, someone may use them to the misfortune of us all. Thus, the scientists have the obligation not to create things that are harmful to the environment.

**B.**

Every scientist is the «end user» of some other scientist's work. Sooner or later, we all are going to realize that «we» are «they». Why not begin at the environment in the design phase of the project?

**C.**

We not only have a responsibility to protect the environment but to attempt to improve the world we live in through technology development. We should contribute to society in a beneficial way, and take responsibility for what we create.

**D.**

Scientists have a very strong ethical obligation to make sure that their work, at the very least, minimizes damage on the environment, and, if possible, helps protect the environment.

**E.**

It seems that each design or product a scientist makes can be characterized as safe or not safe. However, impacts on environment are extremely varied. For example, wind and hydropower are supposed to be environmentally benign, but we now know that they may be dangerous to birds and fish.

**F.**

Why stop at scientists? Everyone has an obligation to protect our environment. We all use it, we all live in it. However, scientists tend to be more educated than the average populace and therefore must consider how our creations will benefit not only humanity, but the environment as well.

**G.**

We should talk not of human AGAINST nature, but of human AND nature.

**Exercise 10.**

importance      important

1. He is one of the \_\_\_\_\_ people in our company.
2. The real \_\_\_\_\_ of this invention is hard to overestimate.
3. It's \_\_\_\_\_ to learn foreign languages.

(to) recycle    recycled    recyclable

4. This bag is made of \_\_\_\_\_ paper.
5. It's possible \_\_\_\_\_ glass.
6. This plastic is \_\_\_\_\_.

reliable    reliably    (un)reliability

7. He may forget about it, he is not very \_\_\_\_\_.
8. I'm \_\_\_\_\_ informed of it.
9. You can depend only on \_\_\_\_\_ source of information.
10. \_\_\_\_\_ is opposite to reliability.

possible    possibility    possibly

11. They have many \_\_\_\_\_ to improve the system.
12. This is only one of many \_\_\_\_\_ answers.
13. Please, do it as soon as \_\_\_\_\_.
14. It's \_\_\_\_\_ that the store is still open.
15. Could you \_\_\_\_\_ lend me 20 dollars ?
16. There is strong \_\_\_\_\_ that they won't come.
17. Let's consider another \_\_\_\_\_.

responsible    responsibility

18. Who is \_\_\_\_\_ for this work?
19. He is very \_\_\_\_\_.
20. I take full \_\_\_\_\_ for this work.
21. It's his \_\_\_\_\_ to make the decision.

**Exercise 11.** Read the passage and answer the questions that follow.

For many years Antarctica was thought to be only an archipelago with islands tied together above sea level by ice. It was thought to be made up of two small subcontinents — East Antarctica, the larger, and West Antarctica, containing the Antarctic Peninsula. The two continents were supposed to be separated below sea level. Modern geophysical studies, however, have revealed a fairly complete picture of the Antarctic landform below its ice cover. Now we know that West Antarctica is connected to the main part of the continent by a chain of mountains well above the sea level. The bedrock of much of East Antarctica appears to be above sea level; some of it (in the Transantarctic Mountains) is far above sea level. Whether mineral wealth lies hidden by ice is unknown. No deposits rich enough to be economically useful have been found. Interpretation of continental structure is an important objective of any extensive geologic investigation, yet except for the earth's ocean basins, no area the size of Antarctica is so geologically unknown. With 98 percent of the continent covered by ice, it is extremely difficult to decipher the continent's general structure.

1. This text is concerned primarily with the
  - a. geological composition of Antarctica
  - b. continents of the world
  - c. exploration of minerals in Antarctica
  - d. earth's ocean basins
2. According to the passage, Antarctica is made up of
  - a. two subcontinents
  - b. connected land masses
  - c. several islands
  - d. two peninsulas
3. It can be inferred from the passage that little is known about Antarctica's
  - a. climate and size
  - b. landform
  - c. bedrock
  - d. mineral wealth
4. The author implies that
  - a. Antarctica used to be an archipelago
  - b. Antarctica supplies rich mineral resources
  - c. the Earth's ocean basins are not thoroughly investigated
  - d. much of East Antarctica is above sea level
5. How much of Antarctica is covered by ice?
  - a. 90 percent
  - b. 89 percent
  - c. 88 percent
  - d. 98 percent

**Exercise 12.**

Choose the one word or phrase that best keeps the meaning of the original sentence if it is substituted for it.

1. Virtually all the members were in agreement with the proposal.
  - a. actually
  - b. almost
  - c. eventually
  - d. seemingly
2. Our project is now under way.
  - a. under examination
  - b. being discussed
  - c. moving forward
  - d. under consideration
3. Hopefully, the committee's suggestions will be implemented soon.
  - a. studied
  - b. discarded
  - c. discussed
  - d. carried out
4. These factories seem to pollute the air.
  - a. make clean
  - b. make impure
  - c. harness
  - d. affect



5. The mine was closed because of coal exhaustion.
- production
  - depletion
  - recycling
  - deposits
6. Their choice turned out to be a mistake.
- proved
  - seemed
  - happened
  - is considered
7. They coupled the carriages of the train together.
- disconnected
  - connected
  - moved
  - separated
8. We observe rapid changes in the world of computer technology.
- slow
  - radical
  - slight
  - fast
9. They discussed hydroelectric and geothermal power, to say nothing of solar energy.
- that is to say
  - not to mention
  - to put it briefly
  - to put it another way
10. He seems to know what they mean.
- is likely
  - happens
  - is sure
  - appears
11. At present, I don't envision any difficulties.
- foresee
  - observe
  - encounter
  - look for
12. It is a good idea to overhaul this aircraft.
- make use of
  - purchase
  - get rid of
  - refurbish

## ***Noteworthy***

*I cannot give you a formula for success, but I can give you a formula for failure: try to please everybody.*

**Herbert Swope**



## **Chapter 10**

*Focus on:*

**Evolution of Manufacturing  
Intelligent Manufacturing**

**Grammar: Verbals  
Gerund**

**Text A** Read the text and be ready to answer the questions that follow.

Manufacturing technology is the technology of process control. It is machines, human labor, and the organization of work brought together to control a manufacturing process. Whenever the approach to process control *shifts* significantly, many parameters change. These shifts suggest six epochs in manufacturing. The new technology dictates changes in the nature and organization of manufacturing, and in the machines used to effect those changes.

The English system of manufacture originated in the late 18th century with the invention of general-purpose machine tools, such as *lathes*, that could be used to fabricate a variety of workpieces. The American system of manufacture that emerged in the mid-1800s emphasized precision and interchangeability of parts.

The era of scientific management began in the late 1800s with the works of Frederick Winslow Taylor, a U.S. mechanical engineer whose principles of manufacturing management are known as Taylorism. Recognizing that the workers themselves were limiting the speed and efficiency of machines, Taylor claimed that these activities could be measured, analyzed, and controlled with techniques analogous to those applicable to physical objects. Using job analysis and time study, he determined a standard rate of output for each job. This approach placed control in the hands of management, which could monitor a worker's productivity by comparing his or her output against a standard.

Next came the era of process improvement, in the mid-20th century, based on statistical process control (SPC). Invented in the U.S. in the 1930s, SPC assumes that machines are *intrinsically* imprecise, since the identical procedure will produce different results on the same machine at different times. It emphasized «outliers» (out-of-control) situations rather than *mean* performance; directed management's attention away from the worker toward machines. Whereas scientific management is concerned with manufacturing problems in essentially static forms, SPC is concerned with the dynamism of the processes.

*Numerical control* (NC) arrived in the 1970s with the microprocessor. NC combines the *versatility* of general-purpose machines with the precision and control of special-purpose machines. It emphasized adaptability above stability. It also implies experimentation, learning, place and nature of work.

Manufacturing entered the computer-integrated era in the late 1980s. Computer-integrated manufacturing (CIM) is based on information about, and models of functional expertise that make it possible to examine and systematize the interactions among functions. Recognizing these interactions and predicting their consequences constitutes system *intelligence*. The systems enabled by CIM are extraordinary, to say nothing of versatility in the form of new products and processes.

Each of six manufacturing epochs focused on a particular aspect of process control — from accuracy, precision, and reproducibility to stability, adaptability, and versatility.

The first three epochs embraced mechanization, with manufacturing conceived in terms of increasing efficiency and control. The engineering focus was on machines, and labor was required to adapt to machines and, ultimately, to become yet another machine. Now the emphasis is on *versatility* and *intelligence*. Machines have come to be viewed as *extensions* of the mind that can enhance cognitive abilities of human beings. This shift, based on information technology, suggests new managerial imperatives (like building small *cohesive* teams), broadens the role of engineering management, and starts treating manufacturing as a service.

**to shift** — to change (in position or direction), move from one place to another укр. змінювати; переміщати

**lathe** — укр. верстат

**intrinsic** — being part of the nature or character of someone or something; **Synonym:** inherent укр. внутрішньо властивий, притаманний за природою

**mean** — average укр. середній; звичайний; пересічний

**numerical control** — укр. числове програмне управління

**versatile** — having many different uses укр. універсальний, багатоцільовий, різнобічний,

**intelligence** — укр. інтелект, розвинені логіко-інформаційні можливості

**extension** — укр. продовження

**cohesive** — укр. згуртований



## GRAMMAR: VERBALS GERUND

	active	passive
Simple (Indefinite)	using	being used
Perfect	having used	having been used

### GERUNDS and NOUNS ending ...ing

NO plural ending  
Writing poetry is difficult.

Take plural ending  
I have read some of his writings recently.

### PREPOSITIONS are often used

**BEFORE Gerunds**  
I am fond of cooking.

**AFTER Nouns**  
The cooking of your sister is better than mine.

### GERUNDS and INFINITIVES

express something real, fulfilled  
I tried closing the door.  
(MEANING: I closed the door).  
I forgot mailing the letter.  
(MEANING: I mailed the letter,  
but I can't remember when).

express something hypothetical, unfulfilled  
I tried to close the door.  
(MEANING: I didn't close the door).  
I forgot to mail the letter.  
(MEANING: I didn't mail the letter).

### ARE USED WITH THE FOLLOWING VERBS:

enjoy  
avoid  
consider  
appreciate  
forgive  
  
postpone  
put-off  
  
quit  
suggest  
admit  
deny  
  
go on  
keep on

hope  
want  
expect

afford  
...

**BOTH** Infinitive and Gerund are used with  
(dis)like  
begin  
start  
continue  
stop  
remember  
forget  
try

They like working hard  
continued to work hard

## USE GERUND WITH THE FOLLOWING EXPRESSIONS

I am	capable of (здатний) fond of (подобатися) accustomed to (призвичаїтися) interested in (цікавитися) successful in (досягати успіху) afraid of (боятися) tired of (втомитися)	doing a lot of work
I have no	excuse (вибачення) reason for (причина) possibility of (можливість)	coming so late
They	succeed in (мати успіх) insist on (наполягати на) think of (думати про) thank for (дякувати) object to заперечувати, виступати проти  • rely on • count on розраховувати  • feel like • don't mind не бути проти	getting a job
It's	• worth • worthwhile варто  • not worth(while) • no use не варто	postponing the meeting

They	<ul style="list-style-type: none"> <li>* can't help</li> <li>* can't resist</li> <li>не могли не</li>   <li>* can't stand</li> <li>* can't bear</li> <li>ненавидіти</li> </ul>	doing nothing
We	<ul style="list-style-type: none"> <li>* look forward to</li> <li>з нетерпінням чекати</li>   <li>Would you mind?</li> <li>Чи не могли б ви ...</li>   <li>*/найбільш ввічлива</li> <li>форма прохання/</li> </ul>	<p>hearing from you</p> <p>coming later?</p>

### GERUND in a Sentence

<b>Subject</b> Підмет	<p><u>Reading</u> books is useful.          Читати книги — корисно.</p>
Part of Predicate	<p><u>Carrying out</u> this task is of great importance.          Дуже важливо виконати це завдання.          Виконання цього завдання має велике значення.          His favorite pastime <u>is listening</u> to music.          How about   <u>postponing</u> the test?          What about  </p>
<b>Object</b> Додаток	<p>He insisted <u>on translating</u> the text.          Він наполягав на перекладі тексту.          Ann likes <u>studying foreign languages</u>.          Енн подобається вивчати іноземні мови.</p>
<b>Attribute</b> Означення	<p>There are two reasons <u>for discussing</u> the problem.          Існують дві причини для обговорення проблеми.  <u>The boiling temperature</u> of water is 100 C.          Температура <u>кипіння</u> води — 100 C.          (ПОРІВНЯЙТЕ: <u>boiling</u> water (Participle I) —          вода, <u>що кипить</u>)</p>
<b>Adverbial modifiers</b> Обставини	<p><u>On entering</u> the room, he greeted everyone.          Зайшовши до кімнати, він привітав усіх присутніх.  <u>After discussing</u> the problem they arrived at important conclusions.          Після обговорення проблеми вони дійшли важливих висновків.</p>

## CONSTRUCTIONS WITH GERUND

## Noun with 's / Possessive Adjective + Gerund

I object to your participating.  
 I know of John's coming late.  
The scientist's having discovered  
 this phenomenon made him famous.

Я виступаю проти вашої участі.  
 Я знаю, що Джон прийде пізно.  
 Відкриття вченим цього явища  
 зробило його відомим.

MIND the difference between

Possessive Adjectives		AND	Possessive Pronouns	
My	Our		Mine	Ours
Your	Your		Yours	Yours
His/Her/Its	Their		His/Hers/Its	Theirs

**Exercise 3.** Translate the following sentences into Ukrainian.

1. Forecasting future is always an uncertain business.
2. We learn much by reading books.
3. Writing essays in English requires practice.
4. It is worth remembering this rule.
5. They are capable of constructing these facilities.
6. Active animal life exists at all temperatures from the melting point of ice, to about 40° below the boiling point of water.
7. There are many reasons for questioning this theory.
8. The exhibition was worth attending.
9. He could not help joining the discussion.
10. I really thank you for taking all the trouble.
11. If you are not interested in asking questions, you are not interested in having answers.
12. The problem is worth solving.
13. I like to work without being disturbed.
14. Your studying much now will help you in your future work.
15. We succeeded in obtaining reliable results.
16. They know about our investigating the problem.
17. In spite of his being tired, he continued to work.
18. I object to your discussing this issue now.
19. A true scientist is interested in being told about his or her mistakes.
20. I know of your having read this article.
21. He went away without having told us the necessary information.
22. The result of his investigation depended upon his having applied the proper method.
23. Academician Artzimovich once humorously defined science as a practice of the scientist's satisfying his or her curiosity at the expense of the government.



