

МІНІСТЕРСТВО ОСВІТИ І НАУКИ, МОЛОДІ ТА СПОРТУ УКРАЇНИ

НАЦІОНАЛЬНИЙ ПЕДАГОГІЧНИЙ УНІВЕРСИТЕТ
ІМЕНІ М. П. ДРАГОМАНОВА

АНГЛІЙСЬКА МОВА
ЗА ПРОФЕСІЙНИМ СПРЯМУВАННЯМ
ДЛЯ СТУДЕНТІВ ПРИРОДНИЧИХ СПЕЦІАЛЬНОСТЕЙ

AMAZING BIOLOGY
First Steps into Science

Навчальний посібник



МІНІСТЕРСТВО ОСВІТИ І НАУКИ, МОЛОДІ ТА СПОРТУ УКРАЇНИ

**НАЦІОНАЛЬНИЙ ПЕДАГОГІЧНИЙ УНІВЕРСИТЕТ
ІМЕНІ М. П. ДРАГОМАНОВА**

**АНГЛІЙСЬКА МОВА ЗА ПРОФЕСІЙНИМ
СПРЯМУВАННЯМ
ДЛЯ СТУДЕНТІВ ПРИРОДНИЧИХ
СПЕЦІАЛЬНОСТЕЙ**

**AMAZING BIOLOGY
First Steps into Science**

Навчальний посібник

КИЇВ 2012

УДК 57.011-054.6

Розглянуто
на засіданні кафедри
іноземних мов
Інституту природничо-географічної
освіти і екології
Протокол № 3 від 22 листопада 2011 р.

Затверджено
Вченою Радою
Інституту природничо-географічної
освіти і екології
Протокол № 3 від 30 листопада 2011 р.

Рецензенти:

завідувач кафедри іноземних мов Інституту природничо-географічної освіти і екології
Національного педагогічного університету ім. М. П. Драгоманова,
к.п.н., доц. Турчинова Г.В.

завідувач кафедри іноземних мов факультету МЕіМ ДВНЗ «Київський національний
економічний університет ім. Вадима Гетьмана»,
к.ф.н., доц. Шевченко О.Л.

Укладачі: викл. Запара В. М., Рудницька К. М.

Запара В. М., Рудницька К. М.

Англійська мова за професійним спрямуванням для студентів природничих спеціальностей. AMAZING BIOLOGY First Steps into Science. Навчальний посібник. – К: Національний педагогічний університет імені М.П.Драгоманова, 2012 – 52 с.

Навчальний посібник “Біологія” призначений для вивчення англійської мови за професійним спрямуванням студентами I та II курсів природничих спеціальностей.

Завдання розроблені з урахуванням комунікативних потреб майбутніх спеціалістів з біології.

Посібник забезпечує формування мовленнєвої компетенції, допомагає засвоїти фахову термінологію, активізувати вміння практично застосовувати набуті знання.

Посібник рекомендовано до вивчення як в аудиторії, так і самостійно.

УДК 57.011-054.6

**Робота виконана за рахунок університету.
Продажу не підлягає!**

© Національний педагогічний університет
імені М.П.Драгоманова, 2012

© Запара В. М., Рудницька К. М., 2012

ПЕРЕДМОВА

Навчальний посібник для роботи над текстами за фахом “Біологія” призначений для вивчення англійської мови студентами I та II курсів природничих спеціальностей.

Методична розробка складена згідно з вимогами навчальної програми з іноземних мов для підготовки бакалаврів з біології і охоплює базовий лексичний мінімум.

Мета даної розробки – розвиток навичок розуміння й аналізу наукових текстів з основних проблем біології, уміння вести бесіду, брати участь у дискусіях англійською мовою, формувати соціально-комунікативну позицію фахівця в галузі природничих наук.

Збірник складається з 16 розділів, кожний з яких містить окрему проблему – тему і включає автентичні тексти із зарубіжної наукової літератури. До текстів пропонуються лексичні вправи та завдання на розвиток мовленнєвих вмінь та навичок в ситуаціях реального спілкування. Це вправи на тлумачення окремих фахових термінів, на переклад з рідної мови на англійську і навпаки. В кінці кожної теми пропонуються різні творчі завдання, спрямовані на закріплення вивченого матеріалу.

Рекомендується для опрацювання студентами як в аудиторії, так і самостійно.

CONTENTS

Foreword	
Unit 1. Biology and Related Sciences.....	5
Unit 2. Biology. My Studies at the University.....	9
Unit 3. Biology. Its Origin and History.....	12
Unit 4. Plants and Animals around Us.....	17
Unit 5. Biology as a Science.....	21
Unit 6. Botany as a Science	23
Unit 7. Zoology as a Science	25
Unit 8. Anatomy as a Science	27
Unit 9. Plants.....	29
Unit 10. Tissue systems and plant organs.....	31
Unit 11. Animals. Part I.....	33
Unit 12. Animals. Part II.....	35
Unit 13. Humans. The Skeleton. The Muscles.....	37
Unit 14. Humans. Respiration.....	40
Unit 15. Humans. Digestion. Foods.....	43
Unit 16. Humans. The Nervous System.....	46
Final Credit Test.....	49

UNIT 1

I. Practice the following for pronunciation:

science ['saɪəns]	discover [dɪ'skʌvə(r)]
scientific [ˌsaɪən'tɪfɪk]	control [kən'trəʊl]
biology [baɪ'ɒlədʒi]	diversity [daɪ'vɜː(r)səti]
biological [ˌbaɪə'lɒdʒɪk(ə)l]	function ['fʌŋkʃ(ə)n]
biologist [baɪ'ɒlədʒɪst]	mankind [mæn'kaɪnd]
guide [gaɪd]	knowledge ['nɒlɪdʒ]
contribution [ˌkɒntrɪ'bjuːʃ(ə)n]	healthy ['helθi]
increase [ɪn'kriːs]	method ['meθəd]
supply [sə'plai]	vaccine ['væksiːn]
variety [və'raɪəti]	penicillin [ˌpenə'sɪlɪn]
disease [dɪ'ziːz]	sulpha ['sʌlfə]
life [laɪf]	digest [daɪ'dʒest]
circulate ['sɜː(r)kjʊleɪt]	blood [blʌd]

II. Translate the following words paying attention to the affixes:

Biology (n), biologist (n), biological (adj.), function (n), functional (adj.); life (n), live (v), living (adj.), nonliving (adj.); health (n), healthy (adj.); inform(v), information (n); solve (v), solution (n); science (n), scientific (adj.); develop (v), development (n); variety (n), vary (v); discover (v), discovery (n); prevent (v), prevention (n); produce (v), product (n), production (n); circle (n), circulate (v), circulation (n).

III. Match the word combinations in column A with their equivalents in column B:

A		B	
1.	to study life in all its diversity	a.	методи профілактики та лікування хвороб
2.	the diversity of living things	b.	підтримувати здоров'я
3.	to give information	c.	перетравлювати їжу
4.	food supply	d.	здійснювати вплив на людство
5.	mysteries of life	e.	вирішення проблем
6.	to affect mankind	f.	виявити причини захворювання
7.	knowledge of biology	g.	надавати інформацію
8.	solution of problems	h.	харчовий запас
9.	scientific methods of investigation	i.	циркуляція крові
10.	varieties of plants and animals	j.	зробити (великий) внесок у (науку)
11.	methods of prevention and cure of diseases	k.	таємниці життя
12.	to digest food	l.	вивчати життя у всій його різноманітності
13.	to discover the causes of diseases	m.	різновиди рослин і тварин
14.	to make a (great) contribution to (science)	n.	наукові методи дослідження
15.	blood circulation	o.	різноманітність живих організмів
16.	to keep healthy	p.	знання з біології

IV. State the tenses used in the following sentences:

1. I am studying biology. 2. Students of the biological department study different subjects. 3. Biologists have solved many mysteries of the body. 4. They began to investigate this problem last year. 5. What branches of biology will you study in the third course? 6. He has been working at this problem for a year and a half. 7. They were discussing this problem when we came. 8. She will be going to Kyiv at this time tomorrow. 9. After they had performed an experiment on the monkey they came to the conclusion that they had been right in their assumption. 10. What brunch of biology are you going to choose for your future specialization? 11. He never stopped to admire the beauties of nature. He used to spend hours watching an insect moving on a stem, leaf or flower of a plant. 12. Don't worry! He will have come by that time. 13. They had been working at the laboratory for two years when the first results of the experiments appeared. 14. I am sure they will have been working in the laboratory for hours to get the results they need.

V. Put the verbs in brackets into a proper tense form:

1. Due to the discovery of the moss *Sphagnum* and the vaccine made of it biologists (to save) millions of lives during World War II. 2. Louis Pasteur (to discover) the causes of such a disease as smallpox. 3. The discovery of viruses at the beginning of the 20th century (to lead) to a solution of many medical and biological problems. 4. With the invention of the microscope biology (to give) scientists a lot of information about unicellular living things. 7. Scientists (to do) their best to increase our food supply. 8. The invention of the microscope (to help) to discover many mysteries of life. 9. Biology (to study) life in all its diversity.

VI. Read the text:

The Science of Life

Biology is the science of life. It studies life in all its diversity. Biology tells us about our body: how it is constructed and how it functions. It gives us information about other living things, and how their lives affect mankind. Knowledge of biology will help you to keep healthy. It will be your guide in solving many of everyday living and scientific problems.

Biologists have made a great contribution to science. They have increased our food supply. They have developed new and better varieties of plants and animals. Scientific methods of farming have given us much more food.

Biologists control many diseases. They have saved millions of lives by discovering the causes of these diseases and methods of their prevention and cure. Vaccines, penicillin and sulphur are products of the biological laboratory. Biologists have solved many mysteries of the body. They have discovered how blood circulates, how food is digested and many other secrets of life. They are now working in different fields of biology and their studies may lead to a solution of many problems.

VII. Which of the following headlines goes with the content of the text better? Give a good reason for your choice:

1. Biology and the living world.
2. Biology and our everyday life.
3. Biology and the subject of its study.
4. Biology and its services to mankind.

VIII. Match a line in A with a line in B to define the branches of biology and relative sciences:

A		B		
1.	Agriculture	is the study	a.	and development of new medicines and drugs on the basis of biochemical investigations.
2.	Anatomy		b.	discovering the causes of diseases and methods of their prevention and cure.
3.	Breeding		c.	of how a living body is constructed.
4.	Medicine		d.	of scientific methods of farming.
5.	Pharmaceutical chemistry		e.	of how a living body is functions.
6.	Physiology		f.	developing new and better varieties of plants and animals.

IX. Fill in the blanks with the words from the text:

1. Biologists study life in all its
2. Biology gives us information about other...things.
3. The life of other living things ... mankind.
4. Biologists have made a great ... to natural sciences.
5. Biologists have increased our food
6. They have ... new and better varieties of plants and
7. Scientific methods of ... have given us much more food.
8. Biologists ... of many diseases.
9. Biologists have discovered and developed the methods of ... and ... of many diseases.

X. Fill in the blanks with proper prepositions:

1. Vaccines, penicillin and sulpha are products ... the biological laboratory.
2. Many ... life have been discovered ... biologists.
3. Biologists are working ...different fields ... this science.
4. The studies ... biologists lead ...a solution ... many problems.
5. Biology studies life ...all its diversity.
6. It gives us information ...other living things.
7. Biologists have made a great contribution ...natural sciences.
8. Biologists have saved millions of lives ... discovering the causes ... these diseases.

XI. Using the text, give the equivalents to the following word combinations:

секрети життя, берегти здоров'я, вирішувати наукові проблеми, робити внесок у науку, повсякденні проблеми, виводити нові та кращі різновиди рослин і тварин, контролювати хвороби, методи землеробства, спасти мільйони життів, причини захворювання, працювати в різних галузях біології, привести до рішення проблем.

XII. Retell the text according to the following plan:

- a) the subject matter of biology;
- b) branches of biology and relative sciences;
- c) its contribution to sciences and its services to mankind.

