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БАКАЛАВРИАТ

АНГЛИЙСКИЙ ЯЗЫК ДЛЯ НАПРАВЛЕНИЯ «БИОЛОГИЯ»

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Учебник создан в соответствии с Федеральным государственным образова-
тельным стандартом по направлению подготовки 020400 — Биология (квалифи-
кация «бакалавр») и предназначен для развития навыков чтения специальной
литературы, перевода специальных текстов, устной и письменной речи, а также
создания необходимого лексического запаса. Состоит из лексического модуля,
грамматического модуля и тестов. Изучаемый материал расположен с повыше-
нием уровня сложности от *Intermediate* до *Upper-intermediate*.

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Авторы **учебника** «Английский язык для направления “Биология”» с благодарностью вспоминают замечательного педагога Наталью Кузьминичну Козицыну, по книгам которой учились многие поколения биологов, и посвящают свой учебник ее памяти.

Учебное пособие предназначено для студентов, изучающих биологию как часть своей специализации. Материал расположен с повышением уровня сложности от A2 в Unit 1 до B2 в Unit 15. При его отборе авторы руководствовались следующими соображениями. Во-первых, пособие ориентировано на студентов, имеющих представление о биологии, а потому обладающих необходимыми предметными знаниями. Во-вторых, в условиях сокращения во многих вузах количества часов, отводимых на изучение английского языка студентами биологических специальностей, приходится интенсифицировать процесс обучения, чтобы выполнить программу. Апробация материалов учебника в разных группах студентов биологического факультета МГУ имени М. В. Ломоносова показала, что обучающиеся успешно справляются с поставленными в пособии задачами. Кроме того, глубина и интенсивность проработки материала определяются преподавателем, который ориентируется на изначальный уровень группы.

Пособие позволяет решать важные учебно-методические задачи, поскольку разработано с целью развития навыков чтения специальной литературы, перевода специальных текстов с английского языка на русский и с русского языка на английский, устной и письменной речи, а также создания требуемого лексического запаса. Данные навыки не только являются неотъемлемым компонентом обучения английскому языку на биологическом факультете, но и необходимы для будущей научной деятельности выпускников: чтения и написания статей, общения с коллегами и др. Таким образом, актуальность данного пособия несомненна.

Пособие состоит из трех частей: лексического модуля, грамматического модуля и тестов.

Лексический модуль (Lexical Module) включает 15 уроков (Units). В нем представлены материалы о систематике живых организмов, строении и функциях основных живых существ, населяющих нашу планету, а также освещаются такие проблемы, как экология, защита окружающей среды, развитие теории эволюции, особенности про-

цесса адаптации живых организмов. Каждый урок посвящен одной теме (Mammals, Birds, Ecosystems и др.) и содержит:

- Упражнения для запоминания и закрепления лексики (Working with Words).

Слова, относящиеся к общей и общенаучной лексике и необходимые для освоения изучаемой темы, предназначены для заучивания. Вместо их перевода предлагаются определения на английском языке, составленные с использованием толковых словарей издательств Oxford и Macmillan, а также биологического словаря Lingvo. Умение объяснить значение английского слова на английском языке существенно активизирует лексический запас и когнитивные навыки студентов.

Упражнение, содержащее слова-термины и названия видов животных, предназначено для самостоятельной работы студентов со словарем. Заучивание данных слов остается на усмотрение преподавателя.

- Разнообразные упражнения для отработки словосочетаний и предложений (Working with Word Combinations and Sentences).

Эти упражнения помогут студентам осознать, насколько важной структурной единицей английской научной речи является словосочетание, а также научат инкорпорировать их в собственные устные и письменные высказывания.

- Основной текст урока (Text 1) и упражнения для работы с ним (Working with Text), нацеленные на проверку понимания прочитанного.
- Два дополнительных текста по теме урока (Text 2, Text 3).

В этих текстах дается несколько иное освещение темы урока или подробно раскрывается какой-либо отдельный аспект обсуждаемой в нем проблемы или явления. В зависимости от уровня группы и количества часов, отведенных на усвоение материала, преподаватель может эти тексты пропустить, предложить для самостоятельного чтения, разобрать на уроке, использовать как материал для пересказа.

- Текст по теме урока для перевода с русского языка на английский (Text 4).

В нескольких уроках в данном разделе приводится больше одного текста, чтобы как можно более полно охватить тему занятия. Перевод с русского языка на английский текстов научного характера — одно из наиболее сложных, но в то же время результативных упражнений. В ходе такого перевода закрепляется усвоенная лексика, а также активизируется владение грамматическими конструкциями.

- Задания на развитие навыков устной и письменной речи (Speaking and Writing).

Каждый урок заканчивается списком тем, по которым студентам предлагается сначала сделать небольшой доклад или презентацию, а затем написать эссе или статью. Умение выступать и излагать свои мысли на английском языке — языке международного общения — как

устно, так и письменно в наши дни чрезвычайно важно для любого ученого.

Грамматический модуль (Grammar Pages) состоит из 15 секций (Sections). Все грамматические явления и структуры, описанные в данном модуле, рассматриваются в учебниках от уровня Pre-intermediate (такие как Simple Tense или Passive Forms) до уровня Upper-intermediate (Modal Verbs, Linking Words). Однако некоторые темы (например, Emphasis) мало освещаются в учебниках General English. Выбор материала и подробность его изложения были обусловлены тем, насколько часто та или иная грамматическая конструкция встречается в текстах научного регистра и, соответственно, востребована студентами. Трактовка отдельных грамматических явлений упрощена и схематизирована — по мнению авторов, в этом случае пособие становится более функциональным, что очень важно для студентов естественно-научных специальностей. Определенные ограничения накладывает и объем пособия. Каждая грамматическая секция содержит:

- Краткое теоретическое изложение той или иной грамматической темы.

Поскольку целевой аудиторией данного учебного пособия являются студенты биологических специальностей, с учетом их интересов и потребностей теоретическая часть материала излагается на русском языке и в несколько усеченном виде, т. е. по каждой теме освещаются лишь основные явления и правила. Дополнить и разнообразить этот материал каждый преподаватель может по своему усмотрению, привлекая дополнительные источники.

- Практические упражнения, позволяющие студентам быстро освоить или повторить предложенный материал.

Упражнения и примеры во многом основаны на специальной, т. е. биологической лексике. Авторы полагают, что такого рода грамматический справочник в сочетании с лексическим модулем, содержащим специальные тексты, будет особенно удобен в использовании как для студентов, так и для преподавателей. Дополнительным преимуществом является тот факт, что Sections грамматического модуля и Units лексического модуля независимы друг от друга и могут изучаться в разном темпе.

Тесты (Tests) предназначены для проверки усвоения материала как лексической, так и грамматической части пособия. Тесты являются сводными: каждый охватывает материал трех уроков (Units или Sections). Для самоконтроля и в целях экономии времени преподавателей в пособии приводятся ответы на часть заданий тестов (Test Key).

Авторы искренне надеются, что данное пособие поможет студентам овладеть словарным запасом и навыками, необходимыми для чтения специальной литературы и устного обсуждения представленных биологических тем.

Словарь (Glossary) призван облегчить работу учащихся с лексическим модулем и представляет собой краткий словарь лексики, которая отрабатывается в учебнике. В основном в него вошли слова, необходимые для работы с научным регистром речи, а также часть терминов, связанных с различными разделами биологии. В случае многозначных слов приведены наиболее употребительные или имеющие отношение непосредственно к тематике учебника варианты перевода. Преподаватели могут использовать словарь для проверки знаний учащихся, приняв его за лексический минимум.

LEXICAL MODULE

ЛЕКСИЧЕСКИЙ МОДУЛЬ

DIVERSITY OF ORGANISMS

Unit 1

Classification (Characteristics of Living Organisms)

Text 1. Systematics

Text 2. Extreme Bacteria

Text 3. Light from Life

Text 4. Система живого мира

Working with Words

1. Study the following words.

1. diverse	<i>adj.</i> very different from each other
2. harmful	<i>adj.</i> causing or likely to cause harm
3. challenge	<i>v.</i> to refuse to accept that something is right, fair, or legal <i>n.</i> something that tests strength, skill, or ability, especially in a way that is interesting
4. confusion	<i>n.</i> when you do not understand what is happening or what something means because it is not clear
5. currently	<i>adv.</i> at the present time
6. accept	<i>v.</i> to take something that someone offers you, or to agree to do something that someone asks you to do

7. similarity	<i>n.</i> if there is a similarity between two things or people, they are similar in some way
8. allow	<i>v.</i> to let someone do or have something, or let something happen to permit
9. flexible	<i>adj.</i> a person, plan etc that is flexible can change or be changed easily to suit any new situation
10. common	<i>adj.</i> happening often and to many people or in many places
11. include	<i>v.</i> to comprise or contain as part of a whole
12. finding	<i>n.</i> the information that someone has discovered as a result of their study, work etc
13. propose	<i>v.</i> to suggest something as a plan or course of action
14. prove	<i>v.</i> to show that something is true by providing facts, information
15. relationship	<i>n.</i> the way in which two people or two groups feel about each other and behave towards each other
16. scholar	<i>n.</i> a specialist in a particular branch of study, especially the humanities
17. superfluous	<i>adj.</i> more than is needed or wanted, unnecessary
18. useful	<i>adj.</i> helping you to do or get what you want

2. Make sure you know these words.

1. Animalia
2. Taxonomy
3. species (*pl.* species)
4. Protista
5. systematics
6. fungus (*pl.* fungi)
7. prokaryote
8. Plantae
9. phylum (*pl.* phyla)
10. nucleus (*pl.* nuclei)
11. Monera
12. kingdom
13. genus (*pl.* genera)
14. eukaryote
15. family
16. domain
17. class

3. Word-building.

Noun	Verb	Adjective
harm		
	know	
		descriptive
		responsive
evolution		
	adapt	
	organize	

4. Translate the words and put them in the correct column.

Scientific, relationship, confusion, currently, continuously, classification, hierarchical, botanical, hierarchy, roughly, characteristics, similarity, simple, adaptable, universally.

Noun	Adjective	Adverb

5. Using the following prefixes, form the words with the opposite meaning.

- | | |
|-----------------|------|
| 1. effective | in- |
| 2. important | dis- |
| 3. arrange | mis- |
| 4. mortal | un- |
| 5. use | re- |
| 6. developed | ir- |
| 7. lead | il- |
| 8. prove | im- |
| 9. common | |
| 10. adaptable | |
| 11. regular | |
| 12. responsible | |
| 13. known | |
| 14. legal | |
| 15. function | |
| 16. possible | |

6. Match the words (1—7) to their antonyms (a—g).

- | | |
|--------------|-------------|
| 1. different | a. complex |
| 2. roughly | b. changing |
| 3. create | c. same |
| 4. unique | d. arrange |
| 5. constant | e. similar |
| 6. confuse | f. exactly |
| 7. simple | g. ruin |

7. Complete the sentences with the words from the box.

*established classify relationships species taxonomic evolution
closely together*

Using the standard rules . . . **1** . . . by Linnaeus, today's taxonomists . . . **2** . . . species based on shared attributes and the closeness of their evolutionary . . . **3** Each . . . **4** . . . is given a generic name (genus), and a specific name (species). Besides genus and species, several higher . . . **5** . . . levels are internationally recognized. The higher levels indicate the phylogenetic relationships, the degree to which different species have diverged from each other during the course of . . . **6** Thus, . . . **7** . . . related groups are placed in the same taxonomic category at all levels, whereas distantly related forms are placed . . . **8** . . . only at the higher taxonomic levels.

8. Match the words (1 — 7) to their definitions (a — g).

- | | |
|---------------|---|
| 1. common | a. to suggest a plan, idea, or action |
| 2. to propose | b. a situation when you mistake one thing for another |
| 3. taxonomy | c. the fact that different things exist within a group or place |
| 4. confusion | d. to put things in a useful order |
| 5. evolution | e. happening frequently or existing in large amounts or numbers |
| 6. diversity | f. the way in which something is gradually changes and develops |
| 7. to arrange | g. the process of organizing living things into groups or types |

Working with Word Combinations and Sentences

9. Translate the word combinations.

Многообразные жизненные формы, общаться эффективно, научные исследования, взаимоотношения в ходе эволюции, важный аспект, основанный на сходстве, методы классификации, ненужный для человека, разработать категории, приблизительно распределить, ведет к заблуждению, иерархия групп, гибкая система, биологические знания, отражать процесс.

10. Rewrite the scrambled sentences putting the words in the correct order.

1. Archaeans | isolated | of Yellowstone National Park | were | from the hot | first | sulphur springs.

2. Archaeans | have | on Earth | existed | any other organism | longer than.
3. Why | archaeans | are | interested | in studying | paleontologists?
4. What | say | on primitive Earth | science | about the conditions | does?
5. Survival | in the evolution of | in extreme conditions | resulted | unusual metabolic | has | processes.
6. Researchers | are | in finding out | organisms | how | at extreme temperatures | interested | can live.
7. Enzymes | within a cell | are | for all the metabolic | required | processes.
8. A prehistoric mosquito | be used | in amber | trapped | can | for DNA analysis.

11. Translate into English.

Хорошо известно разнообразие живой природы. Невидимые глазом бактерии вовлекают в круговорот веществ громадные количества минералов. В капле воды, взятой из водоема, обнаруживается масса различных одноклеточных организмов. В донном иле, в почве, в глубине вод, в лесах, степях и океанских просторах, на дне глубоких океанских впадин обитают самые разнообразные организмы, различающиеся по форме, размерам, подвижности, поведению, типу питания (способам добывания пищи) и многим другим признакам.

Working with Texts

12. Read and translate the text.

Text 1

Systematics

A. To study the diverse life forms that share our planet and to effectively communicate our findings, we need to organize our knowledge of them.

The scientific study of the diversity of organisms and their evolutionary relationships is called systematics. An important aspect of systematics is Taxonomy, the science of naming, describing, and classifying organisms. The term “classification” means ordering organisms into groups based on their similarities or relationships.

B. Different methods of classification have been used throughout history. Animals, for example, were classified by St. Augustine in the 4th century as useful, harmful and superfluous to humans. During the Renaissance scholars began to develop categories based more on the characteristics of the organisms themselves. These categories were arranged roughly in order from simple to complex organisms.

C. Carolus Linnaeus in the mid-18th century developed a binominal system of nomenclature in which each species is given a unique two-part name. The “cuckoo flower” and the “lady’s smock” (сердечник луговой) are two common names for the same wild plant, and this could lead to confusion. However, if the botanical name, *Cardamine pratensis*, is used, there is no chance of error. The Latin form of the name allows it to be used in all the countries of the world.

“Binominal” means “two names.” The first name gives the genus, and the second gives the species.

D. Linnaeus also made a system for arranging species to a hierarchy of groups. His system has proved to be flexible and adaptable to new biological knowledge and theory. Most biologists currently use a hierarchical system that includes

- Domain;
- Kingdom;
- Phylum;
- Class;
- Order;
- Family;
- Genus;
- Species.

E. In 1937, the French marine biologist Edouard Chatton suggested the term “procariotique” (“before nucleus”) to describe bacteria, and the term “eukariotique” (“true nucleus”) to describe all other cells. This dichotomy between prokaryotes and eukaryotes is now universally accepted by biologists.

F. In 1969, R. H. Whittaker proposed a five-kingdom classification, which is now favored by many biologists. Whittaker classified organisms in five kingdoms: Animalia, Plantae, Fungi, Protista, and Prokaryota or Monera.

G. The evolution of systematics reflects the creative and dynamic process of science. Systematists have been very responsive to new data, and so classification of organisms is a challenging and continuously changing process.

13. Match the titles (1—7) to the paragraphs (A—G).

1. Binominal System.
2. Hierarchy.
3. Five Kingdoms.
4. Changing Process.
5. Prokaryotes and Eukaryotes.
6. Methods of Classification.
7. About Terms.

14. Answer the questions to Text 1.

1. What is the difference between systematics and classification?
2. What does ‘binominal system’ mean?
3. Why do scientists use Latin when naming species?
4. What is the difference between prokaryotes and eukaryotes?
5. Do you agree with a five-kingdom classification?

15. Read the texts using your dictionary. Retell one of the texts.

Text 2

Extreme Bacteria

Imagine life in the environment without oxygen or with an extremely high salt concentration or with boiling hot acid. How could any organism live there? All of the animals and plants with which we are familiar would find these conditions uninhabitable. How could a cell's plasma membrane and large molecules remain stable and functional under these conditions? How can these very different, extreme environments be home to a unique group of microorganisms, the Archaea?