**Exercise 4.** Complete the following sentences.

1. This book succeeds in ... structuralist theory.
  - a. being told
  - b. telling
  - c. to tell
  - d. have told
2. ... having been invited to take part in the conference was quite unexpected.
  - a. we
  - b. our
  - c. us
  - d. ours
3. By thoroughly ... the experiment we obtained good results.
  - a. conduct
  - b. having conducted
  - c. to conduct
  - d. conducting
4. After ... the problem in full detail they decided to solve it.
  - a. discussion
  - b. discussing
  - c. having been discussed
  - d. to discuss
5. In spite of not ... any university education, Faraday made his great discoveries.
  - a. to have
  - b. have
  - c. having
  - d. has
6. Everything depends on ... finishing the project on time.
  - a. your
  - b. for you
  - c. yours
  - d. you
7. He was capable of ... the task.
  - a. performance
  - b. performing
  - c. perform
  - d. to perform
8. ... journals is important for every scientist.
  - a. We read
  - b. While reading
  - c. Reading
  - d. Read
9. One cannot master a foreign language without ... at it regularly.
  - a. working
  - b. to work
  - c. works
  - d. work
10. Automatic Call Distribution is the only way of ... that calls are answered without delay, in quick succession.
  - a. to make sure
  - b. will make sure
  - c. when making sure
  - d. making sure

**Exercise 5.** Fill in the blanks with the gerund or the infinitive form of the word given.

1. It's difficult to quit \_\_\_(smoke).
2. On my way home I stopped \_\_\_(buy) some greeting cards at the bookstore.
3. I can't translate this article because I forgot \_\_\_(bring) the dictionary with me.
4. \_\_\_(Wait) for exam made him more and more anxious.
5. Many children have stopped \_\_\_(play) traditional children's games and \_\_\_(seem) \_\_\_(prefer) \_\_\_(play) computer games.
6. They say he can't afford \_\_\_(spend) much money on travels.

**Exercise 6.** This survey will help you identify some of your personality traits, that will help you discover some occupations in which you would have the most interest. Pay special attention to translating verbals.

**Step One:** Circle the number of any item — subject, activity, or type of person — that is appealing to you. Leave all others blank.

- |   |                                  |
|---|----------------------------------|
| 1. Farming                                | 25. Driving a truck              |
| 2. Advanced math                          | 26. Working in a lab             |
| 3. Being in a play                        | 27. Musicians                    |
| 4. Studying people in other lands         | 28. Making new friends           |
| 5. Talking to people at a party           | 29. Leaders                      |
| 6. Word processing                        | 30. Following a budget           |
| 7. Auto mechanics                         | 31. Fixing electrical appliances |
| 8. Astronomy                              | 32. Building rocket models       |
| 9. Drawing or painting                    | 33. Creative writing             |
| 10. Going to church                       | 34. Attending sports events      |
| 11. Work on a sales campaign              | 35. Being class President        |
| 12. Using a cash register                 | 36. Using OT (office technology) |
| 13. Carpentry (working with wood)         | 37. Building things              |
| 14. Physics                               | 38. Doing puzzles                |
| 15. Foreign language                      | 39. Fashion design               |
| 16. Teaching students                     | 40. Belonging to a club          |
| 17. Buying clothes for a store            | 41. Giving speeches              |
| 18. Working from 9:00 am to 5:00 pm       | 42. Keeping detailed records     |
| 19. Setting type for a print shop         | 43. Wildlife biology             |
| 20. Using a chemistry set                 | 44. Being in a science fair      |
| 21. Reading art and music magazines       | 45. Going to concerts            |
| 22. Helping people with personal problems | 46. Working with older people    |
| 23. Selling life insurance                | 47. Salespeople                  |
| 24. Typing reports                        | 48. File letters & reports       |

**Step Two:** On the chart below, again circle the numbers of the items which appealed to you. After you've finished, count the numbers circled on each line. Write the two highest categories on the lines below. These are the clusters in which you have the most interest. For example, if you scored highest in Social, and second highest in Artistic, your Code would be «SA». You would want to concentrate your career exploration efforts in those two categories.

R — Realistic	1	7	13	19	25	31	37	43
I — Investigative	2	8	14	20	26	32	38	44
A — Artistic	3	9	15	21	27	33	39	45
S — Social	4	10	16	22	28	34	40	46
E — Enterprising	5	11	17	23	29	35	41	47
C — Conventional	6	12	18	24	30	36	42	48

I scored highest in \_\_\_\_\_

I scored second highest in \_\_\_\_\_

My Code is \_\_\_\_\_

## OCCUPATIONAL CATEGORIES

### REALISTIC OCCUPATIONS

Realistic people prefer physical activities and hands-on projects. They prefer working alone, and are often found out of doors and in jobs such as forestry, farm management, construction, geology, hazardous waste management, auto repair, manufacturing, and natural gas exploring.

### INVESTIGATIVE OCCUPATIONS

Investigative people have science and mathematical abilities, and tend to be problem solvers. They prefer working on their own, and enjoy occupations such as medical and lab technology, chemistry, engineering.

### ARTISTIC OCCUPATIONS

Artistic people tend to seek opportunities to use their talents to create beauty in art, music, or literature. They usually show emotions more easily than other people, and are found in occupations like musician, artist, writer, and actor. They prefer situations that provide opportunities for creative expression. Artistic people often enjoy working alone.

### SOCIAL OCCUPATIONS

Social people like being with other people, helping others and working in jobs that directly affect other people. They socialize well, and go into occupations such as teaching, nursing, psychology, and religious service.

### ENTERPRISING OCCUPATIONS

Enterprising people tend to be leaders. They have speaking, sales and managerial skills, and enjoy having prestige and high status. They like to influence others, and like occupations such as salesperson, financial manager, travel agent, hotel manager, and real estate.

### CONVENTIONAL OCCUPATIONS

Conventional people like to keep things neat and organized. They enjoy doing computations, keeping records, and are interested in using office skills. They enjoy working with charts, and writing reports. They are self-controlled and enjoy status and authority. They prefer occupations like banking, secretary, accountant.

**Text B** Read the text and be ready to answer the questions that follow.

Manufacturing is a prime generator of wealth and is critical in establishing a sound basis for economic growth. Manufacturing is a cornerstone of all economic activities, and efforts to continuously *advance* manufacturing technology are therefore *vital* to a richer and more stable future. Scientists undertake *feasibility studies* to develop next-generation advanced manufacturing technologies related to the following phenomena:

- the globalization of *corporate* activities;
- greater sophistication in manufacturing operations;
- changes in market requirements (e.g. more *diversified* needs);
- changes in human factors, including *shortage* of skilled labor;
- problems due to the need to preserve natural resources and the environment;
- increased investments required for manufacturing systems and R&D.

Globalization presents particular problem because, depending upon the nature and purpose of its activities, a company may have various facilities located around the world. To manage those facilities effectively, and to handle its policy making and production planning, a company needs a communications network that interconnects its multiple plants and other facilities. Setting up such a network is essential for exchanging data through an internationally *compatible* communications system. Increasingly, companies are finding they need a common intercompany communications system that enables different firms to exchange information.

Future plants based on the intelligent manufacturing system concept are expected to include such autonomous and intelligent systems as industrial robots, numerically controlled machine tools and interacting with an intelligent production management system. Computer-aided design, manufacturing and engineering at an R&D center will help in the rapid development of new products matched to customers needs. A global communications network with standardized interfaces will link the head office to the manufacturing plants, sales agents, and subcontractors.

**to advance** — to move forward in development, to improve укр. розвивати, покращувати

**vital (to, for)** — very necessary, of the greatest importance укр. нагально потрібний, надзвичайно важливий

**feasible** — able to be carried out or done, possible and reasonable укр. здійснимий

**feasibility study** — укр. техніко-економічне обґрунтування

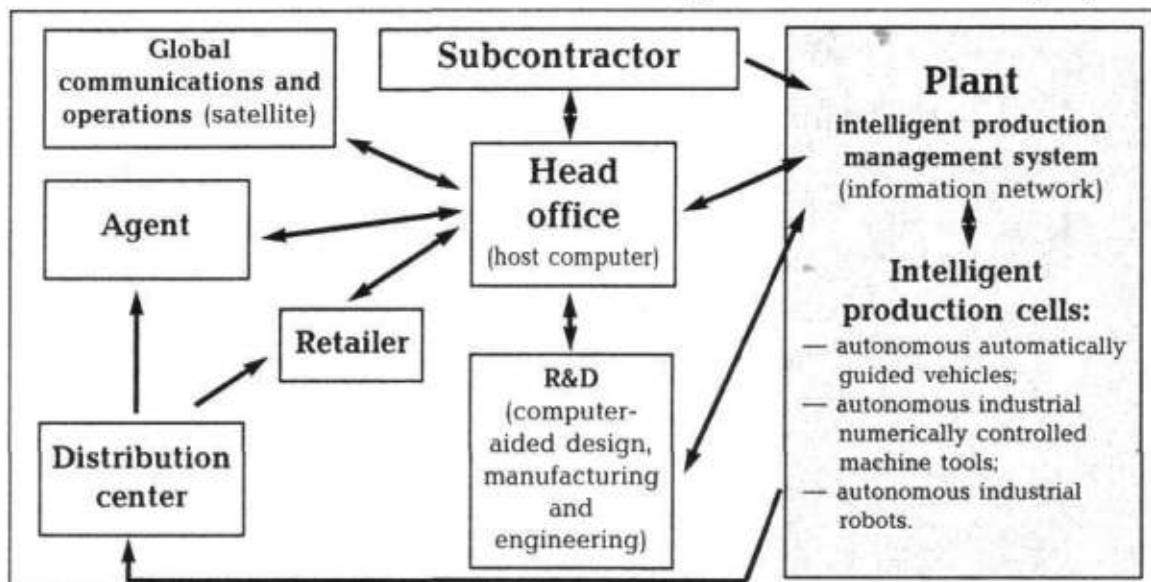
**corporate** — of, belonging to or shared by all the members of a group/corporation **Synonym:** collective

**to diversify** — to make or become different in form, quality, aims, or activities; vary укр. урізноманітнювати

**shortage (of)** — a condition of having less than needed; lacking укр. нестача, брак

**compatible (with)** — able to exist together, or be used together with another thing укр. сумісний, той, що сполучується (поєднується)

### Intelligent manufacturing system



1. What is the problem under discussion?
2. What is a prime generator of wealth and basis for economic growth?
3. What is meant by a feasibility study?
4. What phenomena should be taken into account by all manufacturers?
5. What is specific about future plants and manufacturing systems?

**Exercise 7.** Discuss the following point with your colleagues.

The goal of manufacturing at companies throughout the world is processing orders sooner and faster. The **buzzwords** are «lean», to describe efficient, un wasteful, less costly manufacturing; «agile», said of manufacturing system's speed in reconfiguring itself to meet changing demands; and «flexible», meaning the system's ability to adjust to customers preferences. Customer satisfaction is usually first on the list of priorities.

**buzzword** — a word or phrase especially related to a specialized subject, which is thought to express something important but is often hard to understand

**Exercise 8.** Render the following passage into Ukrainian.

The workplace has changed. Today's employers are asking workers to do more. Now workers have to manage their workstations, schedule their time, think about quality, solve problems, and apply their skills to new technologies.

Manufacturing, too, has changed. Factory employees no longer necessarily perform routine, repetitive tasks. Because of the use of flexible automated manufacturing systems and electronically controlled (rather than mechanical) equipment, they must process information symbolically. Instead of manufacturing parts of a machine, for example, workers must now interact with symbols on a computer. The workers must use complex diagnostic equipment for **troubleshooting**.

**to troubleshoot** — to discover and remove cause of trouble in machines, organizations, etc.

**Exercise 9.**

(to) manufacture    manufacturer(s)    manufacturing

1. This firm \_\_\_\_\_ computers.
2. The \_\_\_\_\_ of these components is very expensive.
3. Our microwave oven didn't work, so we sent it to the \_\_\_\_\_.
4. They promise new job openings in the \_\_\_\_\_ sector.

(to) organize    organization    organized

5. They support a charity \_\_\_\_\_.
6. You should \_\_\_\_\_ a conference next year.
7. You have to \_\_\_\_\_ your facts first in order to make a good speech.
8. What a well-\_\_\_\_\_ structure it is!

precise    precision    precisely

9. The train is supposed to come at about 11 a.m., 11.05, to be \_\_\_\_\_.
10. \_\_\_\_\_ instruments are widely used nowadays.
11. Tell me \_\_\_\_\_ what you want.
12. — You advise me to wait a little?  
— \_\_\_\_\_.

**Exercise 10.** Read the text and answer the questions about it.

Isaac Newton (1642 — 1727) was born in England. Newton set modern physics on its feet by deriving laws showing how objects move on the Earth and in space, and by finding the law that describes gravity. For many years he developed his ideas about the nature of motion and about gravitation. In order to derive them mathematically, he invented calculus. Newton long withheld publishing his results, possibly out of shyness. Finally, Edmond Halley, whose name we associate with the famous comet, persuaded Newton to publish his works. A few years later, in 1687, the «Philosophiæ Naturalis Principia Mathematica» (Mathematical Principles of Natural Philosophy) was published. He built the first reflecting telescope in 1668, and used it to study how the planets move.

Newton's most intellectually fertile years were those right after his graduation from college when he returned home to the country. Newton was a professor of mathematics at Cambridge University, later in life went into government service. His tomb in Westminster Abbey bears the epitaph: «Mortals, congratulate yourselves that so great a man has lived for the honor of the human race». Newton made many discoveries that are part of modern science. Even now scientists still refer to «Newton's laws of motion», «Newtonian telescopes», «Newton's laws of gravitation». Scientists measure the force due to gravity in units called newtons.