XIII. Translate the text without a dictionary:

Biology is a science of living organisms. It is concerned with their nature, functions, reproduction, and place in their environment. It is rooted in physics and chemistry and many of its interpretations are made in terms of these sciences and of mathematics. It is bound closely with geology and meteorology, and applications of its principles are found in anthropology, psychology, sociology, agriculture, medicine, industry, and indeed, in everyday living. Inasmuch as one of its ultimate aims is thorough understanding of living organisms including a man, biology is entitled to be called the most vital of the sciences.

UNIT 2

I. Match the word combinations in column A with their equivalents in column B:

A		B	
1.	social sciences	a.	стати членом наукового гуртка/клубу
2.	to have an opportunity (to do smth.)	b.	вступати в аспірантуру
3.	a modern well-equipped research laboratory	c.	мати нахил до наукової роботи
4.	the problem under investigation	d.	суспільні науки
5.	to get acquainted with (the basic laws of biology)	e.	отримувати знання
6.	to lecture in a subject	f.	проблема, що досліджується
7.	to attend lectures on (physics ...)	g.	сучасна, гарно оснащена науково-дослідна лабораторія
8.	narrow specialization	h.	мати можливість (зробити щось)
9.	a specialized course in (biochemistry)	i.	випускник біологічного факультету
10.	to choose a branch of biology as one's future speciality	j.	відвідувати лекції з (фізики ...)
11.	to join a scientific circle/club	k.	вузька спеціалізація
12.	to acquire knowledge	l.	спецкурс з (біохімії)
13.	a graduate of the biological faculty	m.	читати лекції з предмету
14.	to have a bent for (research work)	n.	вибрати галузь біології, як свою майбутню спеціальність
15.	to apply for a post-graduate course	o.	ознайомитися з основними законами біології

II. Which of these branches of biology do you take a special interest in and why?

Biophysics, biochemistry, botany, microbiology, zoology, physiology of man and animals, physiology of plants, genetics.

III. Put the verb "to be" into a proper tense form:

1. Vaccines, penicillin and sulphamides (to be) products of the biological laboratory. 2. Elementary training in general biology (to be) essential for every educated person. 3. Medicine, physiology, agriculture and forestry (to be) the fields of knowledge requiring elementary training in general biology. 4. In external appearance plants (to be) usually green. 5. The aim of his experiments (to be) to learn more about how the body adapts to weightlessness.

IV. State the tense and voice used in the following sentences:

1. Such functions as sensation, motion, food-taking and respiration are called life functions. 2. To find this out hundreds of guesses were made, thousands of experiments staged. 3. We call sciences studying nature natural sciences. 4. Botany is the scientific study of plants. 5. With the invention of the microscope scientists saw things that had been hidden before. 6. In certain parts of the tropics the arrival of the rainy season has stimulated growth of plants. 7. A lot of investigations have been conducted in this field. 8. No important animal phylum will be restricted to these environments. 9. Almost all the main branches of the animal kingdom are represented in the ocean. 10. Carbon dioxide is constantly being moved from place to place so as to be available everywhere.

V. Use the passive voice in the following sentences:

Example: *Biology gives a lot of information about different living things.*

A lot of information about different living things is given by biology.

1. The life of other living things affects mankind. 2. Biologists have increased our food supply. 3. They have developed new and better varieties of plants and animals. 4. Scientific methods of farming have given us much more food. 5. Biologists control many diseases. 6. They have saved millions of lives. 7. Biologists have discovered and developed the methods of prevention and cure of many diseases. 8. Biologists have solved many mysteries of the human body. 9. Biologists have discovered how blood circulates.

VI. Translate the following sentences into Ukrainian paying attention to the meaning of each modal verb:

1. Some animals can exist under the immense pressure of the deep seas. 2. They are at the University now but they are to meet here. 3. The crop yields are to be increased this year. 4. He has to translate a new article so he will have to work the whole evening. 5. You must read this book. 6. He has to read this book. 7. You should read this book. 8. You are to read this book. 9. You ought to read this book. 10. We have to develop new varieties of plants. 11. We had to adapt the plants to new conditions. 12. We shall have to create suitable conditions for this experiment. 13. Our teacher is to be here at 9 o'clock. 14. This plant has to be treated with cold. 15. These fruits are to be crossed. 16. You ought to plant these seeds in spring. 17. Green plants are so common that you may never stop to think how wonderful and how important they are. 18. The "Beagle" was to make a voyage around the world. 19. He had to learn poetry instead of collecting plants. 20. The giant seaweeds may be more than 100 feet long. 21. The fungi have no chlorophyll. They must get their food from other plants and animals.

VII. Read the text:

My Department

I am a student of the biological department. Our department is one of the largest at the University. We study different subjects: Botany, Anatomy, Microbiology and many others. Besides these subjects we study some social sciences and English. We study English to be able to read scientific books on biology and discuss biological problems.

There are many departments at our Institute: of botany, of zoology, of microbiology, of physiology of man and animals, of physiology of plants, of genetics, and of soil science. Besides, there are research laboratories. Every student has an opportunity to work in modern well-equipped laboratories, where different problems of biology are under investigation.

Students get acquainted with all branches of biology. They are lectured in various subjects of Natural Sciences, namely botany, zoology, anatomy, microbiology, biophysics, biochemistry, genetics and soil science.

During the first two years they attend lectures on chemistry, physics and some subjects of Natural Sciences and foreign languages. In the third year more narrow specialization begins. They have several specialized courses and additional practical and research work in the subject they have chosen as their future speciality. Besides attending lectures they may join some scientific circles and choose a problem to work on according to their bents. All of them know that biology is the science of glorious past and great future. They do their best to acquire as much knowledge as possible.

Graduates of the biological department are assigned to work at laboratories, schools and research institutes. Those who have a bent for research work may apply for a post-graduate course of study.

VIII. Speaking people ask each other different types of questions. The following schemes can help you to compose your questions correctly:

Model 1. A general question.

Do you study English?

1. You are a student of the biological department. 2. The department is one of the largest at the University. 3. You study different subjects. 4. You study English. 5. Botany is one of the largest departments of the Institute. 6. Every student has an opportunity to work in a laboratory. 7. Laboratories are modern and well-equipped. 8. Students can join any scientific club at the faculty. 9. You can choose a problem to work on.

Model 2. An alternative question.

Do you study English or French?

1. You are a student of the biological department (chemistry). 2. You study only biology (social sciences too). 3. You study English (French). 4. You are lectured only in biological sciences (relative sciences too). 5. You attend lectures on subjects of Natural Sciences only (the Humanities too). 6. More narrow specialization begins in the third year (first year). 7. You can choose a problem to work at on your own (your teacher does it). 8. You have a bent for research work (you prefer to work at school as a teacher of biology).

Model 3. A special question.

Where do you study English?

1. You are a student of ... department. 2. You study ... social sciences. 3. You study ... language. 4. You are lectured in ... sciences. 5. You attend lectures on ... subjects. 6. More narrow specialization begins in ... year. 7. You can choose a problem to work at 8. You prefer to work where ...

IX. Work in pairs. Ask your partner:

- if he studies at the biological or chemical department;
- if the biological department is the largest at the University;
- if he studies biochemistry;
- if there are many departments at his Institute;
- if he gets acquainted with all branches of biology;
- if he attends lectures on microbiology;
- when narrow specialization begins;
- what specialized course he has;
- if he can choose a problem to work on according to his bents.

X. Act out the following situations:

a) you meet a foreign student. Tell him about your studies at the University.

b) a group of students have come to NPU on an exchange visit. They would like to interview you about your life and studies at the University.

UNIT 3

I. Practice the following for pronunciation:

kind [kaɪnd]	classification [ˌklæsɪfɪˈkeɪʃ(ə)n]
provide [prəˈvaɪd]	estimate ['estɪmənt]
include [ɪnˈkluːd]	clothing ['kləʊðɪŋ]
pierce [pɪə(r)s]	easy ['iːzi]
describe [dɪ'skraɪb]	

II. Translate the following words paying attention to the affixes:

Estimate (v), estimation (n); provide (v), providence (n); provident (adj.); include (v), exclude (v); describe (v), description (n); classify (v), classification (n); feed (v), food (n).

III. Translate the following word combinations into Ukrainian:

to live and grow inside the body, to keep track of animals, to learn about the living, a system of classification, life depends on...

IV. Put the verb "to be" into a proper tense form:

1. There (to be) many special fields of knowledge and many phases and principles to which elementary training in general biology essential. 2. There (to be) plants which have no apparent blossoms. 3. Among animals there (to be) a great variety of sizes, shapes and colours. 4. There (to be) a system of classification to keep track of this great number of living things. 5. At the dawn of civilization there (to be) only a few sciences. 6. There (to be) places where there (to be) no pronounced seasonal variation in temperature. 7. There (to be) few localities where there (to be) no animal life. 8. There (to be) very few bioluminescent animals in caves. 9. In nature there (to be) rarely too much oxygen for animal life. 10. There (to be) forms that can reduce their oxygen requirements.

V. Put the verbs in brackets into a proper tense form:

1. No one (to know) how many different kinds of plants and animals there are. 2. Some scientists (to estimate) the number of plants and animals as three million. 3. There (to be) some plants and animals that (to pierce) our skin. 4. Some animals (to feed) on the blood of living things. 5. There (to be) many other living things living and growing inside our bodies. 6. By the present time we (to learn) much about all the living things around us. 7. A system of classification (to be set up).

VI. In the sentences below change the Passive constructions into Active ones:

Example: *Many secrets of life have been discovered by biologists.*
Biologists have discovered many secrets of life.

1. Many secrets of life have been discovered by biologists. 2. Up to the present time it was named and described more than 840 000 kinds of animals and 345 000 kinds of plants. 3. A system of classification has been set up. 4. Plants and animals are sorted into groups according to their structure. 5. The only light in all this darkness is made by animals themselves. 6. One more method of discovering the presence of that illness has been found. 7. A lot of different kinds of plants and animals have been studied, identified and named.

VII. In the sentences below change the Active constructions into Passive ones:

Example: *Some scientists estimate the number of plants and animals as three million.*
The number of plants and animals is estimated as three million.

1. Some scientists estimate the number of plants and animals as three million.
2. Many of the plants provide us with food, clothing, shelter and medicines.
3. Some plants and animals can pierce our skin.
4. Certain plants and animals can cause diseases.
5. Scientists study living things with great care.
6. We have learned much about all the living around us.

VIII. Translate the following sentences into Ukrainian:

1. Some mistakes **must have been made** in choosing the methods of investigation. Chalk is made of the shells of little animals. They **must have been** tiny things, for you can only see the shells with a very strong glass.
3. The process of decay of some plants **must have been** very gradual and constant.
4. More **might have been said** about how some of the important advances in biochemistry have been made.
5. The discussion of the previous section **must have been made** it clear that in order to understand the problem of life in general, we must look for the solution in the structure and properties of the living cells.
6. There is actually no reason why this experiment **could not have been performed** by this assistant.
7. What seems easy to us now **might not have been** so many years ago.

IX. Make up word combinations using the words below:

Example A: *to live, matter -----living matter*

1. To compose, elements.
2. To grow, plants.
3. To reproduce, animals.
4. To direct, center.
5. To control, animals.
6. To appear, fruits.
7. To surprise, capacities of protoplasm.
8. To separate, membrane.
9. To form, cells.
10. To divide, nucleus.
11. To function, organs.
12. To convince, facts.

Example B: *to consider, problems ----- considered problems*

1. To test, facts.
2. to examine, parts of plants.
3. To remain, elements.
4. To absorb, water.
5. To digest and to assimilate, foods.
6. To control, animals.
7. To know, data.
8. To disclose, characteristics.
9. To conduct, investigation.
10. To grow, plants.
11. To convert, substances.
12. To dissolve, salts.
13. To suspend, substances.

X. Complete the sentences making up Participle constructions from the word combinations given below:

Example A:

Scientists/to classify these organisms differently...

1. Scientists (classifying these organisms differently) refer them to different kingdoms.
2. Scientists (having classified these organisms differently) refer them to different kingdoms.

- 1) scientists/to investigate these problems;
- 2) lungs/to carry out the function of respiration;
- 3) plants/to perform the function of photosynthesis;
- 4) a group of young scientists/to conduct investigations in the field;
- 5) the student/to examine a tiny piece of a plant under the microscope;
- 6) these experiments/to surprise everybody;
- 7) these characteristics/to change in a new generation of the plants;
- 8) substances/to permeate through the openings in the membrane;
- 9) the cell wall/to

encase the protoplasm; 10) the discovery of the cell/to play an important role; 11) the cell membrane to protect the cell against injury.