This interesting group of microbes is unique; they have thrown the whole classification system for living organisms upside down. Some characteristics of Archaea are closely related to bacteria, whereas other characteristics show a relationship to eukaryotes. But archeans have many distinctive properties that set them apart from bacteria or eukaryotic organisms. Their cell walls and plasma membrane compositions are unique, as is their ribosomal RNA. What does this mean from an evolutionary perspective? The dilemma arose when scientists were deciding where to place these organisms in relation to all other organisms on Earth. Where do they belong, with the bacteria or in their own group? Dr. Carl Woese made the suggestion that the Archaea should be one of three new superkingdoms or domains of organisms, with all bacteria making up the second domain and all eukaryotic organisms making up the third. Does this suggestion make sense? Why or why not?

Archaeans are classified into three main groups, depending on their habitat: methanogens, halophiles, and thermoacidophiles. The methanogens are rod-shaped, live in strictly anaerobic environments, and produce large quantities of methane (CH_4) from carbon dioxide and hydrogen. They live in marshes, lake bottoms (causing the rotten-egg smell that occurs when you poke a stick into the mud at the bottom). The halophiles require high concentrations of salt, such as the Great Salt Lake in Utah. The thermoacidophiles normally grow in hot, acidic environments.

Text 3

Light from Life

You can see some of the coolest lights ever being produced by an array of lifeforms, ranging from bacteria to fish. The word that describes these cool chemical lights is bioluminescence. "Cool" is correctly used here. In this amazing chemical reaction, nearly 100 percent of the energy is released as light, compared with only 10 percent for an electric light bulb. Just imagine if Thomas Edison could have accomplished this efficiency with the electric light bulbs he invented! The bulb in the lamp by which you are reading this article would then emit only light and not wasteful heat.

The biochemical “recipe” for cool light is much the same among the numerous types of organisms that can produce bioluminescence. The ingredients are luciferin, luciferinase, ATP, calcium or magnesium, and oxygen. Biologists think that bioluminescence evolved many times during the existence of life on Earth. Some scientists speculate that bioluminescence may have evolved when Earth’s atmosphere began to accumulate oxygen. The free oxygen was toxic to some of the early inhabitants, and bioluminescence might have provided a pathway for detoxification.

Although the significance of bioluminescence is not always apparent in a particular organism, many uses have been demonstrated. Fireflies in the family Lampyridae use their cool tail lights for attracting the opposite sex. These cool lights can also be deceptive and can lead to a rendezvous with death for unsuspecting male fireflies. Female fireflies of the genus *Photuris* prey on males of different firefly genera by mimicking their flashing mating signals. When the amorous male responds to a female’s return flash and arrives for the mating, he becomes her meal instead.

Bioluminescence can be used to startle or confuse, perhaps by temporarily blinding a potential predator. The flashlight fish has small cavities under its eyes that are jam-packed with bioluminescence bacteria. Some fungi use bioluminescence to advertise their presence and thus call attention to themselves.

Many species of marine plankton are also bioluminescent. While swimming or walking on the beach at night, you may have noticed a glow around you. Although it is not always understood why some organisms are bioluminescent, the simple fact that they are can have wide-ranging implications. The military is especially interested in understanding and predicting the locations of these bioluminescent plankton. Secret beach landings and silent-running submarines are easily revealed by the glow of these bioluminescent organisms.

Many genetic engineers are very interested in bioluminescence. What if it were possible to transfer genes that produce bioluminescence into organisms that do not produce bioluminescence? For example, what if pumpkins could be engineered to glow in the dark? Or if the bioluminescence gene could be used as a marker for tracking antibiotic resistance in various pathogenic bacteria? Bioluminescence is cool and can light up your life; it just depends on what species you are.

16. Translate into English.

Text 4

Система живого мира

Изучением многообразия организмов, выявлением их сходства и различий, классификацией по группировкам (таксонам) разного ранга занимается наука систематика. Систематика служит базой для многих

биологических наук. Особое значение систематики заключается в возможности ориентироваться во множестве существующих и вымерших видов организмов. Эта наука дает картину филогенетического развития живого мира, отражая родственные связи между отдельными группами организмов и помогая решить одну из важнейших проблем биологии — происхождение новых видов и других систематических категорий.

Попытки привести в систему окружающий человека мир животных и растений предпринимались еще в Древней Греции. Аристотель (IV в. до н. э.) описал около 500 видов животных и разделил их по группам. Наблюдения Аристотеля были столь точны, что его классификация просуществовала в неизменном виде 2 тыс. лет, а некоторые выделенные им группы сохранились до сих пор.

Однако основы систематики как науки были заложены выдающимся шведским естествоиспытателем Карлом Линнеем (1707 — 1778). Для обозначения видов растений и животных Линней ввел бинарную (двойную) номенклатуру. В соответствии с ней каждый вид имеет название, состоящее из двух слов. Первое слово обозначает название рода, его пишут с большой буквы, второе слово — название собственно вида, его пишут с маленькой буквы. Например, зайца-беляка (mountain hare) Линней назвал *Lepus timidus*. Слово *Lepus* (заяц) — название рода, *timidus* (трусливый) — вида. Всего род *Lepus* включает 23 вида.

Второе чрезвычайно важное положение системы Линнея заключается в установлении им иерархической соподчиненности таксонов: каждая категория включает несколько таксонов низшего порядка. Так, близкородственные роды образуют семейство. Несколько семейств объединяются в отряд, отряды, в свою очередь, образуют класс. Высшая категория систематики — тип, включающий несколько родственных классов. Часто возникает необходимость в выделении промежуточных категорий: подтипа, подкласса и т. п.

Speaking and Writing

17. Make a report about any plant or animal, specifying its place in the classification.

18. Choose any of the following ideas (or propose your own), find information and write an essay (150 — 250 words).

1. St Augustine and his ideas about classification.
2. The contribution of Carolus Linnaeus to science.
3. Prokaryotes and eukaryotes in the evolutionary process.

Unit 2

Bacteria

Text 1. Bacteria

Text 2. Bacteria Electrifying Modern Life

Text 3. How Bacteria Become Drug-resistant

Text 4. Бактерии

Working with Words

1. Study the following words.

1. iron	<i>n.</i> a strong, hard magnetic silvery-grey metal, the chemical element of atomic number 26, much used as a material for construction and manufacturing, especially in the form of steel
2. average	<i>adj.</i> having qualities that are typical of most people or things
3. surface	<i>n.</i> the top layer of an area of water or land
4. simplicity	<i>n.</i> the quality of being simple and not complicated, especially when this is attractive or useful
5. fascinating	<i>adj.</i> extremely interesting
6. starch	<i>n.</i> a substance which provides your body with energy and is found in foods such as grain, rice, and potatoes, or a food that contains this substance, carbohydrate
7. sulphur (<i>Br</i>), sulfur (<i>Am</i>)	<i>n.</i> a common light yellow chemical substance that burns with a very strong unpleasant smell, and is used in drugs, explosives, and industry (it is a chemical element: symbol S)
8. withstand	<i>v.</i> to remain undamaged or unaffected by, to resist
9. blast	<i>n.</i> an explosion, or the very strong movement of air that it causes
10. eventually	<i>adv.</i> after a long time, or after a lot of things have happened

11. rod	<i>n.</i> a long thin pole used with a line and hook for catching fish, fishing rod
12. stick	<i>n.</i> a long thin piece of wood, plastic etc that you use for a particular purpose
13. helical	<i>adj.</i> having the shape or form of a helix, spiral
14. chain	<i>n.</i> people or things which are connected or next to each other forming a line
15. square	<i>n.</i> a shape with four straight equal sides with 90° angles at the corners
16. vent	<i>n.</i> the opening of a volcano, through which lava and other materials are emitted
17. whip	<i>n.</i> a long thin piece of rope or leather with a handle, that you hit animals with to make them move or that you hit someone with to punish them
18. propel	<i>v.</i> to move, drive, or push something forward
19. tumble	<i>v.</i> to fall down quickly and suddenly, especially with a rolling movement
20. slime	<i>n.</i> a thick, wet substance which covers a surface or comes from the bodies of animals such as snails
21. slug	<i>n.</i> a tough-skinned terrestrial mollusc which typically lacks a shell and secretes a film of mucus for protection

2. Make sure you know these words.

1. mitochondria (*pl.* mitochondria)
2. bacillus (*pl.* bacilli)
3. coccus (*pl.* cocci)
4. Borrelia
5. bacterium (*pl.* bacteria)

3. Word-building.

Noun	Verb	Adjective
		simple
	radiate	
likeness		
	appear	
		developing
	form	
creature, creation		

4. Make word combinations using the following words.

1. complex	cell
2. outboard	ice
3. ozon	layer
4. fertilized	motor
5. modern	sunlight
6. bright	
7. Arctic	
8. slime	
9. fresh	
10. upper	
11. direct	
12. thin	
13. stem	
14. jet	
15. powerful	
16. main	
17. visible	

5. Match the words (1 — 7) to their definitions (a — g).

- | | |
|---------------|---|
| 1. to boil | a. to move forward |
| 2. radiation | b. creature, similar to snail, but it has no shell |
| 3. to propel | c. a form of energy produced during a nuclear reaction |
| 4. slug | d. to move in a circle around a fixed central point |
| 5. stationary | e. the central part of a living cell, containing chromosomes |
| 6. nucleus | f. to heat liquid until it has bubbles and starts to become a gas |
| 7. to rotate | g. standing still instead of moving |

6. Complete the sentences with the words from the box.

*gaseous advantage activity primary decomposition atmosphere
metabolism nutrients available environment contained
depends rely on*

The ecosystem, both on land and in the water, . . . **1** . . . heavily upon the activity of bacteria. The cycling of . . . **2** . . . such as carbon, nitrogen, and sulfur is completed by their hard labor.

When organisms die, the carbon . . . **3** . . . in their tissues becomes unavailable for most other living things. . . . **4** . . . is the breakdown of

these organisms, and the release of nutrients back into the . . . **5** . . . , and is one of the most important roles of the bacteria.

The cycling of nitrogen is another important . . . **6** . . . of bacteria. Plants . . . **7** . . . nitrogen from the soil for their health and growth, and cannot acquire it from the gaseous nitrogen in the . . . **8** The . . . **9** . . . way in which nitrogen becomes . . . **10** . . . to them is through nitrogen fixation by bacteria such as Rhizobium and by Cyanobacteria. These bacteria convert . . . **11** . . . nitrogen into nitrates or nitrites as part of their . . . **12** . . . , and the resulting products are released into the environment. Some plants, such as liverworts, have taken special . . . **13** . . . of this process by modifying their structure to house the bacteria in their own tissues.

Working with Word Combinations and Sentences

7. Give the English equivalents of the following words and word combinations.

Кажущаяся простота, выше точки кипения, всплеск радиации, отделение клетки, миллиарды лет, поселиться, жерло вулкана, плодородная почва, жидкая окружающая среда, изменить направление, вращать флагаеллами, слизистый слой, выделять кислород.

8. Match the beginnings and the endings of the sentences.

- | | |
|---|--|
| 1. Tiny, one-celled organisms called bacteria | a. on the head of a pin. |
| 2. Most of these organisms can be seen | b. do cause sickness. |
| 3. Millions of them would fit | c. live on, in, and around human beings. |
| 4. The study of bacteria | d. no plant or animal life on the Earth. |
| 5. It is true that many of bacteria | e. the spoilage of food. |
| 6. Others are responsible for | f. are helpful to humans. |
| 7. Many other types of bacteria, however, | g. is called bacteriology. |
| 8. Without bacteria there would be | h. only with the aid of a microscope. |

Working with Texts

9. Read and translate the text.

Text 1

Bacteria

A. Bacteria consist of only a single cell, but don't let their small size and seeming simplicity fool you. They are an amazingly complex and fascinating group of creatures. Bacteria have been found that can live in temperatures above the boiling point and in cold that would freeze your blood. They "eat" everything from sugar and starch to sunlight, sulfur, and iron. There is even a species of bacteria — *Deinococcus radiodurans* — that can withstand blasts of radiation 1,000 times greater than would kill a human being.

B. Bacteria fall into a category of life called the Prokaryotes. Prokaryotes' genetic material, or DNA, is not enclosed in a cellular compartment called the nucleus. Bacteria and archaea are the only prokaryotes. All other life forms are Eukaryotes, creatures whose cells have nuclei.

(Note: viruses are not considered true cells, so they don't fit into either of these categories.)

C. Bacteria are among the earliest forms of life that appeared on Earth billions of years ago. Scientists think that they helped shape and change the young planet's environment, eventually creating atmospheric oxygen that enabled other, more complex life forms to develop. Many believe that more complex cells developed as once free-living bacteria took up residence in other cells, eventually becoming the organelles in modern complex cells. The mitochondria that make energy for your body cells is one example of such an organelle.

D. There are thousands of species of bacteria, but all of them are basically one of three different shapes. Some are rod- or stick-shaped and called bacilli.

Others are shaped like little balls and called cocci.

Others still are helical or spiral in shape, like the *Borrelia*.

Some bacterial cells exist as individuals while others cluster together to form pairs, chains, squares, or other groupings.

E. Bacteria live on or in just about every material and environment on Earth from soil to water to air, and from your house to Arctic ice to volcanic vents. Each square centimeter of your skin averages about 100,000 bacteria. A single teaspoon of topsoil contains more than a billion bacteria.

F. Some bacteria move about their environment by means of long, whip-like structure called flagella. They rotate their flagella like tiny outboard motors to propel themselves through liquid environments. They may also reverse the direction in which their flagella rotate so that they tumble about in one place.

Other bacteria secrete a slime layer and ooze over surfaces like slugs.

Others are fairly stationary.

G. Some bacteria are photosynthetic — they can make their own food from sunlight, just like plants. Also like plants, they give off oxygen. Other bacteria absorb food from the material they live on or in. Some of these bacteria can live off unusual “foods” such as iron or sulfur.

10. Match the titles (1 — 7) to the paragraphs (A — G).

1. How They Move.
2. Where They Are Found.
3. What They Eat.
4. What They Look Like.
5. Classification.
6. Early Origins.
7. Bacteria.

11. Answer the questions and do the assignment to Text 1.

1. What place do bacteria have in taxonomy?
2. Tell a few words about evolution and early life of bacteria.
3. What shapes do they have?
4. Where do they live?
5. How do they move?

12. Read the texts using your dictionary. Retell one of the texts.

Text 2

Bacteria Electrifying Modern Life

Batteries made with microbes could help generate power by cleaning up organic waste at the same time.

Sewage is loaded with energy-rich sugars that researchers have struggled for years to convert into useful power. To do so, investigators have experimented with nature’s experts on breaking down waste — bacteria.

Scientists have experimented with a variety of bacteria, but there is one kind that looks very promising and which is naturally found in many soils and sediments. *Geobacter* grows by breaking down organic materials and transferring electrons pretty much onto anything that looks like iron. When attacking environmental pollutants such as aromatic hydrocarbons, *Geobacter* can break down some 90 percent. All in all, systems incorporating *Geobacter* can recover up to nearly all the electrons within sewage.

Still, all the energy that bacteria could generate from wastewater could help power the considerable needs of wastewater treatment. For instance, in the United States, roughly 33 billion gallons of wastewater are treated daily for an annual cost of more than \$25 billion, and some 1.5 percent of the electricity produced every year goes into wastewater treatment alone.

Aside from wastewater, another potentially vast source of energy that bacteria could exploit are the organic chemicals in ocean mud. Although

humanity already taps into some of this fuel in the form of petroleum, most of this energy reservoir remains beyond reach because it is not nearly as easy to extract and use as oil.

Organic matter keeps on raining down onto marine sediments as organisms die, so the idea is that marine sediments could basically be a perpetual system for powering electronic devices.

In terms of advancing these microbial systems further, scientists have experimented with bacteria in terms of genetic engineering. So far they have managed to double power output.

Text 3

How Bacteria Become Drug-resistant

Once in every several hundred million cell divisions a mutation makes a bacterium immune to an antibiotic drug. The mutation alters the bacterium's genetic code and thus its ability to use certain chemicals for its life activities. Mutations can be caused by the radiations from outer space that stream into the Earth's atmosphere, as well as by some atmospheric chemicals. As a result of the mutation, all bacteria that stem from the immune germ will be resistant to the drug unless any of them undergoes a mutation that makes the strain susceptible again. Hence, whenever a new antibiotic is developed, there will be a chance that bacteria will develop an immunity against it. But because mutations are fairly rare, doctors have a good chance of fighting a bacterial disease with the new drug before future strains become resistant.

Some members of a bacterial strain are resistant to certain drugs naturally. In the course of time they can eventually become selected through evolutionary forces to become the dominant drug-resistant forms of a pathogenic strain.

More importantly, some bacteria can pass on their drug resistance to bacteria of another strain by "infection." Since the passing of resistance factors does not depend upon the lengthy process of mutation, it poses a much greater problem of drug immunity. As a consequence, doctors often must prescribe more than one antibiotic to fight certain diseases in the hope that this will slow bacterial resistance.