1. What is the best title for the passage?
  - a. Newtonian telescope
  - b. Great invention
  - c. Isaac Newton
  - d. Edmond Halley
2. According to the author, Newton worked most productively
  - a. as a professor at Cambridge University
  - b. during his government service
  - c. while studying at college
  - d. right after graduation from college
3. It can be inferred from the passage that Isaac Newton
  - a. did not publish Principia in 1687
  - b. published his works together with Halley
  - c. wanted to publish his works as soon as possible
  - d. was probably a modest person
4. According to the passage Isaac Newton build his reflecting telescope at the age of
  - a. 40
  - b. 26
  - c. 28
  - d. 36
5. The passage was probably written by a specialist in
  - a. geology
  - b. geography
  - c. ecology
  - d. astronomy



**Exercise 11.** Choose the one word or phrase that best keeps the meaning of the original sentence if it is substituted for it.

1. We really need to advance this technology.

- a. approach
- b. improve
- c. reproduce
- d. realize

2. There is no shortage of these materials.

- a. abundance
- b. need
- c. analogue
- d. lack

3. Nylon is a versatile material.

- a. is very useful
- b. is indispensable
- c. has many different uses
- d. has very few uses

4. I'm accustomed to getting up early.

- a. used to
- b. not used to
- c. interested in
- d. capable of

5. That's a very sound suggestion.

- a. silly
- b. strange
- c. reasonable
- d. timely

6. I feel like studying tonight.

- a. don't like
- b. don't need
- c. don't mind
- d. don't want

7. He says he can't bear being shouted at.

- a. can't resist
- b. can't stand
- c. can't forgive
- d. can't thank for

8. You can rely on my doing it.

- a. find out
- b. insist on
- c. object to
- d. count on

9. We all share corporate responsibility.

- a. collective
- b. government
- c. partial
- d. this



10. He admitted the intrinsic merits of my idea.
- a. innovative
  - b. intriguing
  - c. inherent
  - d. valuable
11. Ballet originated in Italy in the 1400s.
- a. coexisted with
  - b. developed in
  - c. began in
  - d. brought about
12. Ultimately, the success of the product depends on good marketing.
- a. in the beginning
  - b. in the end
  - c. usually
  - d. from time to time

## ***Noteworthy***

*Genius is 1 percent inspiration and 99 percent perspiration.*

**Thomas Edison**

UNscientifically speaking...

**THEOREM:**

It doesn't matter if something I buy turns out to be a mistake and unreturnable,  
because three years ago I found fifty dollars on the street,  
so THAT BALANCES EVERYTHING OUT!

## **Chapter 11**

*Focus on:*

**DOs and DON'Ts for Young Scientists  
On Innovators and Innovations**

**Grammar: Emphasis**

**Text A** Read the text and be ready to answer the questions that follow.

DOs and DON'Ts may be defined as the rules of behavior. They are meant to emphasize certain points that might be useful.

**1. DO relate what you are doing to the overall system or project objective.**

Make it your business to understand how your part of a project fits into the system being designed and what mission or objective that system is trying *to accomplish*. Putting it another way, try to understand the big picture.

There are two reasons for doing this. It makes your job more interesting and exciting and it may suggest a simpler, better approach to your part of work. There are hundreds of cases where someone completed the assigned part of a larger system, and, after learning the overall objective, pointed out a much better way to accomplish the same objective. If the people around you are too busy, try asking the boss at a lunchtime to tell you «a little more about how you fit into overall program». Thus, DON'T be afraid to challenge the planned way of doing something or to propose a new way.

**to accomplish** — to succeed in doing something; to finish successfully *Synonym*: to achieve  
укр. здійснювати, завершувати

**2. DO give credit to others for their ideas and contributions.**

It's the right, ethical and professional thing to do. Your listeners or readers will be more comfortable and impressed knowing you have explored the field. They will also assume that the work not credited to others is yours. Furthermore, the persons receiving the credit will respect you and be more likely to share their other new thoughts with you. Within a group, such behavior is often *crucial* to effective cooperation. To give emphasis and add a bit of fun, identify a particularly original idea with the originator's name: «Johnson's Chart», «Harris Technique».

**crucial (to, for)** — of deciding importance  
укр. вирішальний

**3. DO keep learning.**

DO join professional society. DO read articles and books, use the library, and attend professional meetings. Set up a requirement of reading at least one scientific paper a week. Select difficult ones. If you don't understand the paper, ask others. DON'T give up.

DO write papers. It's hard and takes time and discipline, but it's important for you and your profession. DO document your work. Write it down. In his book on computers and hackers, «The Cuckoo's Egg», Cliff Stoll quotes the Astronomer's *Rule of Thumb*: «If you didn't write it down, it didn't happen».

**rule of thumb** — укр. емпіричне правило

DO become a «local» expert in some area, even if it's a fairly narrow one.

**4. DO plan and schedule your work.**

Make a detailed plan of all you must do to finish the job. As someone said: «Plan the work, then work the plan».

Assume complete responsibility for your own career. Develop and maintain a strategic plan from Day One. This plan is mandatory for judging your career progress.

**5. DO develop a thorough understanding of entrepreneurship and practical business knowledge.**

Get yourself involved in seeking solutions to some problems of real importance (education, health care etc.). DO try to understand the user and his or her needs.

**6. DO learn to express yourself clearly in speech and writing.**

1. What is meant by DOs and DON'Ts?
2. What is the role of emphatic **do** in this text?
3. Indicate the elements of the text that show the author's recommendations, as well as the most categorical statements.
4. What is the purpose of citing in this passage?
5. What is specific about each piece of advice? Why is it important to follow them?

**Exercise 1.** Give English equivalents of:

завершувати проект; кращий шлях; посылатися на праці; бути вирішальним для ефективної співпраці; бути спеціалістом у досить вузькій галузі; планувати роботу; розробляти стратегічний план; розв'язувати справді важливі проблеми; підприємництво.

**Exercise 2.** Give Ukrainian equivalents of:

to emphasize the point; to fit into overall project (system); to challenge the planned way of doing something; to explore the field; to share thoughts and ideas; crucial factor; to assume responsibility; to judge the progress; entrepreneurship.

**Exercise 3.** Render the following passage into Ukrainian.

## How to Speak in Public

### Be prepared

- ✓ Find out why you are there, what is expected of you, how much time you have.
- ✓ Note down the points you want to make. Don't try to memorize a whole speech — key words on index cards are often useful.
- ✓ Check and double-check technical equipment (microphones, slide projectors, visual presenters etc.). Make sure you know where the power switch is.

### What you say

- ✓ Say what you need to say as clearly as possible. Repeat key phrases/points at the end.
- ✓ Any new information you can incorporate into your speech such as recent statistics, will help to keep your audience interested. However, be careful not to base your whole talk on statistics and/or background information. Tell them something they don't already know. At the end of your talk ask if there are any questions. You can be sure that if you speak effectively, people will remember you.

### Coping with nerves

- ✓ Take a couple of deep breaths before starting. Think of professional achievements you are proud of and keep it at the back of your mind.
- ✓ Speak clearly and smile. Keep your body relaxed and use controlled gestures and pauses for emphasis.

## GRAMMAR: EMPHASIS

Emphasis (intensification) may be signaled in various ways including special stress, intonation, grammar patterns, choice of words etc.

**Emphatic DO**

дієслово —  
підсилювач

**Reflexive pronoun  
after noun**

зворотний займенник  
після іменника

**Double negation**

подвійне заперечення

**It is/was ... that/who**

**It was not until ... that**

**NOTE**

Важливо **відрізнити**  
цю конструкцію від  
безособових зворотів  
типу  
It is believed  
It is known  
It is interesting  
It is (not) surprising

This theory **does** hold.

Ця теорія є **дійсно** справедливою.

It **did** seem strange.

Це **справді** видавалося дивним.

Science **itself** proceeds from the known (dull) to the unknown (interesting).

Власне наука йде від відомого (нецікавого)  
до невідомого (цікавого).

The case is **not** improbable.

Випадок є ймовірним (**не** є **неймовірним**).

It is **not** that we are doing **nothing** about this problem.

Ми вживаємо певні заходи стосовно цієї проблеми  
( **невірно**, що ми **нічого не** робимо).

**It was** professor Johnson **who** delivered a lecture last week.

Саме професор Джонсон прочитав лекцію минулого тижня.

**It is** this theory **that** is of interest to us.

Саме ця теорія цікавить нас.

**It was not until** 1895 **that** Popov invented radio.

І лише у 1895 р. Попов винайшов радіо.

**IS or ARE?**

It **was** the student

who helped us

It **was** the students

**not only ... but also ...**  
**both ... and...**

**either ... or ...**  
**neither ... nor ...**

**hardly ...**  
**scarcely ...**

He visited **not only** Washington, **but also** New York.  
Він відвідав не тільки Вашингтон, але також і Нью-Йорк.

**Або:** He visited **both** Washington **and** New York.

**Neither** my father **nor** I were there.

Ані мій батько, ані я не були там.

It's **either** black **or** white.

Колір або чорний, або білий.

**Hardly/Scarcely** had they arrived

when they had to leave again.

Ледве (тільки-но) вони приїхали, і повинні знову їхати.

**Inversion**

Інверсія —  
непрямий порядок слів

**Double inversion**

Подвійна інверсія (на  
початку речення —  
складний присудок,  
виражений  
дісприкетником I або  
II, іменником з  
прийменником або  
прикметником)

**Emphatic words**

емфатичні слова  
(слова-підсилювачі)

really,  
indeed

certainly, only, even,  
so, such, too, very,  
extremely, intensely,  
just;

\*as much as, \*as late  
(early) as та подібні

\*well + verb

I will never go there (прямий порядок слів)  
**Never will I go there** (непрямий порядок слів).  
Я ніколи не піду туди.  
**Not once did they try.**  
Вони не спробували жодного разу.  
**Little do we know!**  
Як же мало ми знаємо!  
I can't do it. **Neither can I.**  
Він не може цього зробити. Я також.  
They didn't inform us about the conference.  
**Nor did they sent** the invitations.  
Вони не повідомили нас про конференцію.  
Вони також не надіслали запрошень.  
**Isn't it interesting!**  
Як цікаво!

**Presented** in a picture is a scheme.  
На малюнку показана схема.  
**Confirming** this theory is another fact.  
Цю теорію стверджує ще один факт.  
**Of importance** is his point of view.  
Його точка зору має важливе значення.

He **alone** can help us. **Only** he can help us.  
Тільки (лише) він може допомогти нам.  
**Even** under such conditions will the reaction proceed.  
Навіть за таких умов відбувається ця реакція.  
**So much work, and so little time!**  
Так багато роботи, і так мало часу!  
**Such** an interesting idea!  
Яка цікава ідея!  
The task is **too** difficult.  
Завдання надто складне.  
Imagine **the very** idea!  
Тільки уявіть собі власне ідею!  
It's **just** a matter of time.  
Це справа лише часу.  
I **really** want to help you.  
Я справді хочу допомогти вам.  
You may **well agree** with them.  
Ви можете цілком погодитися з ними.  
The discovery was made **as early as** XVIII century.  
Це відкриття зробили ще у XVIII столітті.



**Exercise 4.** Translate the following sentences into Ukrainian.

1. It's really the spirit of inquiry.
2. He said he would come and he did come.
3. The fact is extremely useful.
4. That the author does have this view is obvious.
5. Only now do I realize the significance of the new method.
6. Related to our discussion are many other subjects.
7. This idea is not sufficiently unusual.
8. Texas alone is larger than France, and Alaska is twice as big as Texas.
9. It is by no means unreasonable to compare these data.
10. It was this article that I wanted to read.
11. It is satellite communications that my article deals with.
12. It was not until 1995 that this book was published.
13. It did cause quite a few difficulties.
14. The case is not improbable.
15. Indeed, Copernicus had even studied medicine in Italy as a medical advisor to his uncle, the bishop.
16. Only recently have we done it.
17. You may well think so.
18. It is this category that is of interest to us.
19. The law does hold.
20. They did not present any information. Nor did they provide financial support.
21. It was not until many years after Kepler discovered his three laws of planetary orbits that the laws were derived mathematically from basic physical principles.
22. Not only did the application of scientific knowledge to industrial progress open many possibilities, but from the mid-19th century onward it raised many questions as well.
23. Why should sophisticated computers be difficult to use?
24. For many computer scientists and engineers the answer to this question is an emphatic yes.
25. They performed as many as (as few as) three experiments yesterday.
26. Rarely is the assistant here on time.

**Exercise 5.** Make necessary changes in the sentences for emphasis.

**Example.** We haven't missed our English class. (not once).  
Not once have we missed our English class.

1. I wouldn't go there (under no circumstances).
2. He is a great speaker. (isn't).
3. We can't make an exception. (in no case).

**Exercise 6.** Complete the following statements with information about yourself.

1. Not once (Never) ... .
2. Under no circumstances ... .
3. Not for all money in the world (Not for anything) ... .
4. Not until next year ... .