Example B:

plants to be grouped according to their structure ...

1. Plants (grouped according to their structure) form a gender.
2. Plants (being grouped according to their structure) form a gender.

1) problems/to be investigated by scientists; 2) respiration/to be carried out by lungs; 3) photosynthesis/to be performed by plants; 4) metabolic wastes and excretory products/to be ejected from the cell; 5) the cytoplasm/to be moved to another part of the cell; 6) the nutritive substances/to be passed through the membrane; 7) the green tissue of leaves/to be exposed to light; 8) the foods/to be manufactured by plants; 9) inorganic substances/to be converted in plants into organic ones; 10) mineral salts/to be dissolved in water; 11) water/to be left in the cell.

XI. Use Participle constructions in the sentences below:

Example A:

All the plants which are grown in this region require fertilizers.

All the plants grown in this region require fertilizers.

Example B:

There are living things which live and grow inside our bodies.

There are living things living and grow inside our bodies.

Example C:

A system of classification has been set up. It sorts plants and animals according to their structure.

A system of classification has been set up sorting plants and animals according to their structure.

Example D:

When he conducted his experiments he tried different approaches to the problem.

Conducting his experiments he tried different approaches to the problem.

1. Medicine, physiology and agriculture are fields of knowledge which require elementary training in general biology. 2. There are plants which have no apparent blossoms. 3. Plants have a cell wall which is actually non-living in chemical nature. 4. If some bacteria live and grow inside our bodies they may cause diseases. 5. Some bacteria live and grow inside our bodies and cause diseases. 6. At the conference they discussed the kinds of observations which have been made. 7. We must select the varieties which are being grown for storage. 8. Camels can live in dessert for two or three weeks and eat only dry food and drink no water.

XII. Read the text:

Plants and Animals

No one knows how many different kinds of plants and animals there are. Some scientists estimate the number of three million. Many of the plants provide us with food, clothing, shelter and medicines. Some, (including several kinds of insects) pierce our skin and feed on the blood. Some of living things even live and grow inside our bodies. In this way they may cause diseases. You can see why scientists study living things with great care. Our lives may depend on how we have learned about the living around us. Because there are so many different kinds of plants and animals, the task of a biologist is not easy one. Up to the present time it was named and described more than 840 000 kinds of animals and 345 000 kinds of plants. To keep track of this great number a system of kingdom classification has been set up. Plants and animals are sorted into groups according to

the way they are built. For example, the tiger, the leopard, and the lion will be all grouped together. All of them belong to the cat family. All the members of cat family, in turn, belong to a larger group that includes such meat-eating animals as the dog, the bear. They have teeth that are built for tearing and cutting flesh. Their sharp claws help them to capture and eat their prey. In this way, all plants and animals were classified according to their structure. All living plants and animals were divided in two kingdoms: the animal kingdom and the plant kingdom.

Among the smallest and simplest living things there are some that are difficult to classify. They are tiny plant-like cells that can swim about actively in the water. In some cases, the classification of these is still in doubt.

XIII. Find in the text English equivalents to the following Ukrainian words and phrases:

основні завдання біологів, різні види рослин і тварин, бути причиною хвороби, велика кількість живих організмів, вивчати живі організми; відносити(ся) до сімейства (кошачих), у свою чергу, піймати і з'їсти свою здобич, таким чином, у деяких випадках.

XIV. Fill in the blanks with the words from the text:

1. ... bacteria may live inside our bodies. 2. They may ... different diseases. 3. Our lives may ... on how we have learned about the living around us. 4. Scientists study living things with great
5. Up to the ... scientists have named and described a great number of plants and animals.
6. Scientists of a great number of living things. 7. Scientists have ... a system of classification. 8. Plants and animals are ... into groups ... to their structure.

XV. Fill in the blanks with proper prepositions:

1. The life of plants and animals depends ... many factors. 2. Plant cells have been studied ... great care. 3. Even ... the present time scientists discover unknown living things. 4. It is not easy to keep track ... animals in the wild.

XVI. Work in pairs. Ask your partner about:

- the usual colour of plants;
- the flowers that plants usually have;
- the size and shape of plants;
- the difference between plants and animals;
- the main likenesses between plants and animals;
- how some scientists estimate the number of plants and animals;
- things plants and animals provide us with;
- things plants and animals feed on;
- diseases plants and animals may cause;
- the problems which scientists face now and why they face these problems;
- how many plants and animals scientists have named and described;
- reasons which caused the system of classification;
- reasons which make it difficult to keep track of animals;
- the principles according to which plants and animals are classified.

XVII. Classify the following words and fill the table:

vaccine, skin, medicine, flowers, living things, horticulture, man blood, hygiene, animals, cell, farming, penicillin, organ, agriculture, insects, secrets of life, forestry sanitation, plants, sulphur, physiology.

Medicine	Living things	Sciences connected with biology	Structure of the body

UNIT 4

IX. Practice the following for pronunciation:

special ['speʃ(ə)l]	protoplasm ['prəʊtəplæz(ə)m]
condition [kən'dɪʃ(ə)n]	material [mə'tɪəriəl]
desert ['dezə*ɪ]	microscopic [maɪkrə'skɒpɪk]
mountain ['maʊntɪn]	basic ['beɪsɪk]
oxygen ['ɒksɪdʒ(ə)n]	property ['prɒpə*ti]
important [ɪm'pɔ: *t(ə)nt]	botany ['bɒt(ə)ni]
assimilation [ə,sɪmɪ'leɪʃ(ə)n]	zoology [zu'ɒlədʒi]
growth [grəʊθ]	pressure ['preʃə]
reproduction [,rɪ:prə'dʌkʃ(ə)n]	likeness ['laɪknəs]
temperature ['tempərɪtʃə*]	conscious ['kɒnʃəs]
substance ['sʌbstəns]	respiration [,respə'reɪʃ(ə)n]

II. Translate the following words paying attention to the affixes:

Subdivision (n), subdivide (v); define (v), definition (n); exist (v), existence (n); press (v), pressure (n); deep (adj), depth (n); certain (adj), certainly (adv); necessary (adj), necessity (n), necessitate (v); sense (n), sensitive (adj); resemble (v), resemblance (n); proper (adj), properly (adv), property (n); respire (v), respiration (n); assimilate (v), assimilation (n); reproduce (v), reproduction (n); conscious (adj), consciousness (n); fundamental (adj), fundamentally (adv).

III. Match the word combinations in column A with their equivalents in column B:

A		B	
1.	to include facts/principles	a.	жити під високим тиском (води)
2.	in spite of difficult condition	b.	загальні властивості
3.	to live under immense pressure of (water)	c.	мікроскопічна одиниця
4.	important points of resemblance	d.	включати факти/властивості
5.	general properties	e.	помірна кількість тепла
6.	a microscopic unit	f.	важливі риси (особливості) подібності
7.	to take place in the same manner	g.	незважаючи на важкі умови
8.	Moderate amount of heat	h.	протікати (відбуватися) таким же чином

IV. Use the verb "to be" in the sentences below:

1. Biology (to be) the science of living things. 2. The special study of plants called botany (to be) one of the two great subdivisions of the science biology. 3. The living substance of plants and animals (to be) organized into protoplasm. 4. Protoplasm (to be) the basic material of all living systems. 5. The general properties of protoplasm (to be) fundamentally the same in each system, both in plants and animals. 6. Processes common to both plants and animals (to be) respiration, digestion, assimilation, growth and reproduction. 7. They (to be) both of different shapes, sizes and colours. 8. The differences between plants and animals (to be) more apparent than likenesses. 9. Only three of these differences (to be) important.

V. Statements given below are false. Make them true using negative forms. Add new facts to each statement if you can:

1. Scientists know how many different kinds of plants and animals there are. 2. There is some fundamental difference between plant and animal life. 3. Plants are conscious. 4. Plants can move about. 5. This method fits all the areas from which we are going to gain information. 6. There is protoplasm in lifeless matter. 7. Scientists know everything about the fundamental chemical and physical organization of protoplasm.

VI. Put the verbs in brackets into a proper tense form:

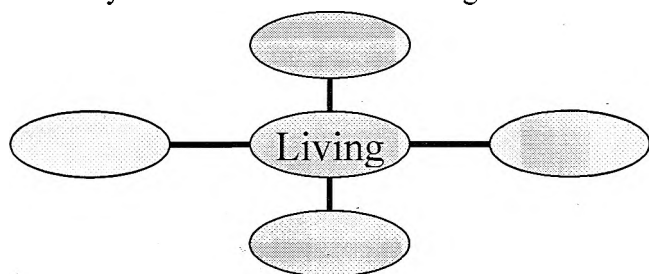
1. The word "biology" (to come) from the Greek words "bio"=life and "logos"=study. 2. Biology (to include) all the facts and principles which have been derived from the scientific study of living things. 3. Life (to exist) in many places in the earth. 4. In the Arctic region the temperature sometimes (to fall) to degrees below zero. 5. In desert the temperature sometimes (to climb) to 120 degrees above zero. 6. Some animals (to live) under the immense pressure of the deep seas. 7. These animals (to live) near the tops of the highest mountains. 8. Certain vital processes (to take) place in plant bodies in the same manner as in animal bodies.

VII. Translate the following. Pay attention to the use of tenses in the "if" and "when" sentences:

1. If the secondary roots outgrow the primary ones, they will give rise to the fibrous root system. 2. If the plant is eaten by an animal, the plant tissues will be digested and carbon atom will be absorbed and assimilated into the body of animals. 3. If the dead body of the plant or animal decays, the carbon atom will be involved in the process of decomposition and return to the atmosphere in a molecule of carbon dioxide. 4. If the plant or animal becomes buried in a peat bog, the carbon atom will become an atom of coal in time. 5. When the coal is burned, the carbon atom will again return to the atmosphere. 6. If living things have access to this or that place and if they find the necessary conditions for their existence there, they will invade it. 7. If you are going to proceed to a new stage of your experiment, there is no time like the present. 8. If water is withdrawn from protoplasm, it will suspend its functions. 9. If water contains salt in such concentration that no osmosis takes place, this water is the most favourable medium for animal life. 10. If water is isotonic with protoplasm, it will be the most favourable medium for animal life. 11. Osmosis doesn't take place between the cell and its surroundings if both contain pure water.

VIII. It is useful to record words which are associated in networks because it can help you to remember them. You can do this in the form of diagram:

What do you associate the word "living" with:



IX. Read the text to find out the details of the conditions living organisms live in and the vital processes taking place inside them.

The Origin of Biology

Biology is the science of living things. The word "biology" comes from the Greek words "bio"=life and "logos"=study. Biology includes all the facts and principles which have been derived from the scientific study of living things. The special study of plants, called Botany, and animals, called Zoology, are the two great subdivisions of the science biology. Plants and animals are called organisms, so biology may also be defined as the science of organisms.

Life exists in many places on the earth, often in spite of very difficult conditions. In the Arctic region the temperature may fall to degrees below zero, while in deserts it may climb over 120 degrees. Some animals live under the immense pressure of the deep seas and other live near the tops of the highest mountains. Let us see what these are: living things need oxygen, living things must have the right amount of pressure, living things must have water, living things need the proper temperature, living things must have food.

Most people think that plants are not alive in the same sense that animals are, or that there is some fundamental difference between plant and animal life. But this is not so. Plants and animals have much in common. There more important points or resemblance are: 1). The living substance of plants and animals is organized into protoplasm. Protoplasm is the basic material of all living systems and its general properties are fundamentally the same in each system both in plants and animals. 2). The living matter is organized in both plants and animals into microscopic units called cells. 3). Certain vital processes take place in plant bodies in the same manner as in animal bodies. These processes are respiration, digestion, assimilation, growth and reproduction. 4). Both plants and animals cannot live without water, air, food, light, and moderate amount of heat.

They both are of different shapes, sizes and colours. In fact, the differences are not so many as the likenesses although they are more apparent, for only three are important, namely: plants are not conscious, they are unable to move about, but they make their own food.

