Дніпровський національний університет імені Олеся Гончара

Факультет української й іноземної філології та мистецтвознавства

Кафедра англійської мови для нефілологічних спеціальностей

Осадча О.В.

BIOLOGICAL VOCABULARY IN CONTEXT

Посібник з англійської мови для самостійної роботи студентів природничих спеціальностей денної та заочної форм навчання

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Для здобувачів вищої освіти за першим (бакалаврським) рівнем біолого-екологічного факультету Дніпровського національного університету імені Олеся Гончара, які навчаються за спеціальностями 091 Біологія (ОП Мікробіологія та вірусологія, Системна біологія та гідробіоресурси, Біохімія та фізіологія, Біорізноманіття та ландшафтний дизайн), 014 Середня освіта (Середня освіта. Біологія та здоров'я людини), 162 Біотехнологія та біоінженерія та 101 Екологія денної та заочної фори навчання.

Посібник містить тексти професійного спрямування та різноманітні вправи до них. Тематика текстів охоплює різні підрозділи біології та екології. Тексти пов'язані з актуальними проблемами сучасної науки й можуть використовуватися як основа для монологічного та діалогічного мовлення.

Посібник стане в нагоді для самостійної роботи студентів у процесі вивчення курсу «Іноземна мова (англійська)» та під час аудиторних занять.

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Видано власним коштом

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INTRODUCTORY COURSE

I AM A STUDENT

I am a student of the faculty of Biology and Ecology at Oles Honchar Dnipro National University. I am proud to say that because it was my dream. I am happy to meet my new groupmates who are nice and kind people. I never miss classes and do my best to get good knowledge. I am a first-year full-time student. I have a good opportunity to spend a lot of time in the library.

The faculty of Biology and Ecology trains specialists in this area. The students study many subjects, such as: Biology, Biochemistry, Ecology. Foreign languages are studied at all faculties, because it is impossible to be good specialists without reading any professional literature.

Students attend lectures that are conducted by experienced teachers and researchers. All students make notes and never miss lectures. They try not to be late. The lectures are supplemented by the seminars where the most interesting questions are discussed. Students get not only theoretical knowledge but also take a lot of practical courses. They have a chance to find a good job as they receive basic education. After graduation from the University students get Bachelor's and Master's degree.

2. ABOUT MYSELF

It's difficult to tell much in a very short time. My name is Mary. I was born in Dnipro and I am proud of my city. I'm a first-year student. My typical day starts at 7 o'clock. I have various classes every day and my timetable is very packed. That's why I'm often short of time. I major in Biology. I'm interested in these subjects. I haven't made up my mind which subject I like better. I try to spend more time at the library and get acquainted with books on Biology that are available there. I also attend the language laboratory which is well-equipped.

I was brought up in a caring family. My home is a place where I always meet love and sincerity of my parents. I am always surrounded by the atmosphere of true

friendship. Whenever I am away I miss my family badly and feel lonely and miserable. It's difficult for me to do without their help and respect. I am sure that my relatives also need my attention and sympathy. I try to spend at home as much time as possible.

I think I'm home-loving, kind and patient. I can get on with people well, because I always try to help them and they trust me. I'm a sociable person. Sometimes I'm lazy. Sometimes I don't do things my parents want me to do. I'm very conservative, they say, and I completely agree with it. I never change anything in my life: ideas, principles, friends. I'm fond of good music.

3. MY HOBBY

People who have a variety of hobbies are interesting to speak to. "All work and no play makes Jack a dull boy". I am keen on photography because it is a good way of expressing creativity. I have a great deal of expensive equipment. I am also fond of travelling. I have been to several countries. I am fascinated by beautiful landscapes I have seen, native people I have spoken to, national cuisines I have tasted.

Now I am studying English. It's impossible to survive in the modern world without knowing foreign languages. The world is becoming a global village where people travel from one part of the world to the other.

Needless to say, it is necessary to study English for different reasons. Firstly, it is the international means of communication. Secondly, it is the most widely spoken language all over the world. Moreover, it gives the opportunity to travel around the world and study abroad.

However, though it seems easy to learn English, when it comes to practice, you may face difficulties. How to learn the languages effectively? The best way is to attend the language courses. Besides, never miss the opportunity to communicate with the native speakers. Work hard at your grammar, reading and

speaking skills. Remember, no matter how great your desire to know English is, it's impossible without hard work. The more you practice, the more you achieve.

4. MY FAMILY

I would like to tell you more about my family. My father is a professor of biology. He works at the research institute. He is very clever and reliable. He is a well-educated man with broad outlook and deep knowledge. He tries to support and encourage all of us. I'm proud of him. Though I look like my mother I took my best character traits after him.

My true friend is my mother. She's the first person I can rely on. When I have problems, she is ready to give me a helping hand. I always share my secrets when I fall in love. I value her opinion because she is wise and experienced. I'm sure she will not let me down.

My parents have two more children besides me. I have an elder sister and a younger brother. We all are very different. My sister is practical and hard-working and honest. She tries to do the work that will help her in future. I believe her dream will come true. She is honest and she doesn't like those people who lie to her. What I don't like about her is that she is bossy. Sometimes I feel offended when she is rude. She tries to be independent and causes a lot of anxiety to my parents, although they understand her desire. She is engaged to a handsome young man. I think she will get married to him next year. My brother is a bit light-minded, because he does everything without thinking. He likes to take risks. The feature of his character that I hate is that he's disorganized and he is always late. That's why my mother is angry with him. In some cases he may be selfish. He may say that he is busy when I ask to do me a favor. But I hope his character will change for the better when he grows up. Now he is a teenager. He started smoking but managed to give up. He is keen on sports and he is going to join a local sports club. He goes in for swimming, football, wrestling. Though I'm a bit critical of my sister and brother I can't imagine my life without them.

5. MY USUAL DAY

Dnipro is not my native city, I came here to study. I didn't want to live in the dormitory, so I decided to rent a flat. To make the rent smaller, I also decided to share my room with another girl – Svetlana. She studies at the university too.

Let me describe my usual day. On weekdays I get up at 7 o'clock. I don't have an alarm-clock so my roommate wakes me up. I turn on the radio, do exercises and take a shower. If I am not short of time, I have breakfast. If I am in a hurry, I have only a cup of coffee. We live not far from the University and it takes us only 15 minutes to get there. We are never late.

Usually, I don't miss classes because I want to pass my exams successfully.

At 10.50 we have lunch. It's my favorite time. That's the time to share the news and to gossip. I usually go home at 2 p.m. but sometimes I have to stay at the University longer because I go to the library to get ready for my practical classes or to write a report. As a rule, I have no spare time on weekdays, so I feel tired.

I try to find time for everything and have good working habits:

- Do things in order of their importance;
- When you face a problem, first analyze the facts to make a decision;
- Clear you desk of all papers except those you need closely at hand;
- Put enthusiasm into you work. It's the only way to enjoy what you are doing;
- Live and learn, analyze your mistakes. Truth lies at the bottom of a well.
- Learn to relax. It will give you time to gain strength and balance.

Module 1. Biology as a Science

Unit 1. Biology as a Science

Biology is a natural science connected with the study of life and living organisms, including their structure, function, growth, evolution, distribution, and taxonomy. Modern biology consists of many branches. However, despite the broad scope of biology, there are certain general concepts which govern all study and research. Biology generally recognizes the cell as the basic unit of life, genes as the basic unit of heredity, and evolution as the engine that helps the synthesis and creation of new species. It is also understood today that all organisms survive by consuming and transforming energy and by regulating their internal environment to maintain a stable and vital condition.

Subdisciplines of biology are defined by the kinds of organisms studied, and the methods used to study them: *biochemistry* examines the chemistry of life; *molecular biology* studies the complex interactions among biological molecules; *botany* studies the biology of plants; *cellular biology* examines the basic building block of all life, the cell; *physiology* examines the physical and chemical functions of tissues, organs, and organ systems of an organism; *evolutionary biology* examines the processes that produced the diversity of life; and *ecology* examines how organisms interact in their environment.

The word “biology” comes from two Greek words: “bio”- “life” and “logos” – “study”. Biology includes all the facts and principles, which come from the scientific study of living things. There are two great *subdivisions* of biology: *botany*, which is the study of plants, and *zoology*, which is the study of animals. Plants and animals are called organisms, so biology may be *defined* as the science of organisms.

There are different branches of biology.

Morphology studies the structural characteristics of an organism (how it is built).

Anatomy is the study of organs.

Cytology is the study of cells.

Histology is the study of tissues.

Physiology studies the functional characteristics (the most important operations).

Embryology is the study of development.

Taxonomy studies animal and plant classification.

Ecology studies the relations between organism and environment.

Genetics is the study of biological *heredity*.

The branches of botany are:

Bacteriology – the study of bacteria.

Mycology – the study of *fungi.*

Algology (phycology) – the study of *algae.*

Bryology – the study of *mosses.*

Pteridology – the study of *ferns.*

Zoology is divided as follows:

Protozoology –the study of *single-cell* animals.

Entomology – the study of *insects*.

Ichthyology – the study of fishes.

Herpetology – the study of amphibians and reptiles.

Ornithology – the study of birds.

Mammalogy – the study of *mammals*.

Microbiology studies all microorganisms, such as *bacteria, yeasts, moulds, algae*. It was founded by a prominent German bacteriologist Robert Koch (1843-1910). He *carried out* many experiments on mice in a small laboratory. In 1882 Koch *discovered* tuberculosis *bacilli*. Due to this discovery Koch became known *all over the world*. In 1884 he published his book on *cholera*. In 1905 Robert Koch got the Nobel Prize for his important scientific discoveries. A branch of microbiology – **bacteriology**, studies bacteria. The presence of *oxygen* is very important in the life and growth of bacterial forms. But some bacteria can exist in both *aerobic* and

anaerobic environment. Any minute bacteria can get into human body. The *protective agents* of the human organism can destroy them. If bacteria are not destroyed, they *cause a disease. According to* the shape, bacteria are divided into some groups: cocci (single) and cylindrical (bacilli, vibrio, spirochaete).

The great majority of bacteria are not only harmless, but also necessary for the life of living things. For example, souring of milk is the result of bacterial action. This is the first step in preparation of butter and cheese. Bacteria can be found in the soil, air, water, food and body.

Virology, the study of *viruses*, was founded by Dmitry Ivanovsky. When he was *investigating* the tobacco mosaic *disease*, he *came to the conclusion* that it *was caused* by a microscopic agent, smaller than bacteria. He did many experiments on various plants. He passed the juice of the diseased plant through a *fine filter*, which could catch the smallest bacteria. Organisms, smaller than bacteria, were called viruses. The viruses can be *cultivated* only in the presence of living cells. They have *parasitic existence* in the *living cells*, often in the cells of a specific *tissue*.

Tasks to Unit 1

Task 1. *Transcribe and translate the following words and word combinations.*

Biology, science, structure, function, evolution, however, species, research, microscope, unit, heredity, diversity, environment, physiology, publish, conclusion, subdivision, cause, disease, system, cell, tissue, virus.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

To be connected with, general functions, basic unit of life, creation of new species, to maintain a stable condition, to examine the physical functions, environment, to consume energy, diversity of life, due to, according to, however, cause of disease, great majority, parasitic existence.

Task 3. *Finish the phrase.*

basic unit of … to consume and transform …	all over … to be divided into …

subdivisions of … to carry out … to come to ….	to cause … various … protective …

Task 4. *Complete the sentences and translate them.*

1. Biology is a natural science … with the study of life and living things.
2. Modern biology … of many branches.
3. Organisms regulate their own internal … to survive.
4. Evolutionary biology examines the processes that produced the … of life.
5. Koch … many experiments on mice in a small laboratory.
6. … the shape, bacteria are divided into some groups.
7. Organisms smaller than bacteria were … viruses.

Task 5*. Put the word into the right form.*

1. The scientist studied the … (to grow) of plants.
2. Organisms survive by … (to consume) and transforming energy.
3. There are two great … (to subdivide) of biology.
4. The great … (major) of bacteria are not only harmless, but necessary for life.
5. Viruses have parasitic … (to exist) in different organisms.

Task 6. *Put the questions to the underlined words.*

1. Biology consists of <u>many</u> branches.
2. <u>The cell</u> is the basic unit of life.
3. Molecular biology studies <u>the interactions</u> among biological molecules.
4. <u>In 1905</u> Robert Koch got the Nobel Prize for his important scientific discoveries.
5. <u>Due to this discovery</u> Koch became known all over the world.

Unit 2. The History of Biology

The word “biology” was first used about 1800. Before then the *various biological sciences*, such as *zoology and anatomy*, had been grouped together with geology and called "*natural history*." The history of biology is the history of many fields, including *medicine, botany, and zoology.*

Important Dates in Biology

400 B.C.	Hippocrates	established the principles of modern medical practice based on the idea that *diseases* have only *natural causes*.
A.D. 100's	Galen	extended knowledge of *anatomy and physiology* through his *treatment of injured gladiators* and *dissections of apes* and pigs.
1543	Andreas Vesalius	published the first scientific text on human anatomy "On *the Fabric* of the Human Body".
1628	William Harvey	published his discovery of how *blood* circulates through the body.
1665	Robert Hooke	made the first drawings of *cells* in his book Micrographia.
Mid-1670's	Anton van Leeuwenhoek	discovered *microscopic forms of life.*
1735	Carolus Linnaeus	classified organisms according to *their structural similarities.*
Late 1700's	Antoine Lavoisier	conducted chemical studies of such physiological processes as *respiration* and the conversion of food to energy.
c. 1800	Baron Cuvier	made major contributions in *comparative anatomy* (the comparison of the structures of different species) and *paleontology* (the study of prehistoric life).
1838-1839	M.Schleiden, T. Schwann	proposed that the cell is *the basic unit* of life.
Mid-1800's	Gregor Mendel	discovered the basic *laws of heredity*.
1859	Charles Darwin	created his theory of evolution in "*The Origin of Species".*
Middle 1800's	Louis Pasteur Robert Koch	established *the germ theory* of disease.
1953	James Watson Francis Crick	proposed a model of the *molecular structure of deoxyribonucleic acid* (DNA), the hereditary material in chromosomes.
Late 1970's	Researchers	used *genetically engineered bacteria* to produce insulin – *a hormone* for treating diabetes.
1983	Researchers	used genetic engineering to transfer *human growth hormone genes* into mice, causing the mice to grow to about twice their normal size.
1996	Ian Wilmut	achieved the first successful *cloning* of a mammal from the cells of an adult animal.

Early Biology

The first knowledge of biology grew out of primitive hunters' *observations* of animals and out of *food-gathering* and cultivation. Progress was slow, however, because *nature* was often considered a *goddess* and *disease* an *evil spirit*. This attitude still exists among certain primitive peoples.

The earliest studies of biology were probably made by ancient *physicians and embalmers.* People of ancient India, China, and the Middle East had a vast knowledge of various *medicinal plants*. The Babylonians and Egyptians had some knowledge of *human anatomy*. The first man who approached disease as a natural, rather than a supernatural, process was **Hippocrates** of Cos, a Greek who became known as the *Father of Medicine*. The greatest student of biology in the ancient world was the Greek philosopher **Aristotle**. His writings include works on *birth, death, the nature of life, and all phases* of animal life. He influenced scholars for nearly 2,000 years. **Galen**, a Greek living in Rome, studied anatomy by *dissecting animals*. His works were used in medical schools in the Middle Ages.

Although many of the ideas of the ancient writers were at least partly correct, many were also misleading or wrong. One of their mistaken ideas was that *a living body* is made up of *four juices*, or humors—*blood, phlegm, black bile, and yellow bile*. Another was the theory of spontaneous generation, according to which certain living things, such as *maggots,* came not from other living things but from *nonliving matter*.

The Middle Ages

There were hardly any *contributions* to biology in Europe in the Middle Ages. But the works of the ancient Greeks and Romans were studied by the Arabs. Scholars of the Middle Ages did not investigate nature - they studied ancient books. The original writers were often wrong, and bad translations sometimes caused a lot of errors. Actually the only careful studies of the *physical characteristics* of plants and animals were made by craftsmen and artists for

artistic purposes. Some new knowledge of *plants* resulted from the work of the *herbalists*, who collected and studied *herbs* for use in medicine.

Tasks to Unit 2

Task 1. *Transcribe and translate the following words and word combinations.*

Principle, natural cause, knowledge, blood, microscopic, chemical, comparative, basic, germ, acid, to transfer, field, ancient, approach, contribution, nature, herbs.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

Treatment of gladiators, dissection of apes, drawings of cells, structural similarities, comparative anatomy, laws of heredity, origin of species, to create the theory, attitude, to cause disease, knowledge of plants.

Task 3. *Finish the phrase using the verbs from the table.*

to establish to create to include	to treat to propose to approach	to publish to use to dissect	to discover to achieve to collect

… medicinal herbs	… the theory	… the principle
… that cell is the unit of life	… gladiators	… successful cloning
… his first book	… apes	… medicine and botany
… the disease as natural process	… laws of heredity	… genetic engineering

Task 4. *Complete the sentence and translate it.*

1. Galen ... knowledge of *anatomy and physiology* through treating gladiators.
2. Charles Darwin created his theory of evolution in "*The … of Species".*
3. Deoxyribonucleic acid (DNA) is the hereditary material in … .
4. Nature was often considered a … and disease an evil spirit.
5. The greatest student of biology in the … world was Aristotle.
6. His works were … in medical schools in the Middle Ages.
7. Scholars of the Middle Ages did not … nature - they studied ancient books.

Task 5. *Put the word into the right form.*

1. B. Cuvier made major contributions in … (to compare) anatomy.
2. I. Wilmut achieved the first … (success) *cloning* of a mammal.

3. There were no … (to contribute) to biology in Europe in the Middle Ages.

4. The earliest studies of biology were … (probable) made by ancient physicians.

5. Bad … (translate) sometimes caused a lot of errors.

Task 6. *Make the following sentences interrogative or negative.*

1. The scientist published the first scientific text on human anatomy.

2. The Babylonians and Egyptians had some knowledge of human anatomy.

3. The researchers used genetically engineered bacteria to produce insulin.

4. Galen, a Greek living in Rome, studied anatomy by dissecting animals.

5. The first knowledge of biology grew out of primitive hunters' observations.

Unit 3. Later Advances in Biology

During the 14th to 17th centuries, there was a great interest in the study of biology. Traditional ideas formulated by ancient Greeks and Romans were challenged. Observation and scientific study was emphasized. Scholars again turned to actual observation of plants and animals as *a means of gaining information*. The first really accurate textbooks on botany and zoology were written in the early 14th century. *Leonardo da Vinci,* the great Italian artist, *dissected* dead human bodies and made drawings of the human anatomy. In the same period *Andreas Vesalius* (1514-64), a Belgian, gave the first accurate and complete *description of the human body*. He was one of the first scientists since ancient times to dissect a human body.

The importance of experiment in the study of biology was shown by the Englishman *William Harvey* (1578-1657). He proved his theory that *blood* circulates in the *veins and arteries* by cutting into animals to show how it happens. Another important step forward was the *development of the microscope* in the early 17th century. *Marcello Malphigi*, the Italian *anatomist*, used the microscope to study *blood circulation*. *Robert Hooke* observed the *structure* of many organisms through the microscope and reported his observations in

“Micrographia”, published in 1665. Five years later, *Anton van Leeuwenhoek* studied organisms that could only be seen through the microscope.