**Exercise 7.** Complete the following sentences.

1. It is only under these conditions ... satisfactory results can be achieved.
  - a. how
  - b. then
  - c. when
  - d. that
2. ... in his chapter are general tendencies of telecommunications development.
  - a. Discussing
  - b. To discuss
  - c. Discussed
  - d. It was the discussion
3. ... created the donkey and elephant that symbolize the Democratic and Republican parties.
  - a. It was Thomas Nast who
  - b. Although Thomas Nast
  - c. Thomas Nast, who
  - d. That was Thomas Nast
4. Only rarely ... neuroses leave a person unable to function in everyday situation.
  - a. had
  - b. are
  - c. do
  - d. that
5. An ultrasonic wave has ... a high frequency that it is inaudible.
  - a. therefore
  - b. above
  - c. thus
  - d. such
6. Vegetables can be purchased not only fresh .. canned and frozen.
  - a. also
  - b. both
  - c. but also
  - d. but both
7. Not until the first land plants developed ... .
  - a. land animals appeared
  - b. did land animals appear
  - c. would land animals appear
  - d. the land animals appear

8. Only along the coasts of Greenland ... areas where people can live.
- there are
  - is there
  - there were
  - are there
9. It was the impact of the railroad ... agriculture to the West.
- it expanded
  - that expanded
  - that it expanded
  - when it expanded
10. ... patriotic, they were fighting for the freedom of their country.
- for they
  - because of
  - intensely
  - intensity

**Text B** Read the text and be ready to answer the questions that follow.

Many scientists agree that the most important characteristics of the innovative mind are an open mind and *persistence* in the face of *discouragement*. The two are related. Great innovators intrinsically enjoy their work, and therefore keep an open mind. Not fearing failure, they have little *hesitancy* in trying something new, like fine artists who say, «You've got to draw it wrong before you draw it right». Even if an experiment fails, they learn from it. Another important thing is freedom that really *nurtures* discovery.

Successful innovators follow different patterns of inventions. A common characteristic, however, is the ability to step back and view a larger picture. For innovative process both mental and experimental models are equally important. Prior to synthesizing the invention, the innovator *compartmentalizes* experiential knowledge. Metaphorically speaking, one puts all the things one knows on cards and throws them into the air. As they hit the floor in interesting combinations, new insight may be revealed.

Inventors indeed do combine patience, skill and pragmatism with an intense, sometimes romantic refusal to give up.

*Pathbreakers* usually *build on* the work of others before them; rarely does genius come without a *pedigree*. Consider the laser. Its origins go back to fundamental research on microwave spectroscopy, which, in 1954, led to the operation of the first maser (that is still in use in radio astronomy). But by the late 1950s the laser emerged (now applied in printing, surgery, telecommunications, optical scanning, the precision cutting of materials, the reproduction of music etc.) In other instances, curiosity plays a key role. Thus the question arises: «What is innovation?» As a matter of fact — how is innovation really defined? The answer is *anything but straightforward*.

Anyway, some inventors are lucky, some are just doing their jobs — but all help define the essence of innovation on which technological progress ultimately depends.

**to persist** — to continue the course of action in spite of opposition or warning укр. уперто робити

**persistence** — укр. завзятість, наполегливість  
**to discourage** — to take away courage, confidence or hope from укр. розчарувувати, зневіритися

**to hesitate** — to pause before making a decision or taking an action укр. вагатися

**hesitant** — showing uncertainty about deciding to act укр. той, що вагається

**to nurture** — to give care to, to cause or encourage to develop укр. плекати

**to compartmentalize** — to divide into separate divisions; to categorize укр. розділяти, категоризувати

**pathbreaker** — укр. першовідкривач

**to build on** — to use as a base for further development укр. ґрунтуватися, базуватися

**pedigree** — ancestry укр. родівід

**anything but** — far from, not at all укр. все, що завгодно (будь-що), тільки не

**straightforward** — not difficult to understand or explain, simple; not hiding anything укр. простий, прямий

1. What is the problem under discussion?
2. Does the author give a definition of innovation?
3. What qualities do we expect to find in an innovator?
4. What is usually disregarded by an innovator?
5. Why does the author mention «throwing cards»?
6. What example is given to illustrate the history of inventions?

**Exercise 8.**

Read the passage and try to appreciate its humor. How does the author produce humorous effect?

### *The Ax Story*

The story of two lumberjacks has meaning for all of us. The young man was anxious to prove that he was a better woodcutter than his older friend. One day he challenged the older woodcutter to a contest to determine who could cut the largest number of trees in a single day.

Daylight found the young man at work chopping his way through a number of trees and never stopping to take a break. He was a very hard worker. Meanwhile the veteran would chop for two hours and then leave only to return an hour later.

At the end of the day the young man was sure he had won the contest since he took no breaks and chopped all day. However, when the logs were counted, the veteran had won. «This can't be», cried the young man. «I worked all day without stopping, but you took frequent breaks». The veteran replied, «It's really very simple. I wasn't taking a break, I was sharpening my ax».

**Exercise 9.**

Read the passage. Give your opinion on the subject. What else would you add to the list? Give the reasons why.

### A checklist for information age

- ◇ Lean to type, because time is money.
- ◇ Learn to use a laser printer, a fax/modem, and software that includes a word processor and spreadsheet.
- ◇ Learn to use a what-you-see-is-what-you-get (WYSIWYG) word processor on a personal computer.
- ◇ Get a personal computer mail account with Internet access and learn how to use e-mail.
- ◇ Prepare two resumes, one nicely formatted on the word processor, the other in plain text (ASCII) to send by e-mail.
- ◇ Learn how information is disseminated electronically.
- ◇ Learn how to protect your privacy and trade secrets.
- ◇ Work on your communications skills not only across all media but also in person.

**Exercise 10.**

(to) refuse refusal

1. They \_\_\_\_\_ an innovation.
2. I \_\_\_\_\_ to answer that question.
3. It was a polite \_\_\_\_\_.

(to) agree agreement

4. They were unable to reach \_\_\_\_\_.
5. I \_\_\_\_\_ with you entirely.
6. We \_\_\_\_\_ on a plan.
7. You have broken the terms of our \_\_\_\_\_.

anxious anxiously anxiety

8. I was terribly \_\_\_\_\_ about you.
9. There is a lot of \_\_\_\_\_ among the staff about annual exhibition.
10. It was an \_\_\_\_\_ wait for the results of our exam.
11. I waited \_\_\_\_\_ by the phone.

**Exercise 11. Read the passage and answer the questions about it.**

Charles Snow was born in a lower middle-class family in England in 1905, educated there at secondary school and the university college. He went to Christ's College, Cambridge, and after taking a PhD for research in physics he joined the government service where he worked as a scientific expert during the Second World War, and as a Civil Service commissioner (1945-60).

Snow's first work of fiction was a detective story «Death Under Sail» (1932). Starting in 1935, he wrote a sequence of novels under the general title of «Strangers and Brothers», covering more than fifty years of the life of a lawyer, Lewis Eliot, his brother Martin Eliot, a physicist, and the various friends and colleagues they associated with in business, scientific endeavor and the public service. In these books Snow, being an upholder of realistic traditions, draws a vast canvas of the British way of life, as well as of complex moral problems. Among his other books are «The Search» (1934), «Time of Hope» (1949), «The Masters» (1951), «The Sleep of Reason» (1968), «Corridors of Power» (1964), «The Physicists» (1980). Snow has also written a collection of biographical portraits and a critical biography.

For his service in industry and government Snow received a knighthood in 1964 and was made a Parliamentary Secretary to the Ministry of Technology. His public lectures were collected in a volume «Public Affairs» (1971). In one of them he speaks of himself as of a bridge between the literary traditional culture and the culture of science.

C. Snow died in 1980.

1. What is the best title for the passage?
  - a. England's greatest writers
  - b. The life and works of C. Snow
  - c. A famous scientist
  - d. American playwrights
2. It can be inferred from the passage that Snow
  - a. became a scientist as well as a writer
  - b. studied at Oxford
  - c. did not care much for academic studies
  - d. has written a lot of plays

3. According to the passage Snow was
- a modernist
  - a realist
  - a post-modernist
  - a pessimist
4. It can be inferred from the passage that Snow was 59 years old when he
- wrote «The Masters»
  - became a Parliamentary Secretary
  - received the Nobel Prize
  - died
5. Which of the following is NOT mentioned in the passage as Snow's literary works?
- detective stories
  - biographical portraits
  - critical biography
  - science fiction

**Exercise 12.** Choose the one word or phrase that best keep the meaning of the original sentence if it is substituted for it.

1. The question is quite straightforward.
- complex
  - original
  - unusual
  - simple
2. They've accomplished a great deal in the last few weeks.
- acquired
  - advertised
  - achieved
  - finished
3. This construction is anything but safe.
- somewhat
  - not at all
  - quite
  - very
4. Innovators have little hesitancy in trying something new.
- time
  - indecision
  - experience
  - hope
5. These negotiations are crucial to our project.
- of little importance
  - of some importance
  - of no importance
  - of deciding importance
6. I think it's a fairly difficult exercise.
- rather
  - very
  - an unusually
  - anything but

7. Gravity works equally on all bodies.
- objectively
  - energetically
  - identically
  - clearly
8. Inventors do combine patience, skill and pragmatism.
- finally
  - now
  - really
  - jointly
9. The situation is not impossible.
- not possible
  - possible
  - quite easy
  - not difficult
10. It's really the spirit of innovation.
- ultimately
  - realistically
  - metaphorically
  - indeed

## ***Noteworthy***

Don't work too hard,  
just work hard!



# Appendix

## I

## USEFUL EXPRESSIONS FOR DISCUSSION

*Expression of*

## FEEDBACK

SAY

Oh, sure. О, так  
 Oh, I see. О, зрозуміло  
 Uh-huh.  
 Uhm-hmm.  
 Well.  
 All right. Добре

DO

Make eye contact with the speaker.  
 Nod your head.  
 Smile.  
 Look surprised when something surprises you.

*During the discussion:*

## INITIATE THE DISCUSSION

Perhaps we could begin by discussing our problem.  
 Можливо, ми почнемо з обговорення нашого питання.  
 Could I suggest that we get everyone's opinion on that?  
 Будь ласка, ваші думки з цього приводу?

## ASK PEOPLE FOR OPINIONS, INFORMATION, AND EXPLANATIONS.

Could you tell us what you think? Чи не могли б ви сказати, що ви думаєте?  
 Does anyone know more about this? Може, хтось знає ще щось стосовно цього?

I	wonder		
	am wondering	why...	Цікаво, чому ...
	was wondering		

## OFFER OPINIONS AND GIVE INFORMATION

I believe that ... Я вважаю, що ... — I guess... *American English*  
 In my opinion ... На мою думку ...  
 It seems to me that ... Здається ...  
 My feeling is that ... Я відчуваю, що ...  
 I have every reason to believe that ... Я маю підстави вважати, що ...

## SUMMARIZE INFORMATION

To summarize, ... Підсумовуючи, ...

## ENCOURAGE PEOPLE TO SPEAK BY BEING COOPERATIVE AND BY ACCEPTING DIFFERENT POINTS OF VIEW.

Do you agree? Ви згодні?

Do you have the same opinion? Ви також думаєте так?

*American English*

Have you got...

*British English*

I think some people here probably disagree with us. I'd like to hear what they have to say.  
 Можливо дехто з присутніх не згоден з нами. Хотілося б послухати, що вони скажуть.  
 I know Alex has a different point of view. I'd be interested in hearing it.  
 Я знаю, що Алекс має іншу думку. Мені було б цікаво її почути.  
 Do you consider (believe) that ... Ви вважаєте, що ...

## II

## ABOUT YOU

## 1.

Are you a

I wonder | if | whether | you are a

scientist?  
 (post)graduate student?  
 biologist?  
 geographer?  
 mathematician?  
 specialist in information technology?  
 physicist?  
 chemist?  
 linguist?

*Yes, that's right*  
*I'm afraid that's wrong*

## 2.

What is your educational background?

*I graduated from ... in ...*  
*I have graduated from ...*

## 3.

Who is your | research advisor?  
 supervisor?

*Academician ...*  
*Professor ...*  
*Doctor ...*

## 4.

What is the subject/topic of your  
 What do you mean by ...  
 Explain the term ...

research?  
 investigation?  
 thesis?  
 dissertation?

## 5.

Why is your work important?

*It reveals some new facts* | *about ...*  
*indispensable for ...*

*It deals with the problems that have not been studied before.*  
*It is an insight into ...*

6.

What is the aim / goal / objective / of your research?

*In order to reach my goal I have to ...*

*to obtain  
to show  
to verify  
to demonstrate  
to confirm*

7.

What are the

*methods  
procedures  
techniques*

of your research?

8.

What is the possible application of your work?

*Is your work*

*theoretical?  
applied?  
both theoretical and applied?  
purely theoretical?  
part of you Institute Research Program?*

9.

Have you already obtained any valuable results?

*Yes, I have. (...)*

*I do hope to obtain (more) promising results in the*

*near future.  
soon.*

What do you do with the data you obtain?

Is it difficult to analyze the results?

(How) can you claim that the problem you studied is solved?

10.

What (equipment) do you use in your work?

*I use sophisticated devices; laboratory equipment.*

*I don't use any special equipment (devices).*

Do you use a computer?

What for?

*I use a computer to store and to process the necessary data.*

What software do you use?

11.

Have you got any publications on the subject you study?

<i>I have already published</i>	<i>several a number of</i>	<i>articles. papers.</i>
---------------------------------	--------------------------------	------------------------------

*Not yet.*

12.

Did you take part in any scientific conference?

Where?

When?

13.

Do you carry out research individually or in a team?

*I work in a team.**I do independent research. / I work independently.*

14.

What (scientific) journals do you read/

What do you like to read?

*I'm fond of ...**I prefer ... to ...*

15.

Are you interested in ... ?

Is this problem

interesting?
of interest?
important?
of importance?
of significance?

16.

What part of your dissertation have you already completed?

## III

## ABSTRACT

(a short summary of a paper)

Наводяться: загальний напрямок, завдання, мета дослідження, короткий виклад теоретичних та експериментальних результатів, загальні висновки.

За змістом та методами дослідження

1	2	3
анотації наукових статей, де наводяться результати оригінальних теоретичних і/або експериментальних досліджень	анотації наукових статей — узагальнень	анотації оглядових наукових статей
«Characteristics of ...»	«Prospects for ...»	«An overview of ...»
(... are examined)	(The potential for ... is examined)	(A summary/overview of ... is presented)

## 1

The present paper	studies ... examines the problem of ... concentrates on analyzing ... describes ...
This paper	presents ... deals with ... considers ... proposes a new approach to ...
Considered here are a) ... b) ... c) ...	
In this paper we discuss ...	
The (main)	objective goal aim purpose of this paper is to ...
<p>An efficient method is proposed for ... The method is based on ... Aspects of ... are discussed. It is shown / demonstrated that ... Special attention / consideration is given to ... Studies of ... also indicate that ... Recommendations for ... are presented.</p> <p>Conclusions regarding ... are   made   arrived at.</p> <p>The results of   theoretical   study are presented.   experimental  </p> <p>The novel theoretical model is verified by experimental results.</p>	
<p>Experimental data and analytical results are found to be in good agreement. The experimental results showed excellent agreement with theory.</p>	

## 2

In this general paper the role of ... in ... is discussed.