X. Make up five sentences with the word combinations of exercise III.

XI. Use the Passive in the following sentences:

1. Biology includes all the facts and principles derived from a scientific study of living things.
2. Some animals endure the immense pressure of the deep seas. 3. Living things require oxygen.
4. Living things require proper temperature. 5. Plants make their own food.

XII. Translate the following sentences into Ukrainian. Follow the example:

Example:

A man is an organism subject to the same laws of nature as all other higher animals.	Людина — це організм, який підкоряється тим самим законам природи, що і всі вищі тварини.
--	---

1. A man is an organism subject to the same laws of nature as all other higher animals. 2. Some living things including several kinds of insects pierce our skin and feed on the blood. 3. The special study of plants called botany is one of the two great subdivisions of the science biology. 4. The living matter is organized in both plants and animals into microscopic units called cells.
5. Processes common to both plants and animals are respiration, digestion, assimilation, growth and reproduction.

XIII. Test yourself. Give the English equivalence for the following word combinations:

наука про живі організми, основний розділ, падати нижче нуля, глибокі моря, вершини гір, не має значення, визначені необхідні умови, мати потребу в кисні, рівень тиску, відповідна температура, жива речовина, певні життєві процеси, відмінності і подібності.

XIV. Report the following questions, beginning with "Tell me please":

1. What language does the word "biology" come from?
2. What are the two greatest subdivisions of the science biology? What do they study?
3. What physical factors do living things require for their existence?
4. What extreme conditions can living things live on?
5. Is living matter organized into microscopic units called cells?
6. Why is protoplasm considered to be the basic material of all living systems?
7. What are the general properties?
8. What vital processes take place inside the cell?
9. Is there fundamental and apparent difference between plant and animal life?
10. How do plants and animals differ in appearance?
11. What do plants and animals have in common?

XV. Retell the text, using the following phrases:

to come from, in spite of, to be derived from, Arctic region, to fall to, to climb to, to live under the pressure of (the deep seas), to live near the tops of mountains, no matter (where/what), proper temperature, in the (same) sense, fundamental difference between, to have (much, little, nothing) in common, general properties, vital processes, moderate amount of heat, to be of different shapes, sizes and colours.

XVI. Discuss with your fellow student likenesses and differences of plant and animal life, mentioning facts and examples other than those used in the text.

UNIT 5

BIOLOGY

Biology is the science of life. The English zoologist Thomas Henry Huxley, who was also an important educator, insisted that the conventional segregation of zoology and botany was intellectually meaningless because scientists now realize that many lower organisms are neither plants nor animals. Today biology is subdivided into hierarchies based on the molecule, the cell, the organism, and the population.

Molecular biology is the branch of biology which spans biophysics and biochemistry. Much is now known about the structure and action of nucleic acids and protein, the key molecules of all living matter. The discovery of the mechanism of heredity was a major breakthrough in modern science. Another important advance was in understanding how molecules conduct metabolism, that is, how they process the energy needed to sustain life.

Cellular biology is closely linked with molecular biology. To understand the functions of the cell — the basic structural unit of living matter — cell biologists study its components on the molecular level. Organismal biology, in turn, is related to cellular biology, because the life functions of multicellular organisms are governed by the activities and interactions of their cellular components. The study of organisms includes their growth and development (developmental biology) and how they function (physiology). Particularly important are investigations of the brain and nervous system (neurophysiology) and animal behavior (ethology).

Population genetics, the study of gene changes in populations, and ecology, the study of populations in their natural habitats, have been established subject areas since the 1930s. These two fields were combined in the 1960s to form a rapidly developing new discipline often called, simply, population biology.

Biology also includes the study of humans at the molecular, cellular, and organismal levels.

Vocabulary. Transcribe and memorize:

Hierarchy, interaction, nucleic acid, brain, protein, behavior, matter, genetics, heredity, human, metabolism, habitat, cell, multicellular.

I. Translate into English:

1. Біологія вивчає живі організми на рівні клітин, молекул, організмів і популяцій.
2. Нуклеїнові кислоти і білок — найважливіші молекули, що входять до складу живих організмів.
3. Біологи вивчають компоненти клітини на рівні молекули, щоб з'ясувати функції клітини.
4. Біологія організмів вивчає ріст, розвиток і фізіологію організмів.
5. Біологія популяції включає генетику популяції і екологію.

II. Answer the questions:

1. What did Thomas Huxley suggest? How did he explain his suggestion?
2. What the most important advances were made in recent years?
3. What is metabolism?
4. Give the definition of the word "cell".
5. How is organismal biology connected with cellular biology?
6. What does population genetics study?

7. What levels does the study of humans include?

III. Give the main idea of the text: say 1-2 sentences for each passage.

IV. Explain in English the following terms:

Habitat, living organisms, genes, molecule, segregation, matter.

V. Write down 4 types of questions to each sentence:

1. Molecular biology is the branch of biology which spans biophysics and biochemistry.
2. Population genetics and ecology have been established subject areas since the 1930s.
3. The study of organisms includes their growth and development.
4. Population biology was formed as a new discipline in the 1960s.
5. Cellular biology is closely linked with molecular biology.

VI. Make the summary of the text (in writing).

VII. Retell the text.

UNIT 6

Read the text about botany. Find the passage which contains the information about the nomenclature and division of plants. Read and translate the passage.

BOTANY

Botany is the branch of biology concerned with the study of plants. Plants are now defined as multicellular organisms that carry out photosynthesis. Organisms that had previously been called plants, however, such as bacteria, algae, and fungi continue to be the province of botany, because of their historical connection with the discipline and their many similarities to true plants. Botany is concerned with all aspects of the study of plants, from the smallest and simplest forms to the largest and most complex, from the study of all aspects of an individual plant to the complex interactions of all the different members of a complicated botanical community of plants with their environment and with animals.

Gross observations and experiments on photosynthesis and the movement of water in plants can be made without knowledge of their structure, but explanations of these phenomena require knowledge of morphology — the study and interpretation of plant form, development, and life histories — and of anatomy — the study of plant tissues and their origin and relations to one another.

Such observations were important not only in the development of plant physiology and anatomy but also in the understanding of genetics, the science of heredity, and of evolution. In the 19th century the Austrian botanist Gregor Mendel worked out the basic principles of genetics. His hybridization experiments required a knowledge of the function of the various parts of the flower in reproduction, and this knowledge was derived from the experiments of the Dutch botanist Rudolph Jacob Camerarius, who established the nature of sexual reproduction in plants. Mendel's experiments went unnoticed; in the meantime, Charles Darwin founded the theory of evolution (which in modern form depends on the principles of genetics) without knowledge of Mendel's work. Darwin observed variation and changes in organisms through time, and Mendel worked out the laws governing the assortment and recombination of different traits. The source of differences and changes became known due to the Dutch botanist Hugo Marie de Vries.

Knowledge of anatomy, genetics and evolution has greatly advanced plant classification by providing a rational basis for this subdivision of botany. The 17th-century British naturalist John Ray divided plants into nonflowering and flowering types, and flowering plants into dicots and monocots. The 18th-century Swedish botanist Carolus Linnaeus, however, provided the framework on which modern classifications are based and, just as important, a simplified system of nomenclature in which each plant is given two names: the first the name of the genus and the second the name of the species.

Botany does not depend on the fossil record for information concerning evolution and classification as much as does zoology, because the record for plants is much less complete than that for animals. Botanists — those engaged in the study of plants — occupy themselves with a broad range of activities. Many botanists are in academic positions that involve both teaching and research duties. The latter may involve laboratory work or field studies. Strictly speaking, botany is a pure science concerned with investigating the basic nature of plants.

Vocabulary. Transcribe and memorize:

Plant, photosynthesis, bacteria, algae (alga), fungi (fungus), tissue, flower, reproduction, trait, flowering/ nonflowering, dicots/ monocots, species, to investigate, to concern, to involve, to observe, to work out.

I. Answer the questions:

1. Give the definition of plants.
2. What organisms were previously included in the kingdom of plants?
3. Speak about each of them in short.
4. Speak about the sphere of study of botany.
5. What knowledge does the explanation of photosynthesis require?
6. Speak about the great botanists and their contribution.
7. Speak about the kind of work botanists do.

II. Write down 4 types of questions to each sentence:

1. Botany is concerned with all aspects of the study of plants.
2. In the 19th century the Austrian botanist G. Mendel worked out the basic principles of genetics.
3. Botanists are engaged in the study of plants.
4. Charles Darwin founded the theory of evolution without knowledge of Mendel's work.
5. Knowledge of anatomy, genetics, evolution has greatly advanced plant classification.

III. Translate into English:

1. Ботаніка – розділ біології, що вивчає рослини, гриби і водорості (їх будову, життєдіяльність, географічне поширення, класифікацію тощо).
2. В середині 18 ст. Карл Лінней першим зробив спробу класифікації рослин та розробив штучну систему, розподіливши рослинний світ на 24 класи.
3. Садівництво, сільське господарство і лісівництво також є галузями ботаніки.
4. Винахід мікроскопа створив умови для розвитку анатомії, клітинної біології.
5. В 1856-66 р.р. Грегор Мендель провів свої знамениті дослідження, що сприяли розвитку нової науки – генетики.
6. Біологія також вивчає структуру, розвиток і розміщення на земній кулі рослинних угруповань.

IV. Explain in English the following terms:

Species, genetics, anatomy, evolution, reproduction.

V. Give the main idea of the text: say 1-3 sentences for each passage.

VI. Make the summary of the text (in writing).

VII. Retell the text.

UNIT 7

ZOOLOGY

Zoology is the branch of biology devoted to the study of the animal kingdom.

The study of zoology can be viewed as a series of efforts to analyze and classify animals. Aristotle was the first to devise a system of classifying animals that recognized a basic unity of plants among diverse organisms; he arranged groups of animals according to mode of reproduction and habitat. He noted that general structures appear before specialized ones, and he also distinguished between asexual and sexual reproduction.

Until the Middle Ages, zoology was a conglomeration of folklore, superstition, misconception, and descriptions of animals, but during the 12th century it began to emerge as a science. The anatomical studies of Leonardo da Vinci were far in advance of the age. His dissections and comparisons of the structure of humans and other animals led him to important conclusions. He noted, for example, that the arrangement of joints and bones in the leg is similar in both horses and humans, thus grasping the concept of homology (the similarity of corresponding parts in different kinds of animals, suggesting a common grouping).

Contemporary zoological studies have two main focuses: on particular taxonomic groups, and on the structures and processes common to most of them.

Taxonomically oriented studies concentrate on the different divisions of animal life. Invertebrate zoology deals with multicellular animals without backbones; its subdivisions include entomology (the study of insects) and malacology (the study of mollusks). Vertebrate zoology, the study of animals with backbones, is divided into ichthyology (fish), herpetology (amphibians and reptiles), ornithology (birds), and mammalogy (mammals). Paleontology, the study of fossils, is subdivided by taxonomic groups. In each of these fields, researchers investigate the classification, distribution, life cycle, and evolutionary history of the particular animal or group of animals under study.

Morphology, the study of structure, includes gross morphology, which examines entire structures or systems, such as muscles or bones; histology, which examines body tissues; and cytology, which focuses on cells and their components. Physiology is the study of function.

Animal behavioral studies developed along two lines: animal psychology, concentrated on laboratory techniques such as conditioning, and ethology, that has its origins in observations of animals under natural conditions.

The study of the interactions between animals and their environment is known as ecology.

Vocabulary. Transcribe and memorize:

Kingdom, to classify, dissection, conclusion (to conclude), joint, backbone, bone, leg, muscles, horse, vertebrate/ invertebrate, insect, reptile, amphibian, mammal, life cycle.

I. Answer the questions:

1. What can you say about Aristotle's suggestion of animal classification?
2. Do you know any modern classifications? Speak about it.
3. What was zoology until the Middle Ages?
4. What contribution and in what way did da Vinci make?
5. What focuses do modern zoological studies include?
6. What are the two main branches of zoology?
7. What do paleontologists study?
8. Speak about the subdivisions of morphology.
9. What is the difference between animal physiology and ethology?
10. What do ecologists study?