By the 18th century, biologists had come to the conclusion that life could be explained in terms of biological processes that took place within the living organism. They rejected the idea of *supernatural intervention* in biological processes. Their views formed part of *materialistic physiology*. In the 18th century, *Antoine Lavoisier* demonstrated that *respiration* involved the use of *oxygen* and the release of *carbon dioxide and heat.*

The *classification of organisms* into groups began as early as Aristotle. But a really logical system was made in the 18th century. *Carolus Linnaeus* (1707-78) from Sweden improved earlier systems and developed the method of classification that (with certain changes) is still used today. His system provided a logical approach to the study of living things and gave biologists a uniform *method of description*. *Orderly classification* also made it possible to see more clearly the relationships between various kinds of life. Linnaeus had used the similarities in structures of plants and animals to group them. This led to another field of biology—*comparative anatomy*. Here, different plants and animals were compared for similarities and differences. In the 18th century, *Baron Cuvier* proposed a system where organisms were classified based on their *body type.*

Biologists *broadened their knowledge* of nature through voyages of exploration. The first important scientific expeditions were commanded by *Captain James Cook* in the 1760's and 1770's. Later expeditions were made by the British ships “Beagle” (1831-36), on which Charles Darwin was naturalist, and “Challenger” (1872-76).

Important developments were made in many fields during **the 19th century** as biologists began to *apply scientific methods* to their work. Discoveries were made not only about specific organisms, but also about the nature of life in general. Early in the century it was discovered that all living things are made up of *cells.* In

Origin of Species (1859) Charles Darwin (1809-82) showed that complex forms of life generally *evolve* from simpler forms by *means of natural selection*. In 1865 *Gregor Mendel* (1822-84), an Austrian abbot, presented his findings on the principles of *heredity*—the first scientific studies of the subject.

During the 20th century, more emphasis was placed on *experimental knowledge* and less on theory. Systematically conducted experiments and use of statistical tools helped biologists understand the various biological processes. As biology became more scientific in its methods, it also became more useful in its *practical applications.* The discovery by *Louis Pasteur* (1882-95) of how *infection* is produced by *bacteria*, and the development of *penicillin* and other "wonder drugs," contributed greatly to the control of disease.

Gregor Mendel found that physical traits are *transmitted from generation to generation* through units from the parent to offspring. These essential units, known as *genes*, are located on *chromosomes within the cells*, as postulated by *Thomas Hunt Morgan* in 1910. In 1953, *James Watson and Francis Crick* discovered the *structure of DNA* that makes up genes. This led to greater understanding of the *mechanism of heredity* and the *process of evolution*.

Research in *genetics* led to many new *breeds* of plants and farm animals, thus increasing the supply of food. Better understanding of the physical structure and habits of simple forms of life made it possible to control many types of *harmful insects* and other *pests.*

Pollution of air and water and increased use of land for housing and commercial development have created *survival problems* for various kinds of organisms. These problems have increased interest in *ecology and conservation*. New tools to study the complex relationships between organisms and their *environment* led to the development of ecology as a separate field of biology in the 1960s. There is also great interest among biologists in *ethology,* the study of animal behavior, especially aspects of survival.

Space exploration has intensified interest in the possibility of life existing elsewhere in the universe. Scientists who study these possibilities, and who try to find methods of *detecting extraterrestrial life*, are called *exobiologists.*

Advances in *neurobiology*, the study of the nervous system, have increased our understanding of how *the brain* and nerve cells function. *Immunology*, the study of the *disease resistance mechanisms* of the body, also benefited from the new methods and tools used in biological studies.

In basic research, the study of life processes continues, particularly in genetics and other *areas of biochemistry*. Since the 1950s, there has been much research involving the composition and functions of *nucleic acid molecules*. In the 1970s, the first successful experiments in *genetic engineering* were made. Genetic engineering involves the transfer of genes from one organism to another. This is very useful in agriculture and medicine, where *desirable traits* of certain organisms can be transferred to other organisms. In the 1990s, scientists determined the complete *genetic codes* of a number of simple organisms, including certain types of bacteria.

Tasks to Unit 3.

Task 1. *Read and translate the following words and word combinations.*

AL [o] – already, all, almost, always, also, although

CH – character, chemistry, ache, chromosome, mechanism,

-TION – evolution, contribution, description, observation, selection, pollution

I [ai] – biology, microscope, life, scientific, desirable,

U [a] – structure, study, function, subdivision, publish, conduct, adult, cultivation,

G – general, gene, genetics, generation,

Task 2. *Make up the sentences using the table.*

Hippocrates	made contribution	how blood circulates through
William Harvey	conducted	the body
A. Leeuwenhoek	classified	microscopic forms of life
Carolus Linnaeus	established	organisms
A. Lavoisier	discovered	chemical studies

Gregor Mendel Charles Darwin Ian Wilmut Baron Cuvier	created produced	the basic laws of heredity to comparative anatomy the principles of modern medicine the theory of evolution a clone of a sheep

3. Make nouns from the given verbs (to achieve success – achievement of success).

to survive in the environment to develop the science to cause disease to discover blood circulation to contribute to anatomy to compare the structure to create the theory to achieve success	to originate to observe nature to investigate plants to classify organisms to inform to describe the human body to conclude to evolve

Task 4. *Make the adjectives and the word combinations with them.*

science medicine physiology comparison nerve success vary	care use harm tradition biology similarity desire

Task 5. *Complete the sentences and translate them.*

1. The first knowledge of biology grew out of hunters' ….
2. People of ancient India had a vast knowledge of …
3. Galen studied anatomy by …
4. According to this theory, a living body is made up of four …
5. Scholars of the Middle Ages didn't … nature, they studied ancient books.
6. Traditional ideas …. by ancient Greeks and Romans were challenged.
7. The importance of the … was shown by William Harvey.
8. Materialists rejected the idea of … intervention into biological processes.
9. Respiration involves the use of … and the release of …
10. The … of organisms into groups began as early as Aristotle.
11. Linnaean system provided a logical … to the study of living things.

12. This classification made it possible to see the … between various kinds of life.

13. Linnaeus used the … in structures of plants and animals to group them.

14. Biologists broadened their knowledge through voyages of …

15. Scientists began to apply … to their work.

16. Complex form of species evolve from simple forms by means of …

17. Biology became more useful in its practical …

18. Development of penicillin contributed greatly to the ….

19. Physical traits are transmitted from …

20. Genes are located on … within cells.

21. Discovery of the structure of DNA led to understanding of the mechanism of …

22. Pollution of … have created survival problems.

23. Ethology is the study of animal …

24. Neurobiology, the study of …, increased our understanding of the brain.

25. Desirable traits can be transferred from one organism to another.

Task 6. *Make up the word combinations, using the words from the table.*

Apes	*disease (2)*	*mammal*	*Herbs*	*farm animals*
anatomy	*engineered*	*generation*	*Illness*	*mechanism*
application	*traits*	*molecules*	*Dioxide*	*heredity*
species	*Life*	*human body*	*Greeks*	

treatment of …

dissection of …

microscopic forms of …

origin of …

successful cloning of …

various medicinal …

description of the …

practical …

desirable …

disease resistance …

comparative …

germ theory of …

laws of …

genetically … bacteria

ancient …

to cause …

carbon …

to transmit from …

breeds of ..

nucleic acid …

Task 7. *Translate the word combination* **(**disease **control – «контроль за хворобою» = control of disease)**

disease **control**	plant **structure**
disease resistance **mechanism**	heredity **principle**
biochemistry **areas**	blood **circulation**
space **exploration**	classification **system**
heredity **mechanism**	nature **investigation**
farm **animals**	animal **observation**
food **supply**	acid **molecule**
life **forms**	respiration **process**
germ **theory**	sheep **clone**

Unit 4. Evolution

Evolution, as defined in biology, is the *continual process* by which one form of life changes, or *evolves*, into another form. Some religious groups deny that evolution exists, but most scientists accept it as fact. The theory of evolution suggests that all living things *descended* from one or several kinds of simple organisms. It also explains why there are so many different kinds of organisms. The *inherited characteristics* of nearly all living things change from generation to generation. The *accumulated changes* may become so great that the *descendant* doesn't look like its *remote ancestor* and may belong to a different species. Evolution is of two types: *anagenesis* and *cladogenesis.* Anagenesis is gradual change in *a single species*. Cladogenesis involves the branching of the species into two or more species over generations. It took a single species more than 3 million years to evolve into the current 10 million species on Earth today. This means that all species on the planet today had *a common ancestor.*

During evolution, natural selection works in a way that ensures that species that are more *capable* of adapting to their environment live and evolve further, while species that are *unsuited to their environment* die out.

Natural Selection. There are more living things produced than can possibly survive, because there is not enough space and food to support them. The result is *competition* among organisms in the struggle for survival. The individuals in each species are not all exactly alike. They have *varying characteristics*, and these variations may either help or hinder them in their struggle to live.

Organisms become *extinct* (die out) if they do not have enough characteristics that enable them to get *sufficient food* and other necessities to withstand the climate, or to compete successfully with other forms of life. The ones that survive and reproduce *pass on* to the next generation some of the characteristics that made them better adapted to their environment. In this way *the successive generations* improve their *internal efficiency* and their *adjustment* to their environment. Natural selection causes *a gradual change* in the characteristics of the species. In some species, *females* prefer *males* with different traits. This leads to evolution of a species where males have traits which are different from those of females.

Directional selection is the evolution of characteristics that assist the species in *adapting to their habitat*. A species that needs longer limbs in order to run fast and catch its prey will evolve longer limbs.

Stabilizing selection is the continuance of the characteristics of a species that already has all the suitable traits needed to survive in its environment. If the average population of a species has all the characteristics it needs to survive, then individuals born with different traits do not survive long enough to pass on their traits through reproduction.

Diversifying selection ensures that the population has two different characteristics. A gene causes *a disorder of blood cells* within the human

population, which is fatal if inherited from both parents. But when inherited from only one parent, it provides carriers of *the gene resistance* to malaria.

Tasks to Unit 4

Task 1. *Read and translate the following words.*

Y [ai] – deny, supply, apply, classify, identify

I [ai] – kind, find, bind, mind, wild

Th [θ] – theory, through, thought, both

Th [ð] – though, although, other, another, either, further, feather

Ur, er, ir [3:] – further, occur, certain, prefer, bird, circulation

Enough, allow, owl, type, ensure, earth

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

To deny, to exist, to accept, to descend, several kinds, inherited characteristics, accumulated changes, remote ancestor, gradual change, to involve the branching, current species, to be capable of , to adapt to environment, to evolve further, to be unsuited to; to support, to compete successfully, in order to, disorder.

Task 3. *Give the English equivalents to the words and word combinations.*

Безперервний процес, визначати/давати визначення, змінюватися від покоління до покоління, належати, спільний предок, Земля, забезпечувати/ гарантувати; природний відбір, конкуренція, боротьба за виживання, покращувати, спричиняти поступові зміни, приводити до, надавати перевагу, схопити здобич, успадковувати.

Task 4. *Finish the sentences.*

1. Evolution is a continual process by which ….
2. Some religious groups …
3. Most scientists …
4. The inherited characteristics of nearly all living things …
5. The accumulated changes may become so great that …
6. Natural selection works in a way that …

Task 5. *Put the questions to the underlined words.*

1. The theory of evolution suggests that all living things descended from one or several kinds of simple organisms. What ……?

2. It also explains why there are so many different kinds of organisms.

3. Anagenesis is a gradual change in a single species.

4. Cladogenesis involves the branching of the species into two or more species over generations.

5. It took a single species more than 3 million years to evolve into the current 10 million species on Earth today. How long……?

Unit 5. Mutation

To explain how plants and animals *develop variations*, biologists turn to genetics, *the science of heredity*. Genetics shows that characteristics are passed from parents to *offspring* by means of genes—segments of large *nucleic acid molecules* contained in chromosomes. Offspring inherit these genes from their parents during *sexual reproduction.*

When a gene is *altered* in any way, the offspring *acquires a new characteristic* not possessed by either parent. The gene is passed on to the offspring in the *mutated form.* This change in the gene is called a *mutation*. Mutations are responsible for *genetic variability* in a given species. When a mutation introduces a *harmful characteristic,* the organism probably will not survive unless the harmful effect is balanced by *beneficial effects*. Helpful characteristics acquired by mutation are likely to be passed on to future generations.

Mutations can be produced in laboratories by the action of *X-rays*, other forms of *radiation,* or *chemicals*. Mutations often happen in nature from *random errors* in *chromosome replication*. Radiation and chemicals present in the environment can also cause the genes to mutate.

Sexual Recombination. The combining of genes from two parents is called *sexual recombination* and controls the *rate* at which *variations occur*. Sexual recombination mostly allows *progressive evolution* but not *chaotic*. Most organisms *reproduce through* sexual recombination. Related to sexual recombination is *genetic drift*, where many of the parents' genes are not passed on to the offspring. During sexual recombination, only half of the chromosomes from each parent are passed on to the *progeny.* If the number of offspring is small, it means that some genes of the parents will not be passed on.

Divergence. When different populations of the same species *become isolated* from each other (as by a physical barrier such as a mountain, *desert,* or ocean) each population *adapts to its own environment*. When a physical barrier separates two populations of the same species, it can give rise to a new species. When the isolated population experiences genetic drift or other mechanisms of natural selection, it causes the evolution of a new species. In time, the isolated populations may diverge into different species. A physical barrier is not always necessary for populations of a species to diverge. For example, different populations sometimes eat different foods in the same *general area*. Such populations will have little interaction with each other and may *eventually* diverge into different species.

The various species of *finches*, known as Darwin's finches, that live on the Galápagos Islands give an example of both forms of divergence. It is thought that these finches evolved from members of a single species blown by the wind from the *mainland* of South America, some 965 km away. The ocean isolated those birds from the rest of their species. Different groups of finches found different types of food on the islands. Each group *developed adaptations* (such as a *particular beak shape*) for eating its own type of food; eventually, the groups diverged into more than a dozen species.

Convergence. When unrelated species adapt to the same kind of environment, they independently develop similar characteristics—that is, they converge. For example, though *whales* are mammals and *penguins* are birds, they each *share certain characteristics* with *fish* (such as *finlike appendages* and *streamlined bodies*).

Other Evolutionary Principles

1. Highly *complex species* evolve from relatively simple ones. *Simple species*, however, may evolve from complex ones—a process called *degeneration*—if a simpler structure helps a species to adapt better to its environment.

2. When different species *interact closely*, as in *predator-prey* or *parasite-host* relationships, they *co-evolve* — that is, they evolve together. For example, through evolution, *rabbits* have developed *keen hearing*, which helps them escape predators, such as *owls*. Owls, on the other hand, have developed *feathers* for *silent flight.*

Tasks to Unit 5

Task 1*. Transcribe and translate the following words.*

Acid, heredity, alter, acquire, means, characteristic, variability, gene, effect, chemicals, occur, isolated, desert, area, island, owl, feather, efficiency.

Task 2. *Give the Ukrainian equivalents to the words and word combinations*

Turn to genetics, science of heredity, by means of genes, to contain, nucleic acid molecules, to possess by either parent, to be responsible for, to introduce a harmful characteristic, beneficial effect, by the action of X-rays, to happen in nature, random errors, little interaction, to escape predators.

Task 3. *Put the verbs in Passive*.

1. Genetics shows that characteristics … (pass) from parents to *offspring*.
2. When a gene … (alter) in any way, the offspring acquires a new characteristic.
3. The gene … (pass) on to the offspring in the mutated form.

4. This change in the gene … (call) a mutation.

5. The organism will not survive unless the harmful effect … (balance) by beneficial effects.

6. Helpful characteristics are likely to … (pass) on to future generations.

7. Mutations can … (produce) in laboratories by the action of *X-rays.*

8. The combining of genes from two parents … (call) sexual recombination.

9. If the number of offspring is small, it means some genes will not… (pass) on.

10. It … (think) that these finches evolved from members of a single species.

Task 4. *Match the nouns with the adjectives to form phrases.*

Barrier	Flight	Change
food	characteristic	generations
hearing	process	population
ancestor	efficiency	effect
drift	selection	errors

1. Continual …	*9. Average …*
2. Remote …	*10. Beneficial …*
3. Gradual …	*11. Harmful …*
4. Natural …	*12. Genetic …*
5. Sufficient …	*13. Random …*
6. Successive …	*14. Keen …*
7. Internal …	15. *Silent …*
8. Physical …	

Task 5. *Complete the sentences with the phrases from Task 4 and translate them.*

1. The accumulated changes may become so great that the descendant doesn't look like its ……..

2. Evolution is a …….by which one form of life changes into another form.

3. Organisms become extinct if they do not get …….and other necessities.

4. Natural selection causes a …….in the characteristics of the species.

5. The successive generations improve their …and adjustment to their environment.

6. When a mutation introduces …, the organism probably will not survive unless the harmful effect is balanced by …

7. Related to sexual recombination is ……, where many of the parents' genes are not passed on to the offspring.

8. Mutations often happen in nature from ……in chromosome replication.

9. When a …… separates two populations of the same species, it can give rise to a new species.

10. Rabbits have developed ……., which helps them escape predators, such as owls. Owls, on the other hand, have developed feathers for …….

Unit 6. Genetics

Ian Wilmut is a British embryologist and genetic engineer who led the team that created a cloned sheep in 1996. *Cloning* is the process of using laboratory methods to create animals or groups of cells that have *exactly the same inherited characteristics*. The sheep, Dolly, was the first mammal cloned from an *adult cell* of another animal, and her birth became known throughout the world as a *milestone* in cloning.

Wilmut was born in Hampton Lucy, England, in 1944, and raised in Coventry. He got *an undergraduate degree* in agricultural science at the University of Nottingham. There he became interested in animal genetic engineering, a field involving techniques that *alter the genes* (hereditary material) or combination of genes in an organism. Genes are bodies in the cells of all living things that *determine* the organism's characteristics. By changing an organism's genes, scientists can give the organism and its descendants different traits.

In 1971, Wilmut got *a doctoral degree* from Darwin College, Cambridge University. Just after completing his doctorate, Wilmut produced Frosty, the first calf ever born from *a frozen embryo*. Wilmut then joined the scientifically progressive staff of the Animal Breeding Research Station in Roslin, Scotland, a small village in farm country a few miles south of Edinburgh. In 1993, the Research Station became Roslin Institute, a *nonprofit* organization *dedicated to*

understanding and i*mproving* the productivity, *breeding*, and welfare of farm animals. Wilmut continues his work at Roslin Institute. In March 2000, he was elected to the Royal Society of Edinburgh.

Cloning of Dolly the Sheep

Early successful cloning experiments had used cells from a very *early stage of development*. The Roslin Institute's first cloned sheep, Megan and Morag, were born in early 1996. They were produced from *embryonic* cells, and their birth caused great interest among scientists.

Most scientists did not believe that it was possible to manipulate adult animal *tissue* to produce a complete organism. As an animal develops before birth, cells begin to specialize as *blood, bone, skin*, and all other kinds of cells in the body. Wilmut and his team of scientists believed that *depriving* an adult cell *of* food would force it into *hibernation*. They could then *transfer* its genes into another cell and *stimulate* that cell to begin dividing. They hoped that this stimulation would *reactivate* all the transferred genes.

The team used this technique in creating Dolly. They took away *the nucleus*, which contains the genes, from a female sheep's egg cell. The scientists then *replaced the nucleus with* a “hibernating” nucleus from another adult female sheep. This transfer made the egg cell genetically identical to the adult sheep that gave the replacement nucleus. After stimulating the egg with *an electric charge*, the scientists placed it in the *womb* of a third female sheep. The egg developed normally, and Dolly was born on July 5, 1996. Before producing Dolly, Wilmut's team had tried their technique about 275 times without success.