The extension of ... and possibilities of its practical application to ... are considered.

Subject matter related to ... as well as to ... is considered.

## 3

A review of ... essential for ... is presented.

Present status and theoretical (experimental) results of ... are summarized.

A bibliography of ... references is included.



## IV

## CONFERENCE MINI-VOCABULARY

a world – всесвітня	symposium симпозіум	a research – наукова
international – міжнародна	conference – конференція	a stimulating – цікава
	a regular – чергова	an annual – щорічна
скликати, збирати – відкриття –	to convene a – opening of a – opening ceremony / session	
рамки (межі) – тематика – хід – бути організатором – організувати – проводити – при сприянні ... місце проведення – точна дата заздалегідь ухвалити дату завершувати – закривати – учасник брати участь	scope of a – topics, themes, subjects, subject-matter of a – the course of a – to host a – to organize a – to run a – under the auspices of ... location/place of a – the exact date in advance to approve the date to conclude a – to close a – participant, attendee to take part, to participate an application form questionnaire to fill out a questionnaire to sign a manuscript a copy (of) proceedings/transactions bulletin board an information desk a fee (a registration fee) to exempt from paying a registration fee	
заявка анкета заповнювати анкету ставити підпис рукопис екземпляр праці конференції дошка для оголошень стіл для довідок реєстраційний внесок звільнити від сплати реєстраційного внеску культурна програма	social events	

a written ~  
письмове

invitation ~  
запрошення

oral ~  
усне

a formal ~  
офіційне

запрошувати  
відмовлятися від ~

to invite  
to refuse an ~  
to decline an ~  
to turn down an ~

прийняти ~  
розглянути питання про ~

to accept ~  
to consider ~

long-term ~  
довгострокова

program ~  
програма

~ in brief  
коротка  
a final ~  
остаточний  
варіант

preliminary ~  
попередня

current ~  
програма, що діє  
на поточний момент

a draft ~  
проект

розробити ~  
запропонувати ~  
за програмою

to develop a ~  
to offer a ~  
according to the program

deputy ~  
заступник

chairperson  
(chairman, chairwoman) ~  
голова

chairmanship  
головування

newly elected ~  
щойно обраний (обрана)

головувати  
виконувати обов'язки

to preside  
to be in the chair (at a conference, meeting)  
to act as a ~

invited ~ запрошений	speaker ~ доповідач	plenary ~ пленарний
principal ~ основний		keynote ~ головний
список доповідачів	a list of speakers	
стендова доповідь	poster presentation	
засідання	session	
семінар	workshop	
обговорення	discussion	
дебати, дискусія	debate	
важливе актуальне	important urgent burning vital	question problem matter issue point
питання, проблема		
точка зору	point of view, viewpoint	
порядок денний	agenda	
включити до порядку денного	to include in the agenda	
регламент	time-limit	
протокол	minutes	
бюлетень	ballot	
голосувати	to vote	

### BASIC CRITERIA regarding the level of papers

ORIGINALITY	Does the paper present a new idea or development which has not previously been published?
TECHNICAL/SCIENTIFIC VALUE	Does the paper present an important step in the process of going from an idea or concept into an industrial product?
CLARITY AND SUITABILITY	Is the subject well presented? Does it clearly state what results have been obtained? Is it suitable for presentation at this particular conference?

**REGISTRATION FORM**

To pre-register complete this form and return it to the organisers.

- I am interested in the conference. Please send me a conference program and registration form
- I am unable to attend but would like to remain on your mailing list

**Please complete in block letters (type or print)**

Title (Mr/Mrs/Ms):

First name:

Last name:

Job title:

Position held:

Organisation:

Address:

Postcode/zipcode:

Country:

Spouse's name (if attending)

Telephone:

Fax:

E-mail:

Signature:

Date:

## TIPS ON RESUME WRITING

The traditional academic *curriculum vitae* (c.v.) highlights your education. A *resume* highlights experience and abilities. It includes:

**a) personal data** (*leave out* such personal data as age and marital status).

NAME  
MAILING ADDRESS  
Telephone number  
FAX, e-mail number

**b) educational background** (mention your degree, college or university attended, areas of special training).

EDUCATION

**c) work experience**

EXPERIENCE

**d) references.**

## VI

## TYPES OF QUESTIONS

## 1. General questions

Загальні запитання — це запитання, на які можна відповісти «так» чи «ні». Присудок ставиться перед підметом, якщо він виражений дієсловом *to be* (або *to have* у *British English*) в Simple Present та Simple Past:

Are you here?

Перед підметом ставиться допоміжне або модальне дієслово, якщо це дієслово входить до складу присудка:

Can you speak Italian?

Are you writing a letter?

Will you do this research?

Якщо присудок виражений дієсловом у Simple Present або Simple Past, (крім дієслів *to be* (to have — *British English*), перед підметом ставиться допоміжне слово *do* (does, did):

Do you know this rule?

Did he come yesterday?

MIND: Do you have this book? (*American English*)

Have you got this book? (*British English*)

У заперечній формі заперечна частка *not* ставиться перед смисловим дієсловом, або зливається з допоміжним або модальним дієсловом. Такі запитання в українській мові перекладаються «невже». В англійській мові ствердна відповідь на запитання у заперечній формі завжди починається словом *yes*:

— Don't you want to join us?

— Yes, I do.

— Didn't you see him?

— Yes, I did.

— Won't you come later?

— Yes, I will.

## 2. Special questions

Спеціальні запитання починаються словами *who?* *what?* *when?* *why?* *where?* *which?* *whose?* *how much/many?*

— Who wrote this article?

— I did.

What did you do yesterday?

## 3. Alternative questions

Альтернативні запитання стосуються одного з двох явищ, речей, і завжди вживаються зі сполучником *or*:

Shall I read or translate this passage?

What test is more difficult: TOEFL or GRE?

Did Bill or did Laura enter the university?

#### 4. Disjunctive questions

Роз'єднувальні запитання складаються з двох частин: перша — стверджувальне або запитальне речення з прямим порядком слів, друга — коротке загальне запитання. Якщо перша частина запитання є стверджувальним реченням, то дієслово у другій частині стоїть у заперечній формі і навпаки:

You have already translated the text, haven't you?

He cannot (can't) understand it, can he?

There is a solution to the problem, isn't there?

He visited Canada last year, didn't he?

MIND:

Everyone (someone) has read the announcement, haven't they?

#### NOTE

**Rhetorical questions** — риторичні запитання

a. **Direct rhetorical questions** often introduce a topic:

What do we know about ... ?

What is the nature of ... ?

b. **The leading rhetorical questions** are used to focus on the main points of a topic:

**with positive implication:**

Isn't Chinese hard to learn? (Implication: it is hard to learn Chinese)

**with negative implication:**

Who was more interested in the project than John? (Implication: no one was more interested in the project).



VII  
Verbs MAKE and DO

**MAKE**

create or produce something

ALSO used with food and meals,  
and nouns related to verbs:

They discovered a new star —  
they made an important discovery.  
I phoned him —  
I made a quick phone call.

**MAKE**

an agreement  
an announcement  
an attempt  
a change  
a decision  
a meal (prepare a meal)  
dinner  
a comment  
remark  
an effort  
an estimate  
an impression (on someone)  
mistake  
money  
progress  
request

**DO**

action

**DO**

a degree  
research (work)  
experiment  
business  
engineering (etc.)  
one's best  
one's duty  
good  
harm  
the homework  
the housework  
the dishes (мыти посуд)

## VIII

## IRREGULAR VERBS

<u>Present</u>	<u>Past</u>	<u>Past Participle</u>
cost	cost	cost
cut	cut	cut
hit	hit	hit
hurt	hurt	hurt
let	let	let
put	put	put
set	set	set
split	split	split
build	built	built
lend	lent	lent
send	sent	sent
spend	spent	spent
hold	held	held
lead	led	led
read /ri:d/	read /red/	read /red/
understand	understood	understood
deal	dealt	dealt
feel	felt	felt
mean	meant	meant
leave	left	left
meet	met	met
lose	lost	lost
sleep	slept	slept
get	got	got (gotten — <i>American English</i> )
win	won	won
sell	sold	sold
tell	told	told
sit	sat	sat
stand	stood	stood
strike	struck	struck
make	made	made
say	said	said <sup>®</sup>
hear	heard	heard
come	came	come
become	became	become
run	ran	run
begin	began	begun
drink	drank	drunk
swim	swam	swum
sink	sank	sunk
ring	rang	rung
break	broke	broken
choose	chose	chosen
give	gave	given
freeze	froze	frozen

steal	stole	stolen
take	took	taken
rise	rose	risen
speak	spoke	spoken
write	wrote	written
grow	grew	grown
know	knew	known
throw	threw	thrown
draw	drew	drawn
bring	brought	brought
buy	bought	bought
seek	sought	sought
catch	caught	caught
teach	taught	taught
think	thought	thought
eat	ate	eaten
fall	fell	fallen
do	did	done
go	went	gone
forget	forgot	forgotten
see	saw	seen
draw	drew	drawn
hide	hid	hidden (hid)

**MIND:**

find	found	found
found	founded	founded

feel	felt	felt
fall	fell	fallen

lay	laid	laid
lie	lay	lain

to learn	—	learnt/learned	—	learnt/learned
to dream	—	dreamt/dreamed	—	dreamt/dreamed
to burn	—	burnt/burned	—	burnt/burned

## IX

## FREQUENCY SCALE

always  
nearly always, almost always  
usually, generally, normally, regularly («on most occasions»)  
frequently, often («on many occasions»)  
sometimes («on some occasions»)  
rarely, seldom («on few occasions»)  
hardly (scarcely) ever («almost never»)  
never

## X

## PROBABILITY SCALE

It is highly probable  
There is high probability  
In all probability  
It is probable  
In all likelihood  
It is very likely  
More than likely  
It is likely  
It is very possible  
It is possible  
It is not impossible  
It is not unlikely  
It is not very probable  
It is not very likely  
It is unlikely

## XI

## TOEFL: FIRST STEPS

The TOEFL test, developed in 1964 is intended to evaluate the English proficiency of nonnative speakers who wish to study in colleges or universities in English-speaking countries.

Over 600000 students take the test each year in more than 170 countries.

Section 1 — Listening Comprehension measures the ability to recognize and understand English as it is spoken in North America.

Section 2 — Structure and Written Expression measures the ability to recognize important grammatical points in English.

Section 3 — Vocabulary and Reading Comprehension measures the ability to understand the meaning of words and phrases in written English as well as reading comprehension of passages from various academic subjects.

## Tips on Section 1

The problems tested include vocabulary and structures that are most frequently used in English as it is spoken in North America.

Part A складається з питань, половина яких передає інформацію прямо та недвозначно. Проте друга половина питань може передавати непряму пораду, пропозицію і т.і., або містити фразеологічний (ідіоматичний) зворот. Такі більш складні структури складають уже 2/3 у Part B. Головною складністю Part C є обсяг текстів. Наведемо декілька прикладів:

**Part A.****Приклад 1**

Ви почуєте: He tasted the coffee.

Вам треба вибрати одну з відповідей:

- (A) He took the whole fee
- (B) He tried the beverage
- (C) The coffee was hot
- (D) He had a test last week

Правильна відповідь — B. He tried the beverage є власне перефразуванням: to taste — to try; coffee як один з видів beverages.

**Приклад 2**

Ви почуєте: What are you going to do tomorrow?

Відповіді:

- (A) What are your plans for tomorrow?
- (B) Will it rain tomorrow?
- (C) What are you doing in the morning?
- (D) Will you close the door?

Правильна відповідь — A, зворот to be going to передає плани на майбутнє.

**Приклад 3**

Ви почуєте: Isn't it an incredible journey!

Відповіді:

- (A) The journey is not very interesting.
- (B) The journey is really amazing.
- (C) I can't believe it's George.
- (D) I don't like traveling.

Правильна відповідь — B, зазначена фраза — своєрідне риторичне питання (за змістом) та вигук (за формою).

Ще кілька прикладів перефразування —  
 every other year — every two years;  
 in a day — the day after tomorrow;  
 as soon as you graduate — after your graduation;  
 There was a two-fold increase — the increase doubled.  
 Перевіряється знання таких зворотів, як, наприклад,

used to ra to be used to ...ing:  
 Janis used to work hard — she worked hard in the past;  
 Janis isn't used to working so hard — she isn't accustomed to hard work (she has no habit)

умовних речень (звороти I wish ..., If only ...),  
 емфатичних зворотів (типу She herself didn't know what to do — she didn't know what to do, she had no idea what to do, або Never have you done such a thing - this is the first time you have done it.)

### Part B.

#### Приклад 1

— What a nice picture! Did you paint it yourself, Sue?  
 — Well, it was my mother's idea, but I had John do it.  
 Who painted the picture?

Відповіді:

- (A) John's brother
- (B) Sue's mother
- (C) John
- (D) Sue

Аби дати правильну відповідь — С — необхідно знати зворот to have / get something done, someone do something.

#### Приклад 2

— I'm thirsty.  
 — Could you bring some cold water?  
 What does the woman offer the man to do?

- (A) Bring some water (правильна відповідь)
- (B) Close the door
- (C) Bring some wine
- (D) Call her on Thursday

Також можливі запитання типу:

What is the woman's (man's) occupation?  
 Where does this conversation (most probably) take place/occur?

Наприклад,

- We'd like something for dessert.  
 — How about our house specialty — raspberry pie?  
 Where does the conversation (most probably) take place/occur?:
- (A) In a supermarket
  - (B) In the garden
  - (C) In a restaurant (правильна відповідь)
  - (D) In the street

Певну складність становлять питання типу «What does the woman / man mean?» «What do we learn from the conversation?», «What could be inferred from this conversation?», «What does the woman/man imply?», коли питають про те, що мається на увазі, про що непрямо йдеться.