II. Translate into English:

1. Зоологія – це біологічна дисципліна, що вивчає навколишній світ тварин та їх взаємозв'язки з навколишнім середовищем.
2. Засновник етології Конрад Лоренц називав етологію “морфологією” поведінки тварин.
3. Ентомологи вивчають комах, що є корисними або шкідливими для людини (наприклад, павуки, скорпіони, кліщі).
4. Теріологія (маммологія, ссавцезнавство) – це наука про ссавців. Сама людина належить до класу ссавців.
5. Герпетологія – це наука про плазунів та амфібій. Пізніше до неї увійшла батрахологія (наука про земноводних).
6. Орнітологи проводять свої дослідження різними способами: найпростіший — спостереження (birdwatching), а також методом кільцювання птахів (ringing).

III. Give the main idea of the text: say 3 sentences for each passage.

IV. Explain in English the following terms:

Morphology, structure, reproduction, taxonomy, mammals, fossils.

V. Write down 4 types of questions to each sentence:

1. During the 12th century zoology began to emerge as a science.
2. Zoology is the branch of biology devoted to the study of the animal kingdom.
3. The study of zoology can be viewed as a series of efforts to analyze and classify animals.
4. The anatomical studies of Leonardo da Vinci were far in advance of the age.
5. The study of the interactions between animals and their environment is known as ecology.

VI. Make the summary of the text (in writing).

VII. Retell the text.

UNIT 8

Read the text about anatomy. Find the passage which contains the brief overview of the development of anatomy. Read and translate the passage

ANATOMY

Anatomy (from the Greek *anatomiā* - to cut up, cut open) is a branch of biology and medicine that is the consideration of the structure of living things. It is a general term that includes human anatomy, animal anatomy and plant anatomy.

The history of anatomy has been characterized, over time, by a continually developing understanding of the functions of organs and structures in the body. Methods have also improved dramatically, advancing from examination of animals through dissection of cadavers (dead human bodies) to technologically complex techniques developed in the 20th century including X-ray, ultrasound, and MRI imaging.

Human anatomy is primarily the scientific study of the morphology of the adult human body.

Generally, students of certain biological sciences, paramedics, physiotherapists, nurses, and medical students learn gross anatomy and microscopic anatomy from anatomical models, skeletons, textbooks, diagrams, photographs, lectures and tutorials. The study of microscopic anatomy (or histology) can be aided by practical experience examining histological preparations (or slides) under a microscope; and in addition, medical students generally also learn gross anatomy with practical experience of dissection and inspection of cadavers.

Human anatomy, physiology and biochemistry are complementary basic medical sciences, which are generally taught to medical students in their first year at medical school. Human anatomy can be taught regionally or systemically; that is, respectively, studying anatomy by bodily regions such as the head and chest, or studying by specific systems, such as the nervous or respiratory systems. A thorough working knowledge of anatomy is required by all medical doctors, especially surgeons, and doctors working in some diagnostic specialities, such as histopathology and radiology.

Vocabulary. Transcribe and memorize:

Medicine, cadaver, X-ray, ultrasound, adult, skeleton, histology, chest, respiratory system, surgeon.

I. Answer the questions.

1. What does the term "anatomy" mean?
2. What has the history of anatomy been characterized by?
3. Speak about methods of investigation used in anatomy.
4. What is human anatomy?
5. What do students of certain biological sciences learn?
6. Which are complementary basic medical sciences?
7. How can human anatomy be taught?

II. Ask 7 questions to the text. Let your groupmates answer them.

III. Write down 4 types of questions to each sentence:

1. Human anatomy is primarily the scientific study of the morphology of the adult human body.
2. Zoology is a general term that includes human anatomy, animal anatomy and plant anatomy.

3. Human anatomy, physiology and biochemistry are complementary basic medical sciences, which are generally taught to medical students in their first year at medical school.
4. A thorough working knowledge of anatomy is required by all medical doctors, especially surgeons, and doctors working in some diagnostic specialities, such as histopathology and radiology.

IV. Explain in English the following terms:

Human anatomy, physiology, biochemistry, medicine, dissection.

V. Translate into English:

1. Анатомія людини – це розділ анатомії, що вивчає органи та системи органів людського тіла.
2. Видатними представниками грецької медицини та анатомії були Гіпократ, Аристотель.
3. Французький природодослідник Жан Батист Ламарк у своєму творі “Філософія зоології” одним із перших висловив ідею еволюції організму під впливом навколишнього середовища.
4. Учень Платона Аристотель зробив першу спробу порівняння тіла тварин і вивчення зародка і став зачинателем порівняльної анатомії і ембріології.
5. Скелет людини – це тверда структура, утворена сукупністю кісток, яка служить опорою людського тіла.
6. При народженні скелет людини містить близько 270 кісток; до досягнення дорослого віку кількість кісток зменшується приблизно до 206.

VI. Render the whole text.

VII. Retell the text.

UNIT 9

Read the text about plants. Find the passage which contains the information about the division into phyla. Read and translate the passage.

PLANTS

Plant is any member of the plant kingdom comprising about 260,000 known species of mosses, liverworts, ferns, herbaceous and woody plants, bushes, vines, trees, and various other forms that mantle the Earth and are also found in its waters. Plants range in size and complexity from small, nonvascular mosses, which depend on direct contact with surface water, to giant sequoia trees, which can draw water and minerals through their vascular systems to elevations of more than 100m.

Plants are multicellular eukaryotes. They differ from other eukaryotes because their cells are enclosed by more or less rigid cell walls composed primarily of cellulose. The most important characteristic of plants is their ability to photosynthesize. During photosynthesis, plants make their own food by converting light energy into chemical energy — a process carried out in the green cellular organelles called chloroplasts. A few plants have lost their chlorophyll and have become saprophytes or parasites — that is, they absorb their food from dead organic matter or living organic matter, respectively.

Fungi, also eukaryotic and long considered members of the plant kingdom, have now been placed in a separate kingdom because they lack chlorophyll and plastids and because their rigid cell walls contain chitin rather than cellulose.

The various groups of algae were also formerly placed in the plant kingdom because many are eukaryotic and because most have rigid cell walls and carry out photosynthesis. Nonetheless, because of the variety of pigment types, cell wall types, and physical attributes found in the algae, they are now recognized as part of two separate kingdoms, containing a diversity of plantlike and other organisms that are not necessarily closely related.

The members of the animal kingdom differ from the plants in deriving nutrition from other organic matter; by ingesting food rather than absorbing it, as in the fungi; by lacking rigid cell walls; and, usually, by having sensory capabilities and being motile, at least at some stage.

Many species of organisms in the plant kingdom are divided into several phyla. The bryophytes are a diverse assemblage of three phyla of nonvascular plants that includes the mosses, liverworts, and hornworts. The other phyla are collectively termed vascular plants, or tracheophytes. There are two types of vascular tissue: xylem, which conducts water and minerals from the ground to stems and leaves, and phloem, which conducts food produced in the leaves to the stems, roots, and storage and reproductive organs. Besides the presence of vascular tissue, tracheophytes contrast with bryophytes in that tracheophyte leafy plants are the asexual, or spore-producing, generation of their life cycle.

Vocabulary. Transcribe and memorize the following words:

Moss, liverwort, bush, vine, tree, vascular/ nonvascular, eukaryotes/ prokaryotes, cellulose, organelle, saprophyte, chitin, nutrition, to ingest, to absorb, to lack, motile, phyla, bryophytes, tracheophytes, xylem, phloem, root, stem, leaf.

I. Answer the questions:

1. What is plant?
2. What is the main characteristic of plant?
3. Why is photosynthesis very important for plants?
4. Have all plants ability to photosynthesize?
5. Why have fungi been placed in a separate kingdom?
6. How many phyla are there in the plant kingdom?

II. Explain in English the following terms:

Plant, fungi, algae, photosynthesize, phyla.

III. Write down 4 types of questions to each sentence:

1. Plant is any member of the plant kingdom.
2. The most important feature of plants is their ability to photosynthesize.
3. Many species of organisms in the plant kingdom are divided into several phyla.
4. The members of the animal kingdom differ from the plants.
5. There are two types of vascular tissue.

IV. Translate into English:

1. Царство рослин включає мохи, папороті, трави, кущі, дерева та інші форми.
2. Важливою характеристикою рослин є фотосинтез.
3. Деякі рослини живляться за рахунок інших організмів.
4. Гриби відносять до царства рослин.
5. Рослина живиться за рахунок перетворення енергії світла в хімічну енергію.
6. Багато видів організмів в царстві рослин поділяються на декілька типів.
7. До царства рослин входять різні групи водоростей, так як вони мають тверді стінки клітини і здійснюють фотосинтез.

V. Draw a scheme according to the task that you choose. You should do it with your own hands. It must be simple, understandable and contain explanatory drawings.

- plant classification;
- the classification into kingdoms and domains;
- nomenclature.

VI. Give the main idea of the text.

VII. Retell the text.

UNIT 10

Read the text about plant tissue systems and plant organs. Find the passage which contains the description of a stem and its functions. Read and translate the passage.

TISSUE SYSTEMS AND PLANT ORGANS

There are many variants of the generalized plant cell and its parts. Similar kinds of cells are organized into structural and functional units, or tissues. Three tissue systems are recognized in vascular plants: dermal, vascular, and ground (or fundamental).

The dermal system consists of the epidermis, or outermost layer, of the plant body. It forms the skin of the plant, covering the leaves, flowers, roots, fruits, and seeds. The epidermis may contain stomata, openings through which gases are exchanged with the atmosphere. The epidermis is covered with a waxy coating called the cuticle, which functions as a waterproofing layer and thus reduces water loss from the plant surface through evaporation. The vascular tissue system consists of two kinds of conducting tissues: the xylem, responsible for conduction of water and dissolved mineral nutrients, and the phloem, responsible for conduction of food. The xylem also stores food and helps support the plant. The ground, or fundamental, tissue systems of plants consist of three types of tissue. The first called parenchyma. The cells of parenchyma tissue carry out many specialized physiological functions — for example, photosynthesis, storage, secretion, and wound healing. Collenchyma functions as support tissue in young, growing portions of plants. Sclerenchyma tissue is important in supporting and strengthening those portions of plants that have finished growing.

The body of a vascular plant is organized into three general kinds of organs: roots, stems, and leaves.

The function of roots is to anchor the plant to its substrate and to absorb water and minerals. Thus, roots are generally found underground and grow downward, or in the direction of gravity. Unlike stems, they have no leaves or nodes. Some roots are important food and storage organs — for example, beets, carrots, and radishes.

Stems usually are above ground, grow upward, and bear leaves, which are attached in a regular pattern at nodes along the stem. Stems are more variable in external appearance and internal structure than are roots. Stems increase in diameter through the activity of lateral meristems, which produce the bark and wood in woody plants. The bark serves as a protective outer covering, preventing damage and water loss. Within the plant kingdom there are many modifications of the basic stem, such as the thorns of hawthorns. Many plants have reduced leaves or no leaves at all. Some stems creep along the surface of the ground other stems are borne underground and serve as food-storage organs.

The leaf is the primary photosynthetic organ of most plants. Many specialized forms of leaves occur. Some are modified as spines, which help protect plants from predators. Insectivorous plants possess leaves that trap and digest insects. Some leaves are brightly colored to attract pollinators. Perhaps the most highly modified leaves are flowers themselves. The individual parts of flowers — carpels, stamens, petals, and sepals — are all modified leaves that have taken on reproductive functions.

Vocabulary. Transcribe and memorize the following words:

Ground tissue system, seed, fruit, stomata, to exchange, layer, to reduce, evaporation, nutrients, to store, parenchyma, to carry out, underground (adv.), carrot, radish, beet, meristem, bark, protective, to prevent, thorn, to creep, to serve as, spine, insect, pollinator, carpel, stamen, petal, sepal.

I. Answer the questions:

1. What tissue systems do you know?
2. What is the dermal system?
3. What is the vascular tissue system?
4. What is the ground tissue system?
5. What are the organs of a vascular plant?
6. Can you name the function of roots? What is it?
7. What is the stem?
8. What forms of leaves do you know?

I. Explain in English the following terms:

Tissue system, parenchyma, collenchyma, sclerenchyma, root, stem, leaf.