The Ethics of Cloning

Genetic engineering has *raised concerns* related to ethics and the potential negative effects of *genetically altered organisms* on the environment. This concern was particularly clear in 1996, when Ian Wilmut created the world's first *cloned animal*, Dolly the sheep. Dolly's birth created *long arguments* in the world.

Scientists, journalists, politicians, and others argued the ethics of cloning and the future possibilities created by cloning. The fear of human cloning created the strongest reaction.

Since the cloning of Dolly, scientists from Japan, the United States, and elsewhere have used a similar technique to *produce clones* of *mice, cattle*, and other mammals. Cloning may be useful for human beings. For example, cloning could produce *disease-resistant livestock*, create new *treatments for illnesses* such as diabetes and Parkinson's disease, and even create animals that can *manufacture donor organs* for transplants to humans.

Cloning may present problems, however. Techniques are not perfect. Moreover, many people believe that cloning human beings is *unethical* or against their religion's principles.

Tasks to Unit 6

Task 1. *Transcribe and translate the following words and word combinations.*

Engineer, genetics, process, exactly, adult cell, throughout the world, techniques, to determine, descendant, calf, staff, agricultural, Royal Society, to argue.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

To be raised in, an undergraduate degree, hereditary material, to complete a degree, dedicated to improving, to be elected, to force into hibernation, take away the nucleus, an electric charge, to raise concerns, disease-resistant.

Task 3. *Complete the sentences with a preposition and translate them.*

1. He became interested … animal genetic engineering.
2. He believed that *depriving* an adult cell … food would force it … *hibernation*.
3. They *replaced the nucleus …* a “hibernating” nucleus from another sheep.
4. Dolly was born … July 5, 1996.
5. Cloning can create new *treatments … illnesses* such … diabetes and so on.

Task 4. *Match the numbers with the letters to make a phrase (e.g., 6-f = injured gladiators) and translate them.*

Past Participle	Noun
1. inherited	a. form
2. accumulated	b. species
3. mutated	c. characteristics
4. isolated	d. changes
5. given	e. population
6. injured	f. gladiators
7. transferred	g. embryo
8. frozen	h. Genes

Task 5. *Complete the table.*

Дієслово/Verb	Іменник/Noun	Дієслово/Verb	Іменник/Noun
1. to survive 2. to compete 3. to reproduce 4. to generate 5. to mutate		6. to resist 7. to interact 8. to develop 9. to contribute 10. to circulate	

Task 6. *Put the questions to the underlined words (Past Simple).*

1. He created a cloned sheep in 1996.

2. Her birth became known throughout the world.

3. Wilmut was born in Hampton Lucy, England.

4. He got *an undergraduate degree* in agricultural science.

5. In March 2000, he was elected to the Royal Society of Edinburgh.

6. The cell developed normally.

Unit 7. Famous Biologists

1. **Metchnikoff, Élie** (Russian: Ilya Ilich Mechnikov) (1845-1916), a Russian-French biologist. In 1884 Metchnikoff discovered that certain white blood cells, which he called *phagocytes*, *engulf (*swallow up) and *digest* bacteria. He called these cells the *body's first line of defense* against disease. Metchnikoff and Paul Ehrlich shared the 1908 Nobel Prize in physiology or medicine for work in immunology.

Metchnikoff *was born* in Ukraine. He *attended* the universities of Kharkiv, Giessen, Göttingen, and Munich. He *taught* at the University of Odessa from 1870 to 1882. In 1888, *at the invitation* of Louis Pasteur, Metchnikoff *joined* the Pasteur Institute in Paris, becoming a subdirector in 1904.

2. **Dobzhansky, Theodosius** (1900-1975), a United States geneticist. He is known for *founding the field* of evolutionary genetics. In Genetics and the Origin of Species (1937), he *synthesized* (integrated) Darwin's theory of evolution and Mendel's theory of *genetic variability*. Dobzhansky's theory of evolution was called the Synthetic Theory. Dobzhansky *was born* in Nemirov, Russia. He *graduated from* Kiev University in 1921. In 1927 he came to the United States to *do research* at the California Institute of Technology. Dobzhansky taught at Columbia University from 1940 to 1962. He did research at Rockefeller University from 1962 until his *retirement* in 1971.

3. **Ivan Pavlov** (1849-1936) was born in a small village in central Russia. He went to a church school and then to a theological seminary. But in 1870 he dropped his theological studies and decided *to enter the University* of St. Petersburg. There he studied *chemistry and physiology*. In 1879 he *received* his doctorate (MD) at the Imperial Medical Academy. He continued his studies and began doing his own research in topics that interested him most: *digestion and blood circulation*. The work began as a study in digestion. He was looking at the digestive process in dogs, especially the interaction between *salivation* and the action of the *stomach*. He realized they were *closely connected* by reflexes in the autonomic nervous system. Without salivation, the stomach didn't get the message to start digesting. Pavlov wanted to see if *external stimuli* could influence this process, so he rang a metronome at the same time he gave the experimental dogs food. After a while, the dogs -- which before only salivated when they saw and ate their food -- began to salivate when the metronome sounded, even if no food was present. In 1903 Pavlov published his results calling this a "*conditioned reflex*," different from *an*

innate reflex. In 1904, he won the Nobel Prize in physiology/medicine for his research on digestion. He worked actively in the lab until his death at the age of 87.

Tasks to Unit 7

Task 1. *Read the past forms of the verbs paying attention to the "-ed".*

[d]: discovered, called, shared, joined, synthesized, studied, received, continued, realized, used, cloned, answered;

[t]: dropped, asked, published, worked, developed, placed, produced, helped, introduced, balanced, escaped, passed, influenced;

[id]: attended, graduated, decided, interested, connected, wanted, salivated, sounded, isolated, related, dedicated.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

The first line of defense, at the invitation of, digestion and blood circulation, salivation, external stimuli, at the same time, after a while, to be present, conditioned reflex, innate reflex, at the age of 87.

Task 3. *Make up the sentences using the table and translate them.*

Metchnikoff	was born in Ukraine.
Dobzhansky	graduated from Kiev University.
Pavlov	went to a church school.
	is known for founding the field of evolutionary genetics.
	attended the universities of Kharkiv and Munich.
	received his doctorate (MD) at the Imperial Medical Academy.
	taught at Columbia University.
	began doing his own research in digestion and blood circulation.
	synthesized Darwin's theory of evolution and Mendel's theory.
	joined the Pasteur Institute in Paris.
	won the Nobel Prize in physiology/medicine.
	did research at Rockefeller University until his retirement.

Task 4. *Complete the table.*

Дієслово/Verb	Іменник/Noun	Дієслово/Verb	Іменник/Noun
	1. explanation 2. descendant 3. definition 4. existence 5. separation		6.evolution 7.adaptation 8.selection 9.comparison 10.pollution

Task 5. *Paraphrase the following sentences using Present Perfect.*

1. It's months since he did research. – He ….. research for months.

2. The last time we saw them was a year ago. – We …. them for a year.

3. He entered the University two years ago. – He …for two years.

4. It's a month since they went to the lab. – They …been to the lab …

5. The last time they ate junk food was last week. – They …since last week.

6. It's centuries since they rang the bells. – They …

7. He taught Chemistry last semester. – He ….

Task 6. *Paraphrase the following sentences using "used to +Verb".*

1. He thought about the Theory of Evolution. – He used to …….

2. He did the research regularly. – He used to …

3. They went to the church. – They used to …

4. They knew little about digestion. – They used to …

5. He often won different prizes. – He used to …

6. They ate ice-cream. – They used to ….

7. She taught Biology at school. – She used to …

Unit 8. Review of Module 1

Module 2. Botany and Zoology (The Plant Kingdom and the Animal Kingdom)

Unit 9. The Plant Kingdom. The Study of Plants

As all animals directly or indirectly *depend on* plants for food, scientists believe that plants were the first living things. These first plants were very *simple organisms*. Later they became more *complex*. Some plants are very small, they can be seen only through a microscope; others like the redwood trees of California are over 300 feet tall. Some plants have *roots, stems or leaves*, some have *seeds* but no *flowers.*

In spite of the great differences among plants scientists can *divide them into* 4 large groups: 1) the *thallus plants*; 2) the *mosses and liverworts*; 3) the *ferns* and their relatives; 4) the *seed plants*.

According to the length of life the plants are classified as *annuals; biennials; perennials.* An annual plant is the one which completes its life cycle within a year. A biennial takes two years to complete it and a perennial is one that lives for many years. A plant grows up, flowers, develops seeds and then dies.

According to their size and structure flowering plants can be classified as *herbs*, *shrubs, trees.* Shrubs and trees are larger than herbs. A tree is a woody plant with a main *stem or trunk* with *branches* and *leaves*.

Lichens are a group of complex, flowerless plants growing on rocks and trees. There are thousands of kinds of lichens which have a wide *variety of colours*. They are composed of *algae and fungi*. The *autotrophic* green algae produce all their food through a process called *photosynthesis*. On the other hand, the *heterotrophic* fungus, which depends on other elements to produce food, *absorbs and stores* water. This unit in which two *dissimilar organisms* live together is called *"symbiosis".*

The Study of Plants

Plant life can be studied from different perspective: *molecular, genetic, biochemical*. It can be studied through *organelles, cells, tissues, organs*,

individuals, plant communities. A botanist must know classification (*taxonomy*), structure (*anatomy and morphology***),** function (*physiology*), connection with environment (*plant ecology***),** biochemistry (*photochemistry***)** and diseases (*physiopathology***)** of plant life. The study of plants is important because they are fundamental part of life on Earth that *generates oxygen*, food, *fibers*, fuel, medicine that allow humans to exist. Through *photosynthesis*, plants *absorb carbon dioxide*, a *greenhouse gas* that influences global climate. They prevent *soil erosion* and take part in the *water cycle*.

Understanding plants is important for our future because:

- plants produce food to feed an *expanding population*;
- it helps to understand fundamental life processes;
- plants produce medicine to *treat diseases*;
- it helps to understand environmental changes.

Tasks to Unit 9

Task 1. *Transcribe and translate the following words and word combinations.*

Through a microscope, cycle, lichen, algae, fungus/fungi, biennials, perennials, tissue, photosynthesis, structure, function, fibers, oxygen, carbon dioxide.

Task 2*. Give the Ukrainian equivalents to the words and word combinations.*

Depend on smth directly, in spite of, divide into, according to, to be classified as, to be composed of, on the other hand, dissimilar, absorb and store, prevent soil erosion, generate fuel, greenhouse gas, to influence global climate, take part in.

Task 3. *Complete the sentences and translate them.*

1. Plants have roots, stems, …….
2. Scientists divide plants into 4 large groups: …….
3. According to the length of life the plants are classified as …..
4. An annual plant completes its life cycle ……
5. A biennial takes two years …..

6. According to their size and structure flowering plants can be classified as …..

Task 4. *Fill in the gaps with a preposition where necessary.*

1. All animals directly or indirectly depend … plants for food.
2. Small plants can be seen only … a microscope.
3. Plants can be divided … 4 large groups.
4. Lichens are composed … algae and fungi.
5. A greenhouse gas influences … global climate.
6. Plants take part … the water cycle.

Task 5. *Join the sentences using "so/that's why" or "because/as".*

1. The study of plants is important. They are fundamental part of life on Earth.
2. Animals depend on plants for food. Scientists believe that plants were the first living things.
3. Some plants are very small. They can be seen only through a microscope.
4. This plant lives for many years. It is called a perennial.
5. Understanding plants is necessary. They produce medicine to treat diseases.

Unit 10. The Structure of Plants

Plants consist of ….

Roots 1) hold plants in place; they *prevent erosion* by holding the soil in place;

2) Absorb water and *dissolved* materials from the soil in order to give plants food to grow.

There are *taproots* (they have a single *cone-shaped* part; they are thick because they contain much stored food) and *fibrous roots* (stringer-like branches of corn roots are good example).

Stems 1) hold up the leaves that get the air and sunlight;

2) act as transportation system;

3) grow upward and are rather stiff;

4) Can be *herbaceous* (are soft and die at the end of the season) or *woody* (live from year to year; form a new *layer of wooden tissue* under the *bark* each year. These layers are known as *annual rings.* You can tell the age of a woody stem by counting the number of annual rings.

Leaves 1) make and store food for a plant;

2) According to the shape they are *simple* (have only one part like *apple, elm*, *oak)* or *compound (*have several leaflets like *chestnut, rose*);

3) have *tubes (veins*) that are connected with the tubes in the stem. *Venation* can be ***netted (****geranium, elm)* or ***parallel*** *(iris, lily, corn)*.

Flower 1) has 4 distinct parts – *sepals, petals, pistil* and *stamens***.**

2) *sepals* are green leaf-like structures that cover the *bud*; just inside them are colored *petals*, whose colour and fragrance attract insects to the flower.

3) *pistil* is the structure in the center of a flower. There are *ovules* that can develop into seeds. Before the seed can develop, *pollination* and *fertilization* must occur.

Fruits 1) are ripened *ovaries*. As the seeds develop, the ovary grows larger and develops a fleshy food material around the seed as in *plums, peaches, watermelons*.

2) some fruits don't have functional seeds to develop (*bananas, seedless oranges, seedless grapefruit).*

The Trees

When I was a child, I read a *science fiction* story that made me think about trees in a new way. In the story, visitors from an advanced civilization come to our planet and their spaceship lands in the middle of a *forest*. The people from another planet have a long talk with the trees of the forest, and then leave again, happy to think that *inhabitants* of the Earth are intelligent and peaceful.

Trees always fascinated people. They are the biggest living things on our planet, and ones of the most beautiful in nature. They appear in many religions and have been inspiring artists for thousands of years.

Trees are also the most *ancient* living organisms on the Earth. They are direct link with thousands of years of history. The great age of the trees makes them *useful* for all sorts of scientific research. The *rings inside a tree* are useful for telling scientists about changes in the climate that happened many years ago.

Trees may have a lot to teach us about how to be a part of a community and how to cooperate. We know that a community of trees *shares all their resources* with each other. So, strong trees in a good position will share food and water with weaker trees that *receive less sunlight*. They do this through their roots and soil.

It is true that trees *absorb* a lot of energy from the sun – more than other living things. And some people think that you can feel energy if you choose a tree that you like and put your arms around it. Spiritual and religious teachers for many years have been telling students to learn from trees, notice their strength and try to imitate them.

It was proved that patients in hospital get better faster, feel less pain and go home quicker if there are trees outside the windows of their rooms. We all know that trees are important for the *environment* and the *survival* of our planet.

Tasks to Unit 10

Task 1. *Transcribe and translate the following words and word combinations.*

Dissolved materials, herbaceous, venation, cone-shaped, fibrous, stiff, fertilization, occur, seedless, inhabitants, fascinate, spiritual, religious, strength.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

Consist of, grow upward, to count the number of annual rings, be connected with, distinct parts, attract insects, cover the bud, pollination, science fiction, share resources with others, receive sunlight, be proved, survival of our planet.

Task 3. *Make up the sentences using the table and translate them.*

Roots Stems Leaves Venation	can be	simple or compound netted or parallel herbaceous or woody taproots or fibrous ones

Roots	make and store food for a plant.
Stems	grow upward and are rather stiff.
Leaves	prevent erosion by holding the soil in place.
	absorb water and dissolved materials from the soil.
	act as transportation system.
	hold up the leaves that get the air and sunlight.
	have tubes (veins) that are connected with the tubes in the stem.

Task 4. *Fill in the gaps.*

A flower consists (1) … four distinct parts – sepals, petals, pistil and stamens. Green leaflike structures that cover the bud are called (2)… . There are colored (3)… inside sepals, whose colour and fragrance (4)… insects to the flower. Pistil is the structure in the (5) … of a flower. There are ovules that can develop into (6)…. Pollination and (7) … occur before the development of seeds.

Task 5*. Paraphrase the sentences (Comparisons).*

1. Trees are the biggest living things on our planet. – There are no ….
2. Trees are the most ancient living organisms on the Earth. – There are no …
3. There are no more peaceful inhabitants than them. – They are …
4. Weaker trees receive less sunlight than stronger ones. – Weaker trees don't receive as …
5. Trees absorb more energy from the sun than other living things. – Other living ..
6. The oldest tree has the most annual rings. – The older …
7. If the climate changes fast, it will be dangerous for our planet. – The faster …
8. Roses are the best flowers of all. – No other flower is …
9. Shrubs are larger than herbs. – Herbs are …
10. No other trees are higher than redwood trees. – Redwood trees … of all trees.

Unit 11. Linnaean System of Classification

Carolus Linnaeus was a Swedish botanist, physician, and zoologist, who *laid the foundations* for the modern biological naming scheme. He is known as the father of modern taxonomy, and is also considered one of the fathers of modern ecology. Many of his writings were in Latin.

Carolus Linnaeus was born in Sweden in a small wooden house. The house had a garden around it, so as Linnaeus *used to say* later it was a good place for a naturalist to be born. All the boy's teachers at school thought him stupid. But one of his father's friends observed that Carl took an unusual interest in plants and that he could *identify* a great many.

Linnaeus' father began teaching him Latin, religion, and geography at an early age; due to family use of Latin for conversation, the boy learned Latin before he learned Swedish. When Linnaeus was seven, the father decided to hire a tutor for him. Linnaeus did not like him, writing in his autobiography that the tutor "could extinguish a child's talents *rather than* develop them." Two years after his tutoring had begun, he was sent to the Lower Grammar School. Linnaeus rarely studied, often going to the countryside to look for plants. He reached the last year of the Lower School when he was fifteen, which was taught by the headmaster, Lannerus, who was interested in botany. Lannerus noticed Linnaeus' interest in botany and let him enter his garden. He also introduced him to the state doctor of Småland. Also a botanist, the doctor broadened Linnaeus' interest in botany and helped him develop an interest in medicine. At the age of 17, Linnaeus had *become acquainted* with the existing botanical literature.

Linnaeus entered the gymnasium in 1724, where he studied mainly Greek, Hebrew, theology and mathematics. Linnaeus' father visited the gymnasium to ask the professors how his son's studies were progressing; to his disappointment, most said that the boy would never become a scholar. Although professor Rothman believed otherwise, suggesting Linnaeus could have a future in medicine.

Rothman showed Linnaeus that botany was a serious subject. He taught Linnaeus to classify plants. Linnaeus was also taught about the sexual reproduction of plants.

In 1727, Linnaeus, aged 21, entered Lund University. Professor Stobæus, natural scientist, physician and historian, offered Linnaeus tutoring and lodging, *as well as* the use of his library, which *included* many books about botany. He also gave the student free admission to his lectures. In his spare time, Linnaeus *explored the flora* of Skåne, together with students *sharing the same interests*.

In August 1728, Linnaeus decided to attend Uppsala University on the advice of Rothman, who believed it would be a better choice if Linnaeus wanted to study both medicine and botany. Rothman based this recommendation on the two professors who taught at the medical faculty at Uppsala.

In 1729, Linnaeus wrote a thesis on plant sexual reproduction. This *attracted the attention* of scientists; in May 1730, Linnaeus was selected to give lectures at the University although the young man was only a *second-year student*. His lectures were popular, and Linnaeus often addressed an audience of 300 people. In June, Linnaeus moved to Rudbeck's house to become the tutor of the three youngest of his 24 children.