13. Translate into English.

Text 4

Бактерии

Бактерии — группа (царство) прокариотных (безъядерных) микроорганизмов, чаще всего одноклеточных. К настоящему времени описано около десяти тысяч видов бактерий, и предполагается, что их существует свыше миллиона. Впервые бактерий увидел в оптический

микроскоп и описал голландский натуралист Антони ван Левенгук в 1676 году. Как и всех микроскопических существ, он назвал их «анималькули». Название «бактерии» ввел в употребление Христиан Эренберг в 1828 году.

Луи Пастер в 1850-х годах положил начало изучению физиологии и метаболизма бактерий, а также открыл их болезнетворные свойства. Дальнейшее развитие медицинская микробиология получила в трудах Роберта Коха, которым были сформулированы общие принципы определения возбудителя болезни.

подавляющее большинство бактерий одноклеточны. По форме клеток они могут быть шаровидными (кокки), палочковидными (бациллы), извитыми (вибрионы) и др. формой определяются такие способности бактерий, как прикрепление к поверхности, подвижность, поглощение питательных веществ.

Из обязательных клеточных структур выделяют три: нуклеоид, рибосомы, цитоплазматическая мембрана (ЦПМ).

вся необходимая для жизнедеятельности бактерий генетическая информация содержится в одной ДНК (бактериальная хромосома). Она в одной точке прикреплена к ЦПМ и помещается в структуре, обособленной, но не отделенной мембраной от цитоплазмы и называемой нуклеоид. ДНК в развернутом состоянии имеет длину более 1 мм.

Размеры бактерий в среднем составляют 0,5 — 5 мкм. В то же время к бактериям относятся самые мелкие из имеющих клеточное строение организмов. *Mycoplasma mycoides* имеет размеры 0,1 — 0,25 мкм, что соответствует размеру крупных вирусов, например табачной мозаики или гриппа.

Многие бактерии подвижны. Имеется несколько принципиально различных типов движения бактерий. Наиболее распространено движение при помощи жгутиков. Другим типом движения является скольжение бактерий, не имеющих жгутиков, по поверхности твердых сред. Наконец, бактерии могут всплывать и погружаться в жидкости, меняя свою плотность, наполняя газом или опустошая аэросомы.

Часть из них может синтезировать все необходимые им органические молекулы из неорганических соединений (автотрофы), другие же требуют готовых органических соединений, которые они способны лишь трансформировать (гетеротрофы).

Speaking and Writing

14. Make a report about any bacterium you find interesting and unusual.

Write a plan first and do not forget to mention the bacterium's

- appearance;
- habitat;

- feeding habits;
- way of reproduction.

15. Choose any of the following ideas (or propose your own), find information and write an essay (150 — 250 words).

1. The origin of bacteria.
2. Harmful bacteria.
3. Useful bacteria.
4. Extraordinary abilities of bacteria.

Unit 3

Amphibia

Text 1. Class Amphibia

Text 2. A Few Facts About Amphibian Behaviour

Text 3. The Red-eyed Tree Frog

Text 4. Красноглазые квакши

Text 5. Класс амфибии

Working with Words

1. Study the following words.

1. dweller	<i>n.</i> a person or animal that lives in a particular place
2. gland	<i>n.</i> an organ in the human or animal body which secretes particular chemical substances for use in the body or for discharge into the surroundings
3. distinction	<i>n.</i> a clear difference or separation between two similar things
4. drought	<i>n.</i> a long period of dry weather when there is not enough water for plants and animals to live
5. ailment	<i>n.</i> an illness that is not very serious
6. exceed	<i>v.</i> to be greater in number or size than a quantity, number, or other measurable thing
7. existence	<i>n.</i> the fact or state of living or having objective reality
8. wart	<i>n.</i> a small hard raised part on someone's skin
9. exploit	<i>n.</i> a brave and exciting adventure that someone has had <i>v.</i> to use something fully and effectively
10. extant	<i>adj.</i> still existing in spite of being very old
11. hatch	<i>v.</i> if an egg hatches, or if it is hatched, it breaks, letting the young bird, insect etc come out
12. horny	<i>adj.</i> something that is horny is hard, strong, and made of horn or of a hard substance like horn

13. irritate *v.* to make someone feel annoyed or impatient, especially by doing something many times or for a long period of time
14. avoid *v.* to stay away from someone or something, or not use something
15. limb *n.* an arm or leg of a person or a four-legged animal or a bird's wing
16. newt *n.* a small slender-bodied amphibian with lungs and a well-developed tail, typically spending its adult life on land and returning to water to breed
17. poison *n.* a substance that harms or kills people or animals if they swallow it or absorb it
v. to make land, rivers, air etc dirty and dangerous, especially by the use of harmful chemicals
18. prey *n.* an animal, bird etc that is hunted and eaten by another animal, predator
19. distinguish *v.* to recognize and understand the difference between two or more things or people, differentiate
20. require *v.* to need for a particular purpose; depend on for success or survival
21. rough *adj.* having an uneven or irregular surface; not smooth or level
22. tail *n.* the part that sticks out at the back of an animal's body, and that it can move
23. burrow *v.* (*of an animal*) to make a hole or tunnel, especially to use as a dwelling
24. eject *v.* to force or throw something out, typically in a violent or sudden way
25. leap *v.* to jump high into the air or to jump in order to land in a different place
26. thaw *v.* if ice or snow thaws, or if the sun thaws it, it turns into water
27. toad *n.* a tailless amphibian with a short stout body and short legs, typically having dry warty skin that can exude poison
28. tadpole *n.* a small creature that has a long tail, lives in water, and grows into a frog or toad
29. spawn *v.* if a fish or frog spawns, it produces eggs in large quantities at the same time
30. venom *n.* poisonous fluid secreted by animals such as snakes and scorpions and typically injected into prey or aggressors by biting or stinging

2. Make sure you know these words.

1. Amphibia
2. arthropod
3. Anura
4. terrestrial
5. mucous

3. Word-building.

Noun	Verb	Adjective
leap		
	burrow	
dweller		
		appearing
habitat		
		existing
	poison	

4. Match the words (1–7) to their definitions (a–g).

- | | |
|-------------------|--|
| 1. prominent | a. to recognize the difference between things |
| 2. to eject | b. to affect the way something happens |
| 3. drought | c. when something frozen becomes warmer and softer |
| 4. to leap | d. important and well-known |
| 5. to influence | e. when something leaves the place |
| 6. to distinguish | f. to make a long and high jump |
| 7. to thaw out | g. a long period of time when there is little or no rain |

5. Complete the sentences with the words from the box.

newts diurnal spawn skin tadpoles burrow capillaries

1. Class Amphibia includes frogs, toads and
2. In frogs the hind limbs have a web of between the toes.
3. Amphibia have moist skin with a good supply of
4. Frogs occasionally hibernate in mud at the bottom of a pond, but more usually, in common with toads and newts they themselves under piles of damp leaves, rotting logs and in underground tunnels.
5. In spring, the amphibians emerge to migrate to their breeding grounds and
6. The toad is terrestrial and (active during the day).

7. Eggs are presumably laid in strings attached to rocks at the bottom of fast-flowing streams, where the develop and grow.

Working with Word Combinations and Sentences

6. Translate these words and word combinations.

Способность использовать, водная среда обитания, наземный житель, способ существования, задние конечности, разнообразие пищи, питаться насекомыми, характерная походка, покрытая бородавками кожа, ядовитые железы, в некоторых случаях, для лечения заболеваний, распространенное мнение, быть причиной возникновения бородавок, липкий язык, через несколько дней, замерзнуть до твердого состояния, точка замерзания, побелеть, избежать повреждений, перепончатые лапки.

7. Find out the difference between these synonyms and write sentences, illustrating it.

illness, sickness (<i>Am</i>)	the state of feeling ill or having a disease
ailment	an illness, usually not a serious one, but can be painful or uncomfortable
disease	a serious illness that usually lasts a long time, often one that affects a particular part of the body
condition	the physical state of a person or animal; an illness or medical problem that affects someone for a long time
infection	an illness that is caused by bacteria and that does not usually last a long time
disorder	a situation in which a particular part of the body does not operate normally
to be sick	(<i>Br</i>) when someone is going to vomit (<i>Am</i>) to be ill

8. Rewrite these scrambled sentences putting the words in the correct order.

1. toad | 20 cm | is about | long | the Surinam.
2. a squat body | has | small eyes | it | and a flat head.
3. mates | in | the Surinam | water | toad.
4. an egg | fertilized | after | it is | released | is.
5. by the male | of the female | egg | to the back | is pressed | each.
6. with a horny lid | grows | to enclose them | the skin | around | in a cyst | the eggs.
7. in | emerge | about 80 | the young | days.

9. Translate into English.

Температура тела амфибий зависит от температуры и влажности окружающей среды. Они отличаются ограниченными возможностями распространения, передвижения и ориентации на суше. Примитивность амфибий как наземных животных особенно ярко выражена в том, что их яйца лишены оболочек, защищающих их от высыхания, и, как правило, не могут развиваться вне воды. В связи с этим у земноводных развивается личинка, обитающая в воде. Развитие протекает с превращением (метаморфоз), в результате которого водная личинка превращается в животное, обитающее на суше. Земноводные — самый малочисленный класс позвоночных, включающий лишь около 2 100 современных видов, представленных тремя отрядами: хвостатых, безногих и бесхвостых.

Working with Texts

10. Read and translate the text.

Text 1

Class Amphibia

A. An amphibian is any member of the class Amphibia, vertebrates distinguished by their ability to exploit both aquatic and terrestrial habitats. The name, derived from the Greek *amphibios* meaning “living a double life,” reflects this dual life strategy. Despite this distinction, however, some species are permanent land dwellers, while other species have a completely aquatic mode of existence.

B. Members of the three living orders of amphibians, Anura (frogs and toads), Caudata (salamanders and newts), and Apoda (caecilians), differ in their structural appearance. Frogs and toads are tailless amphibians with long, powerful hind limbs modified for leaping. Salamanders and newts have tails and two pairs of limbs of roughly the same size and have less-specialized structures than the other two orders. Caecilians are limbless, wormlike, and highly adapted for a burrowing existence.

C. Most amphibians have a biphasic life cycle involving aquatic eggs and larvae that metamorphose into terrestrial adults. Egg size and water temperature influence the length of time required by embryos to develop in the egg before hatching.

D. Adult amphibians consume a wide variety of foods. Earthworms are the main diet of burrowing caecilians, anurans feed primarily on insects and other arthropods, and large salamanders and some large anurans eat small

vertebrates, including birds and mammals. Most anurans and salamanders locate prey by sight, although some use their sense of smell.

E. True toads, of which the American toad and the European toad are representative, are stout-bodied, rough-skinned with short legs that limit them to the characteristic walking or hopping gait. Their size ranges from about 2 to 25 centimeters. The thick, dry, often warty skin on the back is generally brown. Poison-secreting glands are located on the back and in the warts but are most concentrated in two prominent raised areas behind the eyes, the parotid glands.

True toads are mainly terrestrial and nocturnal. They frequently remain in fairly small areas, feeding on whatever insects or small animals they can catch with their sticky tongues. Most remain in their burrows in winter and during drought. They breed in water and may migrate 1.5 kilometers or more to a suitable breeding pond. The tadpoles hatch in a few days and transform into adults in one to three months.

F. The poison, which is secreted or ejected when the toad is disturbed, irritates the eyes and mucous membranes of many, though not all, predators. The poisons of the Colorado River toad and the giant toad affect animals as large as dogs, in some instances causing temporary paralysis or even death. The Chinese have long used dried toad poison to treat various ailments.

G. In many parts of the world, freezing temperatures are common. Aquatic animals in these climates must be able to survive when temperatures fall below freezing. It is well documented that wood frogs actually freeze solid in winter! The lenses of their eyes turn white when they freeze. But when spring arrives, these same frogs thaw out. How do they avoid the damage that freezing causes for most creatures? Their cells concentrate sugars, which lowers the freezing point for the cytoplasm and prevents freezing.

11. Match the titles (1—7) to the paragraphs (A—G).

1. Freezing Mystery.
2. Three Orders.
3. Life Cycle.
4. Feeding Habits.
5. Are They Poisonous?
6. Class Amphibia.
7. About Toads.

12. Using the information from the text,

- give a definition to the Class Amphibia;
- tell about three orders included in the Class Amphibia;

- tell about their feeding habits;
- tell about their habitats;
- tell about their ways of reproduction.

13. Read the texts using your dictionary. Retell one of the texts.

Text 2

A Few Facts About Amphibian Behavior

All amphibians must live near water because their soft skin provides little protection against dehydration. If their skin dries up, they soon die. Most live in the areas between fresh water and dry land or in regions that have plenty of moisture.

Some species of amphibians are active by day, while others move about at night. Their activity is also influenced by temperature and humidity.

Amphibians are cold-blooded animals, meaning they are about the same temperature as their environment. When the temperature drops or rises or the humidity falls, they change habitats in order to become more comfortable. This is necessary because their body temperature influences such processes as growth and egg formation.

In cold or temperate regions, some amphibians go into hibernation. They seek out mud, trees, or caverns in which they remain in a state of inactivity for periods ranging from two to eight months, until the environment is again warm enough.

Some amphibians are considered moderately intelligent. They are known to communicate with each other by calls or croaks that indicate mating, distress, or territorial concerns. Sounds, which vary greatly among the species, are made by the passage of air across the vocal cords. Male frogs have vocal sacs on either side of the throat.

Frogs and toads have a strong sense of location. When taken from their territories or breeding grounds, they can find their way back. Many migratory species tend to return to the same breeding grounds year after year.

Amphibians respond to danger in several ways. Some dive in the water or hide in dens. Others pretend to be dead or camouflage themselves by changing color. Others protect themselves with poisonous skin secretions, or puff up to look large and frightening. The enemies of amphibians include foxes, hedgehogs, storks, snakes, and large spiders.

Humans are the most serious threat to amphibians. Although amphibians help keep insect populations under control, they are often destroyed when people drain marshes to kill mosquitos and other insect pests. Amphibians are eaten in some countries; frog legs are a delicacy. Many amphibians are used in scientific experiments. Some are also kept as pets.

Despite the diversity of amphibians, many aspects of their biology remain unstudied. It is the ecological and behavioral adaptations that have made it a successful component of terrestrial and aquatic ecosystems.

Text 3

The Red-eyed Tree Frog

Many scientists believe the red-eyed tree frog developed its vivid scarlet eyes to shock predators into at least briefly questioning their meal choice.

These iconic rain-forest amphibians sleep by day stuck to leafbot-toms with their eyes closed and body markings covered. When disturbed, they flash their bulging red eyes and reveal their huge, webbed orange feet and bright blue-and-yellow sides. This technique is called startle coloration.

Their neon-green bodies may play a similar role in thwarting predators. Many of the animals that eat red-eyed tree frogs are nocturnal hunters that use keen eyesight to find prey. The shocking colors of this frog may over-stimulate a predator's eyes, creating a confusing ghost image that remains behind as the frog jumps away.

Red-eyed tree frogs, despite their conspicuous coloration, are not venomous. They are found in tropical lowlands from southern Mexico, throughout Central America, and in northern South America. Nocturnal carnivores, they hide in the rain forest canopy and ambush crickets, flies, and moths with their long, sticky tongues.

Red-eyed tree frogs are not endangered. But their habitat is shrinking at an alarming rate, and their highly recognizable image is often used to promote the cause of saving the world's rain forests.

14. Translate into English.

Text 4

Красноглазые квакши

Сезон дождей. Тропические леса Центральной Америки оживают после длительной засухи. В траве лягушки с красными глазами и несоразмерно большими оранжевыми лапками выглядят как рассыпанные леденцы. Обитают в кронах деревьев, но покидают их в период спаривания.

Самцы сражаются за территорию. Самка откладывает икру на ствол дерева, стебель растения или камень — лишь бы они располагались над водой. Наутро по всему берегу развешаны сотни кладок, покрытых желеобразной оболочкой, — здесь ждут своего часа десятки будущих лягушат (из одной кладки может появиться до ста голова-стиков). Их атакуют змеи, которые заглатывают сразу всю икру, и осы — они вытаскивают отдельные зародышей и улетают со своим лакомством. В общей сложности эти два хищника истребляют более половины эмбрионов.

У личинок красноглазой квакши есть в запасе ловкий трюк, позволяющий сохранить популяцию. При нападении врага они могут за считанные секунды выйти из икринки раньше положенного срока (иногда на целых два дня) и нырнуть в спасительную воду. Но что самое поразительное, по частоте и продолжительности колебаний студенистой оболочки кладки эмбрионы ухитряются отличать атаку хищника от порывов ветра или ударов дождевых капель. И это еще не все. Будущие лягушата уже в икринках различают двух своих главных врагов и в зависимости от того, кто их атакует, избирают тактику поведения.