III. Write down 4 types of questions to each sentence:

1. Three tissue systems are recognized in vascular plants: dermal, vascular, and ground.
2. The dermal system consists of the epidermis of the plant body.
3. The cells of parenchyma tissue carry out many specialized physiological functions.
4. The body of a vascular plant is organized into three general kinds of organs: roots, stems, and leaves.
5. Stems are more variable in external appearance and internal structure than are roots.

IV. Translate into English:

1. Розрізняють три типи тканин у судинних рослинах: зовнішня, судинна, основна.
2. Епідерміс – зовнішній шар тіла рослини, який вкриває листя, квіти, коріння, фрукти та насіння.
3. Тіло рослини має три основні органи: корінь, стебло, листя.
4. Корінь – це важливий орган для живлення і зберігання поживних речовин.
5. Стебло відрізняється від кореня зовнішнім виглядом та внутрішньою будовою.
6. Листя – це головний орган фотосинтезу рослини.
7. Квітка має такі органи: плодолистик, тичинку, пелюстки, чашолистки.

V. Draw a scheme according to the task that you choose:

- tissue system of a plant organ;
- the structure of a plant organ;
- the diversity of plant organs;
- the structure of a plant.

VI. Give the main idea of the text.

VII. Retell the text.

UNIT 11

Read the text about animals. Find the passage which contains the information about the kind of food animals eat and the way they get it. Read and translate the passage.

ANIMALS. PART I

Animals are multicellular organisms that obtain energy by eating food. They live in a vast range of habitats, from deserts and Arctic tundra to the deep-sea floor.

Like all living things, animals show similarities and differences that enable them to be classified into groups. Birds, for example, are the only animals that have feathers, while mammals are the only ones that have fur. Animals are also classified according to other characteristics, including their internal anatomy, patterns of development, and genetic makeup. Scientists divide the animal kingdom into approximately 30 groups, each called a phylum.

One phylum of animals, the chordates, has been more intensively studied than has any other, because it comprises nearly all the world's largest and most familiar animals as well as humans. This phylum includes mammals, birds, reptiles, amphibians, and fish together with a collection of lesser-known organisms. Some invertebrate phyla contain relatively few species. Vertebrates are customarily divided into cold-blooded (an animal whose temperature is dictated by its surroundings) and warm-blooded animals (is one that keeps its body at a constant warm temperature by generating internal heat).

Few parts of Earth's surface are entirely devoid of animal life. Animals cannot survive in places where water is unavailable or permanently frozen, or where temperatures regularly exceed 55° C. However, in all habitats that lie between these extremes, animal life abounds. In the seas and oceans, the greatest diversity of animal life is found in habitats close to shores. On land, animal habitats are strongly influenced by climate, the combination of precipitation and temperature conditions experienced in a region. For land animals, the most testing habitats are ones that experience intense drought or extreme cold.

Animals all feed on organic matter, but their diets and way of obtaining food vary enormously. Some animals are omnivores, meaning that they are capable of surviving on a very wide range of foods. Many other animals have extremely precise requirements and cannot deviate from their highly specialized diet. In general, animals eat plants, other animals, or the remains of living things. Plant-eaters, or herbivores, often do not have to search far to find things to eat, and in some cases — for example wood-boring insects — they are entirely surrounded by their food. But plant food can be difficult to digest and is often low in nutrients. Carnivores live on flesh from other animals that is often nutrient-rich and easy to digest but difficult to obtain. Finding and capturing this kind of food calls for keen senses. Some mammalian predators increase their chances of success by hunting in groups. Some position themselves in a suitable location and wait for their prey to come within striking distance. In predatory animals, teeth or other mouthparts often play a part in catching and subduing food as well as in preparing it for digestion.

Wherever they live, animals need oxygen in order to survive. By breathing, or respiring, they extract oxygen from their surroundings and dispose of carbon dioxide waste. Very small animals do not need any special adaptations for obtaining oxygen. Oxygen simply diffuses in through their body surface, with carbon dioxide travelling out the same way. To obtain sufficient oxygen, large animals have to boost their oxygen intake by using special respiratory organs. In water, many animals breathe by using gills.

Vocabulary. Transcribe and memorize the following words:

To obtain, habitat, desert, tundra, bird, feather, fur, internal anatomy, chordates, to comprise, reptile, amphibian, fish, invertebrates/ vertebrates, cold-blooded, warm-blooded, to abound, diversity, climate, precipitation, condition, drought, carnivores/ omnivores/ herbivores, keen senses, predator, prey, to hunt, teeth, to subdue, to breathe, gills, to extract, to dispose.

I. Answer the questions:

1. What are animals?
2. What are the main characteristics of animal classification?
3. How many phylum of the animal kingdom do scientists name?
4. What does the phylum chordates include?
5. Where can animals survive?
6. What do animals eat?
7. How can animals breathe?

II. Explain in English the following terms:

Anatomy, chordates, vertebrates, amphibian, birds.

III. Write down 4 types of questions to each sentence:

1. Animals live in a vast range of habitats, from deserts and Arctic tundra to the deep-sea floor.
2. Scientists divide the animal kingdom into approximately 30 groups.
3. Animals all feed on organic matter.
4. Animals need oxygen in order to survive.
5. In the seas and oceans, the greatest diversity of animal life is found in habitats close to shores.

IV. Translate into English:

1. Тварини – багатоклітинні організми, які отримують енергію з їжі.
2. Як усі живі організми, тварини мають подібні і відмінні риси.
3. Вчені виділяють у класифікації тварин 30 типів.
4. Хребетні тварини поділяються на теплокровних та холоднокровних.
5. Тварини живляться рослинами, іншими тваринами або залишками живих організмів.
6. На землі є місця, де тварини не можуть існувати.
7. Деякі види тварин об'єднуються у зграї для захисту від ворогів.

V. Give each passage a title, say 1-3 sentences to each passage.

VI. Retell the text.

UNIT 12

Read the text about animals. Find the passage which contains the information about the defensive models of animals. read and translate the passage.

ANIMALS. PART II

All animals can move parts of their bodies. Many simple animals move with the help of microscopic hairlike structures called cilia. Another form of creeping movement, seen in earthworms, involves changes in body shape.

Jointed limbs are found in only two groups of animals: the arthropods and vertebrates. Many animals can glide, but only insects, birds, and bats are capable of powered flight.

Like all living things, animals have limited life spans. Although individual animals eventually die, reproduction ensures that they hand on their characteristics to future generations. Animal reproduction takes two overall forms. In the first form, called asexual reproduction, animals produce offspring without needing a partner. A second and much more common form of reproduction, sexual reproduction, involves two parents. The parents produce sperm and egg cells (gametes), which are brought together to form a fertilized cell (zygote) with a new and unique combination of genes.

Asexual reproduction is relatively easy to achieve because it involves only a single animal. Sexual reproduction is much more complex because the partners often have to find each other and precisely coordinate their reproductive behavior.

In the living world, resources such as food and space are limited. As a result, survival is a constant struggle. Through evolution, animals have developed a range of adaptations that give them the best chances of success. The need to eat exposes animals to the danger of being attacked and eaten themselves. To avoid this fate, all animals have physical adaptations that enable them to escape being attacked or to survive an attack once it is underway. The simplest form of defense is a rapid escape. Many plant-eating mammals depend on this strategy for survival and must maintain a constant lookout for danger. A less-demanding survival strategy, found in many small animals such as insects, involves deception. These animals use camouflage to blend in with their backgrounds, or they mimic inedible objects such as twigs or bird droppings. A more sophisticated form of mimicry occurs in animals that resemble species that are poisonous. An alternative defense, seen in a wide range of animals, uses armor or spines to fend off an attack (hard shells, overlapping scales, bands of hardened plates).

Many forms of behavior help animals to survive severe environmental conditions. Two examples are hibernation, which enables animals to survive cold and food shortages in winter; and aestivation, which allows animals to survive drought and heat in summer. Special forms of behavior also help animals to find food, to avoid being eaten, and to protect their young. One of the most advanced forms of this behavior is the use of tools. More rarely, some tool-using animals seek out a particular object and then shape it so that it can be used. Defensive behavior is exhibited by individual animals and also by animal groups. Group defense is common in herding mammals, which form a protective ring around their calves when threatened by wolves. Individual defensive behavior is often based on threatening gestures that make an animal look larger or more dangerous than it actually is. Sometimes it involves some highly specialized forms of deception. One of the most remarkable is playing dead.

Vocabulary. Transcribe and memorize the following words:

Locomotion, cilia, earthworm, anthropoids, bat, zygote, to attack, to avoid, to defense, to escape, deception, camouflage, mimic, inedible, poisonous, armor, scales, shell, hibernation, aestivation, herding, to threaten.

I. Answer the questions:

1. How can animals move?
2. What forms of animal reproduction do you know? Describe them.
3. What physical adaptations help animals to survive?
4. What forms of behavior enable animals to survive?
5. What is camouflage?

II. Explain in English the following terms:

Locomotion, cilia, camouflage, aestivation, hibernation.

III. Write down 4 types of questions to each sentence:

1. All animals can move parts of their bodies.
2. Only insects, birds, and bats are capable of powered flight.
3. Animal reproduction takes two overall forms.
4. Many forms of behavior help animals to survive severe environmental conditions.
5. Defensive behavior is exhibited by individual animals and also by animal groups.

IV. Give the feminine of the following nouns:

Gander, ram, bull, stag, tiger, lion, cock, boar, drake, stallion.

V. Give the masculine of the following nouns:

Mare, ewe, goose, tigress, hen, cow, doe, lioness, sow, sheep.

VI. Translate into English:

1. Усі тварини можуть рухати частинами свого тіла.
2. Як і всі живі організми, тварини живуть певний проміжок часу.
3. Впродовж еволюції у тварин розвинулися певні пристосування, що допомагають їм виживати.
4. Багато тварин використовують для захисту камуфляж.
5. Певні форми поведінки допомагають тваринам знаходити їжу, врятуватися від нападу та захистити своє потомство.
6. Існує дві форми розмноження тварин.
7. Щоб пережити посуху і спеку тварини впадають у «літню сплячку».

VII. Give each passage a title, say 1-3 sentences to each passage.

VIII. Retell the text.

UNIT 13

Read the text about the skeleton and the muscular system of a human body. Find the passage which contains the information about the bones forming the upper part of a body. Read and translate the passage.

HUMANS

Part I: The Skeleton and the Muscles

The human body is separable into the head, the trunk and the limbs. In the head the skull is distinguishable from the face. The trunk includes the chest (thorax) and the abdomen. Of the limbs there are two pairs - the upper (arms), consisting of the upper arm, the forearm, the wrist and the fingers, and the lower limbs (legs), including the thigh, the leg and the toes.

The bones form the skeleton of the body. The most important part of the skeleton is the backbone. The bones which form the skeleton or bony framework of the body include the bones of the head, the bones of the trunk, the bones of the lower and upper limbs. The bones of the head include the bones which make up the skull and freely movable bone which forms our lower jaw. The bones of the trunk include the spinal column, the ribs and the breastbone. The arms join the body at the shoulder, which consists of two bones - the collar-bone in front, and the shoulder-blade behind. Between the shoulder and the elbow there is only one bone in the arm (humerus), but between the elbow and the wrist there are two (ulna, radius). In the wrist there are eight small bones. Next come the bones of the hand itself. We have twenty-seven bones in the framework of the hand and wrist alone.

We know that the muscles constitute approximately fifty per cent of the total body weight. There are three main types of muscular tissue that we identify and classify on the basis of structure and function: smooth or visceral muscle, striated or skeletal muscle, cardiac muscle.

Smooth muscles can contract slowly. They make up the walls of the internal organs such as those of the blood vessels and the digestive tract. The walls of the blood vessels are contracting and expanding when they respond to certain chemicals in the blood or in response to the effect of temperature, but we can't cause them to lift our arm or to open our mouth (involuntary muscles). Striated muscles are most necessary for manipulation of the bones of the skeleton. Those are the muscles necessary for walking, running, turning the head and so on. That's why they are sometimes called the skeletal muscles. This type includes all those muscles which must react quickly to changes in the environment, i.e. those that become active through an effort of will (voluntary muscles). A characteristic feature of cardiac muscle is that fibres have neither a beginning nor an end. In other words, the heart is simply a huge net of muscles in which all elements are continuous with each other.