During a visit to his parents, Linnaeus told them about his plan to travel to Lapland. The first journey was made in 1695, but the detailed results of this exploration were lost in a fire seven years afterwards. Linnaeus' hope was to find new plants, animals and possibly valuable minerals. He was also *curious about* the customs of the native Sami people, reindeer-herding nomads who wandered Scandinavia's vast tundras. In April 1732, Linnaeus *was awarded a grant* from the Royal Society of Sciences in Uppsala for his journey.

One of the first scientists Linnaeus met in the Netherlands was Johan Frederik Gronovius to whom Linnaeus showed one of the several manuscripts he had brought with him from Sweden. The manuscript described a new system for classifying plants. When Gronovius saw it, he *was very impressed*, and offered to help pay for the printing. With an additional monetary contribution the manuscript was published as Systema Naturae.

According to Linnaeus system, every plant and every animal was given a double Latin name. The first word indicated to what general class it belonged, the second word indicates a particular species. Linnaeus announced that, everything in nature should be classified, that's why Linnaeus is considered the founder of taxonomy — the study of the classification. All the known animal species were grouped into six classes: mammals, birds, reptiles, fishes, insects and worms. He even gave the human species an official name — homo sapiens.

Linnaeus continued teaching and writing. His reputation had spread over the world, and he corresponded with many different people. For example, Catherine II of Russia sent him seeds from her country.

Linnaeus' last years were troubled by illness. He had suffered from a disease called the Uppsala fever in 1764, but survived thanks to the care of Rosén. Later he had a stroke which partially paralyzed him. He suffered a second stroke in 1776, losing the use of his right side and partially his memory; while still able to admire his own writings, he could not recognize himself as their author.

Tasks to Unit 11

Task 1. *Transcribe and translate the following words and word combinations.*

Physician, scheme, observe, identify, autobiography, extinguish, become acquainted, otherwise, although, curious, announce, fever, thesis, admire.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

Lay foundations for, be considered, hire a tutor, free admission, be awarded a grant, additional monetary contribution, to address an audience, valuable minerals, nomad, wander, spread all over the world, suffer from, recognize.

Task 3. *Finish the phrases.*

Lay the foundations for …	Become aquainted with …	Share the same …
Take an unusual …	Enter the …	Write a thesis on …
Extinguish …	To his …	Be curious about …
Be interested in …	Offer tutoring and …	Describe a new system …
Broaden …	Give the student …	Lose the use of …

Task 4. *Answer the questions to the Text.*

1. What is Carolus Linnaeus famous for?
2. What was his childhood like?
3. What subjects did his father teach him?
4. How did the headmaster of the Lower School influence the boy's future?
5. What did the professors in the gymnasium think about the boy?
6. What universities did Linnaeus attend? What was his life like there?
7. How did his life change when he became a second-year student?
8. What was the purpose of his journeys to Lapland?
9. How was Systema Naturae published?
10. Why is Linnaeus considered the founder of taxonomy? Describe his system.
11. What fact proves that his reputation spread all over the world?
12. How did Linnaeus spend his last years?

Task 5*. Match the numbers with the letters.*

1. look at	a. examine quickly
2. look after	b. search for
3. look for	c. anticipate with pleasure
4. look forward to	d. take care of
5. look through	e. look for a name, word etc in a book
6. look up	f. watch

Task 6. *Fill in the gaps using Task 4 and translate the sentences.*

1. Linnaeus rarely studied, often going to the countryside to look … plants.
2. Students always look … … summer holidays.
3. Why are you looking … me like that?
4. The scientist quickly looked … the ancient manuscripts.
5. As a tutor, he looked … the youngest children.
6. I'll look … the Latin name in the dictionary.

Unit 12. The Animal Kingdom. Extinct Animals

In recent years, *environmentalists* have become increasingly concerned about the number of animals *facing extinction*. Unless we do something to save them now, we may soon lose many *rare species* forever.

The first thing we should do is stop *destroying the habitats* of wild animals. By doing this, they will be able to live and breed in their *natural environment*.

Moreover, governments should *ban* the hunting of *endangered species* completely. As a result, many animals, such as tigers and alligators, would have a better *chance of survival*.

Finally, we should make more wildlife parks. In this way, rare species will be able to live safely without losing their homes to man, or their lives to illegal hunters.

All in all, there are many ways in which we can save endangered species from *extinction*. Without care and consideration, they will certainly *disappear.*

Extinct Animals

1**. Mammoth** is an *extinct animal resembling* the elephant. There were a lot of Mammoths during the *Ice Age*. Several species have been identified. The imperial mammoth was the largest mammoth. It was 4.6 m high *at the shoulder* and *weighed* more than 8 tons. (An unusually large African elephant may reach a similar *weight* but a *height* of only about 4 m.) Mammoths had long, curved *tusks* 5 m long. The head had a dome of *fatty tissue*. Mammoths were covered with dark hair. Thousands of mammoths have been found frozen in *the soil* of Siberia and Alaska. Many are perfectly *preserved*. *Remains* of *dwarf mammoths*, which were about 1.8 m high at the shoulder, have been found on islands off the coasts of California and Siberia.

Stone Age people *hunted* mammoths and drew pictures of them on the walls of caves. Most mammoths became extinct about 10,000 years ago; some dwarf

mammoths lived 4,000 years ago. Over-hunting by humans and a *warming of the climate* may have together caused the extinction of mammoths.

2**. Mastodon** is a large, extinct animal *resembling* the elephant and mammoth. Like the mammoth, the mastodon had long, curving tusks in the *upper jaw*. Some early species also had a set of short tusks in the *lower jaw*. The mastodon was covered with hair, as was the mammoth, but the mastodon's head was less *dome-shaped* and its body was more s*lender* than the mammoth's. The mastodon was 2.1 to 2.9 m tall and 3 to 4.3m *in length*, *excluding* the tusks. The mastodon lived in Asia, Eastern Europe, and North and South America during the Ice Age. It was hunted by early humans. The mastodon became extinct, *for unknown reasons*, about 10,000 years ago.

3. **Saber-toothed Tiger**, or *Saber-toothed* Cat, is an extinct *carnivorous* animal once found throughout North and South America, Asia, Africa, and Europe. It first appeared 35,000,000 years ago, during *the Oligocene epoch*, and lived until 10,000 years ago. The animal was about 6 m long and had short, *heavy legs* and a short *tail*; large *canine teeth*, sometimes as long as 23 cm, and *wide-opening jaws*. It's easy to imagine that saber-tooth cats hunted in the same way as today's tigers do. Tigers hunt alone, waiting until *twilight* and using *vegetation* to *hide themselves*. A tiger will come to its *prey* close enough to strike in a couple of *quick leaps*. The kill comes when the tiger *bites* through the back of its *victim's neck* and cuts the *spinal cord*. Tigers can also kill their prey with a long-lasting bite to the throat. The cats' oversized teeth were strong, but their jaws weren't built for *strangulation.* Instead, these cats used their canines for cutting the softest parts of their prey -- their *throats* and *abdomens*. Most likely, saber-tooth cats' prey died slowly from *loss of blood* rather than quickly from strangulation or a broken neck. They became extinct at the end of the last ice age, about 10,000 years ago.

4. **Dinosaurs** became extinct at the end of the *Cretaceous Period*. How and why is a *puzzle* that *paleontologists* are trying *to solve* by studying *fossils* and *rock*

formations. These fossils and rock formations do not give all the facts, however. Sometimes different scientists see the same material but come to different *conclusions,* so there are many different theories.

Some paleontologists think the extinction was caused by a *catastrophe* such as a *meteorite* or *comet* hitting the earth or a gigantic *volcano eruption*. Others believe that a more *gradual process* was responsible. Some theories are that *competition* between dinosaurs and mammals was the cause, or possibly climate changes. Some scientists think that the extinction happened in several days. Others say it took from hundreds of generations to over half a million years. The *extinction event* did not kill all animal and plant life. Many kinds of animals survived, including *fishes, frogs, turtles, crocodilians, birds, and mammals.*

Tasks to Unit 12

Task 1. *Transcribe and translate the following words and word combinations.*

Environmentalist, increasingly concerned, rare species, government, breed, appear/disappear, resemble, to weigh/weighed, weight, height, length, curved tusks, dwarf, upper/lower jaw, carnivorous, canine teeth, instead, fossils.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

To face extinction, become extinct, endangered species, ban hunting, as a result, save from extinction, during the Ice Age, at the shoulder, for unknown reasons, vegetation, prey, a couple of quick leaps, victim's neck, spinal cord, a bite to the throat, come to conclusion, volcano eruption, solve a puzzle, gradual process.

Task 3. *Make up sentences using the table.*

Mammoth	resembled	the elephant and mammoth.
Mastodon	had	at the end of the Cretaceous Period.
Saber-toothed tiger	was covered	during the Ice Age.
Dinosaur	lived	long curved tusks.
	was	with dark hair.
	hunted	canines for killing its prey.
	used	about 6 meters long.
	became extinct	alone waiting until twilight.

Task 4*. Fill in the gaps.*

1. The imperial mammoth … more than 8 tons.
2. The mammoth's head had a dome of fatty … .
3. Stone Age people drew pictures of mammoths on the walls of … .
4. Warming of the climate may have caused the … of mammoths.
5. Mastodon had long curving tusks in the … jaw.
6. Saber-toothed cat is an extinct … animal.
7. Saber-toothed cat had short, heavy legs and a short ….
8. A tiger comes to its prey close enough to strike in a … of quick leaps.
9. Tigers can also kill their … with a long-lasting bite to the throat.
10. The extinction was caused by a … such as a meteorite or comet.

Task 5. *Translate the following sentences paying attention to the " –ing"form.*

1. Mammoth is an extinct animal resembling the elephant.
2. Over-hunting by humans may have caused the extinction of mammoths.
3. The mastodon was up to 4 meters in length, excluding the tusks.
4. Tigers hunt alone waiting until twilight and using vegetation to hide themselves.
5. Paleontologists try to solve the puzzle by studying fossils and rock formations.
6. The extinction was caused by a catastrophe such as a comet hitting the earth.
7. Many kinds of animals survived, including fishes, frogs, turtles,birds, mammals.
8. Rare species should live safely without losing their homes to man.

Unit 13. Endangered Species

1. Bees. "Once the bees have left the earth, man will have four years left on the planet." This statement was made by Albert Einstein. The importance of bees' role in *pollination* within the *food chain* has been understood for quite some time. The problem is that over the past two years many bee populations around the world have dropped very much. Bees pollinate *crops,* flowers and plants. Einstein probably thought that man would not be able *to grow adequate*

crops to feed the world without pollination. There would also be other *disruptions* in the food chain, and plants in general would *suffer*. In many areas of the U.S. bee populations have dropped by 50 percent or more. No specific cause for this drop has been identified, though *infections, viruses, pollution and pesticides* have all been considered.

The loss of bees has been called "*colony collapse disorder*." Today there are two *popular hypotheses* for this *phenomenon*. The first is the growing number of *cellular phone towers*. It is thought that the *frequencies* used by cell towers may disrupt the communication between bees and how the bees migrate to and from the *hive.* The second theory involves *genetically modified foods.* GMOs may provide *poor nutrition* for bees or *affect* their life cycle.

2. Cheetahs. Powerful*, black-spotted golden* animals are the fastest sprinters on Earth. Scientists believe cheetahs can *accelerate* from *walking speed* to about 65 kilometers an hour in less than two seconds and *develop top speeds* of 110 kilometers an hour. The cheetah has a *flexible spine* and long *front and hind legs*. It jumps as far as 7 meters — about five times the length of its body. The cat can run at its top speed for only 200 to 300 meters. But it is enough for the cheetah *to overtake its prey*, typically a Thomson's gazelle or other small antelope. The cheetah then knocks the animal to the ground with a *forepaw* and strangles it with a bite to the throat. These gentle-looking cats can not *roar* like lions due to the structure of cheetahs' *windpipes*. Instead, they make *moaning sounds*. Cheetahs can be *tamed*, and beginning at least 3,000 years ago with the ancient Egyptians, aristocrats trained the cats to hunt just as they trained *falcons*. A royal chronicle tells how Akbar the Great, who ruled India's Mogul Empire in the A.D. 1500s, caught at least 9,000 cheetahs during his 49-year reign for hunting *deer.*

3. Wolves. Do you know that in some parts of the world there are no more wolves living *in the wild*? This is because the wolf is traditionally seen as an evil enemy. In fact, this *misunderstood* animal is not bad. Wolves are superb hunters.

They prefer hunting *wild* animals to *domestic* ones. They do not *over-populate*, but keep their numbers at the level they can *feed*. As for killing people, conservationists say that this is simply not true. "Wolves *avoid* people. We have to teach the world that wolves only attack human beings in *fairy tales."*

There are plans to bring wolves back to their wild areas of Scotland, but local people *have doubts* about the idea. "We want wolves back. They lived for thousands of years in Scotland – it is their land – but we fear for our animals," one farmer says. The government has announced that it will pay for any farm animals killed by wolves. People who are not against the idea of bringing the wolf back say this: "Let our children have the chance to hear a wolf *howl* at the moon on a still, Scottish night, and let us *be proud t*hat we made it possible."

4. **Manatees.** The manatee is a large mammal which lives mainly in the waters around Florida in the United States. Adults *range* in length from 2.5 to 4.5 meters and can be as much as 700 kilos in weight. Manatees are *slow-moving creatures* which feed on sea and *fresh-water vegetation*. They live alone or in small family groups of up to twenty members. Members of groups usually communicate by *touching* each other's mouths and noses. Manatees are endangered because of hunting and because they are often *injured* or killed by motor boat propellers. It is extremely important to protect manatees because they help to keep the waters they live in clean and *healthy.*

5. **Elephants**. Elephants have always been very important to the people of India. They are trained to do work which *demands* great *strength.* What many people do not know is that elephants are excellent swimmers. This large, five-tonne*, land-living* animal can put its head under water and use its *trunk* as a *snorkel*. Its huge legs help it move gently in the water. Elephants can swim faster than humans. Working elephants are *well-treated*. At sixty, after many years of hard work, they can relax on the beach and play in the sea. Today, elephants live on almost 300 *islands* near Burma and Indonesia.

6. Crocodiles. For centuries, people lived with and respected the all-powerful crocodile. Those big jaws and *lethal teeth* frightened all attackers away. People were also *fascinated* by their beauty and their *intelligence*. Unfortunately, it was their beautiful skin which put them *under threat*. When explorers realized how *valuable* crocodile skin was, everything changed. Hunters risked their lives – and sometimes lost them – in order to *satisfy* the world's demand for crocodile skin.

Worse was to come. The crocodiles' homes began to *disappear* as new towns and industries were developed on the land near *swamps* and rivers. *Luckily* for the crocodiles, people realized that a world without them would not be the same, and now they are officially declared *an endangered species*. In some parts of the world, there are now parks where crocodiles may live *safely,* with laws to protect them.

"It is *illegal* to kill crocodiles," says conservationist Charles Swaby, who has spent the last thirty years protecting the Jamaican crocodiles. The problem is that when farm animals are killed by crocodiles, farmers *ignore* the law and kill them. This is what Charles is fighting against. "Crocodiles are much more *scared* of us than we are of them. They are *scary* but lovely to watch," he adds. If Charles, and others like him, can *convince* the world to *share this opinion*, crocodiles will be with us forever.

A radio programme about endangered species.

Presenter: Good evening, listeners. On this week's edition of the "Animal Kingdom", Ms Ellen Gordon, *a conservationist*, will tell us about endangered animals. Welcome, Ms Gordon.

Ms Gordon: Thank you. Well, I'd like to talk about the animals that I have studied recently. For example, *the sea turtle* is in great danger because hunters are killing it for food. Its numbers are also *decreasing* due to the *destruction of its habitat.* A particular type of *seal* like the harp seal, is also endangered due to the fact that

hunters are killing it for its *skin*. In the Antarctic, the Emperor Penguin *is threatened* due to increased fishing and pollution of the seas.

Presenter: Can you tell us what is done *to protect* these animals?

Ms Gordon: Yes. Many countries *are banning* the hunting of seals. In the Antarctic, there are programmes that *make sure* that the waters are not polluted. But there's still a lot that needs to be done.

Presenter: Well, I'm afraid we'*re out of time*. Thank you for joining us today.

Tasks to Unit 13

Task 1. *Transcribe and translate the following words and word combinations.*

Percent, hypotheses, phenomenon, frequency, cellular phone, hive, forepaw, to tame, avoid, doubt, creature, injure, tonne, well-treated, frighten away, unfortunately, scare/scary, convince, under threat, declare, ignore, decrease.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

Within the food chain, pollinate, grow adequate crops, disrupt communication, colony collapse disorder, provide poor nutrition, to affect life cycle, flexible spine, overtake prey, roar like a lion, moaning sounds, domestic animals, fresh-water vegetation, valuable skin, satisfy demand for, share the opinion, be out of time.

Task 3*. Complete the sentences.*

1. The bee's role in pollination within the … … is very important.
2. There are two popular … for the colony collapse disorder.
3. Bees migrate to and from the … .
4. Frequencies from cellular phone towers … the communication between bees.
5. Cheetahs are the … sprinters on Earth.
6. Cheetahs can not … like lions due to the structure of their windpipes.
7. Wolves prefer hunting … animals to … ones.
8. Manatees are … creatures which feed on sea and fresh-water ….
9. An elephant can use its … as a snorkel.
10. Now crocodiles are officially declared an … species.

Task 4. *Choose the correct word out of the following pairs to fill in the gaps.*

long/length

1. Manatees range in … from 2.5 to 4.5 meters.

2. Crocodiles can be as … as 6 meters.

weighed/weight

3. Manatees can be 700 kilos in … .

4. The imperial mammoth … more than 8 tons. An elephant can reach a similar …

high/height

5. Dwarf mammoths were about 1.8 m … at the shoulder.

6. A large African elephant can reach a … of about 4 meters.

strong/strength

7. Elephants do work which demands great … .

8. No doubts, elephants are very … animals.

Task 5*.Turn the following into Reported speech.*

1. "I'd like to talk about the animals that I have studied recently".

Ms Gordon <u>said</u> that she 'd like to talk about the animals that …

2. "The sea turtle is in great danger because hunters are killing it for food".

She <u>told</u> us that the sea turtle ……..

3. "Its numbers are also decreasing due to the destruction of its habitat*".*

She <u>added</u> that ……..

4. "The Penguin is threatened due to increased fishing and pollution of the seas".

She <u>noticed</u> that the Penguin ……..

5. "Can you tell us what is done to protect these animals?'

The presenter <u>asked</u> if she …….

6. "There are programmes that make sure that the waters are not polluted".

Ms Gordon <u>informed</u> us that …….

7. "A world without crocodiles will never be the same".

People <u>realized</u> that a world without …

Unit 14. The Natural Vegetation and the Animal World of Ukraine

The natural vegetation. 30% of Ukraine's territory is occupied by the area of *natural vegetation*. 14% is *forested*, 8% is *swampland*, 3% is *highlands*.

Ukraine has mostly *coniferous (pine, fir*) and *deciduous trees (oak, beech (бук), birch (береза).* Plantations of oak and beech are increasing. The forests include *berries, mushrooms, medicinal herbs*. Characteristics of Polissia are the *alder (ольха), willow (ива), pine (сосна), oak (дуб), aspen (осина), maple (клен), linden (липы)*. The forest-steppe zone contains the oak, *hornbeam (граб), black poplar (тополь), ash (ясень)* and *pine.*

In the Carpathians the vegetation is rich: *mixed forests, grasses, low shrub, saffron, primrose (примула), mercury, snowdrop, edelweiss.*

In the Crimean Mountains you can find oaks, *juniper (можжевельник), snowdrops, crocuses, cypresses, palms, magnolias, platans and laurels.* The Nikitsky Botanical Gardens contain plants from all over the world.