- The weather is perfect. Will you go to the beach?  
 — I guess so.  
 What does the woman mean?  
 (A) She doesn't like the weather  
 (B) She will probably go to the beach  
 (C) She doesn't agree with the man  
 (D) She thinks it's too hot

Правильна відповідь — В, вирази *I guess so, I think so, I wouldn't say no to ...* передають непряму згоду.

Окремо слід наголосити на розрізненні фразеологічних зворотів:

- I don't know whether Mark is kidding or not.  
 — He is always pulling my leg, too.  
 What do we learn from a man's response?  
 (A) He thinks Mark is a good kid  
 (B) He has long legs  
 (C) He doesn't know if it is true  
 (D) He says Mark makes playful fun of him as well

Аби дати правильну відповідь D треба знати значення виразів *to make fun, to kid, to pull someone's leg* (обманювати).

Наведемо декілька типових фразеологічних зворотів:

- |   |  |
|---|--|
| — Can we postpone this test?                        |  |
| — <u>That is out of the question!</u>               | i.e. impossible                        |
| — Do you often cry?                                 |  |
| — <u>Once in a blue moon!</u>                       | i.e. almost never                      |
| — Are you here on vacation?                         |  |
| — Actually, I'm going to stay here <u>for good.</u> | i.e. permanently, forever              |
| — Why are you learning Spanish?                     |  |
| — I think it will be useful <u>in the long run.</u> | i.e. in the distant future             |
| — Will you come to dance tonight?                   |  |
| — <u>I'm looking forward to it!</u>                 | i.e. want it happen in future          |
| — Sorry, I'm late.                                  |  |
| — <u>Never mind.</u>                                | i.e. don't worry, it's OK              |
| — It was a swell party!                             |  |
| — <u>It sure was!</u> або                           |  |
| — <u>You bet!</u>                                   | i.e. Sure! Of course! Ще б пак! Авжеж! |
| — Boy, it's hot!                                    |  |
| — <u>You can say that again.</u>                    | i.e. I completely agree with you.      |
| — I <u>do</u> like your room!                       | i.e. really                            |
| — I still need some chairs <u>to fit the bill.</u>  | i.e. to match                          |
| — Do you live <u>on campus?</u>                     | to live on campus —                    |
| — No, I don't.                                      | жити у студентському містечку          |
|   | to live off campus —                   |
|   | жити за його межами                    |
| — I can't concentrate on this work!                 |  |
| — <u>Take your time.</u>                            | i.e. don't hurry                       |
| — I <u>would rather</u> not do it.                  | i.e. prefer                            |
| — <u>It's up to you.</u>                            | i.e. The decision is yours             |

— Will you go <u>jogging</u> ?	jogging — біг підтюпцем
— I'm afraid, not. <u>I'm a little bit under the weather</u> today.	i.e. slightly ill (but not seriously)
— It took so much time to write this article! — But <u>it was well worth the trouble</u> .	i.e. it deserved difficulty
— I'm so tired. — <u>Can I lend you a hand</u> ?	i.e. Can I help you?
— Wish me good luck. — <u>I'll keep my fingers crossed for you!</u>	i.e. wish me well i.e. I wish that nothing goes wrong
— Thanks for your help! — <u>Anytime!</u>	i.e. My pleasure. You're welcome. Don't mention it.

Для аудіювання пропонуються більш довгі бесіди та тексти науково-популярного характеру (уривки з лекцій, діалоги з життя студентів тощо). Наприклад:

The regulations of the Graduate School provide for two plans of study for the Master's degree. Plan A requires 24 hours of course work plus a written thesis. Plan B requires 30 hours of course work and submission of the more modest Master's essay.

It should be noted that, by devoting a third year to the Master's Program, it's usually possible for a student to complete both the Master's Program and the requirements for Secondary teaching certification. The coordinator of secondary teaching major will advise Master's Students interested in certification, and there is a checklist of requirements for the combined programs available in the department office.

What is the (main) topic of the text?

Відповіді:

- (A) Two plans for M.A. studies (правильна відповідь)
- (B) Teaching certification
- (C) A new course
- (D) Regulations for undergraduate students

Who is the speaker addressing?

- (A) Educational specialists
- (B) Pupils
- (C) Students (правильна відповідь)
- (D) Professors

(Можливе запитання: «Who is the speaker?»)

Which program demands a more serious thesis?

- (A) Plan B
- (B) Plans A and B
- (C) Plan A (правильна відповідь)
- (D) Secondary Teaching Certification

Where a checklist of the requirements for the combined programs can be found?

- (A) Behind the department office.
- (B) Near the department office
- (C) At the dean's office
- (D) In the department office (правильна відповідь)



## Tips on Section 2

The language tested is formal, rather than conversational. The topics of the sentences are of a general academic nature.

Section 2 складається з двох частин, у першій треба додати частину речення, якої не вистачає, у другій — знайти слово, конструкцію або зворот з помилкою. Корисно повторити такі сполучення як neither ... nor, either ... or, both ... and, in spite of, despite, to approve of, to be aware of, to differ from, to be capable of, to interfere with, to be opposed to, to refer to, to worry about, to distinguish between, to be known for, to be satisfied with, possibility of, exception to та ін.

### Checklist for Section 2

#### 1. Missing subject

... spend the winter in a state of hibernation.

- (A) That many animals
- (B) Because animals
- (C) Many animals (правильна відповідь)
- (D) While animals

#### 2. Repeated subject

The students they will have to take the test.

A                      B    C                      D

Відповідь — B

Chemicals used in the home they should be stored out of reach of children.

A                      B                      C                      D

Відповідь — B

#### 3. Verbs (tense, agreement or form)

The Universal Product Code ... in 1973.

- (A) introduced
- (B) is introduced
- (C) was introduced (правильна відповідь)
- (D) has been introduced

These devices have been first used in 1890.

A                      B                      C                      D

Відповідь — B (правильно were).

#### 4. Pronouns (form or agreement)

She was a scientist whose studied anthropology as well as history.

A                      B                      C                      D

Відповідь — B. Правильно — who.

#### 5. —ING and —ED forms

I enjoy to speak foreign languages.

A                      B                      C                      D

Відповідь — B (після слова enjoy вживається герундій — speaking).

They were ... in our publications.

- (A) interesting
- (B) interest
- (C) interested
- (D) to be interested

Відповідь — C.

**6. Articles and Singular/Plural Nouns**

The oxygen is known to be the most abundant element.

A B C D

Відповідь — A.

American university degrees are awarded on completion of a specified amount of courses

A B

which earn students credits.

C D

Відповідь — B (правильно — number)

**7. Comparatives and superlatives.**

The more we studied the subject, ... we liked it.

(A) the least

(B) less

(C) at least

(D) the less

Відповідь — D.

**8. Word forms (nouns, verbs, adjectives or adverbs).**

Electronics is the world's most important industrialization.

A B C D

Відповідь — D (правильно — industry).

**9. Vocabulary usage.**

I looked at a movie on television today.

A B C D

Відповідь — A (правильно — watched

to look — подивитися, поглянути

to watch — дивитися досить довго).

Strange as it may seem, I have very little knowledge in electricity.

A B C D

Відповідь — D (правильно — knowledge of).

**10. Conditional sentences.**

If it will rain, I'll come and meet you in the car.

A B C D

Відповідь — B (правильно — if it rains, ...).

If there were no unemployment we will not have the amount of crime we have today.

A B C D

Відповідь — B (правильно — would).

**11. Unnecessary repetition**

The invention of the laser greatly expanded the power of scientific research tremendously.

A B C D

Відповідь — D (greatly та tremendously означають одне і те саме).

**12. Parallel structures**

These people are famous for their unique language, colorful costumes, and independent.

A B C D

Відповідь — D (правильно — independence).

## 13. Word order

This process requires the use of 10 muscles different.

A                    B            C                    D

Відповідь — D (правильно — different muscles).

Корисно запам'ятати правило порядку слів у словосполученні, яке складається з багатьох КОМПОНЕНТІВ:

OpShACOM — Opinion, Shape, Age, Color, Origin, Material

an interesting    new        American    magazine.  
opinion            age            origin

## Tips on Section 3

This section tests the ability to understand meanings of words and reading materials.

## Part A.

## Example

An event of momentous proportion prevented me from arriving on time.

- (A) important
- (B) trivial
- (C) strong
- (D) influential

Відповідь — А. Зверніть увагу на т.зв. «фальшивих друзів перекладача» типу:

momentous — важливий, а не моментальний  
data — дані, а не дата  
decade — десятиріччя, а не декада  
complexion — колір обличчя, а не комплекція.

technical assistance —  
консультації, консультативна  
допомога

## Part B.

1. All information needed to answer the questions is given in the passages.

2. Previous vocabulary knowledge is helpful for the readings. The topics are usually from science and technology (55%), arts (music, literature — 25%), U.S. Government and History (20%). Therefore, any extensive reading in these areas is helpful.

3. There are seven types of questions which normally occur:

## a) main idea

(The main theme of the passage is ... , What does the passage mainly discuss?

With what topic is the passage mainly concerned?

What is the main topic of the passage?

Which of the following is the best title for the passage? etc.)

## b) factual (dates, figures etc.)

## c) inference

(What is the author's viewpoint/attitude/tone?

It can be inferred from the passage that ...

The author implies that ... )

## d) vocabulary;

## e) asking what a word refers to;

## f) identifying what the author did NOT say;

## g) asking the topic of the previous or following paragraph.

4. Extensive paraphrasing is used.

5. There are several strategies. Use the one that you think works best for you.

## Strategy #1

a) Scan the entire passage for general meaning. Don't worry about understanding every word.

b) Now read the passage carefully.

c) Read each question and scan back for the answer.

**Strategy #2**

- a) Read each question quickly.
- b) Read the entire passage carefully.
- c) Reread each question and scan back for the answer.

**Test of written English (TWE)**

Since 1986 the TOEFL examination has included a writing test — a thirty-minute essay. The examinees are asked to write on a specific topic (express or support an opinion, defend a point of view, or interpret information presented in a chart or graph).

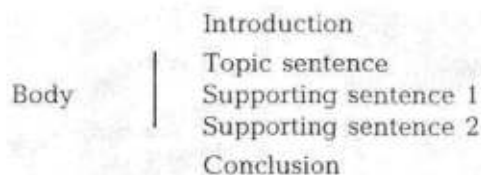
A good essay is

- well-organized and well-developed;
- effectively addresses the writing task;
- uses appropriate examples and details to support and/or illustrate ideas;
- demonstrates syntactic variety, range of vocabulary, appropriate word choice;
- shows unity and progression.

**TIPS ON TWE**

An essay has three parts:

1. An introduction (where the main idea is stated).
2. Body paragraph(s) (made up of topic sentence and supporting sentences).
3. Conclusion (restatement of the main idea, writer's opinion/viewpoint on the topic).



The number of paragraphs depends on the number of points you want to discuss.

**Outlining** is a way of organizing your thoughts before you write.

There are several steps that precede the outlining

- 1) brainstorming (writing down as many ideas and details as possible);
- 2) grouping the ideas.

Make use of transitions (logical connectors). You may begin the essay with such phrases as:

*Many people think that ... (but others believe that ... )*

*It goes without saying that ...*

*X is important because ...*

**USE**

one the one hand ...

on the other hand ...

First ... second ... third ...

for instance ...

in addition ...

also ...

moreover ...

likewise ... /similarly ...

(yet) conversely/by turns

despite/ in spite of

In my opinion ...

Personally, I think that ...

**NOTE**

The clause marker **therefore** occurs after a semicolon (;) or period (.),

NOT a comma (,)

## SAMPLE ESSAY

The key to protecting the environment is action. We all must work together to make the environment as clean and healthy as possible. Give specific reasons why.

Environmentalists say that protecting the health of our planet will help us all. However, it is really hard to change our lives enough to prevent global pollution. The biggest trouble, for example, with most air pollutants is that they are invisible. That makes it difficult to see how dangerous they are.

Consider such dangerous pollutant as carbon dioxide. Carbon dioxide comes from things we do every day, like driving cars. A gallon of gasoline weighs eight pounds. If you burn it in the engine of a car it releases more than five pounds of carbon in the form of carbon dioxide. Even our gas stoves give off carbon dioxide.

New kinds of cars and furnaces that run on solar power or wind power or some other kind of renewable energy will help conserve scarce fuel and reduce the amount of pollutants being released into our air, land, and water. But while we are waiting for those kinds of things to come along, we need to use less gas, oil and coal. It's true that we probably can't give up cars altogether — but we can use them less. People could walk and bike many more places than they do now. At least, they could drive small cars that use less gas.

Now many people are fighting for the environment, but despite the work of many people, each year the health of our earth gets worse. Unless we are willing to work on saving the environment, it will probably keep getting worse. But if we choose to care about our planet, we could leave the world greener than we found it.

## Final Test

### 120 questions

#### I. Read the passage and choose the one best answer to each question.

Safe drinking water is often taken for granted in the modern world. But have you ever thought how important water is? All animals and plants are mostly water. A person's body is about 65 percent water. Each of us needs to drink at least five pints of water each day. Big animals need about 15 gallons of water a day. Water has other uses too. It is used for washing and air conditioning, household work and gardening. Steel, gasoline, paper and most other products are made with the help of water. Power plants use water for cooling. Farms, of course, need water to grow food. Worldwide, the major use of water (approximately 73 percent) is in agriculture. Water is also used for swimming, boating, and other kinds of recreation. We can easily see that life would be impossible without water. That is why it is so important to keep our water clean. Yet, polluted water is becoming very common. Water that has become polluted is unsafe to use. Pollution can happen when untreated wastes have been dumped into it. Polluted water can smell, have garbage floating in it, and be unfit for boating or swimming. But even water that looks clean and smells good can be polluted. It may be loaded with germs and dangerous chemicals you cannot see.