Text 5

Класс амфибии

Температура их тела зависит от температуры и влажности окружающей среды; они отличаются ограниченными возможностями распространения, передвижения и ориентации на суше. Примитивность амфибий как наземных животных особенно ярко выражена в том, что их яйца лишены оболочек, защищающих их от высыхания, и, как правило, не могут развиваться вне воды. В связи с этим у земноводных развивается личинка, обитающая в воде. Развитие протекает с превращением (метаморфоз), в результате которого водная личинка превращается в животное, обитающее на суше. Земноводные — самый малочисленный класс позвоночных, включающий лишь около 2 100 современных видов, представленных тремя отрядами: хвостатых, безногих и бесхвостых.

Бесхвостые земноводные (Anura) содержат наибольшее число — около 1 800 — видов, приспособившихся к передвижению по суше прыжками при помощи удлинённых задних конечностей. Сюда относятся различные лягушки, жабы, чесночницы, жерлянки, квакши и т. п. Распространены бесхвостые по всем материкам, кроме Антарктиды.

Хвостатые земноводные (Caudata, или Urodela) более примитивны; их всего около 280 видов. К ним относятся всевозможные саламандры и тритоны, распространённые почти исключительно в Северном полушарии.

Безногие земноводные (Apoda) объединяют примерно 55 видов тропических червяг, большинство из которых ведет подземный образ жизни. По-видимому, это очень древние земноводные, дожившие до наших дней благодаря приспособленности к роющему образу жизни.

Амфибии имеют большое значение для хозяйственной деятельности человека, так как истребляют насекомых, вредящих садам, огородам, полям и лесам. Также они поедают различных переносчиков заболеваний и промежуточных хозяев паразитических червей: комаров, москитов и их личинок, а также моллюсков и червей.

Speaking and Writing

15. Make a report about any amphibian you find interesting and unusual. Write a plan first and do not forget to mention the amphibian's

- appearance;
- habitat;
- feeding habits;
- way of reproduction.

16. Choose any of the following ideas (or propose your own), find information and write an essay (150 — 250 words).

1. Amphibia's place in taxonomy.
2. Unusual qualities.
3. Hibernation.
4. Humans and Amphibia.

Unit 4

Insects

Text 1. Insects

Text 2. Ants

Text 3. Cockroaches

Text 4. О бабочках

Text 5. О гусеницах

Working with Words

1. Study the following words.

1. rival	<i>n.</i> a person, group, or organization that you compete with in sport, business, a fight etc; a competitor
2. outnumber	<i>v.</i> to be more numerous than somebody/ something
3. certain	<i>adj.</i> used to talk about a particular person, thing, group of things etc without naming them or describing them exactly
4. pest	<i>n.</i> a small animal or insect that destroys crops or food supplies, vermin
5. compound	<i>n.</i> a thing that is composed of two or more separate elements; a mixture
6. image	<i>n.</i> a picture that you have in your mind, especially about what someone or something is like or the way they look
7. mature	<i>adj.</i> fully developed physically, full-grown
8. immature	<i>adj.</i> not fully developed
9. maturity	<i>n.</i> the quality of behaving in a sensible way like an adult
10. offspring	<i>n.</i> an animal's baby or babies
11. abdomen	<i>n.</i> the part of the body of a vertebrate containing the digestive and reproductive organs; the belly

12. abundant	<i>adj.</i> existing or available in large quantities; plentiful
13. spiracle	<i>n.</i> an external respiratory opening, especially each of a number of pores on the body of an insect, or each of a pair of vestigial gill slits behind the eye of a cartilaginous fish
14. ovipositor	<i>n.</i> a tubular organ through which a female insect or fish deposits eggs
15. horn	<i>n.</i> the hard pointed thing that grows, usually in pairs, on the heads of animals such as cows and goats
16. bear	<i>v.</i> to support, to carry the weight of
17. fold	<i>n.</i> an area of skin that sags or hangs loosely
18. occur	<i>v.</i> to happen, to take place
19. shed	<i>v.</i> if a plant sheds its leaves or if an animal sheds skin or hair, they fall off as part of a natural process
20. molt	<i>v.</i> (<i>of an animal</i>) to shed old feathers, hair, or skin, or an old shell, to make way for a new growth
21. undergo	<i>v.</i> to experience or be subjected to
22. maggot	<i>n.</i> a soft-bodied legless larva of a fly or other insect, found in decaying matter
23. hollow	<i>v.</i> to make a hole or empty space by removing the inside part of something

2. Make sure you know these words.

1. ocellus (*pl.* ocelli)
2. holometabolous
3. ametabolous
4. chitinous
5. larva (*pl.* larvae)
6. pupa (*pl.* pupae)
7. tracheole

3. What insects are these?

1. wasp
2. dragonfly
3. tick
4. silverfish
5. firefly
6. cockroach

7. grasshopper
8. ant
9. fly
10. bumblebee
11. mosquito
12. beetle
13. bee
14. caterpillar

4. Write antonyms of the following words.

1. dry
2. unknown
3. rare
4. similar
5. difficult
6. simple
7. to soften

5. Write synonyms of the following words.

1. moist
2. to help
3. particular
4. to shed
5. to transform
6. to finish
7. significant

6. Match the words (1 — 7) to their definitions (a — g).

- | | |
|--------------|---|
| 1. warning | a. a series of actions or events |
| 2. pattern | b. picture or idea of something in your mind |
| 3. to avoid | c. the action of signalling something |
| 4. nocturnal | d. an action or statement, telling someone about a possible problem or danger |
| 5. signature | e. existing in large quantities |
| 6. abundant | f. active at night |
| 7. image | g. to escape something, keep off something |

7. Complete the sentences with the words from the box.

<i>hollow shed bear underwent occurred rival distinguish</i>
--

1. This newly inserted species is now a serious to many of the older ones, upsetting the natural balance.
2. Some adult deer males the scars of the former fights.

3. This patient an operation three years ago.
4. The tree trunk of the old oak was completely
5. Complications in only 2 per cent of cases studied.
6. Can you a termite from an ant?
7. Many trees their leaves each autumn.

Working with Word Combinations and Sentences

8. Give the English equivalents of the following word combinations.

Области с умеренным климатом; знакомый вид; сырые районы; удерживать влагу; вбирать кислород; защитный механизм; обеспечивать поддержку; питаться червями; жидкость, вызывающая онемение; самые многочисленные существа; ближайшие соперники; роговидное вещество; защитная пластина; зрелое насекомое; увеличительное стекло; обнаружить свет; вверх ногами.

9. Match the beginnings and the endings of the sentences.

- | | |
|---|---|
| 1. Many people are fond of ladybugs because | a. a ladybug may eat some 5,000 aphids. |
| 2. Most ladybugs voraciously consume plant-eating insects | b. but on plants. |
| 3. By the end of its three-to-six-week life | c. which gives them a foul taste. |
| 4. There are about 5,000 different species of these insects | d. may both play dead and secrete the unappetizing substance to protect itself. |
| 5. A few ladybugs prey not on planteaters | e. are meant to make them unappealing to predators. |
| 6. Their distinctive spots and attractive colours | f. and not all of them have the same appetites. |
| 7. A threatened ladybug | g. of their colourful, spotted appearance. |
| 8. Ladybugs can secrete a fluid, | h. and in doing so they help to protect crops. |

10. Translate into Russian.

Insect eyes are of two general types — simple and compound. Simple eyes, also called ocelli, are usually located in small clusters on the sides of the head or on the forehead.

Compound eyes, like the sight organs of higher animals, are present in pairs. They are most common in adult insects. Some — certain mayflies (чешуйница), for example — have two pairs of compound eyes.

The eyes are called compound because each one is composed of many lenslike facets. Each of these facets — of which there are, for example, some 25,000 in a single dragonfly eye — receives a separate image. The total effect of these images is a composite picture in the insect's brain. The eyes of many insects — bees, for example — are sensitive to ultraviolet light.

Working with Texts

11. Read and translate the text.

Text 1

Insects

A. The world's most abundant creatures are insects, whose known species outnumber all the other animals and the plants combined. Insects have been so successful in their fight for life that they are sometimes described as the human race's closest rivals for domination over the Earth.

Despite their diversity, all adult insects share some basic external and internal anatomical features. Insects are distinguished from other members of the animal kingdom by having six legs; one pair of antennae; a ringed, or segmented, body; and three well-defined body regions.

The three main sections of an insect's body are the head; the middle section, or thorax; and the hind section, or abdomen. The body is covered with a horny substance containing chitin. The protective plate also serves as an external skeleton, or exoskeleton, for the support of the internal organs.

The head bears the antennae, the mouthparts, and the eyes. The thorax has three segments; on each is a pair of legs. In winged insects the thorax also bears one or two pairs of wings. The abdomen typically has 11 segments; it contains a large part of the digestive system.

B. The nervous system of the insect includes a brain and a pair of parallel nerve cords, which extend along the length of the underside of the body. Along the nerve cords are a series of nerve masses, called ganglia. Each ganglion controls certain activities and is more or less independent of the others.

Air enters the body through breathing pores, called spiracles. A pair of spiracles is usually found on each of two thoracic segments and on several abdominal segments. From the spiracles, large air tubes called tracheae and smaller ones known as tracheoles carry air to all parts of the body. Some water insects breathe by means of gills. Other aquatic insects have a tube that leads to the water's surface. Certain internal parasites and very primitive insects breathe directly through the body wall.

C. The development from egg to adult is most interesting, especially in those insects that go through the complex changes called complete meta-

morphosis. The growth of insects is quite different from that of vertebrates because the insect skeleton is an external covering rather than an internal framework, thus the growing insect must periodically shed, or molt, its covering. The new skin, already formed, then expands and begins to harden.

The offspring of all insects undergo a varying number of such growth intervals before maturity. Adult insects do not grow at all. Primitive species such as silverfish mature with little change in appearance except their size. These kinds of insects are known as ametabolous insects. The immature insects of such species are called simply the “young.”

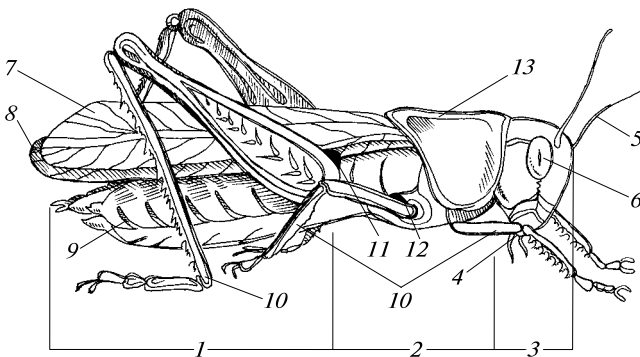
D. Bees, beetles, butterflies, and moths are some of the insects that go through all the changes of complete metamorphosis. They are said to be holometabolous. The young are called larvae (*sing.*, larva). In the inactive stage immediately preceding adulthood they are called pupae (singular, pupa).

The larva hatches from an egg. Often larvae are mistaken for worms. They may be smooth-bodied, like the maggots of the fly, or hairy, like some caterpillars.

Near the end of its larval stage, the insect must find a place in which to pupate, or turn into a pupa. Beetle larvae, as well as certain caterpillars, may hollow out cells in the soil. Some caterpillars may spin silken cocoons about their bodies; some may spin bands to hold themselves against twigs or leaves.

The pupal stage is a time of tissue transformation. When the changes are completed, the creature bursts out of its old skin to become a fully developed insect. In this final, sexually mature state, it is also known as an imago.

12. Look at the picture and, using the information from Text 1, label the parts of the insect.



13. Match the titles (1—4) to the paragraphs (A—D).

1. Larvae and Pupae.
2. External Anatomical Features.

3. Growth and Development.
4. Internal Organs.

14. Answer the questions and do the assignments to Text 1.

1. Name the main distinguishing features of insects.
2. What are the main sections of the insect's body?
3. How do insects breathe?
4. What do we call ocelli?
5. Tell about the compound eyes of the insects.
6. How do insects breed?
7. What is the pupal stage?

15. Read the texts using your dictionary. Retell one of the texts.

Text 2

Ants

Ants are common insects, but they have some unique capabilities. More than 10,000 known ant species occur around the world. They are especially prevalent in tropical forests, where they may comprise up to half of all the insects living in some locations.

Ants look much like termites, and the two are often confused. However, ants have a narrow "waist" between the abdomen and thorax, which termites do not. Ants also have large heads, elbowed antennae, and powerful jaws. These insects belong to the order Hymenoptera, which includes wasps and bees.

Ants live in structured nest communities that may be located underground, in ground-level mounds, or in trees. Carpenter ants nest in wood and can be destructive to buildings. Ant communities are headed by a queen, whose function in life is to lay thousands of eggs that will ensure the survival of the colony. Workers are wingless females that never reproduce, but instead forage for food, care for the queen's offspring, work on the nest, protect the community, and perform many other duties.

Male ants often have only one role — mating with the queen. After they have performed this function, they may die.

Ants communicate and cooperate by using chemicals that can alert others to danger or lead them to a promising food source. They typically eat nectar, seeds, fungi, or insects. However, some species have diets that are more unusual. Army ants may prey on reptiles, birds, or even small mammals.

Text 3

Cockroaches

The cockroach is considered one of the most unpleasant of household pests. This brown or black insect can be found in houses, apartment and

office buildings, ships, trains, and airplanes in many parts of the world. Domestic cockroaches, which are also called roaches, have a disagreeable odor. They live in warm, dark areas. Their broad, flat bodies permit them to crawl in narrow cracks and along pipes. They hide in the daytime, coming out at night to feed. The diet of the cockroach, which includes both plant and animal products, ranges from food, paper, clothing, and books to dead insects. Although cockroaches can be difficult to eliminate entirely, a variety of common poisons and traps are effective in controlling their numbers. Cockroaches are believed to be able to transmit several different human diseases.

Cockroaches are among the oldest living insects. Fossil cockroaches that resemble today's species are commonly found in Coal Age deposits from more than 320 million years ago. About 3,500 species have been identified. Although the most notable varieties are those that infest households in the temperate regions, most species are tropical. Some reach lengths of several inches, and many are colorful.

The cockroach has long, powerful legs and can run very fast. Long antennae on the head are used for feeling in dark places. Most species have two pairs of wings that are larger in the males. The female cockroach carries her eggs in a leathery capsule called an ootheca. Females of some common species lay 16 to 45 eggs at a time. The eggs take from 4 to 12 weeks to hatch. After the female deposits an egg case, soft, white young called nymphs emerge. After exposure to air, the nymphs harden and turn brown.

16. Translate into English.

Text 4

О бабочках

Бабочки, или чешуекрылые (Lepidoptera), — один из самых распространенных отрядов класса насекомых. По количеству видов — более 150 000 — они занимают второе место, уступая только жукам (которых насчитывается около 300 000 видов).

Форма крыльев у бабочек разнообразна. У подавляющего большинства видов они пригодны для полета. Правда, крылья бабочек могут выполнять и другие функции. Предполагают, например, что нижние крылья у бабочки глазчатого бражника (*Smerinthus ocellatus*) служат для отпугивания врагов. Если к бражнику приблизится какая-нибудь птица, тот, почувствовав опасность, поднимает верхние крылья, и птица, увидев вдруг появившиеся яркие пятна, похоже на широко открытые глаза, в испуге останавливается.

В поисках корма, полового партнера или места для откладывания яиц бабочки часто путешествуют на значительные расстояния. Знаменита своими миграциями бабочка монарх (*Danais plexipus*). Живут

монархи в США и Канаде, а осенью летят на юг — во Флориду, в Центральную Америку, на Кубу, Багамские острова — и зимуют там, из года в год собираясь в огромных количествах на одних и тех же деревьях. Перезимовав, бабочки снова летят в родные края и там, отложив яйца, погибают. А осенью новое поколение монархов летит на юг — к деревьям, на которых зимовали их родители.

Бабочки способны различать цвета и, как все насекомые, обладают стереоскопическим зрением, т. е. способны оценивать расстояние.

Современные бабочки сильно страдают от изменения человеком окружающей среды — особенно в ситуациях, когда под влиянием антропогенных факторов исчезают растения, на которых кормятся гусеницы. Многих крупных и красивых бабочек отлавливают коллекционеры.

Text 5

О гусеницах

Гусеницы некоторых чешуекрылых освоили водную среду. Ряд их дышит в воде через покровы тела, а дыхальца, посредством которых дышат все наземные виды гусениц, у них редуцированы. Некоторые виды водных гусениц покрыты густым волосяным покровом и дышат воздухом, который остается между волосками при погружении гусеницы в воду.

Кроме растительной пищи гусеницы бабочек могут питаться и пищей животного происхождения. Гусеницам десятка семейств бабочек свойственно хищничество.

Широко известна способность некоторых видов гусениц к маскировке. Например, многие гусеницы пядениц (*Geometridae*) отлично подражают сучкам (*twig*) растений, на которых кормятся.

Многие несъедобные, ядовитые гусеницы имеют яркую предупреждающую окраску.