The animal world of Ukraine is very *diverse*, with hundreds of species of mammals and birds. *Predators* include *wolf, fox, badger (барсук) and marten (куница). Hoofed animals* include *roe (косуля), deer, wild pig and elk (лось)*. There is *beaver (бобер), hamster (хомяк), field mouse.*

The *birds* include *sparrow, grouse, owl and partridge (серая куропатка).*

Fur animals are *nutria, mink, silver-black fox* and *musk-rat (ондатра)*. In the rivers there are *perch (окунь), pike* and *carp*.

The animals of Polissia include the *wolf, wild pig, elk, lynx, polecat (хорек), raccoon (енот)* and *bear*. Birds include *black, hazel, wood goose*.

The animals of forest-steppe zone also include *squirrels, forest martens, foxes, hares and roes.* The animal life of the Carpathians is unique. Here we find *deer, wild cats, ermines (горностай), golden eagles, black woodpeckers (дятел).*

The common *mammals* of the steppe Crimea are the *rodents***.** The *harvest mouse, hamster* are active day and night. In 1961 *wild rabbit* was brought to

Tarkhankut peninsula. There are many different birds in the Crimea, such as *grey heron (цапля), crane (журавель), pelican, sea-gull, bustard (дрофа) and lark (жаворонок)*. The forests are *inhabited by starling (скворец), bull finch (синица) and turtle-dove (горлинка).*

The animal life is very *fragile*. Our most important task is to protect the animals that share the *habitat* with us. In recent years environmentalists are worried about the number of *animals facing extinction.* If we don't do something, we will lose the *rare species* forever. Firstly, we must stop *destroying the natural habitat*. Secondly, the governments should *ban hunting endangered species*. Finally, we should make more *wildlife parks* and in this way save endangered species from extinction.

Tasks to Unit 14

Task 1. *Transcribe and translate the following words and word combinations.*

Be occupied, coniferous, fir, deciduous, swampland, increase, the Carpathians, diverse, predator, hoofed animals, fur animals, unique, rodent, fragile, mercury.

Task 2*. Give the Ukrainian equivalents to the words and word combinations.*

Natural vegetation, include, contain, common mammals, be inhabited by, share the habitat with, in recent years, be worried, the number of, lose rare species forever, destroy natural habitat, ban hunting, endangered species, wildlife parks.

Task 3*. Put the questions to the underlined words.*

1. 30% of Ukraine's territory is occupied by <u>the area of natural vegetation</u>.
2. Ukraine has mostly <u>coniferous and deciduous</u> trees.
3. The forests include <u>berries, mushrooms, medicinal herbs</u>.
4. The forest-steppe zone contains <u>the oak, black poplar, ash and pine</u>.
5. <u>In the Crimean Mountains</u> you can find snowdrops, crocuses, cypresses, etc.
6. The Nikitsky Botanical Gardens contain plants <u>from all over the world</u>.

Task 4*. Fill in the gaps using the words from the box.*

Birds	predators	fur animals	hoofed animals	rodents	mammals

1. ….. are nutria, mink, silver-black fox and musk-rat.

2.The animal world of Ukraine includes hundreds of species of … and birds.

3. Sparrow, grouse, owl, crane, lark and sea-gull are … .

4. ….. include deer, wild pig and elk.

5. Wolf, fox, bear, badger and marten are the representatives of ….. .

6. The steppe Crimea is inhabited by … : harvest mouse, hamster, rabbit, etc.

Task 5. *Open the brackets (Conditionals).*

Type I Conditional: If + Present Tense, will + verb. (Unless = if not)

1. If we …(continue) destroying the natural habitat, we <u>will lose</u> rare species.

2. Endangered animals <u>will disappear</u> if we …(not/protect) them.

3. Unless governments <u>ban</u> hunting of seals, we … (see) them any more.

4. Unless/if we … (make) wildlife parks, we … (save) these species from extinction.

Type II Conditional: If + Past Simple, would + verb.

5. If people <u>protected</u> the animal world, many species … (be) under threat.

6. The sea turtle <u>wouldn't be</u> in danger if hunters … (kill) it for food.

7. If the waters … (not/pollute), the Penguin … (not/threaten). (*Mind Passive!)*

8. If people … (stop) destroying the nature, everyone … (live) safely.

Type III Conditional: If + Past Perfect, would have + verb 3.

9. Dinosaurs <u>wouldn't have become</u> extinct if the comet … (hit) the Earth.

10. If many species <u>hadn't survived</u> then, the planet … (change) its face.

11. We … (see) the extinct animals if we … (visit) the Zoo Museum last summer.

12. If we …(not/hear) the program, we … (not/learn) about endangered species.

Unit 15. The Wonderful World of Nature

Task 1. *Male Birds Sing Their Song by Putting a Little Muscle into It*

Some male songbirds can sing **(1) …** notes than females because they have stronger muscles to make the sounds. Some scientists used to think it was all about how well the birds could force air out of their lungs, but new research says it has more to do with muscles in the **(2) …** throats.

There's a reason the boy birds are better singers. They have **(3) …** a mate. The more varied their songs, **(4) …** it will stand out from other boy birds who are also singing in hopes of finding a mate. Varied songs also are easier to hear over noises, like a rushing stream or the noisy calls of other birds.

Although all birds **(5) …** knowing certain calls, songbirds learn how to sing from their parents. That ability is only found in songbirds, humans and a few other mammals like dolphins, whales and bats.So think about muscles the next time you hear a bird singing. Muscles **(6) …** just in your arms and legs, or in a bird's wings.

1	**A** much	**B** the most	**C** more	**D** many
2	**A** songbird	**B** songbirds'	**C** songbird's	**D** songbirds
3	**A** attracted	**B** attracting	**C** been attracted	**D** to attract
4	**A** better	**B** the better	**C** best	**D** the best
5	**A** are born	**B** will be born	**C** to be born	**D** born
6	**A** weren't found	**B** weren't finding	**C** aren't finding	**D** aren't found

Task 2. *The Keeper of the Wolves*

Doug Smith is the senior wildlife biologist in Yellowstone National Park. He manages wildlife within the park boundaries ranging from predator to prey, on the ground and in the sky. Doug first came to the park as wolf project manager at the beginning of the grey wolf reintroduction.

Since the age of 18 Doug has worked with wolves. His first job entailed noting captive wolf behavior at Purdue University. Following that experience he made "a very important career move" by studying wolf and moose interactions at Isle Royale on Lake Superior starting in 1979.

In 1994 he moved to Yellowstone National Park where his current job has him researching and managing wolves in the park, although he started off in charge of wolves in the entire Greater Yellowstone Ecosystem.

"Today my job is more about research than management," he explains. "When you study wolves outside a national park setting it's going to be more management than research because the problems are going to be greater than you know. In the park, we're trying to study the situation to better provide information to those working on the management side of things outside the park setting. "Doug supervises an average of 12 employees who maintain radio collars on wolves so they can track their movements and monitor each pack.

"In addition to that I try to keep people away from wolves because people can **"love them to death"**. We try to protect the wolf areas. Wolves in the pack are not as afraid of people as they are outside the park so I have to try to keep people from approaching them".

Doug and his crew had to kill a wolf last spring because visitors had fed it and the wolf was approaching 20 people and cars a definite human/wildlife safety threat.

Doug also spends a lot of time communicating with other agencies, researching and writing papers on the species, and doing community outreach to make sure people get accurate information.

"A big part of what I do is try to tell the facts about the story because wolves are such a controversial animal and an emotional animal so everybody has their own view about them and people tend to ignore the facts. I think there's no other animal that is so prone to misinformation as wolves".

1 What did Doug Smith do before his work in Yellowstone National Park?

A He managed a group of employees.

B He managed a moose population.

C He worked at Purdue University.

D He worked at Purdue University.

2 Which of the following functions is NOT among Doug Smith's responsibilities?

A Writing research papers on wildlife in the National Park.

B Studying the behaviour of wolves in captivity.

C Informing the National Park authorities about wolves.

D Raising awareness about wolves.

3 What opportunities does Doug Smith's current job give him?

A To provide captive wolves and moose with care.

B To provide captive wolves with care.

C To manage a group of independent researchers.

D To do a comprehensive project on wolves in the wild.

4 What does Doug mean by saying people can **"love them to death "**?

A People's good intentions can pose a threat to wolves.

B People's behavior towards wolves can be violent.

C People can have a lifelong affection to wolves.

D People may hunt wolves to extinction.

5 What can be inferred from the text about Doug Smith's work?

A Doug and his team treat wolves with distrust

B Doug prefers to deal with wolves instead of people.

C Doug manages wolves in order to limit their numbers.

D Doug and his team work to protect both wolves and people.

Task 3. *Whales are Singing Louder*

The seas around the UK have got so noisy that whales have to sing louder in order to make **(1)** … heard above the din created by ships, wind farms and oil exploration. According to a story by a marine biologist, whale song **(2)** … the coast of Britain is now ten times louder than it was 50 years ago. Scientists found that whales are trying to adapt either by emitting much louder noises or by calling at **(3)** … frequencies. With whale numbers severely depleted, the ability **(4)** … over long distances could be key to finding a mate. The whales' messages are getting simpler and **(5)** … more often, just like a human forced to shout.

	A	B	C	D
1	Themselves	their	They	theirs
2	Through	over	Around	across
3	High	higher	Highest	the high
4	Communicate	to communicate	communicating	communicated
5	Repeating	repeats	Repeated	repeat

Task 4. *Amazon Parrots*

Amazon parrots are native to the New World. Indeed, **(1)** … , that he brought back to Europe after his first voyage here. There are 27 species of Amazon parrot. Most parrot species are bred successfully in captivity and several types of Amazons are available from breeders and pet stores here in Canada. Prices generally range, depending on the species, from $800 to $1600, **(2)** … .

Amazon parrots are very good at talking and imitating sounds. One test subject, Alex – a parrot, can name about 40 objects, identify seven different colours, and say whether two objects are the same or different; and **(3)** … . Studies put the intelligence of these feathered chatterboxes on the same level as three-year-old humans, dolphins and monkeys.

Amazons are actually very similar in personality to monkeys. Parrots are very energetic, playful, social creatures that crave lots of interaction with their human owners. The best pet birds are hand-raised and have bonded early with human companions. More than other parrot species, **(4)** … . They can be, at different times, loud, quiet, stubborn, silly, playfully aggressive or irritable. They will play and fight with their toys for hours on end **(5)** … . Sometimes, an Amazon may temporarily become quite aggressive.

You really have to understand your bird's moods and behaviours **(6)** … . Amazon parrots are definitely not for all pet owners, they need much more love and attention than most people would expect. Owning an Amazon is very similar to owning a dog with wings.

A with a premium paid for the breeds that are considered to be better "talkers"

B even rolling over on their backs to juggle a ball or play with some string

C the research has clearly shown that it is very intelligent and will speak in context

D as the trickier aspect of owning an Amazon parrot

E and talking ability will vary from species to species and from bird to bird

F Christopher Columbus himself apparently gave the name "Amazon" to the green, short winged parrots

G they also love being around people, and they are particularly good at speaking

H Amazons are well known for their strong or often moody characters

Task 5. *Why Do Onions Make You Cry?*

Onions, **(1) …** other plants, are made of cells. The cells are divided into two sections **(2) …** by a membrane. One side of the membrane contains an enzyme which helps chemical processes to **(3) …** in your body The other side of the membrane contains molecules that contain sulfur. When you cut an onion, the **(4) …** on each side of the membrane mix and cause a chemical reaction. This reaction **(5) …** molecules such as ethylsufine which make your eyes water.

To **(6) …** crying when you cut an onion, cut it under a running tap of cold water. The sulfur compounds **(7) …** in water and are rinsed down the sink before they **(8) …** your eyes. You can also put the onion in the freezer for ten minutes before you cut it. Cold temperatures slow down the reaction **(9) …** the enzymes and the sulfur compounds, so fewer of the molecules, that caused a **(10) …** sensation, will reach your eyes.

	A	**B**	**C**	**D**
1	Like	similar	As	such
2	Isolated	shared	Sorted	separated
3	Carry	go	Occur	flow
4	Properties	contents	Ingredients	flavours
5	Does	brings	Produces	discovers
6	Prevent	remove	Protect	except

7	Miss	lose	Dissolve	steam
8	Come	achieve	Take	reach
9	Among	between	Through	along
10	Sparkling	flaming	Burning	shining

Task 6. *The Swiftly Evolving Blackcap*

Evolution doesn't have to take centuries. In the case of the Blackcap songbird, **(1)** … decades were enough. The birds breed in the forests of southern Germany, and traditionally fly to Spain for the winter. Most still make the journey south, but since the 1960s, 10% **(2)** … to wintering in England, where the colder climate is more than **(3)** … by the food left out on bird tables – a postwar phenomenon. These birds have rounder wings than their Spanish cousins (which provide better mobility but are **(4)** … suited to long-distance flight) and longer, narrower beaks, better suited to bread and nuts than to olives. Researchers speculate that if the birds **(5)** … to evolve in this way, they could eventually become a distinct species.

	A	**B**	**C**	**D**
1	a little	few	Little	a few
2	have taken	taken	has taken	taking
3	Balance	balanced	Balances	balancing
4	Little	least	Less	the least
5	will continue	continues	continued	continue

Unit 16. Review of Module 2

Module 3. Integrity of the Organism
Unit 17. The History of Medicine

Medicine is among the most ancient of human occupations. It began as an art and gradually developed into a science over the centuries. There are *3 main stages* in medicine development: Medicine of Ancient Civilizations, Medicine of Middle Ages and Modern Medicine.

Early man, like the animals, *was subject to illness and death*. At that time medical actions were mostly a part of ceremonial rituals. The medicine-man practiced magic to help people who were ill or had a wound. New civilizations, which developed from *early tribes*, began to study the human body, its *anatomic composition*. Magic still played an important part in treating but new practical methods were also developing. The early Indians, e. g., *set fractures* and practiced aromatherapy. The Chinese were pioneers of *immunization and acupuncture*. The contribution of the Greeks in medicine was enormous. An early leader in Greek medicine was Aesculapius. His daughters, Hygeia and Panacea gave rise to dynasties *of healers* (curative medicine) and hygienists (preventive medicine). The division in curative and preventive medicine is true today. The ethic principles of a physician were summarized by another Greek, Hippocrates. They are known as *Hippocratic Oath*.

The next stage of Medicine's development was the Middle Ages. A very important achievement of that time was *the hospital*. The first ones appeared in the 15-th century in Oriental countries and later in Europe. Another advance of the Middle Ages was the *foundation of universities* during 13 – 14-th centuries. Among other disciplines students could study medicine. During 18-th century new discoveries were made in chemistry, anatomy, biology, others sciences. The advances of that time were *invention of the stethoscope* (by Rene Laennec), *vaccination for smallpox*, *discovery of anesthetics* and *development of immunology and scientific surgery.*

The next century is rise of *bacteriology*. Important discoveries were made by Louis Pasteur and Robert Koch. The development of scientific bacteriology made possible advances in surgery: *using antiseptics* and *control of wound infection*.

Medicine in the 20-th century made enormous contribution in the basic medical sciences. These are *discovery of blood groups and vitamins, invention of insulin and penicillin, practice of plastic surgery and transplantation.*

Tasks to Unit 17

Task 1. *Transcribe and translate the following words and word combinations.*

Occupation, century, ritual, wound, tribes, acupuncture, immunization, healer, dynasty, foundation, surgery, anesthetics, vitamins, enormous, appear, division.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

Gradually, to be subject to illness and death, to practice magic, anatomic composition, Hippocratic Oath, curative medicine, preventive medicine, to found universities, discovery of blood groups, immunization, wound infection.

Task 3. *Complete the sentences and translate them.*

1. Medicine began as an … and gradually developed into a … .
2. The medicine-man practiced magic to help people who were ill or had a … .
3. The early Indians set fractures and practiced … .
4. The development of scientific bacteriology made possible advances in …
5. Medicine in the 20-th century made enormous … in the basic medical sciences.

Task 4. *Make the following sentences passive.*

1. Early tribes used medicine as a part of ceremonial rituals. Medicine …
2. New civilizations studied the human body. The human body …
3. The Chinese started immunization and acupuncture.
4. Another Greek, Hippocrates summarized the ethic principles of a physician.
5. Among other disciplines students could study medicine.

Task 5. *Conventional and Natural Medicine*

Medical science has made enormous (1) …. in the 20th century. Most of the great "killer" diseases have been (2) …, and almost every day a new drug appears on the market. But the medical profession is (3) … a crisis of confidence.

Surveys (4) … that less than 40% of people really trust their family doctor. People are (5) … away from conventional medicine to look for alternative (6) … of treatment. The main reason for this is that conventional medicine had (7) … to satisfy the needs of the (8) … of people. In spite of the apparent progress made by medical science, we are actually less (9) … than our parents or grandparents.

Medical students are taught that diseases are (10) … by germs, viruses and toxins. Therefore, treatment must (11) … on attacking these things. The mind and the emotions are not thought to play any (12) … in the disease process. But people who practice "natural" medicine (13) … with this principle, and try to treat the whole person. They believe that personality and lifestyle are important when considering a patient's (14) … health.

Some conventional doctors are beginning to (15) … that there is a lot of truth in these ideas. Others (16) … regard it as a dangerous threat to their profession.

1	A steps	B distances	C increases	D advances
2	A won	B defeated	C erased	D broken
3	A experiencing	B holding	C bearing	D living
4	A indicate	B lead	C describe	D point
5	A growing	B taking	C turning	D coming
6	A ways	B makes	C forms	D fashions
7	A missed	B stopped	C lost	D failed
8	A lot	B majority	C most	D largest
9	A healthy	B nutritious	C fine	D wholesome
10	A caused	B made	C brought	D involved
11	A aim	B function	C concentrate	D try
12	A game	B piece	C part	D action
13	A reject	B dislike	C object	D disagree
14	A normal	B typical	C common	D general
15	A recognize	B observe	C view	D know
16	A still	B yet	C but	D even

Unit 18. Cell as the Unit of Life

The cell is a smallest independent unit in the body containing all the *essential properties* of life. The *cell* is the unit of life, the unit of structure in the *human body*. Cells are so small that they cannot be seen *by naked eye*. High-powered microscopes are required in order to study them. Many types of human cells can be grown in test tubes after being taken from the body. Cells are characterized by high degree of complexity and order in both structure and function. The cell contains a number of structures called *cell organelles*. These are responsible for *carrying out* the specialized biochemical reactions.

The *cell membranes* ensure that chemicals are present in the proper region of the cell *in appropriate concentration*. The cell membranes of a *mixture of protein and lipid* form its surroundings. Membranes are an essential component of almost all cells organelles. The membrane allows certain molecules to pass through it.

The most visible and essential organelle in a cell is the *nucleus*, containing genetic material and regulating the activities of the entire cell.

The area outside the molecules is called the *cytoplasm*. Cytoplasm contains a variety of organelles that have different functions. The combination of cells and the product of their secretion form *tissues*. The tissues form organs. A group of *organs* performing the same functions and having identical tissues is a *system.*

Metabolism

The *vital activities* of cells, tissues, organs and the whole organisms are based on *metabolism*. It consists of two processes: *assimilation of nutritive substances* (*anabolism*) and *decomposition of organic substances (catabolism)*. The complex substances of the cells and tissues split into more simple ones. The *catabolism* gives energy which operates all the processes in the organs and tissues.