Vocabulary. Transcribe and memorize:

Trunk, limbs, skull, thorax, abdomen, upper arm, forearm, wrist, thigh, leg, toe, backbone, framework, jaw, spinal column, rib, breastbone, shoulder, collar-bone, shoulder-blade, elbow, humerus, ulna, radius, smooth (visceral), striated (skeleton), cardiac, to contract, internal, blood vessels, digestive tract, voluntary/involuntary, fibres.

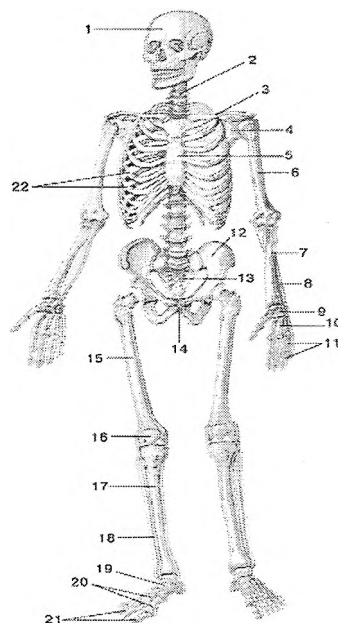
I. Translate into Ukrainian:

1. The number of the bones in the hand and wrist alone is 27.
2. A separate bone in the vertebral column is called a vertebra.
3. Each hand has four fingers and one thumb.
4. We have no special names for ulna and radius in the modern English language.
5. There is the skull at the upper end of the backbone.
6. There are three bones in each finger.
7. There is no backbone in invertebrate.
8. Naturalists divided all animals into two classes.
9. The bones of the trunk include the spinal column, the ribs and the breastbone.
10. The upper cavity, the thorax, includes the heart and the lungs.
11. The parts of the body are the head, the trunk, and the limbs.
12. Smooth or unstriated muscles contract without any volition.
13. Blood vessels are contracting when they respond to the temperature.
14. The bones of our body make up the skeleton.
15. The word "muscle" means "little mouse" in Latin.
16. Cardiac muscle is under involuntary control.
17. The involuntary muscles control the beating of the heart.
18. The walls of the blood vessels are expanding when they respond to certain chemicals in the blood.
19. The skeletal muscles are the organs of muscle system.
20. Smooth muscles form the muscular coat of internal organs, blood vessels and skin.
21. We call the muscles that form internal organs visceral muscles.

II. Translate into English:

1. Хребетні тварини утворюють клас вищих тварин.
2. Ребра захищають серце, легені та інші органи грудної клітки.
3. За структурою і функціями м'язи можна розділити на три групи.
4. Гладенькі м'язи скорочуються мимовільно.
5. Поперечно-смугасті або скелетні м'язи реагують на зміни в оточуючому середовищі.

III. Write the bones of the skeleton according to the task:



IV. Speak about the bones of the lower limbs. You may use the passage in which the bones of the upper limbs are described.

V. Speak about the functions of the muscles:

- smooth /visceral/;
- striated /skeletal/;
- cardiac.

VII. Make the summary of the text.

VIII. Retell the text.

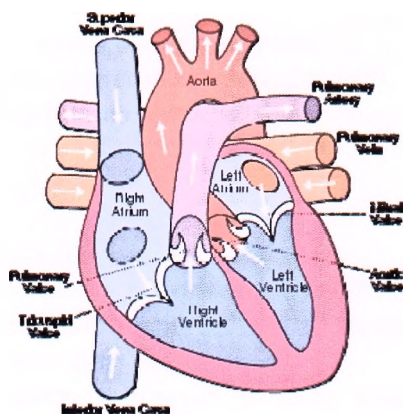
UNIT 14

Read the text about the cardiovascular and respiratory systems of the human body. Find the passage which contains the description of the heart. Read and translate the passage.

HUMANS

Part II: The Circulatory System. Respiration.

The cardiovascular system is the system of blood circulation. By the cardiovascular system we mean the heart, the arteries, the veins and the capillaries of the human body. The centre of the circulatory system is the heart. It lies in the thoracic cavity and has four chambers. The right heart consists of an upper chamber — the atrium or the auricle — and a lower chamber — ventricle. Between these two chambers is a one-way valve, the tricuspid valve. The left heart has two chambers, but the valve that separates them is called the mitral valve. The right heart receives blood (which is a red fluid) from the veins and pumps it into the lungs by way of the lesser circulatory system. In the lungs the blood receives oxygen. Then it moves into the left heart. From the left heart the well-oxygenated blood moves into a large artery, the aorta. The blood returns to the heart by means of the veins.



Blood vessels that receive blood from the ventricle and lead it away from the heart and towards other organs are arteries. The arteries continue to divide and form smaller and smaller vessels and finally divide into capillaries. Gradually the capillaries begin to join into larger vessels — the veins. The pulmonary vein carries the freshly oxygenated blood to the left auricle. The pulmonary artery and the pulmonary vein make up the pulmonary circulation.

The term “respiration” means the exchange of gases, which takes place between the living organism and the environment. It is the process by which the body cells and tissues make use of oxygen and carbon dioxide or the waste products of respiration are removed. Air is breathed through either the mouth or nose into oral cavity (pharynx). It then passes through the voice box (larynx) into the trachea. The trachea divides into two smaller tubes (bronchi), one is going to each lung. The bronchi divide into tiny passage-ways that are named bronchioles, which lead to air sacs (alveoli). The exchange of life-giving gases is effected through the walls of the alveoli.

Inhaled air contains about 20 per cent oxygen and four hundredths of one per cent carbon dioxide. Exhaled air consists of approximately 16 per cent oxygen and 4 per cent carbon dioxide. Nitrogen, which makes up about 79 per cent of the atmosphere, is not involved in the breathing process. When the air is inhaled into the lungs, a portion of the oxygen is passing into the blood and is being

circulated through the body. At the same time, carbon dioxide is being diffused of the blood into the lungs and exhaled.

Vocabulary. Transcribe and memorize:

Cardiovascular, blood circulation, pulmonary, artery, aorta, vein, capillaries, thoracic cavity, atrium/ auricle, ventricle, valve, to separate, tricuspid, mitral, to pump, lung, to breathe, pharynx, larynx, oral cavity, trachea, bronchi, passage-way, bronchioles, inhale/ exhale, approximately.

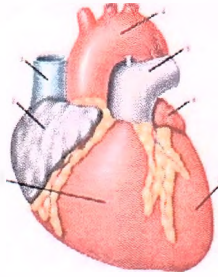
I. Translate into Ukrainian:

1. The heart makes 70-80 contractions a minute.
2. The veins are larger than capillaries.
3. The aorta is the largest artery which distributes the blood throughout the body.
4. The blood reaches the arteries, because of the contraction of the heart.
5. The walls of the arteries and veins are thicker than those of the capillaries.
6. There are no blood capillaries in certain parts of the body.
7. We call the valve that separates the chambers, the atrium and the ventricle, the mitral valve.
8. The heart is a hollow organ and has four chambers.
9. We call the three major types of blood vessels: the arteries, veins and capillaries.
10. The heart pumps the blood into the lungs by the circulatory system.
11. From the left heart the blood is pumped into the aorta.
12. Harvey collected ideas of the circulation of blood which until then had been studied but not confirmed by the experiments.
13. When the left ventricle is contracting its contained blood is being forced into the aortic artery.
14. The total number of alveoli in the lung has been estimated as 750 millions.
15. Respiration is usually thought of as the mechanical process of breathing.
16. Air is breathed into the lungs 20 times a minute all our life.
17. The lungs are built of the alveoli and through the bronchi, larynx, pharynx, mouth cavity and nasal ones they expire CO₂ and inspire oxygen.
18. The term "respiration" means the exchange of gases.
19. The exchange of gases varies according to the size and activity of the organism.
20. The right lung that is slightly larger of the two is divided into three lobes.
21. It is possible to remove one lobe of the lung without any damage to the rest.

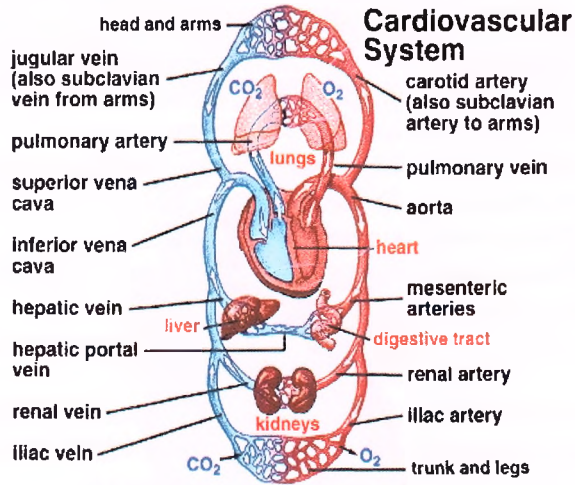
II. Translate into English:

1. Серцево-судинна система включає серце, артерії, вени і капіляри.
2. Кров рухається до серця по венах.
3. Права і ліва частини серця складаються з двох камер: передсерця і шлуночка.
4. При скороченнях лівого шлуночка кров проштовхується в аорту.
5. Стінки капілярів такі тонкі, що поживні речовини і кисень проникають через них в тканини.
6. Дихання властиве всьому живому – як тваринам, так і рослинам.
7. У процесі дихання тканини поглинають кисень, а CO₂ - виводиться з організму.
8. Повітря, яке ми видихаємо, містить близько 20% кисню.
9. Бронхи поділяються на дрібні повітроносні шляхи, які називаються бронхіолами.
10. Зупинка дихання навіть на кілька хвилин призводить до смерті.
11. Верхня частина дихальної системи служить для проведення повітря і відтворювання голосу; вона складається з носа, глотки, гортані, трахеї і бронхів.

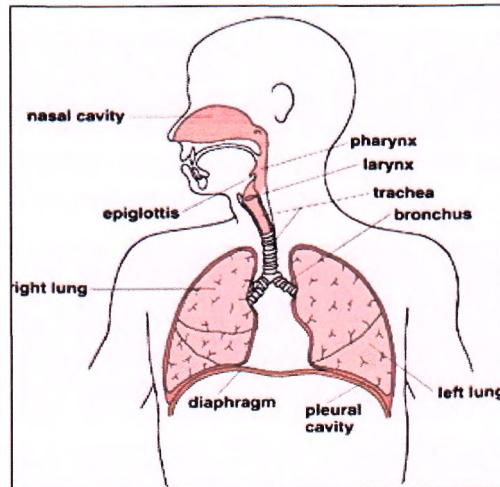
III. Write down the parts of the heart. Describe the way of the blood through the heart.



IV. Speak about the large circulatory system. Describe the process.



V. Speak about the way the air makes when it is got inside our body.



VI. Speak about the contents of inhaled and exhaled air.

VII. Make the summary of the text (in writing).

VIII. Retell the text.

UNIT 15

Read the text about the digestive system of the human body. Find the passage which contains the information about inorganic foods and minerals. Read and translate the passage.

HUMANS

Part III: The Abdomen. Foods

The abdomen is the largest cavity of the body. The organs of the abdominal cavity are the liver, the gall-bladder, the stomach, the intestines, the pancreas, the spleen, the kidneys and the bladder. The liver lies under the right ribs. It weighs about one and a half (1.5) kg. The liver secretes bile, which detoxifies some toxic substances. The gall-bladder lies beneath the right lobe of the liver. It serves as a bile reservoir. The stomach lies under the left ribs and extends across to the right. It serves as a container of food, which is partly digested in it. The size and shape of the stomach vary with any amount of food. Its capacity is some 1-2 litres. The intestines occupy chiefly the central portions of the abdominal cavity. In the small intestine the food undergoes further mechanical and chemical changes. As the contents of the small intestine cannot move back they may freely pass into the large intestine.

Every cell of the human body requires certain chemical nutrients to supply them the body must break down complex foods into molecules to pass through tissues and be delivered by blood or lymphatic systems to the various body cells. This break of insoluble forms is known as digestion.

Foods are substances which when taken into the body yield energy on oxidation, build new tissue, repair old tissue and play an essential role in growth and nutrition. Foods are to be divided into two general classes. These are inorganic and organic foods. The former class includes inorganic salts and water. The latter class includes carbohydrates, fats and proteins.