Личинки бабочек — важные члены природных сообществ. Питаясь в основном растительной пищей, они сами служат кормом многим насекомоядным животным. Очень велика их роль в питании ряда насекомоядных птиц, которые не только едят их сами, но и собирают в больших количествах как корм для птенцов.

Стадия куколки у различных видов бабочек продолжается от одного-двух дней до нескольких лет. Толчком к такому замедлению развития могут служить продолжительность светового дня, температура окружающей среды, влажность и другие факторы.

Speaking and Writing

17. Make a report about any insect you find interesting and unusual. Write a plan first and do not forget to mention the insect's

- appearance;
- habitat;
- feeding habits;
- way of reproduction.

18. Choose any of the following ideas (or propose your own), find additional information and write an essay (150 — 250 words).

1. Ants can lift and carry more than three times their own weight. Why?
2. Do you know the difference between insects and spiders? If no, find out.
3. Why is insects' blood green, yellow or colourless?
4. What ideas do most people have about insects? Why do you think they feel this way?
5. Discuss the pros and cons of organic versus chemical insect controls.

Unit 5

Fishes

Text 1. Fish

Text 2. Flying Fish

Text 3. White Sharks

**Text 4. Фрагмент из повести Дэвида Аттенборо
«Мадагаскарские диковины»**

Working with Words

1. Study the following words.

1. range	<i>n.</i> the area over which a plant or animal is distributed
2. fin	<i>n.</i> one of the thin body parts that a fish uses to swim; flipper
3. scale	<i>n.</i> one of the small flat pieces of skin that cover the bodies of fish, snakes etc
4. diverse	<i>adj.</i> very different from each other
5. apply	<i>v.</i> to use something such as a method, idea, or law in a particular situation, activity, or process
6. share	<i>n.</i> the part of something that you own or are responsible for <i>v.</i> to have or use something with other people
7. feature	<i>n.</i> a part of something that you notice because it seems important, interesting, or typical
8. gill	<i>n.</i> one of the organs on the sides of a fish through which it breathes
9. slit	<i>n.</i> a long straight narrow cut or hole
10. supply	<i>v.</i> to provide with something needed or wanted
11. overlap	<i>v.</i> if two or more things overlap, the edge of one thing covers the edge of the other

- | | |
|----------------|--|
| 12. broad | <i>adj.</i> having a distance larger than usual from side to side; wide |
| 13. alteration | <i>n.</i> a small change that makes someone or something slightly different, or the process of this change |
| 14. curb | <i>v.</i> to control or limit something in order to prevent it from having a harmful effect |
| 15. otherwise | <i>adv.</i> in a different way, apart from that |
| 16. unfamiliar | <i>adj.</i> not known to you |
| 17. provide | <i>v.</i> to give something to someone or make it available to them, because they need it or want it; to supply |
| 18. indulge | <i>v.</i> to let yourself do or have something that you enjoy, especially something that is considered bad for you |

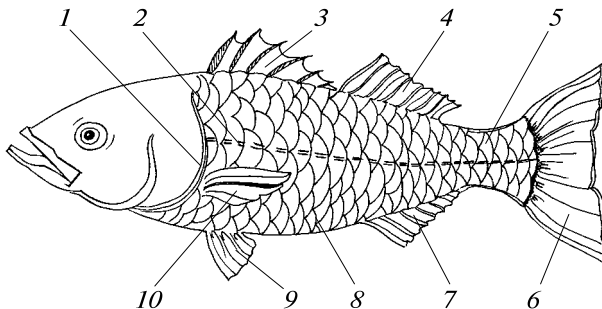
2. Make sure you know these words.

1. operculum (*pl.* opercula)
2. cartilaginous
3. dorsal

3. What fish are they?

1. perch
2. shark
3. trout
4. pike
5. salmon
6. herring
7. flounder
8. puffer
9. lamprey
10. hagfish
11. eel

4. Look at the picture and label the parts of the fish.



5. Word-building.

Noun	Verb	Adjective
		diverse
dependency		
alteration		
		challenging
	apply	
	be ready	
	be able	
behaviour		

6. Add one of the following prefixes to each of these words to make opposites and insert them in the sentences of your own.

1. to appear dis-
2. familiar un-
3. vertebrate in-
4. dependent ir-
5. important
6. to cover
7. natural
8. regular
9. responsible
10. interesting
11. available
12. usual
13. rational
14. to charge

7. Complete the sentences with the words from the box.

fins aquatic habitat flattened vary evolved existence gill

Fishes have been in . . . **1** . . . for more than 450,000,000 years, during which time they have . . . **2** . . . to fit into almost every type of . . . **3** The popular conception of a fish as a slippery, streamlined aquatic animal that possesses fins and breathes by . . . **4** . . . supplies to many fishes, but far more fishes deviate from that conception than conform to it. For example, the body is elongate in many forms and greatly shortened in others; the body is . . . **5** . . . in some (principally in bottom-dwelling fishes) and laterally compressed in many others; the . . . **6** . . . may be elaborately extended, forming intricate shapes, they may be even lost; and the positions of the mouth, eyes, nostrils, and gill openings . . . **7** . . . widely.

Working with Word Combinations and Sentences

8. Give the English equivalents of the following word combinations.

Пресная вода; многочисленные и многообразные виды; определенные черты; жаберные щели; паразитический образ жизни; хрящевые рыбы; костные рыбы; находящие друг на друга пластины; огромная важность; очевидная причина; запас продуктов; неисчерпаемый источник; изменение окружающей среды; личинка москита; заболевание, переносимое москитами; привыкнуть к неволе; держать рыбок; создавать трудности.

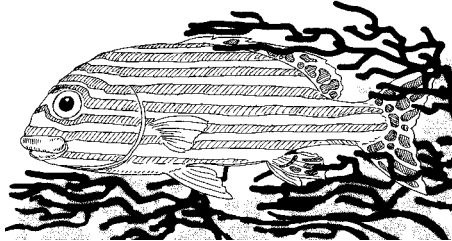
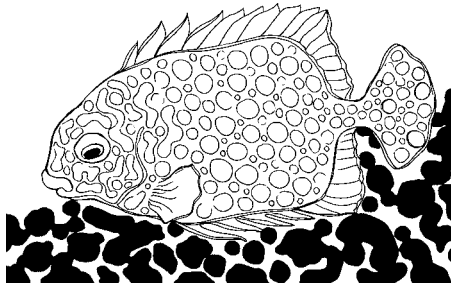
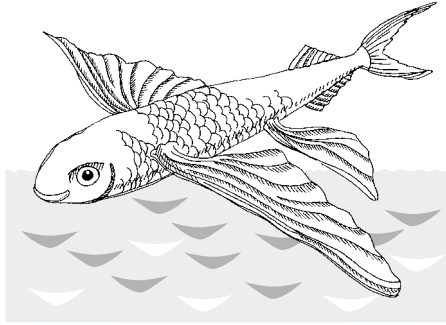
9. Match the words (1 — 7) to their definitions (a — g). Write your own sentences with these words.

- | | |
|---------------|---|
| 1. obvious | a. something that needs a lot of energy or skill to deal with |
| 2. to realize | b. able to change easily |
| 3. flexible | c. to begin to understand something |
| 4. challenge | d. clear to understand |
| 5. distinct | e. an important part or aspect of something |
| 6. feature | f. to use or have something at the same time as someone else |
| 7. to share | g. separate and different |

10. Match the beginnings and the endings of the sentences.

- | | |
|---|---|
| 1. By far one of the most colourful and diverse groups of animals in the sea is | a. helping a fish to go unseen. |
| 2. And although they may be beautiful to behold, | b. for the home aquarium. |
| 3. Red colours appear black under water, | c. there is a real function behind each of these designs. |
| 4. Stripes allow a fish | d. to confuse a would-be predator. |
| 5. Spotted patterns serve | e. deals with survival in its own way. |
| 6. Each species of fish | f. when referring to many different species at once. |
| 7. Most of these species are suitable | g. that of the coral reef fishes. |
| 8. It is perfectly acceptable to use the term 'fishes' | h. to camouflage itself against the coral. |

11. Look at the pictures. What adaptations do these fishes have? Why?



Working with Texts

12. Read and translate the text.

Text 1

Fish

Fishes have been in existence for more than 450,000,000 years, during which time they have evolved to fit into almost every type of aquatic habitat. In a sense, land vertebrates are simply highly modified fishes, for when fishes colonized the land habitat, they became tetrapod (four-legged) land vertebrates.

The term “fish” is applied to a variety of vertebrates of several evolutionary lines. It describes a life form rather than a taxonomic group. As members of the phylum Chordata, fish share certain features with other vertebrates. These features are gill slits at some point in the life cycle, a notochord, or skeletal supporting rod, a dorsal hollow nerve cord, and a tail. Living fishes represent some classes, which are distinct from one another. For example, the jawless fishes (Agnatha) are the only fishes that have a filter-feeding mouth, a feature that makes them dependent on an essentially parasitic way of life.

Sharks, skates, and rays are examples of cartilaginous fishes. The bony fishes are by far the largest class. Examples range from the tiny sea horse to the 450-kilogram (1,000-pound) blue marlin. Unlike those of the cartilaginous fishes, the scales of bony fishes, when present, grow throughout life and are made up of thin, overlapping plates of bone. Bony fishes also have an operculum that covers the gill slits.

The study of fishes, the science of ichthyology, is of broad importance. Fishes are of interest to humans for many reasons, the most important being their relationship with and dependence on the environment. A more obvious reason for interest in fishes is their role as a moderate but important part of the world’s food supply. This resource, once thought unlimited, is now realized to be finite and in delicate balance with the biological, chemical, and physical factors of the aquatic environment. Overfishing, pollution, and alteration of the environment are the chief enemies of proper fisheries management, both in fresh waters and in the ocean.

Another practical reason for studying fishes is their use in disease control. As predators on mosquito larvae, they help curb malaria and other mosquito-borne diseases. Fishes are valuable laboratory animals in many aspects of medical and biological research. Fishes have been especially important in the study of animal behavior, where research on fishes has provided a broad base for the understanding of the more flexible behavior of the higher vertebrates.

There are aesthetic and recreational reasons for an interest in fishes. Millions of people keep live fishes in home aquariums for the simple pleasure of observing the beauty and behavior of animals otherwise unfamiliar to them. Sportfishing is another way of enjoying the natural environment, also indulged in by millions of people every year. Interest in aquarium fishes and sportfishing support multimillion-dollar industries throughout the world.

13. Answer the questions and do the assignment to Text 1.

1. Define the fish as a living organism.
2. What classes of fish do you know?
3. How do they breathe?
4. How do they reproduce?
5. What do you know about the feeding habits of fish?
6. Why are fish so important for humans?

14. Read the texts using your dictionary. Retell one of the texts.

Text 2

Flying Fish

Flying fish can be seen jumping out of warm ocean waters worldwide. Their streamlined torpedo shape helps them gather enough underwater speed to break the surface, and their large, winglike pectoral fins get them airborne.

Flying fish are thought to have evolved this remarkable gliding ability to escape predators, of which they have many. Their pursuers include mackerel, tuna, swordfish, marlin, and other larger fish. For their sustenance, flying fish feed on a variety of foods, including plankton.

There are about 40 known species of flying fish. Beyond their useful pectoral fins, all have unevenly forked tails, with the lower lobe longer than the upper lobe. Many species have enlarged pelvic fins as well and are known as four-winged flying fish.

The process of taking flight, or gliding, begins by gaining great velocity underwater, about 60 kilometers per hour. Angling upward, the four-winged flying fish breaks the surface and begins to taxi by rapidly beating its tail while it is still beneath the surface. It then takes to the air, sometimes reaching heights over 1.2 meters and gliding long distances, up to 200 meters. Once it nears the surface again, it can flap its tail and taxi without fully returning to the water. Capable of continuing its flight in such a manner, flying fish have been recorded stretching out their flights with consecutive glides spanning distances up to 400 meters.

Flying fish are attracted to light, like a number of sea creatures, and fishermen take advantage of this with substantial results. Canoes, filled with enough water to sustain fish, but not enough to allow them to propel themselves out, are affixed with a luring light at night to capture flying fish. There is currently no protection status on these animals.

Text 3

White Sharks

The large and extremely aggressive white shark, *Carcharodon carcharias*, is considered by most experts to be the most dangerous shark in the world. Although the total number of attacks by white sharks on swimmers, surfers, and boats is higher than that by other sharks, the rate of attack is relatively low, certainly much lower than other fatalities on the sea such as drowning.

White sharks are large, reaching a size of at least 6 meters and perhaps as much as 8 meters in length. Large individuals may weigh as much as 2,180 kilograms. The mouth is large and located on the undersurface of the head. Large gill slits, of which there are five on each side of the head, extend onto the upper surface of the body.

The fearsome teeth of the white shark are particularly notable: large, triangular, and bladelike. These teeth, combined with the shark's powerful jaws, size, and swimming strength and speed, make the white shark a superpredator capable of exploiting a variety of prey. Its diet includes fishes and marine mammals. Young white sharks tend to favor fishes, while mature sharks appear to prefer mammals. Other sharks and invertebrates such as crabs and squid also serve as prey. Less commonly found in the stomachs of captured white sharks are sea turtles and birds such as gulls, and penguins. The remains of sheep, pigs, horses, dogs, and, rarely, humans have been found in their stomachs, as has indigestible garbage.

The white shark, like the other members of the same family, owes much of its strength and endurance to adaptations in its circulatory system that enable it to maintain a body temperature above that of the surrounding water. A series of structures called countercurrent exchangers, located near the gills, forms a thermal barrier that prevents the loss of heat from the body into the surrounding environment. The resultant increased body temperature allows for a more efficient metabolism, enabling these sharks to swim faster and with greater strength and endurance than fish that lack this adaptation.

15. Translate into English.

Text 4

Фрагмент из повести Дэвида Аттенборо (David Attenborough) «Мадагаскарские диковины»

(Аттенборо Д. Мадагаскарские диковины // Под тропиком Козерога. — М.: Наука, 1986. — С. 170—171)

Несмотря на то что большую часть жизни он проводит не в воде, илистый прыгун (*mudskipper*) — самая настоящая рыба. Его тонкое, усеянное пятнами туловище длиной около пятнадцати сантиметров увенчано непропорционально крупной головой. Глаза расположены на макушке, а огромный рот квадратный: он напоминает удивленного миниатюрного гиппопотама. Передние плавники рыбы трансформировались в конечности, с помощью которых она выбирается из воды. Илистый прыгун закрепляется на суше, где проводит основную часть времени, присасываясь к ней второй парой брюшных плавников. Дышит он через влажную кожу, абсорбируя кислород примерно таким же образом, что и лягушка. Если кожа у прыгуна полностью высыхает, он, как и лягушка, начинает задыхаться. По этой причине он не отваживается удаляться от воды больше чем на несколько метров, чтобы в случае опасности тут же нырнуть в нее.

Я наблюдал илистых прыгунов во многих частях света: в Западной Африке, Северной Австралии, Индонезии — и всегда отмечал, что они ведут себя в полном соответствии со своим именем, т. е. прыгают

в иле. И только здесь я увидел, как они взбираются на скалы. Мне было, конечно, известно, что они выбираются из воды в поисках пищи — прыгуны едят мелких ракообразных и насекомых, но никогда не доводилось мне видеть, как они это делают . . .

Удивительная способность вылезать из воды появилась у илистых прыгунов не так давно; дело в том, что эти рыбы принадлежат к эволюционной группе, развившейся в сравнительно недавнем геологическом периоде. Превращение плавников в подобие конечностей было этапом пути, пройденным древнейшими рыбами миллионы лет назад. Постепенно они обрели способность дышать воздухом и ходить по земле; их потомки уже меньше зависели от воды, возвращаясь туда только для размножения. Они стали первыми земноводными и первыми позвоночными, заселившими сушу. Именно от них произошли рептилии, птицы, млекопитающие и в конечном счете сам человек.

Speaking and Writing

16. Make a report about any fish you find interesting and unusual. Write a plan first and do not forget to mention the fish's

- appearance;
- habitat;
- feeding habits;
- way of reproduction.

17. Choose any of the following ideas (or propose your own), find information and write an essay (150 — 250 words).

1. The shark's family tree.
2. How many fishes are there in the world?
3. Do sharks really threaten people?
4. Sharks and dolphins.
5. The importance of fish to humans.
6. Comment on this statement: 'Eating fish is good for the brain.'