The relations between the various systems of organs can also be demonstrated by the coordinated changes in their activities. For example, physical work makes

metabolism increase in muscles. It leads to the change in the activity of *cardio-vascular and respiratory systems.*

This connection may be seen in disease. *Pathological changes* in one particular organ influence other systems of organs.

Tasks to Unit 18

Task 1. *Transcribe and translate the following words and word combinations.*

Essential, property, require, type, characterize, responsible, biochemical, membrane, appropriate, mixture, cytoplasm, nucleus, substance, activity, tissue.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

Essential properties, by naked eye, complexity and order, responsible for, protein, lipid, appropriate concentration, to allow, vital activities, nutritive substances, to lead to, pathological changes, connection, to increase in muscles.

Task 3. *Finish the phrase.*

high-powered …	to contain the genetic …
high degree of …	cardio-vascular …
to carry out …	pathological …
appropriate …	one particular …

Task 4. *Fill in the preposition if necessary.*

to be seen … naked eye	to lead … the change in activity
to be responsible …	to carry … experiments
to be based … metabolism	the relations … various systems
to influence … other organs	to split … simple substances
a mixture … protein and lipid	in order … study the cell

Task 5. *Give the definitions to the following words and word combinations*

1. cell 2. cell organelles 3. cell membrane 4. nucleus 5. cytoplasm 6. tissue	a) basic unit of life b) assimilation of nutritive substances c) a number of structures in a cell d) group of organs performing the same functions and having identical tissues e) mixture of protein and lipid that allows only certain

7. system 8. anabolism 9. catabolism	molecules to pass f) organelle containing genetic material and regulating the activities of the entire cell g) area outside the molecules h) combination of cells and the products of their secretion i) decomposition of organic substances

Task 6*. Form Participle I or Participle II to complete the sentences.*

1. The cell is a smallest unit … (to contain) all the *essential properties* of life.

2. The institute has high-powered microscopes … (to require) to study cells.

3. The scientist investigated the human cells … (to grow) in test tubes after being taken from the body.

4. The cell membranes … (to form) the surroundings of a cell is a mixture of protein and lipid.

5. The catabolism gives energy … (to operate) all the processes in the organs.

6. Pathological changes in one organ … (to influence) other systems of organs may lead to serious complications.

7. The area outside the molecules … (to call) the cytoplasm contains a variety of organelles.

Unit 19. The Structure of the Human Body

In the human body there are the following systems: *muscular, skeletal, cardio-vascular, digestive, respiratory, nervous, endocrine, urinary, reproductive.*

System	Function	Main Elements
Muscular	Motion	skeletal *muscles*
Skeletal	Structural	*bones, ligaments, cartilages*
cardio-vascular	transportation of *nutrients*, oxygen	*heart, blood vessels, blood*
Digestive	*digest* food	*alimentary tract* and associated *glands*
respiratory	carry *oxygen* to the lungs and remove *carbon dioxide*	*lungs, bronchi*

Nervous	receiving and communicating information	*brain, spinal cord, nerves, ganglia, receptors*
Endocrine	regulate different activities	*glands* which produce *hormones*
reproductive	Reproductive	*reproductive organs*
Urinary	remove *waste products* from the blood	2 *kidneys*, 2 *ureters*, *urinary bladder*, *urethra*

Muscular-Skeletal System. Bone is the type of connective tissue that forms the body's supporting framework, the skeleton. It serves to protect the internal organs from injury. The *bone marrow* inside the bones is the body's major producer of both red and white blood cells.

The bones of women are generally lighter than those of men, while children's bones are more *resilient* than those of adults. Bones also respond to certain physical physiological changes: they may *atrophy or waste away*.

Bones are generally classified in two ways. When classified on the basis of their shape, they fall into four categories: *flat bones*, such as the ribs; *long bones*, such as the thigh bone; *short bones*, such as the wrist bones; and *irregular bones*, such as the *vertebrae*.

The bones of our body make up a skeleton. The skeleton forms about 18 % of the weight of the human body. The skeleton of the human body consists of three parts: the *head*, the *trunk* and *limbs*. In the adult skeleton there are over 200 *bones*. They differ in size and shape. The bones are connected together by the *cartilages, ligaments and joints*. The joints allow the bones to move.

The *muscles* form about 35-40% of the body weight. All the muscles *are divided into* the muscles of head, trunk and limbs. There are about 600 skeletal muscles. They allow us to make movements due to their *contractions* and *relaxations*. The muscles may be divided from a physiological standpoint into two classes: the *voluntary muscles*, which are under the control of the will, and the *involuntary muscles*, which are not. All muscular tissues are controlled by the nervous system.

When muscular tissue is *examined under the microscope*, we can see that it is made up of small *threadlike cells*, which are called muscle fibers. Great research work was carried out by many scientists to determine the functions of the muscles. Their work helped to establish that the muscles were the active agents of motion and contraction.

Respiratory system is structurally and functionally adapted for the efficient transfer of gases between the air and the bloodstream as well as between the bloodstream and the tissues. The major functional components of the respiratory system are: the airways, alveoli, and blood vessels of the lungs; the tissues of the chest wall and diaphragm; the systemic blood vessels; red blood cells and plasma.

Digestive system. The gastrointestinal tract and associated organs are collectively called the digestive system. This system is responsible for receiving food and breaking it down by using *enzymes from the glands* and by the movement of the various parts of the *intestinal tract*; for *absorption of these components* into the blood; and for *eliminating undigested food* and certain metabolic wastes from the body.

The process of digestion begins when food is taken into the mouth. Chewing breaks the food into smaller pieces. *Saliva* moistens the food, so facilitating swallowing, and it contains the enzyme which begins the *conversion of carbohydrates into simple sugars.*

The major processes of digestion *do not occur* until the food passes down through the esophagus into the stomach. The stomach has both a chemical and a physical function. The walls of the stomach, which are protected by a *layer of mucus*, *secrete gastric juices* composed of several enzymes and *hydrochloric acid.* The most powerful enzyme is *pepsin*, which begins the process of converting proteins into amino acids. In addition, waves of contraction and relaxation, known as *peristalsis*, move the walls of the stomach.

Tasks to Unit 19

Task 1. *Transcribe and translate the following words and word combinations.*

Cardio-vascular, bones, ligaments, cartilages, muscle, injury, internal, atrophy, classify, voluntary, carbohydrates, stomach, enzymes, mucus, hydrochloric acid.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

Transportation of nutrients, alimentary tract, waste products, connective tissue, bone marrow, resilient, contractions and relaxations, threadlike cells, intestinal tract, layer of mucus, amino acids, peristalsis, metabolic wastes, swallowing.

Task 3. *Give classification of the bones, using the table.*

flat bones	*vertebrae*
long bones	*ribs*
short bones	*thighs*
irregular bones	*wrist*

Task 4. *Make up the sentences using the verbs in Passive Voice.*

The body	may be classified	for the transfer of gases.
The respiratory system	are controlled	from injuries.
Internal organs	is structurally adapted	by cartilages and joints.
The walls of the stomach	was carried out	according to their shape.
All muscular tissues	are produced	by the skeleton.
Great research work	are connected	by the bone marrow.
Red and white blood cells	are protected	by the nervous system.
Bones	is supported	by many scientists.
Bones	are protected	by a layer of mucus.

Task 5. *Complete the sentence and translate it.*

1. The most powerful … is pepsin.
2. Bone is the type of … tissue that forms the body's supporting framework.
3. Waves of contraction and relaxation are known as …
4. The bones of women are generally … than those of men.
5. All the muscles are divided into the muscles of … .
6. Small threadlike cells are called …

7. … moistens the food, so facilitating swallowing.

8. Muscles allow us to make movements … their contractions and relaxations.

Task 6*. Put the word into the right form.*

(connect) tissue	to be (structure) adapted	major (function) components
(digest) system	the (long) of the bones	(contract) of muscles
(power) enzyme	(absorb) of the components	(connect) of the bones
(muscle) tissue	to (classification) organs	(nerve) system

Task 7. *Change the structure of the sentence using Degrees of Comparison.*

1. There is no more powerful enzyme than pepsin.

   Pepsin …

2. The bones of women are generally lighter than those of men.

   The bones of men are …

3. If you eat enough fruit and vegetables, you stomach works better.

   The more …

4. The wrist bones are not so long as the thigh bones.

   The thigh bones are …

5. The number of bones in the adult organism is over 200.

   There are …

Unit 20. Cardio-Vascular System. Blood

This is the system of *blood circulatio*n. It includes the heart, the *arteries* (large *thick-walled blood vessels*, which lead blood away from the heart), the *veins* (*thinner-walled blood vessels* that carry *waste-filled blood* from the tissues) and the *capillaries* of the human body.

The heart is the central organ of the circulation. It regulates the rate at which blood circulates and the direction of the *blood flow*. In the adult the heart makes from 60 to 80 *beats per minute.*

The heart consists of two *chambers*: the *right and the left atrium* and the right and the left *ventricle*. The right heart receives blood from the veins and *pumps* it into the lungs. In the lungs it gives off *carbonic acid* and takes in oxygen. From the left heart the *well-oxygenated blood* is pumped into a large artery, *aorta*, to all the *peripheral parts* of the body.

Finally the arterial blood reaches *capillary network*. The walls of the capillaries are so thin that the *dissolved nourishment* and oxygen can pass through them into the tissues of the body. Arteries don't have *valves*; veins have valves to prevent the *backflow of blood* and keep blood moving in one direction. The *blood pressure* in veins is extremely low as compared to pressure in arteries.

There are between 250 and 300 million red cells and 350- 500 white cells in each drop of blood when you are in good health. But when you get an infection, the number of white cell begins to increase. The disease germs produce certain chemicals in the body. When a white cell is close to the place of infection, it wraps the germ up and eats it up. In this way the white cells help to fight the infection.

Our blood also has proteins in it. And it has a lot of little cells called platelets. When you cut your finger and the blood comes to the surface of the wound, the platelets break down. The chemical is released and it starts to affect the gelatin – like protein in the blood, building a network of fibers. Soon the network is big enough to form a jelly-like stopper for the wound.

Blood

Blood is considered a modified type of *connective tissue*. The forming elements of the blood include *erythrocytes, leukocytes, and platelets*.

Due to its importance to life, blood is associated with a large number of beliefs. One of the most basic is the use of blood as a symbol for family relationships; to be "related by blood" is to be related by ancestry rather than marriage. There are such sayings as "blood is thicker than water" and "bad blood", as well as "blood brother". Blood is given particular emphasis in the Jewish and Christian religions.

Mythic references to blood can sometimes be connected to the life-giving nature of blood, seen in such events as childbirth, as contrasted with the blood of injury or death.

For centuries, evil spirits in the body were thought to be the cause of illnesses. *Bloodletting* was a process used to drain blood of these evil spirits. Until the 19th century it was the treatment for many illnesses.

Blood is one of the most important tissues in the body. It transports materials such as *digested food*, water, oxygen to our cells. It carries wastes from the cells to the parts of the body where they are released. The two main parts of blood include a *liquid part* and a *solid part*. About half of whole blood is clear, yellowish-coloured liquid called plasma. Most of *plasma* is water. It is an *aqueous solution* containing proteins, inorganic salts, and organic compounds. *Albumin* is the major plasma protein that *maintains the pressure of blood*. Plasma proteins fight disease and help *clot the blood*. The disease-fighting plasma proteins are called antibodies.

The solid part of the blood consists of red blood cells, white blood cells and platelets. Red blood cells are round, somewhat like donuts without holes. Mature red blood cells contain *hemoglobin*. It gives the red blood cells their red colour. The function of hemoglobin is to combine with oxygen in the lungs and to carry it to the cells.

White blood cells are larger than red blood cells. There are fewer white blood cells than red blood cells. White blood cells attack foreign invaders faster than the *antibodies*. For this reason, the white blood cells are known as the body's "first line" of defense.

Platelets are tiny, colourless particles that help form blood clots, which stop the *bleeding* from a cut or injury. Blood is often called the "gift of life". Many lives are saved each year by *blood transfusions*.

Tasks to Unit 20

Task 1. *Transcribe and translate the following words and word combinations.*

Circulation, arteries, blood flow, adult, chemical, increase, chamber, valve, circulation, pressure, acid, germ, extremely, disease, hemoglobin, oxygen, liquid, surface, injury, digested, protein, particle, solution, lungs, symbol.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

Thick-walled blood vessels, waste-filled blood, right and the left atrium, ventricle, from 60 to 80 beats per minute, dissolved nourishment, surface of the wound, clot the blood, maintains the pressure of blood, first line" of defense, blood transfusions.

Task 3. *Fill in the prepositions where necessary.*

to lead blood away … heart	to be saved … blood transfusion
capillaries … human body	to transport materials such … food
direction … blood flow	the first line … defense
to be … good health	to consist … red blood cells
to be close … the place of infection	due … its importance to life

Task 4. *Complete the sentences and translate them.*

1. Blood transports materials such as … food.
2. Blood is … with a large number of beliefs.
3. … is the major plasma protein that maintains the pressure of blood.
4. The… part of the blood consists of red blood cells, white blood cells and platelets.
5. The function of hemoglobin is to combine with … in the lungs.
6. Finally the arterial blood reaches capillary … .
7. From the left heart the well-oxygenated blood goes into a large artery, …

Task 5. *Change the structure of the sentence.*

1. White blood cells are larger than red blood cells.

   Red blood cells are …

2. There are fewer white blood cells than red blood cells.

There are … red blood cells than …

3. White blood cells attack foreign invaders faster than the antibodies.

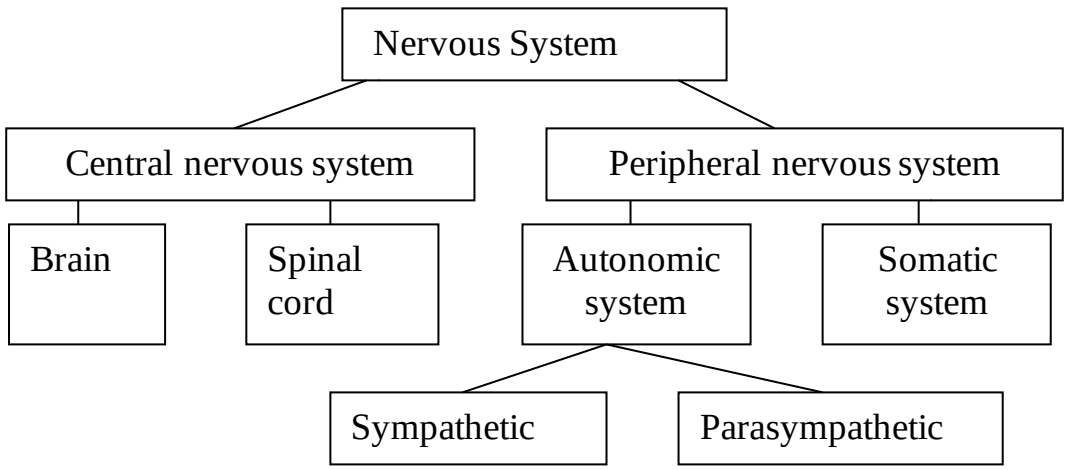
Antibodies are not … …. to attack invaders … white blood cells.

Task 6. *Put the word into the right form.*

1. Cardio-vascular system is the system of blood … (circle).
2. It regulates the … (direct) of the blood flow.
3. (Final) … the arterial blood reaches capillary network.
4. Due to its … (important) to life, blood is associated with many beliefs.
5. The blood … (press) in veins is extremely low.
6. In the lungs it gives off … (carbon) *acid* and takes in oxygen.

Unit 21. Nervous System. The Brain

All parts of the nervous system are interrelated. The nervous system can be separated into the following *divisions and subdivisions*:



The *central nervous system* includes all the nerves in the *brain* and *spinal cord*, and it contains the majority of the body's *neurons.* Some of the very simplest *stimulus-response reflexes* are carried out within the spinal cord. The *peripheral* nervous system consists of the nerves leading from the brain and spinal cord to the other parts of the body. The peripheral nervous system is subdivided into the *somatic* system and the *autonomic* system.

The nerves of the somatic system transmit information about external stimulation from *skin, muscles and joints* to the central nervous system; they make us feel pain, pressure and temperature variations. Nerves of the somatic system also carry impulses from the central nervous system back to the body parts where they start action.

The nerves of the autonomic system run to and from the internal organs regulating such processes as *respiration, heart rate, and digestion*. It took its name from the fact that many of the activities that it controls are autonomous, or *self-regulating* – such as digestion and *circulation*, which continue even when a person is asleep or *unconscious.*

The Brain. Your body's personal computer:

- is soft and looks like a *cauliflower*;
- consists of over ten billion nerve cells;
- is pink/ grey colour;
- has two distinct halves;
- controls every aspect of your physical and *mental life*.

The human brain has 3 main functions:

1) it controls the body;
2) it stores data in the form of memories;
3) it creates thoughts, dreams, ideas, emotions, moods.

The brain works by receiving and sending signals at fast speed. Let's take a simple example. You're visiting a friend and you pick up a cup of tea. What happens? Well, first the *receptor cells* in your hand collect information about how big/ heavy/ hot the cup is. All this information is sent to the brain by nerves called *sensory neurons*. They exist in every part of the body and pass signals from one to the next like electricity. So the information about the cup is in your brain. Next, it is *processed*. The brain does this by using its memory of the same experiences in the past to make decisions. What decisions? Well, perhaps the cup is very hot –

dangerously hot. In this case the brain tells your hand to put down or even drop the cup. Instructions like these travel back to the hand along *motor neurons*. The last motor neuron in the chain is connected to a muscle. The signal arrives – the muscle *contracts* - your hand puts down (or drops) the cup.

Thousands of signals are received and sent every second – signals about what you see, touch, hear, feel, say, taste, remember.

While you are asleep it makes sure that the *internal organs* which you can not control (the liver, kidneys, heart) continue to work. It produces dreams. No one exactly knows why we *dream*, but there are two main theories. One is that we all have *fears and fantasies* which are difficult to fully understand and *express* while we are awake. The result? Our brain explores them at night. While we are asleep, our brains *store information* about the previous day. In other words, they *file* what happen, who we met, what people said to us, the emotions we felt, comparing it with the information already in the memory.

The brain is divided into several different areas, each of which has a specific job – controlling *vision, speech, thought or memory*. There is some difference between the left and the right side *(hemispheres*) of the brain. The *left brain* controls logic, numbers, facts, analysis, movements of the right-hand side of the body. The *right brain* controls emotions, music, dreams, imagination, movements of the left-hand side of the body. For most people, the left half of the brain is more powerful or dominant than the right. But for creative artists, painters, writers, composers - the opposite is true.

Tasks to Unit 21

Task 1. *Transcribe and translate the following words and word combinations.*

Include, nerve, spinal, majority, neuron, peripheral, leading, autonomic, subdivided, muscle, joint, pressure, process, respiration, activity, digestion, halves, function, store, necessary, memory, create, sensory, cell, to process, process, experience, neuron, muscle, liver, hemisphere, logic, opposite.

***Task 2**. Give the Ukrainian equivalents to the words and word combinations.*

Nervous system, to contain, to carry out reflexes, spinal cord, subdivided, transmit information, pressure variation, internal organs, respiration, blood circulation, to be asleep, to receive signals, receptor cells, to exist in every part of the body, to process information, to make decisions, to have fears, previous day.