One way of polluting water is to allow fertilizers and untreated wastes to wash from farms and building sites into waterways after rain. Human is making more waste than nature can handle. More and better waste water treatment is needed. People fundamentally depend on recycled waste water for domestic use and drinking supplies. Over 50 percent of the water drunk in Western Europe and North America is reprocessed. Finland and the Netherlands use more than 70 percent reprocessed water, and Denmark and Sweden exceed 90 percent. Clean water is so important to our lives. We should make an effort to make sure we have enough of it.

This passage is mainly concerned with

- a. fresh water animals
  - b. the importance of water
  - c. popular waterways
  - d. kinds of recreation
2. This article suggests that polluted water
- a. always looks dirty
  - b. carries many germs
  - c. is not very common
  - d. is safe to use
3. It can be inferred from the passage that polluted water
- a. always has an odor
  - b. is usually found near the ocean
  - c. sometimes looks safe and clean
  - d. is used for swimming rather than boating
4. According to the passage, water often becomes polluted because we allow
- a. oil barges to travel the waterways
  - b. people to swim and boat in clean water
  - c. bacteria to feed on some wastes
  - d. untreated wastes to enter our waterways
5. According to the passage, which of the following can keep our water clean?
- a. stronger chemicals
  - b. treatment plants
  - c. intensive farming
  - d. wire fences

## II. Complete the following sentences

6. The answers ... are based on our experience.
- provided
  - provide
  - providing
  - when provided
7. They can visit ... more places next year.
- much
  - many
  - a little
  - fewer
8. Teachers should ... energetic, enthusiastic and reliable.
- flexible
  - to be flexible
  - be flexible
  - flexibility
9. They should know and understand the curriculum as well as effective techniques for ... the curriculum to the students.
- deliver
  - delivering
  - delivered
  - having delivered
10. Everybody is interested in the problem ... at our scientific conference.
- to discuss
  - when discussion
  - that discussed
  - to be discussed
11. When encouraged to do so, students actively participate in learning by ..., exploring, and discussing.
- investigating
  - to investigate
  - investigation
  - investigate
12. Weekly seminars ... to discuss the appropriate application of technology.
- to be designed
  - designing
  - designed
  - are designed
13. ... anything go wrong, the whole project would fail.
- When
  - Should
  - Unfortunately
  - As ill luck would have it
14. Oxygen ... to be the most abundant element.
- known
  - to know
  - is known
  - knowing



15. It was necessary that this work ... done in time.  
a. to be  
b. had been  
c. was  
d. be
16. The experimental data are said ... with theoretical expectations.  
a. to coincide  
b. coincide  
c. coinciding  
d. coincided
17. ... is human.  
a. mistaken  
b. to err  
c. err  
d. mistakes
18. If they ... tomorrow, I'll meet them at the station.  
a. will come  
b. came  
c. comes  
d. come
19. If he ... the problem better, he wouldn't have made this mistake.  
a. knew  
b. had known  
c. knows  
d. is to know
20. This law is ... to be used in science universally.  
a. may  
b. probably  
c. can  
d. likely
21. If the metal ... heated, it would melt.  
a. was  
b. were  
c. had been  
d. is being
22. — What is your cousin?  
— ...  
a. That's she.  
b. I haven't got any.  
c. It was she.  
d. She's a teacher.
23. — Have you ever been to Canada?  
— ...  
a. Not until.  
b. None.  
c. Not yet.  
d. Still.



24. ... clever idea!
- So
  - What a
  - What
  - How
25. Last year ... many tourists here.
- it was
  - they were
  - there was
  - there were
26. By the time we arrive, the movie ...
- will have started
  - has to start
  - had started
  - has started
27. Would you care for some more coffee? There's still ... left.
- a little
  - a few
  - little
  - few
28. She didn't mind ... late because she enjoyed it.
- to work
  - working
  - works
  - worked
29. Professor was surprised her assistant was out. « He ... somewhere », she thought.
- ought to have gone
  - is going to
  - goes
  - must have gone
30. ... I need is a good dictionary.
- How that
  - Which
  - What
  - That
31. They ... don't believe it even though we've shown them the evidence.
- yet
  - still
  - already
  - no longer
32. He was very generous ... his efforts to save.
- however
  - although
  - nevertheless
  - in spite of
33. IEEE stands ... «Institute of Electrical and Electronics Engineers».
- as
  - for
  - like
  - by

34. — I missed my English classes last week.  
— So ... ..
- I did
  - I have
  - have I
  - did I
35. They couldn't help ... that the professor was worried.
- notice
  - noticing
  - to notice
  - noticed
36. This flour can be used ... cakes.
- to do
  - when doing
  - to make
  - and making
37. Cassandra, ... , has been the subject of many poems.
- the Greek heroine
  - that Greek heroine was
  - was the Greek heroine
  - who the Greek heroine was
38. ... included Germany, Brazil, and Australia.
- When countries
  - To survey countries
  - Countries surveyed
  - It was survey
39. Multimedia applications ... voice, text and image.
- combines
  - combination
  - combining
  - combine
40. ... for a way to improve the performance of your system?
- You are looking
  - When you look
  - Are you looking
  - That you look
41. The smaller the phenomena a scientist is investigating, ... is the equipment needed to conduct research.
- the biggest
  - then big
  - the bigger
  - and the bigger
42. His short stay in Europe was very important to Jack, ... provided the background to several of his experiments.
- it was
  - much of
  - for it
  - by then

43. I ... him recently.
- didn't see
  - hasn't seen
  - will not see
  - haven't seen
44. To understand is ...
- forgiving
  - to forgive
  - forgives
  - forgive
45. ... the process what matters is how energy is released.
- When
  - For
  - How
  - This
46. ... that they all are here.
- It is surprised
  - Is it surprising
  - It is surprising
  - What is surprising
47. ..., heat is produced.
- That certain chemicals are mixed together
  - The mixing of certain chemicals
  - Whenever certain chemicals are mixed together
  - How certain chemicals are mixed together
48. ... a new point of view on the problem.
- Is there
  - There are
  - There is
  - There being
49. The former theory is ... more interesting than the latter.
- many
  - the least
  - fewer
  - much
50. A logarithm is ... as an exponent.
- known what
  - known what it is
  - what is known
  - what it is known
51. It is this approach ... makes everything clear.
- when
  - that
  - how
  - while
52. Only rarely ... naturally.
- they occur
  - do they occur
  - they would occur
  - they will occur

53. ... that they were the first to discover this phenomenon.
- Is it believed
  - It is believing
  - It is believed
  - How it is believed
54. These special cases are worth ... .
- to highlight
  - highlighting
  - highlighted
  - to be highlighted
55. The acceleration of all ... bodies is the same independent of their size, shape or mass.
- fallen
  - falling
  - fall
  - falls
56. ... , this substance proved to have promising properties.
- When examining
  - To examine
  - When examined
  - They examined

**III. Choose the one word or phrase that best keeps the meaning of the original sentence if it is substituted for the underlined word or phrase.**

57. A Master's Degree candidate must prepare a research paper called thesis. But some master's programs involve a great deal of independent study and individual research.
- some
  - part of
  - a lot of
  - little
58. This package is apparently from overseas.
- perhaps
  - obviously
  - strangely
  - really
59. Technology acts as a catalyst to bring about changes that energize learning environments.
- believe in
  - cause
  - carry out
  - foresee
60. Teachers need to feel comfortable with technology. Furthermore, guidance in when and how to appropriately use technology is often needed.
- nevertheless
  - in general
  - in a nutshell
  - moreover
61. My book is virtually finished.
- really
  - almost
  - appropriately
  - eventually

62. We have 100\$. That's plenty.
- too much
  - enough
  - not enough
  - big money
63. The international character of the Institute gives it some important advantages.
- limitations
  - activities
  - merits
  - linkages
64. The first of these new trends is to be seen in rapidly changing political environment.
- problems
  - tendencies
  - elements
  - issues
65. The number of working women increases every year.
- grows
  - decreases
  - meets
  - reorganizes
66. Some crops must be rotated periodically with other crops.
- constantly
  - simultaneously
  - regularly
  - rarely
67. Scientists once thought that human origins were in Asia.
- decidedly
  - always
  - vaguely
  - at one time
68. The Center was established to stimulate and accelerate the use of computers and software tools in education.
- in order of
  - as
  - for
  - in order to
69. He looked somewhat upset.
- not very
  - a little
  - as always
  - very
70. People often use their first names rather than their family names when talking.
- together with
  - sooner or later
  - and also
  - instead of

71. At present the world population is doubling every 37 years.
- usually
  - customarily
  - currently
  - universally
72. This popular conception is not supported by research.
- notion
  - imagery
  - misinterpretation
  - reaction
73. Gravity works equally on all objects.
- objectively
  - clearly
  - energetically
  - identically
74. Some differences between these two cultures are obvious.
- non-verbal
  - verbal
  - evident
  - normal
75. Revolutions have always dramatically altered the course of historic events.
- changed
  - reduced
  - joined
  - expanded
76. Although we know what these changes are due to, some gaps still exist in our knowledge of their nature.
- However
  - Thus
  - Even though
  - Also
77. Another indicator is even more important.
- the other
  - the only
  - other
  - one more
78. They've decided to treat the problem in full detail.
- discard
  - predict
  - deal with
  - realize
79. He exerts all his power to get things done.
- gives away
  - ignores
  - avoids
  - makes active use of

80. Their office is adjacent to the library.
- remote
  - very close
  - very far
  - a long way
81. There is promise of yet greater advances, thanks to biotechnology.
- trying
  - owing to
  - grateful
  - coming
82. I can't understand it because it's too complicated.
- because of
  - rather
  - since
  - owing to
83. Biomedical research continues to provide scientists with new insights into the workings of human body.
- prevents
  - liberates
  - proclaims
  - goes on
84. The flights were canceled because of bad weather conditions.
- due to
  - because
  - instead of
  - despite
85. Shorthand methods enable people to write more rapidly.
- more legibly
  - more decoratively
  - at greater speed
  - more precisely
86. The brief reports did not leave time for any details.
- short
  - extended
  - long
  - weak
87. Your version of the report doesn't seem to agree with the facts.
- project
  - aspect
  - interpretation
  - correlation
88. Notebook computers are swiftly replacing traditional ones.
- rapidly
  - gradually
  - finally
  - previously

89. George is a brilliant scientist.
- mediocre
  - shining
  - talented
  - hard-working
90. You will learn English through intensive program.
- updated
  - crash
  - modern
  - progressive
91. A barometer is a device for measuring changes in atmospheric pressure.
- method
  - invention
  - figure
  - instrument
92. Nearly all weather occurs in the troposphere.
- almost
  - entirely
  - barely
  - closely
93. Tides are a latent source of electric power.
- expensive
  - important
  - valuable
  - potential
94. This method involved studying genuine material.
- genetic
  - realistic
  - authentic
  - different
95. Tides are caused by the gravitational influence of the moon on ocean level.
- impact
  - affluence
  - superfluity
  - reality
96. English physicist Henry Cavendish first confirmed that water is a combination of hydrogen and oxygen.
- explained
  - verified
  - thought
  - proposed
97. In spite of these promising results, we need more training in this area.
- although
  - so that
  - despite
  - in order to



98. In this respect we seem to be undergoing the combined effects of the process.
- appear
  - prove
  - happen
  - have
99. This museum houses one of the finest collections in the world.
- promotes
  - creates
  - contains
  - advertises
100. We were discussing the actual collection and processing of pertinent data.
- the latest
  - relevant
  - promising
  - important
101. One of the ways of presenting findings is through publications.
- prognoses
  - hypotheses
  - analyses
  - results
102. In the past decade, a number of trends have influenced educational policies.
- 10 days
  - 10 months
  - 10 weeks
  - 10 years
103. Other trends, too, have emerged in the course of the last three or four years.
- disappeared
  - appeared
  - expressed
  - turned out
104. He devoted himself completely to science.
- suddenly
  - immediately
  - entirely
  - effectively
105. It is hard to cope with social problems in big cities.
- handle
  - know
  - witness
  - find
106. Stars move in identifiable patterns in the heavens with regularity and precision.
- stability
  - exactness
  - provision
  - accessibility
107. Mahatma Gandhi was an outstanding humanitarian.
- exhaustive
  - remarkable
  - charitable
  - stable

108. She completely disregarded all our objections.
- disliked
  - ignored
  - overestimated
  - agreed with
109. This is undoubtedly true.
- vaguely
  - certainly
  - maybe
  - alternatively
110. Many people are unaware of this fact.
- are capable of
  - doubt
  - realize
  - don't know
111. The problems we witness are the consequences of former years.
- know
  - observe
  - disregard
  - solve
112. Washington was the first city in history to be created solely for the purpose of governance .
- partly
  - arbitrarily
  - reasonably
  - exclusively
113. In a way I can see what you mean, even though I don't share your point of view.
- I'm sure
  - As a rule
  - In a sense
  - Rather
114. The first factor is speed of response.
- activity
  - reaction
  - appearance
  - disappearance
115. These data are useful for forecasts.
- prognosis
  - analyses
  - prognoses
  - discussion
116. They gave us quite a bit of help.
- a lot of
  - very little
  - very quiet
  - not much
117. They've answered all the questions save two.
- and saved
  - namely
  - together with
  - except

118. In other words, the simulator would serve as a training and research tool in place of the real one.

- a. rather
- b. instead of
- c. located on
- d. close to

119. We didn't realize that fact.

- a. understand
- b. follow
- c. foresee
- d. demonstrate

120. He attempted to figure out the problem.

- a. express
- b. solve
- c. discuss
- d. pose

# ANSWER KEY

## CHAPTER 1

### Ex. 2

I. 1.F, 2.C, 3.E, 4.A, 5.H, 6.G, 7.D, 8.B.  
 II. 1.B, 2.D, 3.C, 4.A.

### Ex. 6

1.E, 2.G, 3.F, 4.A, 5.B, 6.D, 7.C, 8.J, 9.H, 10.I.

### Ex.7

1. the; 2.a; 3.\_; 4.an, \_; 5.the; 6.\_, \_; 7.\_; 8.the; 9.\_, \_; 10.the.