Unit 6

Birds

Text 1. Birds

Text 2. The Eagle

Text 3. ПИНГВИНЫ

Working with Words

1. Study the following words.

1. chamber	<i>n.</i> a cavity in a plant, animal body, or organ
2. keen	<i>adj.</i> sharp or penetrating
3. feather	<i>n.</i> one of the light soft things that cover a bird's body
4. down	<i>n.</i> the soft fine feathers of a bird
5. shell	<i>n.</i> the hard outer part that covers and protects an egg, nut, or seed
6. vocalization	<i>n.</i> the musical sounds of a bird or birds, typically uttered by a male songbird in characteristic bursts or phrases for territorial purposes
7. nestling	<i>n.</i> a bird that is too young to leave its nest, a baby bird
8. chick	<i>n.</i> a young bird, especially one newly hatched
9. rely (on)	<i>v.</i> to trust or depend on someone or something to do what you need or expect them to do
10. extinct	<i>adj.</i> an extinct type of animal or plant does not exist any more
11. fossil	<i>n.</i> an animal or plant that lived many thousands of years ago and that has been preserved, or the shape of one of these animals or plants that has been preserved in rock
12. paddle	<i>n.</i> a short pole that is wide and flat at the end, used for moving a small boat in water

13. perch	<i>n.</i> a branch or stick where a bird sits
14. innate	<i>adj.</i> an innate quality or ability is something you are born with, inborn
15. vital	<i>adj.</i> extremely important and necessary for something to succeed or exist, crucial
16. insulation	<i>n.</i> protection from heat, cold, noise, or electricity
17. consequent	<i>adj.</i> happening as a result of a particular event or situation
18. forage	<i>n.</i> food supplies for horses and cattle
19. brood	<i>n.</i> a family of birds or other young animals produced at one hatching or birth
20. flock	<i>n.</i> a group of sheep, goats, or birds
21. beg	<i>v.</i> to ask for something in an anxious or urgent way, because you want it very much
22. elaborate	<i>v.</i> to give more details or new information about something
23. decay	<i>n.</i> the gradual destruction of something as a result of a natural process
24. line	<i>v.</i> to cover the inside surface of (a container or garment) with a layer of different material
25. bill	<i>n.</i> a bird's horny projecting jaws, a beak
26. woven	<i>adj.</i> made by interlacing items such as cane, stems, flowers, or leaves
27. diurnal	<i>adj.</i> happening or active in the daytime
28. conspicuous	<i>adj.</i> clearly visible

2. What birds are these?

1. grouse
2. stork
3. owl
4. lark
5. nightingale
6. hummingbird
7. robin
8. hawk
9. raven
10. ostrich
11. eagle
12. pigeon
13. crow
14. sparrow

3. Word-building.

Noun	Verb	Adjective
	rely	
		extinct
response		
	care	
	vary	
use, usage		
	radiate	

4. Match the animal to the suitable group name.

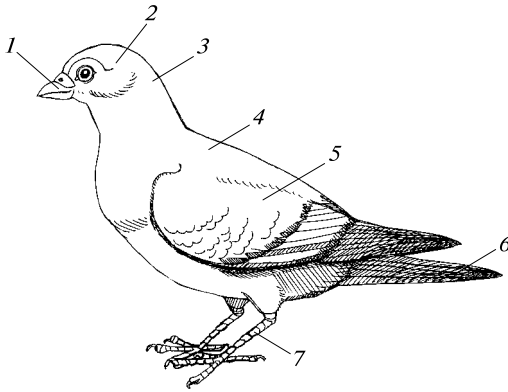
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|-----------|-----------|
| 1. bird | a. school |
| 2. fish | b. pack |
| 3. lion | c. herd |
| 4. person | d. swarm |
| 5. bee | e. crowd |
| 6. wolf | f. pride |
| 7. deer | g. flock |

5. Match the words (1—7) to their definitions (a—g). Write your own sentences with these words.

- | | |
|----------------|--|
| 1. to hatch | a. to allow someone to do something |
| 2. to warn off | b. quality or ability you have from your birthtime |
| 3. decay | c. to tell someone they must stop doing something |
| 4. innate | d. a structure that birds make to keep their eggs and young in |
| 5. down | e. the gradual destruction as a result of a natural process |
| 6. to permit | f. to come out of an egg |
| 7. nest | g. the small soft feathers of a bird |

6. Look at the picture and label the parts of the bird.

Beak, breast, feathers, leg, wing, tail, cheek, moustache, thigh, feet, throat, rump.



7. Complete the sentences with the words from the box.

insulated enormous rainforests radiate mates vessels bill

The toucan (*Ramphastos toco*), which hangs out in the canopies of tropical . . . **1** . . . in South America, has the largest . . . **2** . . . relative to the body size of any bird, making up about one-third of the toucan's body length of about 64 cm.

Researchers have puzzled for centuries over the bill's possible purpose, suggesting it might be used to attract . . . **3** . . . or to get fruit. The new study doesn't solve the case of the . . . **4** . . . bill, but the results suggest one possible function—to regulate body temperature. The toucan's bill is giant, meaning it has a large surface area over which to . . . **5** . . . heat; it's not . . . **6** . . . with feathers or other heat-trapping material; and it is equipped with a network of blood . . . **7** . . . for dumping or absorbing heat.

Working with Word Combinations and Sentences

8. Give the English equivalents of the following words and word combinations.

Четырехкамерное сердце, измененные передние конечности, острое зрение, скорлупа яиц, обоняние, диапазон слуха, вымерший вид, ископаемые останки, неограниченное распространение, значительные различия, способность летать, врожденное поведение, уход за

перьями, различимый звук, тревожные нотки, немзыкальные звуки, тщательно разработанный ритуал ухаживания, шелканье клювом, разлагающаяся растительность.

9. Match the verbs to the paragraphs.

Characteristics of Living Organisms

All living organisms, whether they are single-celled, many-celled, plants or animals, do the following things:

- | | |
|--|--------------|
| 1. They may take in solid food as animals do, or digest it first and absorb it later like fungi do, or build it up for themselves like plants do. | a. respire |
| 2. They take in oxygen and give out carbon dioxide. This exchange of gases takes place between the organism and the air or between the organism and water. The oxygen is used for respiration. | b. reproduce |
| 3. They break down food to obtain energy. Most organisms need oxygen for this. | c. grow |
| 4. Respiration and other chemical changes in the cells produce waste products such as carbon dioxide. Living organisms expel these substances from their bodies in various ways. | d. feed |
| 5. Bacteria and single-celled creatures increase in size. Many-celled organisms increase the numbers of cells in their bodies, become more complicated and change their shape as well as increasing in size. | e. breathe |
| 6. Single-celled organisms and bacteria may simply keep dividing into two. Many-celled plants and animals may reproduce sexually or asexually. | f. respond |
| 7. The whole animal or parts of plants respond to stimuli. | g. move |
| 8. Most single-celled creatures and animals move about as a whole. Fungi and plants may make movements with parts of their bodies. | h. excrete |

10. Read and translate the text.

Text 1

Birds

A. Birds are warm-blooded vertebrates of the class Aves, unique in having feathers, the one major characteristic that distinguishes them from all other animals. Birds have a four-chambered heart, forelimbs modified into wings,

a calcareous-shelled egg, and keen vision, the major sense they rely on for information about the environment. Their sense of smell is not highly developed, and the auditory range is limited. Most birds are diurnal in habit. There are approximately 8,700 living species, and more than 1,000 extinct species have been identified from fossil remains. The ability to fly has permitted an almost unlimited spreading of birds, so that they are now found virtually everywhere on earth.

B. There are considerable differences in flying ability among various birds. Penguins cannot fly but spend much of their time in the water swimming with their paddle-like wings; such birds as ostriches and kiwis have rudimentary wings and are permanently afoot. At the other extreme are the long-winged frigate birds that move from their perches only to fly, never to walk. Most birds alternate some walking or swimming with their flying.

C. Auditory signals, like visual ones, are almost universal among birds. The most familiar vocalization of birds is that usually referred to as “song.” It is a conspicuous sound that is used, especially early in the breeding season, to attract a mate, to warn off another bird of the same sex, or both. As such it is usually associated with establishing and maintaining territories. Many other types of vocalizations are also known. Pairs or flocks may be kept together by series of soft location notes. Alarm notes alert other individuals to the presence of danger; in fact, the American robin (and probably many other species) uses one note when it sees a hawk overhead and another when it sees a predator on the ground. Begging calls are important in stimulating parents to feed their young. Other calls are associated with aggressive situations, courtship, and mating. Nonvocal sounds are not uncommon. Some snipe and hummingbirds have narrow tail feathers that produce loud sounds when the birds are in flight. The elaborate courtship displays of grouse include vocalizations as well as stamping of the feet and noises made with the wings. Bill clapping is a common part of courtship in storks.

D. Most birds build nests in which the eggs are laid. Nests vary widely: they may be a scrape in the sand, a deep burrow, a hole in a tree or rock, or an elaborately woven hanging structure. The materials with which nests are made also vary widely. Some nests are lined with small stones, others are built of mud with or without plant material. Sticks, leaves, algae, rootlets, and other plant fibers are used alone or in combination. Some birds seek out animal materials such as feathers, horsehair, or snakeskin.

E. All birds incubate their eggs, except megapodes, which rely on the heat generated by decaying vegetation or other external sources, and brood parasites, which lay their eggs in the nests of other species.

Incubation takes from 11 to 80 days, depending at least in part on the size of the bird and the degree of development at hatching. Most songbirds and members of some other groups are hatched nearly naked and helpless

and are brooded until well able to regulate their body temperature. They are fed by the parents until they are capable of flight. The young of numerous other birds, such as chickens, ducks, and shorebirds, are hatched with a heavy coat of down and are capable of foraging for themselves almost immediately.

11. Match the titles (1 — 5) to the paragraphs (A — E).

1. Major Characteristics.
2. Auditory Signals.
3. Incubation and Brooding.
4. Nest Building.
5. Locomotion.

12. Answer the questions and do the assignment to Text 1.

1. Give the main characteristics of the class Aves.
2. How do birds move?
3. What can you tell about birds' behaviour?
4. What kinds of calls do birds use?
5. What are their nests made of?
6. What do you know about incubation and brooding?

13. Read the text using your dictionary.

Text 2

The Eagle

Because of the eagle's majestic appearance and power of flight, it has been called the "king of birds." Since ancient times it has been a symbol of strength and courage. The Sumerians chose the "spread eagle" as their emblem of power 5,000 years ago. So did imperial Rome many centuries later.

The American bald eagle was chosen by Congress in 1782 as the emblem of the United States. On the national seal the bird is shown with its wings spread, holding an olive branch in one claw and arrows in the other.

Only two species of eagles are found in North America — the bald and the golden. The more common bald eagle has white tail feathers and white plumes on the head and neck. Early colonists, used to the gray sea eagle of Europe, called these birds "bald-headed." (Bald originally meant "white.") The female is several inches larger. A sea eagle, the bald eagle migrates only if the body of water that it normally fishes, freezes. It returns each year to the same nest, called an aerie, with the same mate.

The golden eagle, a magnificent bird, is more common in the Old World than in the New, but it is found in the western part of North America from Mexico to Alaska. It is somewhat larger than the bald eagle, and its plum-

age is darker except for tawny feathers on its head and neck that shimmer like gold. The bald eagle has bare “ankles,” whereas the legs of the golden eagle are feathered to the toes. The golden eagle builds its huge nest on a high mountain crag.

Eagles are birds of prey, related to vultures, hawks, and falcons.

All eagles are renowned for their excellent eyesight, and the bald eagle is no exception. They have two centers of focus, that allow the birds to see both forward and to the side at the same time. Bald eagles are capable of seeing fish in the water from several hundred feet above. This is quite an extraordinary feat, since most fish are counter-shaded, meaning they are darker on top and thus harder to see from above.

Young bald eagles have been known to make mistakes, such as attacking objects like plastic bottles floating on or just below the surface of the water. Bald eagles will locate and catch dead fish much more rapidly and efficiently than live fish, because dead fish float with their light underside up, making them easier to see.

Eagles have eyelids that close during sleep. For blinking, they also have an inner eyelid called a nictitating membrane. Every three or four seconds, the nictitating membrane slides across the eye from front to back, wiping dirt and dust from the cornea. Because the membrane is translucent, the eagle can see even while it is over the eye.

Eagles, like all birds, have color vision. An eagle’s eye is almost as large as a human’s, but its sharpness is at least four times that of a person with perfect vision. The eagle can probably identify a rabbit moving almost a mile away. That means that an eagle flying at an altitude of 1,000 feet over open country could spot prey over an area of almost 3 square miles from a fixed position.

Eagles are not distinguished for their hearing, but this does not mean that they have poor hearing. Diurnal birds of prey like hawks and eagles use their hearing to locate prey or other birds, but the sharpness is not as essential as in some owls, which can locate prey in the dark only by their sound.

14. Translate into English.

Text 3

Пингвины

Пингвины — вид бескрылых водоплавающих птиц, которые живут в естественной среде только в землях Южного полушария. Пингвины проводят приблизительно половину своей жизни в океане, а другую половину — на суше. Как правило, большинство разновидностей пингвинов обитают в Антарктиде и в некоторых других самых холодных областях полушария. Определенные виды могут выжить в умеренных и даже тропических широтах.

Пингвины созданы для жизни в море. Их тяжелые, твердые кости действуют в воде как тяжелый пояс водолаза, позволяя пингвинам оставаться под водой. Крылья, сформированные как плавники, помогают двигаться под водой со скоростью до 15 миль в час. Обтекаемое тело, подобные веслу ноги, изолирующий слой жира и водонепроницаемые перья — все служит эффективному и комфортному пребыванию этих необычных птиц под водой. У них также есть замечательная способность глубоко нырять.

Жесткие, очень компактно расположенные перья (до 70 в 1 кв. см), обеспечивающие гидроизоляцию, предотвращают потерю тепла. Пингвины покрывают перья жиром из железы около хвоста, чтобы увеличить водонепроницаемость. Черно-белая расцветка делает их почти невидимыми для хищников.

Пингвины, как полагают ученые, являются самыми социальными птицами. Колонии могут содержать тысячи особей. Даже в море они плавают и питаются группами.

Большинство разновидностей пингвинов строит гнезда, которые состоят из груды камней или пустот в грязи. Императорские пингвины не строят гнезд; они сохраняют яйцо между ног под складкой кожи, называемой карманом для выводка (pouch).

Рост императорского пингвина может достигать 1,3 м, а вес — 45 кг. Это самый крупный из всех современных пингвинов.

Для того чтобы согреться, императорские пингвины собираются в плотные группы, внутри которых температура поднимается до +35 градусов при температуре окружающего воздуха –20 °С. При этом пингвины постоянно перемещаются от края группы в центр и обратно, чтобы все особи находились в равных условиях.

Императорские пингвины начинают размножаться в мае — июне, когда в местах их обитания температура опускается ниже –50 °С, а ветер дует со скоростью до 200 км/ч. Самка откладывает единственное яйцо на лапы и накрывает его сверху кожной складкой. Через некоторое время все заботы о яйце берет на себя самец, а самка отправляется в море искать пищу. В возрасте пяти недель птенцы императорских пингвинов уже не помещаются в наседной сумке и уходят в так называемые детские сады. Взрослые пингвины охраняют потомство от хищников.

Speaking and Writing

15. Make a report about any bird you find interesting and unusual. Write a plan first and do not forget to mention the bird's

- appearance;
- habitat;

- feeding habits;
- way of reproduction.

16. Choose any of the following ideas (or propose your own), find information and write an essay (150—250 words).

1. The ancestors of birds.
2. The best singers.
3. The importance of birds to humans.
4. Extinct and endangered species of birds.
5. Birds as symbols in human history.