***Task 3.** Finish the phrase.*

to consist of …	to store …	internal …
to send …	to exist …	previous …
to pass …	left and right …	receptor …

***Task 4**. Find in the text the word that corresponds to the definition.*

a) greater number or part

b) the process of breathing

c) involuntary response to a stimulation of the nerves

d) going around continuously

e) the part of the body that can produce movements when tightens or loosens

f) pass, send

g) half a sphere

h) fibre carrying impulses of feeling and motion between the brain and the body

i) the mass of soft grey matter in the head, center of nervous system

j) coming earlier in time or order

k) reasonable explanation of facts and events

l) excitement of the mind or the feelings

m) power, act, manner of speaking

n) entirely different, contrary

***Task 5.** Give derivatives of the following words.*

Person, necessity, inform, electrical, danger, connect, difficult, express, think, biology, analyze, imagine, power, create, art, paint, compose, explore.

Task 6. *Complete the sentence and translate it.*

The central nervous system includes……..

The peripheral nervous system consists of ……

The peripheral nervous system is subdivided…….

The nerves of the somatic system transmit ……..

The nerves of the autonomic system regulate such processes as ……

Internal organs are ……

The human brain has 3 main functions: ……..

The left brain controls ……..

Unit 22. Health

Health is a state of complete physical, mental and social *well-being* and not simply the absence of disease. This definition, which was ratified during the first World Health Assembly, has not been modified since 1948. Health may be regarded as a balance of physical, mental and social aspects of life in a being.

Physical health is good bodily health, and is the result of regular exercise, proper diet and nutrition, and proper rest for physical recovery. A strong indicator of the health of populations is height, which is generally increased by improving nutrition and health care, and is also influenced by the standard of living and quality of life. Genetics is also a major factor in people's height.

Mental health is "a state of *emotional and psychological well-being* in which an individual is able to use his or her *cognitive and emotional capabilities*, function in society, and *meet the ordinary demands* of everyday life."

According to the World Health Organization, there is no one "official" definition of mental health. *In general*, most experts agree that "mental health" and " mental illness" are not opposites. In other words, the absence of a recognized mental disorder is not necessarily an indicator of mental health.

One way to think about mental health is by looking at how effectively and successfully a person functions. *Feeling capable* and competent; being able to

handle normal levels of stress, *maintain relationships*, and lead an independent life; and being able *to recover from difficult situations*, are signs of mental health.

Health maintenance. Achieving health and remaining healthy is an active process. Effective strategies for staying healthy and improving one's health include the following elements:

Nutrition is the science that studies how what people eat *affects their health* and performance, such as foods or food components that cause diseases (such as eating too many calories, which is a major contributing factor to *obesity*, diabetes, and heart disease). The field of nutrition also studies foods that improve health, and cure or prevent disease, such as *eating fibrous foods* to reduce the risk of *colon cancer*, or *supplementing with vitamin C* to strengthen teeth and gums and to improve the immune system.

Personal health depends partially on the social structure of one's life. The maintenance of strong social relationships is connected with good health conditions, *longevity*, productivity, and a *positive attitude*. This is due to the fact that positive social interaction *increases many chemical levels* in the brain which are linked to personality and intelligence traits.

Exercise is the performance of movements in order to develop or maintain physical fitness and health. *Frequent and regular* physical exercise is an important component in the *prevention of some diseases* such as cancer, heart disease, cardiovascular disease, diabetes, obesity and back pain.

Exercises are generally grouped into three types depending on the effect they have on the human body:

- *flexibility exercises,* such as stretching, improve the range of motion of muscles;
- *aerobic exercises,* such as walking and running focus on increasing cardiovascular endurance and muscle density;
- *anaerobic exercises* such as weight training increase muscle mass and strength.

Physical exercise is considered important for maintaining physical fitness including healthy weight; building and maintaining healthy bones, muscles, and joints; promoting physiological well-being; reducing surgical risks; and strengthening the immune system.

Hygiene is the practice of keeping the body clean to prevent infection and illness, and *avoiding contact* with infectious agents. Hygiene practices include bathing, brushing and flossing teeth, washing hands especially before eating, washing food before it is eaten, cleaning *food preparation utensils* and *surfaces* before and after preparing meals, and many others. This may help prevent infection and illness. By cleaning the body, dead skin cells are washed away with the germs, *reducing their chance* of entering the body.

Stress management. Psychological stress may negatively influence health and *weaken the immune system*. Stress management is the *application of methods* that reduce stress or increase tolerance to stress. Relaxation techniques are physical methods used to relieve stress. Psychological methods include *cognitive therapy, meditation, and positive thinking* which work by reducing response to stress. Improving some skills and abilities builds confidence, which also reduces the stress reaction. *Reducing uncertainty* by increasing knowledge has the same effect. Learning *to cope with problems* better, such as improving problem solving and time management skills, may also reduce stressful reaction to problems.

Health care is the *prevention, treatment, and management of illness* and the preservation of mental and physical well being through the services offered by the medical, nursing, and other health professions. The organized services make a health care system. This can include a specific governmental organization such as the National Health Service in the UK.

Health research builds primarily on the basic sciences of biology, chemistry, and physics as well as a variety of multidisciplinary fields (for example medical sociology). Some of the other *research-oriented fields* that make significant

contributions to health science are biochemistry, epidemiology, and genetics. *Applied health sciences* are biochemical engineering, biotechnology, nursing, nutrition, pharmacology, public health, psychology, physical therapy, and medicine.

Tasks to Unit 22

Task 1. *Transcribe and translate the following words and word combinations.*

Health, ratify, modify, nutrition, infectious, application, reduce, frequent, regular.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

Social well-being, definition, proper diet and nutrition, recover from difficult situations, obesity, flexibility, weaken the immune system, to strengthen, to relieve, tolerance, prevention, to cope with problems, to maintain, endurance.

Task 3. *Diana wants to be healthy and regrets not doing many useful things. What does she say? Use* ***"I wish+ Past Simple****".*

I don't do flexibility exercises. - I wish I …

I don't keep to a diet. – I wish I …

I eat a lot of junk food. – I wish I …

I don't eat a lot of fibrous food. – I wish I …

I can't cope with stress. – I wish I …

Task 4. *Mother wants to give Diana some good advice. Use* ***Complex Object****.*

You should use some relaxation techniques. - I want you …

You should do aerobic exercises. – I want you …

You should lead an independent life. – I want you …

You should increase your knowledge. – I want you …

You should develop the positive attitude. – I want you …

You should reduce uncertainty. – I want you …

Task 5. *Answer the questions to the text.*

1. What is health? When was this definition ratified?

2. What is a strong indicator of the health of populations? How is it increased?

3. What is mental health? What are the signs of it?

4. What does the field of nutrition study? Why is vitamin C important?

5. Into what groups are all exercises divided? What do they develop?

6. What do hygiene practices include?

7. How can you reduce stress?

8. What do psychological methods of stress management include?

9. What is health care?

10. What are applied health sciences?

Unit 23. Pioneers of Medicine

These days people live longer, healthier lives than ever before. Why? Well, one reason is the development of modern medicine. Here, we look at the key figures in that development. Some were doctors – others were scientists – all of them were pioneers who changed medical history.

Hippocrates (Nationality: Greek / Dates: 460 – 377 BC)

Hippocrates is often called "the father of western medicine". He lived in ancient Greece and founded medical school on the island of Kos over 2000 years ago. At that time doctors understood very little about the *causes of illness*. But Hippocrates understood the importance of *hygiene, rest and good diet.* He also *observed* his *patients* very carefully and wrote notes of their diseases. Books based on these notes influenced other doctors for centuries. In fact, even today doctors have to *obey "the Hippocratic Oath"*. This is the list of "dos and don'ts" which describe a doctor's duty to the patients.

Andreas Vesalius (Nationality: Belgian / Dates: 1514-64)

Medicine in Europe developed very slowly after Hippocrates. A famous doctor in the Roman Empire called Claudius Galen wrote over 500 books, but some of his theories were wrong. One reason for this was that doctors couldn't *cut open* dead

bodies and *investigate* them. As a result, they understood very little about basic anatomy – how bones, muscles, nerves are organized.

The man who changed that was a young Belgian. His name was Andreas Vesalius. He became a university professor at the age of 24. He paid people to take human bodies from graves in order to examine them. In 1543 he published the book "On the Structure of the Human Body". It had 300 illustrations and made anatomy a science for the first time in medical history.

Ambroise Pare (Nationality: French / Dates: 1510-90)

Some of the most *terrible injuries* to the human body happen during wars. This was true in the past. It is true today. But today soldiers have modern medicine to help them. In the past many people *suffered* in terrible conditions. Thousands died from shock or loss of blood after operations in the Middle Ages. But in the middle of the 16th century their number began to go down. Why? Thanks to a French *surgeon* Ambroise Pare. He discovered *less painful ways* to operate on injured soldiers. But it wasn't his only achievement. He was one of the first doctors who made *artificial* arms, legs and teeth.

Edward Jenner (Nationality: British / Dates: 1749-1823)

The discovery that made this doctor famous was *vaccination*. It's a simple idea, but it has saved millions of lives since then. When people catch a serious disease like *polio*, they have no defense against it. But if they receive a very *weak form* of the disease (not enough to make them ill) they produce special cells called *antibodies*. They last for years and defend the body when it is attacked by the disease itself. Jenner first used vaccination against *smallpox*. In the 18th century this was a common disease which killed thousands every year. Jenner noticed that the girls who milked cows and often caught a very mild disease called *cowpox* never caught smallpox. Was cowpox protecting them from smallpox? He proved this theory. Jenner named his discovery "*vaccination*" after the Latin word for cowpox, which is "vaccine".

Florence Nightingale (Nationality: British / Dates: 1820-1910)

Between 1854/56 the Crimean War took place, with Turkey, France and Britain on one side, and Russia on the other. One of the hospitals, where *injured soldiers* received *treatment*, was in a place called Scutari. 39 British *nurses* led by Florence Nightingale arrived there from London in 1854. They were shocked by the conditions in Scutari. The hospital was dirty, the food was bad and 42% of the injured soldiers were dying. In less than 12 months it began to change. Florence Nightingale made this hospital clean and well-organized. The result? By the end of the war only 2% of the soldiers were dying, not 42 %.

In 1856 Florence Nightingale returned to England, where newspaper reports about Scutari made her famous. People collected money to open a college for nurses at St. Thomas Hospital in London. It was the first nursing school in the history of medicine.

Louis Pasteur (Nationality: French / Dates: 1822-95)

Louis Pasteur was a professor of chemistry. He worked at Lille University and made his discoveries about *bacteria*. They are tiny organisms that *cause disease*. Before Pasteur, no one in medical history had isolated and studied bacteria. It opened the door to a completely new age of scientific and medical developments. Pasteur realized, for example, that bacteria which make wine and milk go bad can be killed by heating them. That work led to the process called *pasteurization* which is still used today. Pasteur's discoveries made it possible to develop new vaccines. Now, thanks to Louis Pasteur, millions can be protected from *a wide range of diseases*.

Tasks to Unit 24

Task 1. *Transcribe and translate the following words and word combinations.*

Reason, island, thousands, nurses, patients, vaccines, vaccination, pasteurization, chemistry, caught, received, soldiers, suffered, France, other, influence, observe.

***Task 2**. Give the Ukrainian equivalents to the words and word combinations.*

Key figures, to found medical school, cause of illness, to observe patients, Hippocratic Oath, Roman Empire, terrible injuries, artificial arms, to prove the theory, tiny organisms, completely new, a wide range of diseases.

***Task 3.** Complete the sentences and translate them.*

1. Hippocrates founded …
2. The Hippocratic Oath is …
3. Hippocrates understood the importance of …
4. They understood very little about basic anatomy – how …
5. Thousands of soldiers died from …
6. If people receive a very *weak form* of the disease …
7. The Latin word "cowpox" means …
8. The nurses who arrive from London …
9. A college for nurses at St. Thomas Hospital in London was …
10. Pasteurization is the process in which bacteria …

***Task 4.** Match the words in the columns.*

a variety	to make different
to return	to feel pain
disease	a wide range of
tiny	wide spread
to understand	a doctor who performs operations
to change	very small
to observe	horrible
terrible	to come back
to suffer	illness
to protect	to watch
common	man made
surgeon	to defend
artificial	to realize

Unit 24. Review of Module 3

MODULE 4. ECOLOGY

Unit 25. Ecology as a Science

Ecology is the study of the relationship of plants and animals with their physical and biological environment. The *physical environment* includes light and heat or solar radiation, moisture, wind, oxygen, carbon dioxide, nutrients in soil, water and atmosphere. The *biological environment* includes organisms of the same kind as well as other plants and animals.

The term “ecology” was introduced by the German biologist Ernst Heinrich Haeckel in 1866. It is derived from the Greek “oaks” (“household”), having the same root as “economics”. So, the term means the study of the economy of nature. Modern ecology, in part, began with Charles Darwin. In developing his theory of evolution, Darwin *stressed the adaptation* of organisms to their environment *through natural selection*.

Ecology is usually considered a branch of biology, the general science that studies living organisms. Organisms can be studied at many different levels, from proteins and nucleic acids (in biochemistry and molecular biology), to cells (in cellular biology), to individuals (in botany and zoology), and finally at the level of populations, communities, and ecosystems, to the biosphere as a whole.

Disciplines of ecology

Ecology is a broad discipline which has many sub-disciplines:

* *Ecophysiology* examines how the physiological functions of organisms influence their interaction with the environment, both biotic and abiotic.

* *Behavioral ecology* examines the role of behaviour in animal adaptation to its environment.

* *Population ecology* studies the dynamics of populations of a single species.

**Community ecology* focuses on the interactions between species within an ecological community.

* *Ecosystem ecology* studies the flow of energy and matter through the biotic and abiotic components of ecosystems.

* *Systems ecology* focuses on the study, development, and organization of ecological systems from a holistic perspective.

* *Landscape ecology* examines processes and relationship across multiple ecosystems or very large geographic areas.

* *Evolutionary ecology* studies the evolutionary histories of species and their interactions.

* *Political ecology* connects politics and economy to problems of environmental control and ecological change.

Levels of ecological organization

* **Biosphere**: "What role does concentration of atmospheric carbon dioxide play in the regulation of global temperature?"

* **Region**: "How has geological history influenced regional diversity within certain groups of organisms?"

* **Landscape**: "How do vegetated corridors affect the rate of movement by mammals among isolated fragments?"

* **Ecosystem**: "How does fire affect nutrient availability in grassland ecosystems?"

* **Community**: "How does disturbance influence the number of mammal species in African grasslands?"

* **Interactions**: "What evolutionary benefit do zebras gain by allowing birds to remove parasites?"

* **Population**: "What factors control zebra populations?"

* **Individual**: "How do zebras regulate internal water balance?"

Because of the different approaches to studying organisms in their environment, ecology is connected with such sciences as climatology, hydrology, physics, chemistry, geology, animal behaviour and mathematics. Ecology plays a

very important role in the modern world because it helps to understand the processes of the nature better and *save our planet from destruction*.

Tasks to Unit 25

Task 1. *Transcribe and translate the following words and word combinations.*

Environment, moisture, proteins, nucleic acids, destruction, diversity, affect, matter, biosphere, multiple, nutrient availability.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

To consider, interaction, to examine behaviour, flow of energy and matter, isolated fragments, approach, to gain benefits, to remove parasites, to allow.

Task 3. *Fill in the right prepositions.*

to save … destruction

relationship … the environment

organisms … the same kind

as well .. other plants

adaptation … the environment

to focus .. the interaction

to study … different levels

because … the different approaches

processes … the nature

… a whole

Task 4*. Complete the sentences and translate them.*

The physical environment includes …

The biological environment includes …

Darwin stressed…

Organisms can be studied at many different levels, such as …

Ecophysiology examines …

Community ecology focuses on …

Task 5. *Make the sentences Passive.*

1. Darwin stressed the adaptation of organisms to their environment.
2. We can study organisms at different levels.
3. Ecophysiology examines the physiological functions of organisms.
4. Behavioral ecology examines the role of behaviour.

5. Evolutionary ecology studies the evolutionary histories of species.

6. We can connect economic and ecological problems.

Unit 26. The Main Concepts of Ecology

Biosphere. The outer layer of the planet Earth can be divided into several parts: the hydrosphere (or sphere of water), the lithosphere (or sphere of soils and rocks), and the *atmosphere* (or sphere of the air). The *biosphere* (or sphere of life), sometimes described as "the fourth envelope," is all living matter on the planet. It reaches well into the other three spheres, although there are no permanent inhabitants of the atmosphere. Relative to the volume of the Earth, the biosphere is only the very thin surface layer that extends from 11,000 meters below sea level to 15,000 meters above. The biosphere contains great quantities of elements such as *carbon, nitrogen, hydrogen and oxygen*. Other elements, such as *phosphorus, calcium, and potassium*, are also essential to life, yet are present in smaller amounts. At the ecosystem and biosphere levels, there is a continual recycling of all these elements, which change between the mineral and organic states.

The ecosystem concept. *A central principle* of ecology is that each living organism has a continual relationship with every other element that makes up its environment. All interacting living organisms and their non-living environment in an area form an ecosystem. Studies of ecosystems usually focus on the *movement of energy and matter* through the system**.**

Almost all ecosystems run on energy received from the sun by primary producers *via photosynthesis*. This energy then flows through the *food chains* to primary consumers (*herbivores* who eat and digest the plants), and to secondary and tertiary consumers (either *carnivores or omnivores*).

Matter is incorporated into living organisms by the primary producers. Photosynthetic plants fix carbon from carbon dioxide and nitrogen from atmospheric nitrogen or soil nitrates to produce amino acids. Much of the carbon

and nitrogen contained in ecosystems is created by such plants, and is then consumed by secondary and tertiary consumers. Nutrients are usually returned to the ecosystem via decomposition. The entire movement of chemicals in an ecosystem is termed a *biogeochemical cycle*, and includes *the carbon and nitrogen cycle.*

Ecosystems of any size can be studied. For example, a rock and the plant life growing on it might be considered an ecosystem. This rock might be within a plain, with many such rocks, small grass, and grazing animals - also an ecosystem. This plain might be in the tundra, which is also an ecosystem. In fact, the entire *terrestrial surface* of the earth, all the matter which composes it, the air that is directly above it, and all the living organisms living within it can be considered as one, large ecosystem. Ecosystems can be divided into *terrestrial* ecosystems (including forest ecosystems, steppes, savannas, and so on), *freshwater* ecosystems (lakes, ponds and rivers), and *marine* ecosystems, depending on the dominant biotope.

Biocenose, or community, is a group of populations of plants, animals and microorganisms.

Ecosystem productivity. In an ecosystem, the connections between species are generally related to food and their role in the food chain. *There are three categories of organisms*:

- *Producers* -- usually plants that are capable of photosynthesis but could be other organisms such as bacteria in oceans that are capable of chemosynthesis.
- *Consumers* -- animals, which can be primary consumers (herbivorous), or secondary or tertiary consumers (carnivorous and omnivores).
- *Decomposers* -- bacteria, mushrooms which degrade organic matter of all categories, and restore minerals to the environment. And decomposers can also decompose decaying animals.

Tasks to Unit 26

Task 1. *Transcribe and translate the following words and word combinations.*

Layer, hydrosphere, inhabitants, permanent, consumer, potassium, nutrient, ocean, cycle, photosynthesis, entire, restore, volume, connection.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

outer layer, although, quantities, continual recycling, central principle, food chains, primary consumers, herbivores, soil nitrates, terrestrial ecosystems.