### Ex. 8.

the, \_ the, \_ \_ the, the, the, \_ the, \_ \_ \_ the, the, the, \_ \_ the, \_

### Ex. 9

1.\_; 2. \_ (the), the; 3. the, the, the, the; 4. \_ the; 5. the; 6.\_; 7.\_ (the); 8. the; 9. the, the, the.

### Ex. 10

A. b; B. c; C. 1.a, 2.b, 3.c.

### Ex.11

1. productive; 2. to produce; 3. product; 4. production, productivity; 5. producers; 6. produce; 7. predict; 8. predictable; 9. to predict; 10. prediction; 11. science; 12. scientist; 13. scientific; 14. apply; 15. applications; 16. applied; 17. require; 18. required; 19. requirements; 20. curiosity; 21. curious; 22. imagine; 23. imagination; 24. imaginative; 25. development; 26. to develop.

### Ex. 12

1.a; 2.b; 3.b; 4.c

### Ex. 13

1.c; 2.b; 3 a; 4.c; 5.b; 6. c; 7.a; 8. c; 9.a; 10.b; 11.b; 12.c; 13.a; 14.d; 15. b; 16. b; 17. b.

## CHAPTER 2

### Ex. 3

1. many; 2. is; 3. the number of, is increasing; 4. much; 5. is; 6. is; 7. many; 8. were; 9. is; 10. are; 11. was; 12. was; 13. are; 14. have; 15. has; 16. are; 17. is; 18. is.

### Ex. 5

radii, crises, antennae (antennas), appendices, criteria, stimuli, encyclopedia, prognoses, sanatoria (sanatoriums), axes, aircraft, media, matrices, nebulae, phases, optima, syllabi (syllabuses), supernovae, syntheses, spectra, theses, equipment, maxima, hypotheses, equilibria, millennia, oases, curricula, phenomena, analyses.

### Ex. 7

1.G, 2.E, 3.I, 4.C, 5.H, 6.N, 7.J, 8.L, 9.K, 10.D, 11.A, 12.F, 13.B, 14.M, 15.P, 16.O.

**Ex. 10**

1. improvement; 2. improve; 3. improvement; 4. benefit; 5. beneficial; 6. to benefit; 7. technology; 8. technological; 9. a technologist; 10. technology.

**Ex. 11**

1.d; 2.c; 3.b; 4.d; 5.d.

**Ex. 12**

1.a; 2.d; 3.b; 4.d; 5.a; 6.c; 7.b; 8.d; 9.a; 10.b; 11.d; 12.a; 13.c; 14.a; 15.d; 16.d; 17.b; 18.d; 19.b.

**CHAPTER 3****Ex. 3**

1.E, 2.C, 3.D; 4.A, 5.B

**Ex. 5**

1. understand; 2. sounds; 3. goes; 4. smells; 5. phones

**Ex. 6**

1. was studying; 2. was studying; 3. will be taking; 4. will call; 5. was reading, was watching.

**Ex. 7**

1. bought; 2. has taken; 3. have read; 4. have translated; 5. haven't finished; 6. arrived; 7. haven't seen.

**Ex. 8**

1.a; 2.b; 3.a; 4.a; 5.b.

**Ex. 9**

1. will have studied; 2. said, had published; 3. have known; 4. has been;  
5. has studied (has been studying); 6. have finished; 7. arrived.

**Ex. 10**

1. My friend said that English and French are the two official languages in Canada.
2. Shakespeare once observed that love is blind.
3. Yesterday morning my teacher said that the results of our test would be there two days from then.
4. My father always told me that to learn is never too late.
5. Last week my cousin told me that he had already completed the essay for his classes that week.
6. When I saw Paula last month she told me that she had received John's letter two months earlier.
7. Elizabeth told me that she couldn't come earlier.
8. Michael said that he would get the tickets.

**Ex. 11**

1.b; 2.b; 3.a; 4.d; 5.b; 6.a; 7.c; 8.d; 9.a.

**Ex. 13**

1. increasingly; 2. increased; 3. competition; 4. competitors; 5. competitor(s); 6. competitive;  
7. investments; 8. to invest; 9. invested; 10. prospers; 11. prosperity; 12. prosperous;  
13. innovative; 14. innovations.

**Ex.14**

1.d; 2.c; 3.c; 4.b; 5.a.

**Ex. 15**

1.b; 2.c; 3.d; 4.c; 5.a; 6.a; 7.b; 8.a; 9.d; 10.d; 11.c; 12.d; 13.a.

**CHAPTER 4****Ex. 2**

1.D, 2.C, 3.E, 4.B, 5.A

**Ex. 5**

1.b, 2. c, 3.d, 4.c, 5.c, 6.c, 7.b, 8.b

**Ex. 6**

2. intelligent, the least intelligent; 3. more (less) famous, the most (the least) famous; 4. bad, the worst; 5. more (less) comfortable, the most (the least) comfortable; 6. more (less) careful, the most (the least) careful; 7. bright, brighter; 8. more (less) useful, the most (the least) useful; 9. more (less) guilty, the most (the least) guilty; 10. hard, the hardest.

**Ex. 8**

like; while; by contrast; however

**Ex. 9**

A. 1.a; 2. d; 3. a; 4. c; 5. a;  
B. 1. are; 2. as; 3. like; 4. are; 5. is.

**Ex. 10**

1.a; 2.b; 3.d; 4.c; 5.b; 6.d; 7.c.

**Ex. 13**

1. creative; 2. creativity; 3. create; 4. creation; 5. capable of;  
6. capability; 7. modifications, modify; 8. modified; 9. modify.

**Ex. 14**

1 — b; 2 — c; 3 — a; 4 — d; 5 — b.

**Ex. 15**

1.a; 2. b; 3.b; 4.d; 5.d; 6.d; 7.c; 8.d; 9. b; 10.d; 11.b;  
12.b; 13.d; 14.b; 15.d; 16.a; 17.c; 18.b; 19.b; 20.d; 21.c.

**CHAPTER 5****Ex. 3**

1.b; 2.b; 3.a; 4.b; 5.a; 6.a; 7.b; 8.a; 9.a; 10.a; 11.a; 12.b.

**Ex. 5**

1. E; 2. B; 3. I; 4. K; 5. J; 6. A; 7. C; 8. L; 9. D; 10. F; 11. H; 12. M; 13. G.

**Ex. 6**

1.c; 2.b; 3.d; 4.c; 5.d.

**Ex. 9****A.**

1. Secretaries should be familiar with their duties.
2. Members of congress will cast their votes.
3. When everyone contributes the ideas, the workshop will be very stimulating.
4. Professors should meet their students regularly.
5. A director will bring the draft.

**B.**

1. humanity; 2. assistant; 3. has a career; 4. police officer; 5. the average person/ordinary people; 6. spouses; 7. chairperson; 8. lay people.

**Ex. 11**

1. explain; 2. explanation; 3. explanatory; 4. intention; 5. intentional; 6. accurate; 7. accuracy; 8. to avoid; 9. avoidance; 10. theoretically; 11. theorist (theoretician); 12. to theorize; 13. theoretical; 14. theoretical.

**Ex. 12**

1.c; 2.b; 3.b; 4.c; 5.c.

**Ex. 13**

1.c; 2.b; 3.b; 4.d; 5.b; 6.a; 7.a; 8.c; 9.b; 10.d; 11.b; 12.b; 13.d; 14.d.

**CHAPTER 6****Ex. 5**

1.b; 2.a; 3.c; 4.c; 5.a; 6.c; 7.b.

**Ex. 9**

1. D; 2. E; 3. A; 4. B; 5. C.

**Ex. 10**

1. collects; 2. collection; 3. collective; 4. experiment; 5. experiment; 6. experimental; 7. experimentation; 8. to assess; 9. assessment.

**Ex. 11**

1.d; 2.c; 3.b; 4.a; 5.d.

**Ex. 12**

1.b; 2.d; 3.a; 4.c; 5.a; 6.d; 7.b; 8.b ; 9.d; 10.c.

**CHAPTER 7****Ex. 2**

1. D; 2. F; 3. A; 4. B; 5. C; 6. E

**Ex. 3**

1. J; 2. M; 3. E; 4. K; 5. B; 6. H; 7. D; 8. C; 9. F; 10. G; 11. I; 12. A; 13. L

**Ex. 4**

1.b; 2.c; 3.d; 4.d; 5.c; 6.d; 7.a; 8.b; 9.c; 10.a; 11.b

**Ex. 8**

1.

occurrence; leadership; fitness; absentee; reporter; designer; development (developer); freedom; tenderness; selection; dependence; agreement; requirement;

2.

symbolize; falsify; strengthen; activate; soften; normalize; freshen; validate; signalize; legalize; individualize;

3.

praiseworthy; affordable; presentable; washable; reusable; hazardous; noiseless; useful (useless); trustworthy; faithful; salty; adjustable; flawless.

**Ex. 9**

1.b; 2.d; 3.c; 4.b; 5.d.

**Ex. 10**

1.b; 2.c; 3.a; 4.b; 5.d; 6.b; 7.d; 8.b; 9.c; 10.a; 11.a; 12.d; 13.d.

**CHAPTER 8****Ex.6**

1.c; 2.b; 3.a.

**Ex.7**

1.b; 2.c; 3.a; 4.d; 5.d; 6.b; 7.b; 8.c; 9.a; 10.d; 11.a; 12.d; 13.c.

**Ex.9**

1. recognition; 2. recognize; 3. recognized; 4. alterations; 5. altered; 6. add; 7. to add; 8. additions; 9. addition.

**Ex.10**

1.d; 2.d; 3.c; 4.a; 5.b.

**Ex.11**

1.a; 2.b; 3.d; 4.c; 5.b; 6.d; 7.a; 8.c; 9.c; 10.b; 11.c; 12.b; 13.d.



**CHAPTER 9****Ex. 5**

1. E; 2. G; 3. I; 4. C; 5. H; 6. B; 7. A; 8. D; 9. F.

**Ex. 6**

1.a; 2.d; 3.b; 4.b; 5.c; 6.c; 7.a; 8.d; 9.b; 10.a; 11.d; 12.b.

**Ex. 10**

1. important; 2. importance; 3. important; 4. recycled; 5. to recycle; 6. recyclable; 7. reliable; 8. reliably; 9. reliable; 10. unreliability; 11. possibilities; 12. possible; 13. possible; 14. possible; 15. possibly; 16. possibility; 17. possibility; 18. responsible; 19. responsible; 20. responsibility; 21. responsibility.

**Ex. 11**

1.a; 2.b; 3.d; 4.d; 5.d.

**Ex. 12**

1.b; 2.c; 3.d; 4.b; 5.b; 6.a; 7.b; 8.d; 9.b; 10.d; 11.a; 12.d.

**CHAPTER 10****Ex. 4**

1.b; 2.b; 3.d; 4.b; 5.c; 6.a; 7.b; 8.c; 9.a; 10.d.

**Ex. 5**

1. smoking; 2. to buy; 3. to bring; 4. waiting; 5. playing, seem, to prefer, playing; 6. to spend.

**Ex. 9**

1. manufactures; 2. manufacturing; 3. manufacturer; 4. manufacturing; 5. organization; 6. organize; 7. organize; 8. organized; 9. precise; 10. precision; 11. precisely; 12. precisely.

**Ex. 10**

1.c; 2.d; 3.d; 4.b; 5.d.

**Ex. 11**

1.b; 2.d; 3.c; 4.a; 5.c; 6.c; 7.b; 8.d; 9.a; 10.c; 11.c; 12.b.

**CHAPTER 11****Ex. 5**

1. Under no circumstances will I go there.
2. Isn't he a great speaker!
3. In no case can we make an exception.

**Ex. 6**

Answers will vary.

## Ex.7

1.d; 2.c; 3.a; 4.c; 5.d; 6.c; 7.b; 8.d; 9.b; 10.c.

## Ex.10

1. refused; 2. refuse(d); 3. refusal; 4. agreement; 5. agree; 6. agree(d);  
7. agreement; 8. anxious; 9. anxiety; 10. anxious; 11. anxiously.

## Ex.11

1.b; 2.a; 3.b; 4.b; 5.d.

## Ex.12

1.d; 2.c; 3.b; 4.b; 5.d; 6.a; 7.c; 8.c; 9.b; 10.d.

## FINAL TEST

## I

1. b
2. b
3. c
4. d
5. b

## II

- |       |       |       |       |
|-------|-------|-------|-------|
| 6. a  | 19. b | 32. d | 45. b |
| 7. b  | 20. d | 33. b | 46. c |
| 8. c  | 21. b | 34. d | 47. c |
| 9. b  | 22. d | 35. b | 48. c |
| 10. d | 23. c | 36. c | 49. d |
| 11. a | 24. b | 37. a | 50. c |
| 12. d | 25. d | 38. c | 51. b |
| 13. b | 26. a | 39. d | 52. b |
| 14. c | 27. a | 40. c | 53. c |
| 15. d | 28. b | 41. c | 54. b |
| 16. a | 29. d | 42. c | 55. b |
| 17. b | 30. c | 43. d | 56. c |
| 18. d | 31. b | 44. b |       |

## III

- |       |       |        |        |
|-------|-------|--------|--------|
| 57. c | 73. d | 89. c  | 105. a |
| 58. b | 74. c | 90. b  | 106. b |
| 59. b | 75. a | 91. d  | 107. b |
| 60. d | 76. c | 92. a  | 108. b |
| 61. b | 77. d | 93. d  | 109. b |
| 62. b | 78. c | 94. c  | 110. d |
| 63. c | 79. d | 95. a  | 111. b |
| 64. b | 80. b | 96. b  | 112. d |
| 65. a | 81. b | 97. c  | 113. c |
| 66. c | 82. c | 98. a  | 114. b |
| 67. d | 83. d | 99. c  | 115. c |
| 68. d | 84. a | 100. b | 116. a |
| 69. b | 85. c | 101. d | 117. d |
| 70. d | 86. a | 102. d | 118. b |
| 71. c | 87. c | 103. b | 119. a |
| 72. a | 88. a | 104. c | 120. b |

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