Unit 7

Mammals

Text 1. Mammals

Text 2. Rodents

Text 3. Dolphins

Text 4. Многообразие млекопитающих

Working with Words

1. Study the following words.

1. nourish	<i>v.</i> to provide with the food or other substances necessary for growth, health, and good condition
2. hinge	<i>v.</i> to attach something to allow it to open and shut
3. skull	<i>n.</i> a bone framework enclosing the brain of a vertebrate; the skeleton of a person's or animal's head
4. cavity	<i>n.</i> a space or hole in something such as a solid object or a person's or animal's body
5. persist	<i>v.</i> to continue to do something, although this is difficult, or other people oppose it
6. womb	<i>n.</i> the organ in the lower body of a woman or female mammal where offspring are conceived and in which they develop before birth
7. versatile	<i>adj.</i> able to adapt or be adapted to many different functions or activities <i>n.</i> versatility
8. lineage	<i>n.</i> direct descent from an ancestor; ancestry or pedigree
9. assess	<i>v.</i> to evaluate or estimate the nature, ability, or quality of
10. precise	<i>adj.</i> marked by exactness and accuracy of expression or detail

11. domesticate	<i>v.</i> to tame an animal and keep it as a pet or on a farm
12. strain	<i>n.</i> a) a particular breed, stock, or variety of an animal or plant; b) a natural or cultured variety of a microorganism with a distinct form, biochemistry, or virulence
13. captive	<i>n.</i> an animal that has been confined
14. pelt	<i>n.</i> the skin of a dead animal, especially with the fur or hair still on it
15. ivory	<i>n.</i> a hard creamy-white substance composing the main part of the tusks of an elephant, walrus, or narwhal, often used to make ornaments and other articles
16. livestock	<i>n.</i> animals such as cows and sheep that are kept on a farm
17. deplore	<i>v.</i> to disapprove of something very strongly and criticize it severely, especially publicly
18. impact	<i>n.</i> the effect or influence that an event, situation etc has on someone or something
19. afflict	<i>v.</i> (<i>of a problem or illness</i>) to cause pain or trouble to, to affect adversely
20. fever	<i>n.</i> an abnormally high body temperature, usually accompanied by shivering, headache, and in severe instances, delirium
21. rabies	<i>n.</i> a very dangerous disease that affects dogs and other animals, and that you can catch if you are bitten by an infected animal
22. offend	<i>v.</i> to make someone angry or upset by doing or saying something that they think is rude, unkind etc
23. span	<i>n.</i> the length of time for which a person or animal lives or a thing functions
24. swamp	<i>n.</i> an area of low-lying, uncultivated ground where water collects; a bog or marsh
25. attain	<i>v.</i> to succeed in achieving something after trying for a long time
26. store	<i>v.</i> to keep or accumulate something for future use
27. contaminate	<i>v.</i> to make something impure by exposure to or addition of a poisonous or polluting substance
28. requirement	<i>n.</i> a thing that is needed or wanted

29. gestation	<i>n.</i> the process or period of developing inside the womb between conception and birth
30. prolific	<i>adj.</i> (<i>of a plant, animal, or person</i>) producing much fruit or foliage or many offspring
31. possess	<i>v.</i> to have as an ability, quality, or characteristic
32. dormant	<i>adj.</i> (<i>of an animal</i>) having normal physical functions suspended or slowed down for a period of time, in or as if in a deep sleep
33. litter	<i>n.</i> a number of young animals born to an animal at one time
34. inconvenience	<i>n.</i> the state or fact of being troublesome or difficult with regard to one's personal requirements or comfort
35. insulate	<i>v.</i> to protect (someone or something) from unpleasant influences or experiences
36. fur	<i>n.</i> the short, fine, soft hair of certain animals
37. handle	<i>v.</i> to manage (a situation or problem)

2. Make sure you know these words.

1. monotreme
2. ungulate (hoofed)
3. viviparous
4. marsupial
5. whale
6. rodent
7. plague

3. What animals are these?

1. platypus
2. ape
3. armadillo
4. hedgehog
5. gerbil
6. porcupine
7. beaver
8. squirrel
9. marmot
10. hamster
11. guinea pig
12. chipmunk
13. hare
14. gopher

4. What other animals do you know? Name as many as you can.

5. Word-building.

Noun	Verb	Adjective
	offend	
		domestic
remark		
		beneficial
	require	
evolution		
	except	
		possessive

6. Match the abbreviations (1—6) to the phrases (a—f).

- | | |
|-------------|---|
| 1. i. e. | a. for example (<i>Latin</i> : <i>exempli gratia</i>) |
| 2. NB | b. that is to say (<i>Latin</i> : <i>id est</i>) |
| 3. etc/etc. | c. as soon as possible |
| 4. e. g. | d. please note (<i>Latin</i> : <i>nota bene</i>) |
| 5. asap | e. and so on (<i>Latin</i> : <i>et cetera</i>) |
| 6. RSVP | f. please reply (<i>French</i> : <i>repondez s'il vous plait</i>) |

7. Write another word with a similar meaning.

1. huge
2. remarkable
3. estimate
4. possess
5. extinct
6. impact
7. requirement
8. prolific
9. offspring
10. lack

8. Define the following words.

1. nourish
2. exploit
3. strain
4. domesticate
5. livestock
6. impact
7. herd
8. aridity

9. Draw a human and label parts of the human body.

Thumb, finger, palm, wrist, hand, arm, elbow, shoulder, neck, chest/breast, back, stomach, waist, hip, thigh, leg, knee, calf, shin, ankle, foot, heel, toe, sole, nail, side, head.

10. Complete the sentences with the words from the box.

*range crops fur diversity vectors research shape extensive
jaw fever layers*

Despite their great species . . . **1** . . . , all rodents share common features. Rodents have a single pair of incisors in each . . . **2** . . . , and the incisors grow continually throughout life. The incisors have thick enamel . . . **3** . . . on the front but not on the back; this causes them to retain their chisel . . . **4** . . . as they are worn down. Rodents show a wide . . . **5** . . . of life-styles, ranging from solitary organisms such as porcupines to highly social organisms living in . . . **6** . . . colonies, such as prairie dogs and naked mole rats.

Rodents cost billions of dollars in lost . . . **7** . . . each year, and some are . . . **8** . . . of human diseases such as plague, typhus, and Hanta . . . **9** However, various rodent species are economically important as sources of food or . . . **10** . . . in many parts of the world, and others are used extensively in biomedical . . . **11**

Working with Word Combinations and Sentences

11. Give English equivalents of the following word combinations.

Вскармливать молоком, уникальные черты, нижняя челюсть, проводить звуковые волны, брюшная полость, дуга аорты, относительно продвинутая степень развития, менее сложная форма, жестокий холод, наиболее многочисленный, одомашненные млекопитающие, попытка оценить, точные термины, постоянно растущее население, причинить существенный вред, стада домашних животных.

12. If someone behaves A, people say they are B.

A

1. malicious tongued
2. dull, uninteresting
3. ashamed or embarrassed about something
4. bad-tempered
5. stubborn
6. arrogant

B

- a. sheepish
- b. cocky
- c. mousy
- d. dogged
- e. ratty
- f. catty/bitchoy

13. Translate into English.

Семейство хомяковые (Cricetidae)

Семейство хомяковые объединяет более 580 видов и около 100 родов. Размеры этих животных колеблются от очень мелких до средних: длина тела — от 6 до 50 см, масса — от 7 г до 3 кг. Хвост — от едва заметного до превышающего длину тела. Он покрыт или роговыми чешуйками с примесью редких волос, или волосами разной густоты и длины, иногда с кисточкой на конце. Ноги либо нормального «бегающего» (наземного) типа, либо приспособленные к передвижению прыжками, или к рытью земли (лапы с мощными когтями), или к плаванию (перепонки между пальцами).

Working with Texts

14. Read and translate the text.

Text 1

Mammals

A. A mammal is any member of the class Mammalia, a group of vertebrate animals in which the young are nourished with milk from special secreting glands of the mother. In addition to these characteristic glands, mammals are distinguished by several other unique features. Hair is a typical mammalian feature. The mammalian lower jaw is hinged directly to the skull, instead of through a separate bone as in all other vertebrates. A chain of three tiny bones transmits sound waves across the middle ear. A muscular diaphragm separates the heart and the lungs from the abdominal cavity. Only the left aortic arch of the primitive pair persists. Mature red blood cells in all mammals lack a nucleus; all other vertebrates have nucleated red blood cells.

B. Except for the monotremes (echidnas and platypuses), which lay eggs, all mammals are viviparous. In the placental mammals (including humans) the young are carried within the mother's womb, reaching a relatively advanced stage of development before being born. In the marsupials (kangaroos, opossums) the newborn, incompletely developed at birth, continue to develop outside the womb.

C. The evolution of the Mammalia has produced tremendous diversity in form and habits. Living kinds range in size from a bat weighing less than a gram to the largest animal that has ever lived, the blue whale, which reaches a length of more than 30 meters and a weight of 136,000 kilograms. Every major habitat has been invaded by mammals that swim, fly, run, burrow, glide, or climb.

D. Wild and domesticated mammals are so interlocked with our political and social history that it is impractical to attempt to assess the relationship in precise economic terms. Throughout our own evolution, for example, humans have been dependent on other mammals for food and clothing. Domestication of mammals helped to provide a source of protein for ever-increasing human populations and provided means of transportation and heavy work as well. Today, domesticated strains of the house mouse, European rabbit, guinea pig, hamster, gerbil and other species provide much-needed laboratory subjects for the study of human-related physiology, psychology, and a variety of diseases from dental caries to cancer. The study of nonhuman primates (monkeys and apes) has opened broad, new areas of research relevant to human welfare. The care of domestic and captive mammals is, of course, the basis for the practice of veterinary medicine.

E. Wild mammals are a major source of food in some parts of the world, and many different kinds (from bats and armadillos to whales) regularly are captured and eaten. In addition, hunting, primarily for sport, is a multibillion-dollar enterprise.

Aside from pelts and meat, special parts of some mammals regularly have been sought for their special attributes. The horns of rhinoceroses are used in the Orient; ivory from elephants and walrus is highly prized; and ambergris, a substance regurgitated by sperm whales, was once widely used as a base for perfumes.

F. Some mammals are directly detrimental to human activities. Murid rodents (house rats and mice of Old World origin) now occur virtually throughout the world and each year cause substantial damage and economic loss. Herbivorous mammals may eat or trample crops and compete with livestock for food, and native carnivores sometimes prey on domestic herds. Large sums are spent annually to control populations of “undesirable” wild mammals, a practice long deplored by conservationists. In addition to their impact on food resources, mammals are important reservoirs or agents of transmission of a variety of diseases that afflict man, such as plague, tularemia, yellow fever, rabies, leptospirosis, hemorrhagic fever etc.

15. Find key sentences in each paragraph.

16. Write a title to each paragraph (A—F).

17. Answer the questions and do the assignments to Text 1.

1. Give a general definition of a mammal.
2. What is the smallest and the biggest animal in the group?
3. Enumerate unique mammalian features.
4. In what habitats can mammals live?

5. What can you tell about their feeding habits?
6. Why are mammals so important to humans?

18. Read the texts using your dictionary. Retell one of the texts.

Text 2

Rodents

Rodents are the largest group of mammals, constituting almost half of the class Mammalia. They are indigenous to every land area except Antarctica, New Zealand, and a few Arctic and other oceanic islands, although some species have been introduced even to those places through their association with humans. This huge order of animals contains 27 separate families, including not only the “true” rats and mice (family Muridae) but also such diverse groups as porcupines, beavers, squirrels, marmots, pocket gophers, and chinchillas.

All rodents possess constantly growing rootless incisors that have a hard enamel layer on the front of each tooth and softer dentine behind. The differential wear from gnawing creates perpetually sharp chisel edges.

Rodents have lived on the planet for at least 56 million years and modern humans for less than one million, but the consequences of their interactions during that short overlap of evolutionary time have been profound. For rodents, early humans were just another predator to avoid, but with *Homo sapiens*' transition from nomadic hunting and gathering to agricultural practices, humans became a reliable source of shelter and food for those species having the innate genetic and behavioral abilities to adapt to man-made habitats. The impact of these species upon human populations ranges from inconvenient to deadly.

Crops are damaged before harvest; stored food is contaminated by rodent waste; and objects are damaged by gnawing. Certain species are reservoirs for diseases such as plague, typhus, tularemia etc. Only a few species are serious pests or vectors of disease, but it is these rodents that are most closely associated with people.

Various other rodents are beneficial, providing a source of food through hunting, apparel derived from their fur, test animals for biomedical and genetic research, pleasure as household pets, and insight on mammalian biology and evolutionary history.

Rodents may be diurnal, nocturnal, or sometimes active part of the day and night. Although some species are herbivorous, diets of most include vegetable and animal matter. Others are opportunistic generalists, and some are specialized predators. Food is either eaten where gathered or carried to burrows and stored. Species living in arid habitats and on oceanic islands are able to obtain their water requirements from their food. A wide variety of shelters are used or constructed; these range from tree holes, rock crevices, or simple burrows to hidden nests on the forest floor, leaf and

stick structures in tree crowns, mounds of cut vegetation built in aquatic environments, or complex networks of tunnels and galleries. Rodents may be active all year or enter periods of dormancy or deep hibernation. Breeding time and frequency, length of gestation, and litter size vary widely, but two of the most prolific are both associated with humans. The brown rat (*Rattus norvegicus*) can give birth to litters of up to 22 offspring, and the house mouse (*Mus musculus*) can produce up to 14 litters annually.

Text 3

Dolphins

Dolphins are warm-blooded like men, and give birth to one baby called a calf at a time. At birth, a bottlenose dolphin calf is about 90—130 centimeters long and will grow to approximately 4 meters, living up to 40 years. They are highly sociable animals, living in pods which are fairly fluid, with dolphins from other pods interacting with each other from time to time.

Dolphins use their powerful tail flukes in an up and down motion to move through the water. They also use their tails when hunting, hitting a fleeing fish up into the air with their tail, stunning it, then scooping the fish up when it falls back into the water. A dolphin slapping its tail on the water in the wild may be a sign of annoyance, or a warning to other dolphins of danger.

Dolphins breathe through their blowhole located at the top of their head. A dolphin may empty and refill its lungs in less than a fifth of a second. As the dolphin breathes, the air leaves the blowhole at speeds of over 100 mph. Complex nerve endings around the blowhole sense pressure changes, so the dolphin knows exactly when the blowhole is in or nearing the air and can be opened. Water in a dolphin's blowhole will actually drown it, so powerful muscles close the blowhole as it dives under the water again.

The dolphin's eyes produce a special slippery secretion which protects the eyes from foreign objects and water friction. To sleep, a dolphin must shut down only half of its brain, as its breathing is under voluntary control.

The dolphin's skin is completely smooth allowing the dolphin to move easily through the water, and also reduce heat loss.

Dolphins are able to dive to great depths, and also leap to great heights. They may leap to avoid predators or to show how powerful they are to females at mating time. Noisy splashing jumps may also be used to herd fish. Bottlenose dolphins can dive to depths of over 500 meters.

Dolphins carry their young inside their womb, and gestation is about 12 months for a bottlenose. The baby emerges tail first, and will suckle from its mother for up to 4 years (a calf may stop suckling sooner depending on circumstances).

The baby will however stay with its mother for between 3—6 years, during which time it learns all about feeding techniques, social interaction, and group foraging.

19. Translate into English.

Text 4

Многообразие млекопитающих

Млекопитающие распространены практически по всей Земле; их нет только на Антарктическом континенте, хотя у его побережья встречаются тюлени и киты. Широко распространены млекопитающие и по жизненным средам. Достаточно вспомнить, что наряду с наземными видами, которых большинство, ряд видов в той или иной мере связан с водной средой; многие активно летают по воздуху; кроме того, значительное число зверей обитает в почве, где проходит вся или большая часть их жизни. Ни один класс позвоночных не дал такого разнообразия форм, как млекопитающие.

Специфическая среда обитания определяет многие особенности зверей. Среди млекопитающих — обитателей тропических лесов выделяются, например, южноамериканские ленивцы, паукообразные обезьяны, некоторые южноазиатские медведи, вся или почти вся жизнь которых проходит в кронах деревьев. Здесь они кормятся, отдыхают и размножаются. В связи с таким образом жизни у видов этой группы развились разнообразные приспособления. Медведи лазают с помощью острых когтей, лемуры и обезьяны имеют хватательные лапы. У некоторых южноамериканских обезьян и опоссумов развит цепкий хвост.

Размножение млекопитающих, характеризующееся большим разнообразием, имеет все же общие черты: внутреннее оплодотворение, живорождение (за редким и неполным исключением), выкармливание новорожденных молоком, а также устройство большинством видов специальных гнезд для деторождения. В простейшем случае — у однопроходных — настоящего живорождения нет и самки откладывают яйца. Недоразвитые детеныши сумчатых завершают развитие, будучи прикрепленными к соскам, чаще открывающимся в полость кожистой сумки.

Приспособления млекопитающих к переживанию неблагоприятных в кормовом и погодном отношении периодов года более разнообразны и совершенны, чем у нижестоящих классов. К зиме или засушливому лету в организме накапливаются резервные энергетические вещества, помогающие пережить тяжелый сезон. У некоторых особей до 25 % общей массы тела составляет жир. Сезонные приспособления выражаются и в миграциях. В целом у млекопитающих миграции свойственны относительно меньшему числу видов, чем у птиц и рыб. В наибольшей мере они развиты у морских зверей и копытных, в то время как среди видов наиболее многочисленных групп — грызунов, насекомоядных и мелких хищников — их практически нет. Третье сезонное приспособление — это спячка, или сезонный сон. В этом случае температура тела, число дыхательных

движений и общий уровень обменных явлений снижаются мало. При изменении обстановки или беспокойстве сон легко может быть прерван.

Значение млекопитающих в жизни человеческого общества весьма разнообразно. Итоговая оценка значения ряда видов иногда бывает затруднительной, так как один и тот же вид в разной природной и хозяйственной обстановке играет разную роль. Многие виды мелких грызунов вредны для полевых культур. Местами они мешают лесонасаждению. Вместе с тем ими питаются пушные хищники, мех которых представляет большую товарную ценность.