Task 3*. Finish the phrase.*

outer …	permanent …	below sea …
food …	central …	to focus on …
terrestrial …	primary …	organic …

Task 4. *Make up sentences with Passive Voice using the table.*

Ecosystems	can be	studied.
The plains	might be	divided into *several parts.*
The outer layer of the Earth	may be	considered an ecosystem.
The energy	could be	described as "the fourth envelope".
A rock and the plant life		found in the tundra.
The biosphere (sphere of life)		received from the sun by primary producers.

Task 5*. Choose the correct variant to fill in the blanks.*

Planting the seeds of change

The Green Wave project aims to help meet the goals of the United Nations Convention **(1)** … Biological Diversity by **(2)** … young people on the importance of biodiversity. In an ambitious program, students from schools all across the world **(3)** … to mark the International Day for Biodiversity each year by planting a single tree. On May 22, **(4)** … student groups will each plant their tree – uniting to send a 'green wave' from east to west around the planet. Promoting research and learning about nature, encouraging team-work and partnership across countries

and continents, The Green Wave **(5)** … a positive step toward maintaining biodiversity all over the world.

1	**A** about	**B** on	**C** for	**D** of
2	**A** educate	**B** educated	**C** educating	**D** educates
3	**A** have been invited	**B** have been inviting	**C** invite	**D** have invited
4	**A** this	**B** those	**C** that	**D** these
5	**A** take	**B** is taking	**C** taking	**D** taken

Unit 27. The Problems of the Planet

We have spent thousands of years fighting for our *survival*. But now we discovered that our planet is *under threat* and it's our *fault.*

The *rainforests* are dying, *rare plants and animal species* are disappearing, rivers and seas are *contaminated*, crops don't grow, people are dying of hunger and the air is *polluted*. It's time we woke up to these problems and started *repairing the damage*.

One of the major problems is the *deforestation* of the *rainforests* in South America. They are home to half the world's species and to millions of people. Moreover, the rainforests clean the air by *absorbing carbon dioxide and giving out oxygen.* The trees are cut down for paper or to make room for *cattle* farms. As a result, birds and animals lose their home and die. This *destruction* is also *bringing about changes* in the climate, air pollution, *flooding, drought and famine.* If we continue to *burn down and cut down the rainforests* as we are doing now, the earth will never be the same again.

Another big problem is *water pollution*. Do you like swimming in the sea or drinking a cool glass of water on a hot day? These simple pleasures may soon become a thing of the past. Factories are polluting our rivers and lakes with *dangerous chemicals*. Tons of *industrial and domestic waste* are poured into the sea. Consequently, sea life is *threatened with extinction*.

Air pollution is another *important issue*. The cars and factories in and around our cities are *giving off dangerous fumes*. In the past few years, more and more people than ever before have *developed allergies and breathing problems*. If we don't do something now, our cities will become impossible to live in.

Fortunately, it is not too late *to solve these problem*s. We have the time and even the technology to prepare the way for a better, cleaner and safer future. We can plant trees and *adopt animals*. We can *create parks for endangered species.* Together we can *save our planet.*

Tasks to Unit 27

Task 1. *Choose the right word.*

Rare plant and **human / animal** species are disappearing.

Birds and animals **lose / miss** their homes and die.

Factories are polluting our rivers and lakes with dangerous **oils / chemicals**.

Sea life is threatened with **extinction / loss**.

We can plant trees and **adopt / adapt** animals.

Task 2. *Find the match.*

drought	**a**. lack of food
contaminate	**b**. take in
famine	**c.** lack of rain
absorb	**d**. pollute
damage	**e**. harm

Task 3. *Finish the phrase using the following words.*

To be threatened, carbon, to become, endangered, to give off, breathing, to take, industrial/domestic, to fight, to develop

… waste	… dioxide	… a thing of the past	
… for survival	… fumes	… with extinction	
… allergies	… problems	… species	… action

Task 4. *Make the following sentences passive.*

1. Factories pollute our rivers and lakes.
2. The cars in our cities give off dangerous fumes.
3. A lot of people developed allergies.
4. The rainforests clean the air.
5. Oil tankers contaminated seas.
6. People repaired the damage.
7. We can plant trees.
8. They will adopt animals.
9. People create parks for endangered species.
10. We will save our planet.

Task 5. *Translate the verb "to pollute" using the right tense.*

* *завжди* забруднюють	* забруднювали *з червня до серпня 2009 р*
* *зараз* забруднюють	* будуть забруднювати *наступного року*
* забруднюють *з 2007 року*	* *збираються* забруднювати
* *вже* забруднили	* є забрудненими
* забруднювали *5 років тому*	* були забрудненими

Task 6. *Put the questions to the following sentences.*

1. It's our fault.
2. Birds and animals lose their home.
3. Factories are polluting our rivers and seas.
4. We have spent thousands of years fighting for our survival.
5. The earth will never be the same.

Unit 28. A Gloomy Picture

The *environment* is everything that surrounds and influences the character and growth of living things. *Ecological issues* can not be separated from *mankind*.

Population explosion. Today there are more than 6 billion people on the planet. Global population has doubled in the last 40 years. African nations are *expanding*

at the fastest rate. The *annual growth* is 3%. China is the most *populous country* in the world. Its population is expected to reach over 1.5 billion by 2050.

Famine is another great problem. Many people go to bed hungry every night. According to the United Nations report, 37% of people in India cannot buy food to feed their families. The UNO reports that in the developing countries people are *starving*, they cannot *satisfy the most basic needs* in life.

Pollution. For many people the most alarming problem is *contamination* of air, earth and water from *dumping*. Open sewage drains are common sites in many parts of the world. Children are *born deformed* and die of rare illnesses that are caused by dangerous chemicals. *Creatures* of sea also suffer from pollution. They may *pass* toxic chemicals. So, people are polluting *at the expense of their lives.*

Deforestation. The rapid *reduction of forest land* worries people. Forests *absorb carbon dioxide* from the air and *supply oxygen*. They are home to plants and *wonderful creatures.* They *provide people with fuel, food and shelter*. But instead of forests we have farms and industrial developments.

Extinction. Biological *diversity* is the variety of living organisms and their *habitats*. It is *under threat* now. Tropical *deforestation* is the main reason of the *crisis*, but the pollution of the rivers, lakes and oceans plays the important role. The *total number of species* is not known. Biologists *estimate* that there are between 5 and 30 million species, among them *insects, tiny sea creatures*, plants and animals. The *loss of a single species* can cause the *chain reaction*. Every species plays an important role in the *balance of nature*.

Global warming. Human activity is changing the *composition* of the atmosphere and the global climate. *Natural greenhouse* gas keeps *the Earth's surface* warm, but humans add new dangerous chemicals to the atmosphere. Carbon dioxide has increased for the last four decades from *burning fossil fuels, deforestation* and using aerosol sprays. Cars and factories *pour it into the atmosphere*. This greenhouse gas is *heating up the atmosphere* and is *thinning the upper level* of

the atmosphere, the *ozone layer.* For the past 250 years, humans *have been giving off* large amounts of CO2 and other *heat-trapping greenhouse gases* into the atmosphere by burning *coal, oil,* and natural gas in our power plants, motor vehicles, homes, and factories. The *buildup* of these gases has caused an increase in the earth's *average surface temperature*, and this global warming will continue to rise in the coming decades if we do not *reduce* the pollution.

Global warming means much more than hotter temperatures. Left unchecked, global warming will quickly *destroy* our planet's climate system, causing changes in average temperatures and *precipitation* patterns and *weather extremes* such as *heavy downpours*, storms, and *droughts*.

Tasks to Unit 28

Task 1. *Transcribe and translate the following words and word combinations.*

Surround, mankind, explosion, annual, satisfy, contamination, average, creatures, balance, activity, surface, pattern, burn, atmosphere, fuel.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

Annual growth, populous country, to starve, famine, pollution, contamination, fossil fuel, deforestation, pour into the atmosphere, habitat, reduce pollution, to destroy, precipitation, weather extremes, heavy downpours.

Task 3. *Complete the sentences and translate them.*

The environment is …

China is the most …

Children are born…

Creatures of sea also suffer …

In the developing countries people cannot satisfy ..

Forests absorb … and supply people with …

Human activity is changing …

The loss of a single species can cause …

Task 4. *Fill in the gaps.*

The environment (1) … the character and growth (2) … living things. Today the mankind faces a (3) … of problems. One (4) … them is deforestation. Forests (5) … a very important role, (6) … they provide people (7) … fuel and shelter. Due (8) … deforestation, many species (9)… their habitat. It may cause the (10)… reaction. Another problem is global (11) …. . The (12) … gas destroys the (13) … layer of the atmosphere. If we don't (14) … the pollution, global warming (15) … continue to rise. People have (16) … be more careful to biological diversity.

Unit 29. Recycling

When was the last time you walked down a *litter-free street*? Although millions of pounds are spent on *clearing rubbish*, this alone can not solve the problem. The solution lies in our hands. *Dropping litter* is against the law in Great Britain. You can *be fined* up to 10000 pounds. Litter is not only ugly, but also dangerous. Why is there so much litter? Most *consumer products* are over-packaged: they are wrapped in plastic, put in a box.

What can we do about the problem? Try *recycling paper* and plastic bottles. Never drop litter, even the smallest piece makes the problem worse. Avoid buying over-packaged things from supermarkets. Organize day-trips to the local countryside in order to pick up rubbish. If we are responsible for our clean cities, the problem may be solved.

Recycling has been a common practice for most of human history since 400 BC. During periods when *resources were scarce*, archaeological studies of *ancient waste dumps* show less *household waste* (such as ash, broken tools and pottery) because more waste was recycled in the absence of new material.

Recycling involves *processing used materials* into new products in order to prevent the waste of potentially useful materials, *reduce the consumption* of fresh *raw materials*, *reduce energy usage*, reduce air and water pollution by reducing

the need for "conventional" waste disposal, and lower *greenhouse gas emissions*. Recycling is a key component of modern waste management and is the third component of the "*Reduce, Reuse, Recycle*" hierarchy.

Recyclable materials include glass, paper, metal, textiles and plastics. Though similar, the composting of biodegradable waste – such as food or garden waste – is not typically considered recycling. These materials are brought to a collection centre and sorted, cleaned and reprocessed into new products necessary for manufacturing.

Keep Our City Clean

Environment and the activity of humans are closely connected. The more *thoughtless* people are to nature, the more *harm they bring*. As a result they have more health problems than our ancestors did. Nowadays people *suffer from allergies*, *heart attacks, cancer*. The *humanity* is worried about the state of environment.

Firstly, the problem of deforestation may bring the *lack of oxygen* as well as the extinction of the biological species. And this is only because people need wood for the industrial purposes.

Secondly, our common home, the Earth, is becoming more and more polluted because people do not take the problem of *recycling* very seriously.

Needless to say, everyone should be responsible for keeping the cities clean. Such simple steps as fines for throwing litter, arranging “clean-up days”, state control for the environment protection may be the solution to the problem.

Tasks to Unit 29

Task 1. *Transcribe and translate the following words and word combinations.*

Recycling, litter, rubbish, law, consumer, worse, resources, scarce, lack, typical.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

Litter-free street, solve the problem, consumer products, avoid, over-packaged,

to process used materials, raw materials, greenhouse gas emissions, lack of oxygen, to bring harm, needless to say.

Task 3. *Change the structure of the sentences.*

1. They started to recycle litter many centuries ago.

   …… for many centuries.

2. Manufacturers wrap a lot of consumer goods in plastic.

   A lot of consumer goods …

3. The teacher said to her pupils: “Never drop litter”.

   The teacher asked her pupils …

4. We recycle things, we save raw materials.

   The more things …

5. People process used materials because they want to reduce the waste.

   People … in order to ….

6. That’s a pity people don’t take the problem of recycling seriously.

   I wish …

7. It’s the responsibility of the residents to keep their cities clean.

   Residents should be …

8. We are not so healthy as our ancestors.

   Our ancestors were … than …

9. The state of the environment is worrying.

   We are …

10. Dropping litter is illegal in Great Britain.

    …. against …

Task 4. *The Litter Police*

A shop owner in a small village in England has come up with a clever way to stop kids from **(1) …** litter. Yvonne was fed up with seeing so **(2) …** litter around her village, so she decided to take matters into her own hands. When kids buy crisps, sweets and drinks from her shop, Yvonne writes their names on the packets. If

Yvonne **(3) …** any litter around the village, she picks it up and looks for a name on it, so she knows who's to blame. The "criminals" then get a penalty from Yvonne - she temporarily bans them from her shop or they **(4) …** to pick up litter around the village. Yvonne says, "It is a bit of education and it seems to be working. The whole village is a lot **(5) …** .

	A	**B**	**C**	**D**
1	drop	dropped	Drops	dropping
2	many	much	lots of	plenty of
3	spots	will spot	had spotted	spotted
4	send	are sending	are sent	will send
5	clean	cleaner	Cleanest	the cleanest

Unit 30. Ecotourism

Nowadays, many of us try to live in a way that will *damage the environment* as little as possible. We *recycle* our newspapers and bottles, we take public transport to get to work, we try to buy locally produced fruit and vegetables and we stopped using *aerosol sprays* long ago. That's why we choose the alternative form of tourism – ecotourism which is becoming more and more popular all over the world. There are many names for this form of tourism – *responsible tourism,* nature tourism, educational tourism. People agree that ecotourism must:

1) *conserve the wildlife* and culture of the area;
2) involve local community;
3) make a profit without *destroying natural resources*.

Tourists *stay in local houses* with local people, not in specially built hotels. So they experience the local culture and do not take energy and water away from local people. They travel on foot, by boat, bicycle or elephant so there is no *pollution.* And they have a special experience that they will remember all their lives. This type of tourism can only involve small numbers of people so it can be expensive. But you can use these principles wherever you are on holiday.

Learn the basic rules of ecotourism:

1. Learn about the place you are going to visit. Find out about its culture and its history. Learn a little of foreign language, at least basic phrases like “please” and “thank you”.

2. Wear clothes that will not *offend* people. Ask permission before you take a photo. Remember that you are a visitor. Stay in local hotels and eat in local restaurants, buy local food.

3. If the area doesn’t have much water, don’t take 2 showers a day. Remember the phrase: “Leave nothing behind you except your footprints and take nothing with you except photographs. *Take much care of* the places you visit. Don’t buy souvenirs made of *endangered animals* or plants. Walk or use *non-polluting* kinds of transport.

Don’t be afraid to ask the holiday company about what is “eco”. Remember that “eco” is very fashionable today and a lot of holidays that *are advertised* as ecotourism are not much better than traditional tourism. Before you get too enthusiastic, think about how you are going to get to your dream “eco” paradise. Flying is one of the *biggest sources of carbon dioxide* in the atmosphere. One *return flight* from London to Miami puts as much carbon dioxide into the atmosphere as the *average British car driver* produces during a year. So, you don’t have to fly long distances for your “eco” holiday. There are probably places of natural beauty and interest in your own country that you have never visited.

Tasks to Unit 30

Task 1*. Transcribe and translate the following words and word combinations.*

Damage, alternative, conserve, experience, phrases, permission, advertise,except.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

As little as possible, that’s why, all over the world, involve, make a profit, offend people, take much care of the places, ask permission, endangered animals, average car driver, fashionable, advertised, probably.

Task 3. *Put the word into the right form.*

Globalisation

It is no exaggeration to say that the world has become a …. village. Modern methods of ….. have made the world much smaller and the problems we face such as .... are not restricted to one country. The ..... of the rainforests in Brazil is everyone's problem and the .....which is common in many African countries is a challenge for Europe too. The .... of rare species is a tragedy for the planet as a whole, and the exhaustion of oil supplies will shake the ….. of the world's economy. The ..... of the environment is the responsibility of all nations, rich and poor. However, uncontrolled economic .... between strong and weak nations leads to the ..... of inequality between the rich and poor nations.	globe communicate pollute destroy starve extinct found protect compete create

Unit 31. Changing the Way We View Ecological Issues

Al Gore has been concerned with climate changes, or "*climate crisis*" as he calls it, for the majority of his political career. As the years have passed, he started travelling the world in order to educate people about the effects of global warming using computer slideshows. *Free of charge*, he explained to his audiences that the world *is facing* "*planetary emergency*" and that it is not too late to stop it if *appropriate action* is taken now.

During this time of touring and giving lectures Gore was noticed by Hollywood producer Laurie David, who asked to *turn his slideshow into a documentary* in which he would play the starring role. At first, Gore didn't agree, but David persuaded him. The result was a fascinating documentary giving *predictions about the future of our planet*. It concentrated on the terrifying *consequences of climate change.*

"Inconvenient Truth" certainly gives us much to think about. For example, is there a link between the *frequency of strong hurricanes* and *global warming*? Why was 2005 the hottest year ever recorded? Could whole cities such as San Francisco one day go under water due to *rising sea levels*?

At the same time as the *release of the film*, Gore published the book of the same title. It contained additional information and scientific analysis. The profits from both the film and the book are now *funding other campaigns* to spread the message about global warming. Schools are using the DVD to help them teach *awareness of environmental issues* to their students.

Although the film seems pessimistic, it ends on a positive note. It's not too late to solve this crisis. The author hopes that most people *accept the reality* and turn their knowledge into action. According to Gore, if we are clear about what the problem is, we can make changes in our daily lives, such as choosing the "*greenest" lights bulbs or cars*. He insists on *using biodiesel vehicles* and has decided to *become carbon neutral*, which means that he *reduces the amount of carbon dioxide* he produces every day.

Gore understands that people need a little more help when it comes to changing their habits. For this reason he has been working hard to encourage large shops to sell more *environmentally friendly* products. He believes that together people can change the world.

Tasks to Unit 31

Task 1. *Transcribe and translate the following words and word combinations.*

View, issue, majority, career, emergency, appropriate, persuade, inconvenient truth, certainly, frequency, hurricane, release, title, campaign, awareness, vehicle.

Task 2. *Give the Ukrainian equivalents to the words and word combinations.*

Climate crisis, free of charge, turn a slideshow into a documentary, play the starring role, give predictions, concentrate on the terrifying consequences of, rising sea levels, accept the reality, light bulb, encourage, for this reason.

Task 3. *Finish the phrase.*

Be concerned with …	Appropriate …	Publish the book of …
Majority of …	Be noticed by …	Contain additional …
Educate people about …	A fascinating …	Fund other campaigns to …
Free of …	A link between …	Teach awareness of …
Explain to …	Due to rising …	Insist on …
To face planetary …	The release of …	Reduce the amount of …
During the time of …	To solve …	Encourage shops to …

Task 4. *Answer the questions to the Text.*

1. What is Al Gore's purpose of travelling the world?
2. How did his slideshow become a documentary?
3. What does "Inconvenient truth" make us think about?
4. How did the book differ from the film?
5. How are the profits from both the film and the book used?
6. What are the ways of solving the crisis according to the author?

Task 5. *Choose the correct verb.*

rise – rose –risen	or	*raise – raised - raised*

1. The sun … in the East.
2. The sea level has … dramatically.
3. After the lecture he … and left the room.
4. The author … the problems of ecological issues in his film.
5. If you wish to ask a question, … your hands.

Література

1. Baxter Steve, Cook Terry. PTE. Pearson Test of English. Skills Booster. Level 2. Pearson Longman. 2016. 144 p.

2. Evans Virginia. Round-Up 5. Longman. 2014. 176 p.

3. Evans Virginia. Round-Up 6. 2014. 250 p.

4. Murphy Raymond. Essential Grammar in Use. Cambridge University Press.2010. 256 p.