Proteins are found most abundantly in muscles. Fat is concentrated in the adipose (fat) cells under the skin and around the intestines. Carbohydrates are found mainly in the liver, muscles and blood. Carbohydrates are known as the chief source of energy. The absence of carbohydrates upsets the fat and protein metabolism. As for the minerals, high levels of calcium and phosphorus form part of the bones and teeth, sodium and chloride are found mainly in the body fluids, potassium is the main mineral in the muscles, iron is essential to red blood cells, and magnesium is found throughout the body.

Other types of food (vitamins) needed in very small amounts for various functions of the body are essential. They are found in certain foods and are necessary for the growth, development and general health of the body. Such foods include milk and many products made from it, all green leafy vegetables like cabbage, spinach, other fresh vegetables, fruits and fruit juices, whole-grained cereals, eggs and number of others. You determine how you feel throughout each day by the type of breakfast you eat. Your energy production, which corresponds to the quality of sugar available, determines how you think, act and feel.

Vocabulary. Transcribe and memorize:

Liver, gall-bladder, stomach, intestines, pancreas, spleen, kidneys, bladder, bile, nutrients, lymphatic, carbohydrates, fat, protein, adipose cells, cabbage, spinach, whole-grained cereals.

I. Translate into Ukrainian:

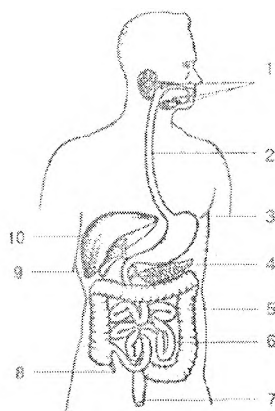
1. The liver plays a very important part in the vital activity of the organism.
2. It secretes bile which participates in the digestive process and has a defensive function, i.e. some toxic substances are detoxified in the liver.

3. The stomach is a bag the walls of which are largely made up of involuntary or smooth muscles.
4. It is the gastric glands in the stomach that secrete gastric juice, which is acid and acts on meals.
5. After the food leaves the stomach it is acted on by several enzymes.
6. After the food is properly prepared it is absorbed into the lymph and blood vessels.
7. Salivary glands, liver and pancreas are situated outside the digestive tract.
8. The muscles of different types form the walls of the intestine.
9. It is known that the abdomen is the largest cavity of the body.
10. Nutrients are substances that help your body to grow and develop.
11. There was general agreement that the patient's diet should be rich in protein and carbohydrates, but poor in fat.
12. The vitamins are substances which must be found in the diets of animals in order they can utilize the organic foodstuffs to best advantage.
13. The present investigation is carried out to determine the liver functions in experimental dogs.
14. It is advisable to study the movements of the stomach by means of X-rays.
15. Protein is essential for growth and repair.
16. The most convenient approach to understand metabolism is to examine the properties of different sorts of foods.
17. The carbohydrates animals most commonly ingest consist of a variety of sugars.
18. Vitamins are organic chemical compounds to be present in the diet.
19. Certain foods are the best sources each body requires.
20. Vitamin K is produced by intestinal bacteria.
21. Scientists have studied the deficiency diseases for many years.
22. The body is known to utilize six kinds of food-stuffs - carbohydrates, proteins, fats, water, mineral salts and vitamins.

II. Translate into English:

1. Відомо, що печінка, розташована у правому підребер'ї, є одним з найбільших органів.
2. Вона виконує декілька життєво важливих функцій.
3. Саме в печінці знешкоджуються деякі токсичні речовини.
4. Продукти харчування, які ми вживаємо, можна розподілити на два загальні класи. Це органічні і неорганічні речовини.
5. Додаткові речовини, що має містити наша дієта, це — вітаміни.
6. Відсутність або нестача вуглеводів в організмі порушує жировий і білковий обмін.

III. Write down the internal organs that you know:



IV. What is digestion? Describe the process of digestion in any form you like.

V. Make the table of foods sources according to the task:

a)

FOODS	MEANING	PRODUCTS
<i>fats</i>		
<i>carbohydrates</i>		
<i>proteins</i>		

b)

VITAMINS	MEANING	PRODUCTS

VI. Make the summary of the text (in writing).

VII. Retell the text.

UNIT 16

Read the text about the endocrine and the nervous systems. Find the passage which contains the description of the brain. Read and translate the passage.

HUMANS

Part IV: Endocrine Glands. The Nervous System. Senses.

There are two organ systems — the nervous system and the endocrines — which coordinate the activities of all others. Thus, the thyroid gland stimulates the metabolism of all bodily parts. The adrenal medulla mobilizes the activities of many organ systems in case of the emergency. And the adrenal cortex exercises control over many body functions, so important that its removal results in failure of the functions and the death of an animal.

Endocrine glands or glands of internal secretion are ductless glands, that is, they empty their secretion — chemical substances called hormones — directly into the blood stream. Many of hormones affect metabolism and the activity of the cardiovascular and other systems. The activities endocrine glands are regulated by the nervous system, particularly through the hypophysis. It is the gland which consists of an anterior lobe, an intermediate part and a posterior lobe. Anterior lobe is necessary for proper growth to adult stature, for normal development and function of the reproductive system and for control the activities of other endocrine glands. The hypophysis is connected with the hypothalamus, which secretes special substances to regulate the secretion of the hypophysical hormones.

The nervous system is made up of the nerve cells with their fibres. Nerves lead from the spinal cord or from the brain to each part of the body. Then they lead from each part of the body back to the brain or spinal cord. The brain is made up of three parts. The cerebrum sits like a cap on the cerebellum. And the medulla is that long portion connecting the brain with the spinal cord. The cerebrum has certain parts that do certain work. Studying human beings with accidental injuries of brains helped scientists to get information about these areas. Many experiments have shown that the brain is the centre of feeling and understanding. The nerve cells in the brain can be “put to sleep” with ether or other anaesthetics.

Sense organs are specialized endings of the sensory division of the peripheral nerves. We are commonly thought to possess five senses. Actually, there are many more. We may classify them as follows: 1) the cutaneous senses — touch, heat, cold and pain; 2) the deeper senses — pressure and muscle sense; 3) the internal senses, or senses from the internal organs of the body; 4) the special senses, or those in which the receptors lie in special organs — sight, hearing, equilibrium, taste and smell; and finally 5) the general body senses — hunger, thirst, fatigue, sexual sensation, etc.

Vocabulary. Transcribe and memorize:

Endocrine, thyroid gland, adrenal medulla, adrenal cortex, emergency, ductless, internal secretion, hormone, hypophysis, stature, reproductive, hypothalamus, cerebrum, cerebellum, sense, cutaneous, sight, equilibrium, taste, smell, thirst, fatigue.

I. Translate into Ukrainian:

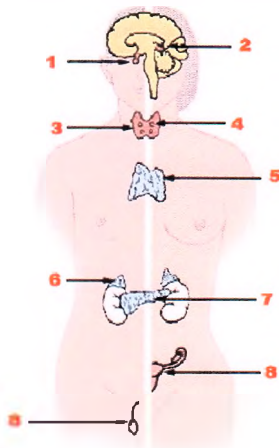
1. Thus, the thyroid gland stimulates metabolism.
2. Hormones affect metabolism and the function of the cardiovascular system.
3. The functions of the endocrine glands are interconnected.

4. The hormones either stimulate or depress the activity of various organs.
5. The activities of endocrine glands are regulated by the nervous system.
6. The hypophysis is believed to be the chief endocrine gland.
7. Cells need oxygen to carry metabolic processes.
8. There are more senses than we are commonly thought to possess.
9. The spinal cord and the brain regulate motor activity.
10. The brain is the primary centre for regulating and coordinating body activities.
11. The man receives his information concerning the outside world through his sense organs.
12. We know the position of an arm or leg without looking at it.
13. The conditioned reflexes discovered by I.P. Pavlov are the mechanism through which the body responds to the outside world in avoiding injury, obtaining food and performing many more complex acts.
14. The brain has many different parts controlling different aspects of the body functions.
15. The cerebellum is located beneath the posterior part of the cerebrum, its function being to aid in the coordination of voluntary movements and to maintain balance and muscular tone.
16. The Professor told us about the diagnosing the hypophysis disfunctions.
17. If you ascend in the atmosphere as in flying an airplane, climbing up a high mountain, or riding a fast elevator, the atmospheric pressure, and that in the outer ear will drop, while that in the middle ear remains the same.
18. All sensations such as touch, pain and temperature are lost if cerebral hemispheres are destroyed.

II. Translate into English:

1. Нервова і ендокринна системи координують і стимулюють діяльність організму.
2. Зниження функції або зменшення активності ендокринних залоз викликає (провокує) зміни в роботі всього організму.
3. Діяльність усіх ендокринних залоз взаємозв'язана і регулюється гіпофізом.
4. Нервова система контролює роботу ендокринних залоз.
5. Багато наукових досліджень підтвердили той факт, що саме мозок є центром почуттів і розуміння.
6. Клітинам потрібен кисень, щоб керувати метаболічними процесами в організмі.
7. Людина отримує всю інформацію з навколишнього світу через органи відчуттів.

III. Write down the organs that are familiar to you:

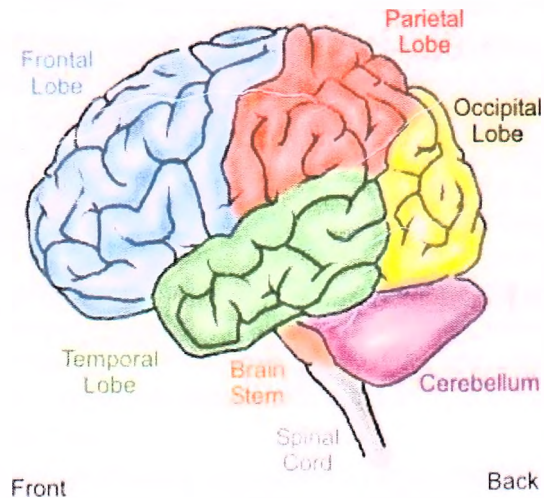


IV. Determine the class of a sense present in the following situations:

1. It's rather a problem to walk along the roads in winter as they are partly covered with ice.
2. I won't eat even a piece, my stomach is full.
3. I hate camping — wherever you go there is always a great amount of mosquitoes.
4. I need to sleep.
5. I feel short of breath and I'm constantly coughing.

V. Look at the brain. You see what parts of the brain control different activities. Read the titles and speak about the brain of a man.

Regions of the Human Brain



VI. Make the summary of the text (in writing).

VII. Retell the text.

FINAL CREDIT TEST

Part I

Topics for discussion:

1. Natural studies. Its branches and activities.
2. Diversity of the biosphere. Classifications.
3. Plants. Classification. General characteristics.
4. Protista. General characteristics. The main representatives.
5. Insects. General characteristics.
6. Fish. Internal anatomy.
7. Reptiles. Internal anatomy.
8. Amphibian. Internal anatomy.
9. Birds. Internal anatomy.
10. Mammals. Classification. Internal anatomy.

Part II

Individual tasks (to be done in writing):

(Choose the topic you are interested in and prepare a short report or composition. Your opinion is important).

1. My view of the origin of life (based on theories or the theory of your own).
2. My opinion of a possible end of the world (from the scientific point of view).
3. The place of a human being in the natural hierarchy.
4. The aim of biology.
5. Is our world knowable (cognizable) or is it not? Are we able to learn all the secrets of nature?
6. What is NATURE for you? Is it only your surrounding or anything more?
7. What is death? Do you believe in anything after death? What is it (if you do)?

Literature:

1. Life's Origin. The Beginning of Biological Evolution / Ed. By J.W. Schopf-Berkeley, Los Angeles, London University of California Press, 2002, 208 pp.
2. Stephen Stearns. Evolution. An Introduction. Oxford, Oxford Univ. 2000, 381 pp.
3. Nature. Magazine (2001-2004).
4. English-Russian Biological Dictionary. Fourth Edition, 1979.
5. Macmillan English Dictionary For Advanced Learners. International Student Edition, 2006.
6. A.S. Hornby. Oxford Advanced Learner's Dictionary of Current English. Revised and Updated. Oxford University Press.