Speaking and Writing

20. Make a report about any mammal you find interesting and unusual. Write a plan first and do not forget to mention the mammal's

- appearance;
- habitat;
- feeding habits;
- way of reproduction.

21. Choose any of the following ideas (or propose your own), find information and write an essay (150 — 250 words).

1. Mammalian features.
2. Sense organs.
3. The human being as a representative of Class Mammalia.
4. Domestic animals: selection and importance to humans.

Unit 8

Invertebrates

Text 1. Invertebrates

Text 2. Jelly Fish

Text 3. Echinoderms

Text 4. Моллюски

Working with Words

1. Study the following words.

1. captivate	<i>v.</i> to attract and hold the interest and attention of, to charm
2. unrelated	<i>adj.</i> not related or linked
3. disguise	<i>v.</i> to change the appearance, sound, taste etc of something so that people do not recognize it
4. feat	<i>n.</i> an achievement that requires great skill or strength
5. adhere	<i>v.</i> to stick firmly to something
6. mash	<i>v.</i> to crush or smash something to a pulp
7. diminish	<i>v.</i> to make or become less
8. palp	<i>n.</i> each of a pair of elongated segmented appendages near the mouth of an arthropod, usually concerned with the senses of touch and taste
9. posterior	<i>adj.</i> further back in position; of or nearer the rear or hind end
10. constitute	<i>v.</i> to combine to form (a whole) or be a part of a whole
11. merge	<i>v.</i> to combine or to join things together to form one thing
12. retractable	<i>adj.</i> able to be shrunk or capable of contracting

13. reveal	<i>v.</i> to make previously unknown or secret information known to others
14. hook	<i>n.</i> a curved piece of metal or plastic that you use for hanging things on
15. saliva	<i>n.</i> watery liquid secreted into the mouth by glands, providing lubrication for chewing and swallowing, and aiding digestion <i>adj.</i> salivary
16. contraction	<i>n.</i> the process in which a muscle becomes or is made shorter and tighter
17. sucker	<i>n.</i> a part of an insect or of an animal's body that it uses to hold on to a surface
18. backbone	<i>n.</i> the series of vertebrae extending from the skull to the pelvis, the spine
19. suspension	<i>n.</i> an accumulating in numbers or amount until there is a large quantity in one place
20. tentacle	<i>n.</i> a slender, flexible limb or appendage in an animal, especially around the mouth of an invertebrate, used for grasping or moving about, or bearing sense organs
21. conceal	<i>v.</i> not allow to be seen, to hide
22. trait	<i>n.</i> a distinguishing quality or characteristic, typically one belonging to a person
23. expel	<i>v.</i> to force out something, especially from the body
24. viscera	<i>pl. n.</i> the internal organs in the main cavities of the body, especially those in the abdomen, e. g. the intestines

2. Make sure you know these words.

1. radula (*pl.* radulae)
2. centipede
3. clam
4. cuttlefish
5. flatworm
6. horsehair worm
7. horseshoe
8. jellyfish
9. millipede
10. mussel
11. bivalve
12. oyster
13. rotifer

14. roundworm
15. snail
16. sponge
17. squid
18. starfish
19. urchin

3. Word-building.

Noun	Verb	Adjective
captivity		
	adhere	
		flat
		related
	possess	
		vital
characteristic		
number		
	recognize	

4. Match the parts to get compound words.

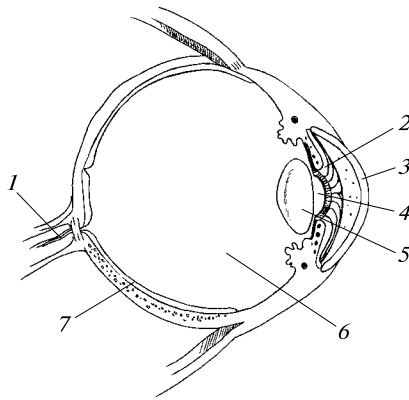
- | | |
|-----------|-------------|
| 1. other | a. worm |
| 2. multi | b. road |
| 3. back | c. fish |
| 4. cuttle | d. wise |
| 5. draw | e. cellular |
| 6. green | f. back |
| 7. flat | g. house |
| 8. cross | h. bone |

5. Match the words (1—8) to their antonyms (a—h).

- | | |
|----------------|------------------|
| 1. posterior | a. increase |
| 2. diminish | b. indistinctive |
| 3. vital | c. anterior |
| 4. expel | d. excretion |
| 5. distinctive | e. primitive |
| 6. complex | f. retain |
| 7. absorption | g. permeable |
| 8. dense | h. unimportant |

6. Label the parts of the eye.

Iris, pupil, lens, cornea, retina, optic nerve, vitreous body.



7. Complete the sentences with the words from the box.

to identify pumps ink excretory three chambers feeding surrounded

Squid have . . . **1** . . . hearts. Two branchial hearts, . . . **2** . . . the gills, each surrounding the larger systemic heart that . . . **3** . . . blood around the body. The hearts have a faint greenish appearance and are . . . **4** . . . by the renal sacs—the main . . . **5** . . . system of the squid. The kidneys are faint and difficult . . . **6** . . . and stretch from the hearts (located at the posterior side of the . . . **7** . . . sac) to the liver. The systemic heart is made of three . . . **8** . . . , a lower ventricle and two upper auricles.

Working with Word Combinations and Sentences

8. Give the English equivalents of the following words and word combinations.

Многоклеточное животное, различные сообщества, единственная особенность, отсутствие позвоночника, вымершие формы, пресная вода, отличительные черты, жизненно важные органы, пищеварительный тракт, внутренности, заключенный в полости, сложный мозг, предназначенные для сокращения мышцы, сильный клюв, слюнные железы, задний отдел, замечательное разнообразие, приспособление для маскировки, прямой контакт, прикрепить к телу, захватить добычу, способность менять цвета, многочисленные хроматозы, плотная группа, участок кожи.

9. Match the beginnings and the endings of the sentences.

- | | |
|--|--|
| 1. The vampire squid can emit luminescence for longer than two minutes as a result | a. which is usually followed by an escape response. |
| 2. The arm tip organs can also emit luminescence (glowing or flashing) | b. by the arm tip organs or an undiscovered visceral organ and can glow for up to 9.5 minutes. |
| 3. The third and final form of luminescence are luminescent clouds which appear | c. of the photophores which either glow simultaneously, flash one to three times per second, or pulsate. |
| 4. The particles are thought to be released | d. a mucous matrix with glowing particles in it. |

10. Match each part of the eye structure to its definition and its context.

Part	Definition	Context
1. Pupil	A. The light-sensitive membrane that lines the back wall of the eyeball and is composed of several layers, including one containing the rods and cones.	a. The structure of in the eyes of owls gives these nocturnal birds of prey excellent night vision.
2. Reflection	B. The elongated cells or elements of the sensory layer of the retina, some of which are cylindrical, others somewhat conical.	b. Our tend to contract in bright light and dilate in the dark.
3. Retina	C. The circular opening in the centre of the pigmented iris of the eye, through which light passes to the retina.	c. As Shakespeare wrote, 'The eye sees not itself, But by'
4. Rods and cones	D. The phenomenon of light or sound waves being thrown back from a surface; the act of reflecting, or turning or sending back.	d. The receives an image formed by the lens and converts it into chemical and nervous signals that reach the brain by way of the optic nerve.

11. Translate the text into Russian.

The Structure of the Cephalopod Eye

The cephalopod eye is probably the most sophisticated eye of all invertebrates and is as complex as the vertebrate eye, though the two are not homologous. For their body size, cephalopod eyes are relatively large. They contain an iris, pupil, and lens, but not necessarily a cornea. Octopuses are the only cephalopods with a completely protected “closed” cornea. That means that the eyes of squids and cuttlefish are in direct contact with sea water! The pupil in cephalopods is unique in that its morphology is different in octopuses, cuttlefish, and squid. Octopuses have a slit-shaped rectangular pupil. In cuttlefish it is W-shaped, and in squids it is round.

Working with Texts

12. Read and translate the text.

Text 1

Invertebrates

A. A variety of otherwise unrelated groups of animals are lumped together by scientists as invertebrates. The only trait that distinguishes invertebrates from vertebrates, or animals with backbones, is the absence or presence of a backbone.

B. More than two dozen phyla of living invertebrates, plus many extinct forms, are recognized. Some of the largest and most important phyla of invertebrates are Sponges; Jellyfishes and Sea Anemones; Flatworms, Rotifers, Horsehair Worms, and Roundworms; Mollusks (snails, bivalves, squids, and octopuses), Annelida (segmented worms), Arthropoda (horse-shoe crabs, spiders, crabs, centipedes, millipedes, and insects), and Echinodermata (starfishes and sea urchins).

C. The large group of animals called mollusks live on land and in both fresh and salt water. They constitute the phylum Mollusca, a major group of animals known to have as many as 100,000 living species and more than 50,000 fossil forms. Most mollusks, including snails, clams, oysters, and mussels, have shells. A major group called the cephalopods, however, including octopuses, squids, and cuttlefish, have shells that are either greatly diminished or absent. One of the most distinctive anatomical features characteristic of mollusks is a true coelom, a body cavity that contains most of the vital organs. The digestive tract, heart, liver, and reproductive organs are all housed inside the coelom.

Two other features that are characteristic of the mollusks and absent in most other groups of animals are the visceral mass and the mantle. The visceral mass is the main body of the animal and contains all the vital organs. The mantle is a thick covering of tissue that surrounds the visceral mass and has glands that secrete the shell, if the animal has one. Many of the aquatic mollusks also have another distinctive feature—gills that are enclosed within a cavity formed by the mantle.

D. Cephalopoda is the most morphologically and behaviorally complex class in the phylum Mollusca. Cephalopoda means “head foot,” and this group has the most complex brain of any invertebrate. Cephalopods are characterized by a completely merged head and foot, with a ring of arms and/or tentacles surrounding the head. The mantle surrounds the visceral sac and possesses strong muscles required for contraction of the cavity and respiration.

Cephalopods are the most intelligent, most mobile, and the largest of all mollusks. Squid, octopuses, cuttlefish, the chambered nautilus, and their relatives display remarkable diversity in size and lifestyle with adaptations for predation, locomotion, disguise, and communication. Today, biologists and paleontologists continue to captivate the human mind and imagination with details of these mollusks’ behavior, natural history, and evolution.

E. Arms and tentacles are another distinguishing cephalopod characteristic. All cephalopods have arms, but not all cephalopods have tentacles. Octopuses, cuttlefish, and squid have eight non-retractable arms, but only cuttlefish and squid have tentacles (two each). Arms usually have palps, often suckers, and sometimes hooks along their undersides. These can be attached to the arm directly or by a flexible stalk and are used to adhere to substrates and catch prey. Tentacles are longer than arms, are retractable, and usually have a blade-shaped or flattened tip, which is covered in suckers.

F. Cephalopods have an amazing ability to change color very rapidly. They accomplish this feat using numerous pigment-filled bags, called chromatophores. Chromatophores are found in the skin, and expand and contract to reveal or conceal small dots of color. They can be so densely concentrated that 200 may be found in a patch of skin the size of a pencil eraser.

13. Give a title to each paragraph (A—F).

14. Answer the questions and do the assignments to Text 1.

1. What phyla of invertebrates do you know?
2. What features distinguish molluscs from other invertebrates?
3. Tell about morphological characteristics of Cephalopods.
4. Describe the structure of Cephalopods.

5. Why and how do they change colour?
6. What is the difference between arms and tentacles?
7. Tell about invertebrates' importance to humans.

15. Read the texts using your dictionary. Retell one of the texts.

Text 2

Jelly Fish

The jellyfish is one of the oldest living creatures in the world. Jellyfish have existed on the face of this planet for over 650 million years. There are over 2,000 species of jellyfish known in the world, with many more species being discovered as man searches the depths of the ocean. Jellyfish are a member of the phylum Cnidaria, to which the coral, sea whip, and sea anemones also belong. They are simple invertebrates and are mobile unlike all other members of the phylum Cnidaria.

The perfectly symmetrical body of the jellyfish allows it to respond to danger from all sides. It also helps it in being able to detect food from every direction. The body of a jellyfish contains only a nervous system, and the nerve receptors themselves formulate appropriate reaction to detection of light, odor, pressure, and other external stimuli. The jellyfish does not have a brain or any specialized functional system. It has an outer layer (epidermis) and an inner layer (gastrodermis), which lines the gut. In between is the thick, elastic-like jelly known as mesoglea. In a simple digestive cavity the gullet, stomach, and the intestine lie. There are four to eight oral arms near the mouth that help in bringing the food near the mouth, along with the tentacles. In fact, only 5 percent of the body of a jellyfish is solid matter.

Jellyfish have different shapes, sizes, and colors. They can be smaller than an inch or larger than 7 feet in diameter, with tentacles spanning more than 100 feet! Irrespective of their size, jellyfish can only have control over their vertical movement. Horizontally, their movement is completely controlled by the wind and the current. Their bell shape allows them to contract to get a push upwards. Jellyfish have the ability to sting with their tentacles. Their tentacles have a number of capsules that are filled with paralysis-causing toxins and are fired when the tentacles come in contact with something. Jellyfish use this facility mainly for hunting; however, jellyfish also use this facility to defend themselves. The toxins in the tentacles are powerful enough to paralyze their victim and buy enough time to escape, if not to kill it. However, in the case of humans, most jellyfish stings will only result in minor discomfort. The severity of stings is high in jellyfish found in warm and temperate oceans, and these can be dangerous to humans.

While jellyfish do not actively attack humans, when their tentacles come in contact with human flesh, their stingers are released as part of their natural defense mechanism.

Text 3

Echinoderms

The phylum Echinodermata, which contains about 6,000 species, gets its name from the Greek, literally meaning “spiny skin.” Many echinoderms actually do have “spiny” skin, but others do not. This phylum exists exclusively in the sea and cannot be found on land or in fresh water. All echinoderms have one thing in common: radial symmetry. This means that the creatures have appendages (or body construction) which point outward from the center of the body like the spokes on a bicycle wheel. Furthermore, these appendages usually occur in multiples of five, although there are a few exceptions. There are several well-known members of this group, like sea stars and sea urchins. The radial symmetry is obvious in these creatures.

Perhaps not as obvious is the water vascular system, another trait common to all echinoderms. By examining the underside of a sea star, one will be able to see hundreds of tiny feet usually arranged into several rows on each ray (appendage) of the star. These are called tube feet, or podia, and are filled with sea water in most echinoderms. The vascular system within the body of the animal is also filled with sea water. By expanding and contracting chambers within the water vascular system, the echinoderm can force water into certain tube feet to extend them. The animal has muscles in the tube feet which are used to retract them. By expanding and retracting the right tube feet in the proper order, the creature can walk. Many echinoderms can also form suckers on the ends of their tube feet. These suckers can be used to capture and hold prey, or to hold onto rocks in a swift current or tide.

Interestingly, although most mature echinoderms live on the bottom, the larvae are usually planktonic with bilateral symmetry. During the process of maturing, the echinoderm will change its body shape from bilaterally symmetrical to radially symmetrical, and in the process, settle down on the sea floor.

Sea stars are capable of regenerating limbs in the event that one or more is damaged. The wound first closes off, and in time, the new limb will begin to grow. In a few species, the severed limb can regenerate a new sea star, but in most species, the severed limb dies. Sea stars eat a variety of different things, including clams, mussels, snails, sea urchins, and in some cases, other sea stars! Many sea stars, such as the Northern Sea Star, eat mussels and clams in a fascinating way. The sea star first surrounds its intended victim. Then it applies outward force (with its suction cup equipped tube feet) on the two mussel shells (called valves), to pull them apart. Contrary to popular belief, the sea star does not need to apply force for a long time in order to tire out the mussel. The sea star can apply so much force to the mussel valves (7 or more pounds!) that it will bend the shell. Seizing the moment, the sea star then everts its stomach out through its mouth, and into the mussel (only a 1/100th of an inch opening is required). Once the sea

star begins to digest its victim within the victim's own body, the victim dies. The sea star then finishes the meal by consuming the rest of the mussel. When the star is finished with the mussel, nothing remains but a shell.

16. Translate into English.

Text 4

Моллюски

Моллюски, или мягкотелые, — главным образом водные, реже наземные животные. Тело их не сегментировано, состоит из головы, туловища и ноги. Органом движения служит нога — мускулистый вырост брюшной стенки тела. Основание туловища у моллюсков окружено большой кожной складкой — мантией. Между мантией и телом находится мантийная полость. На спинной стороне, как правило, расположена выделяемая мантией защитная раковина — цельная, реже двустворчатая или состоящая из нескольких пластинок. Наружный слой раковины образован органическим рогоподобным веществом, внутренний — тончайшими пластинками извести. У некоторых групп моллюсков раковина погружена под кожу или исчезает совсем.

Органы дыхания у большинства видов представлены жабрами, у наземных представителей и форм, вторично перешедших к водному образу жизни, — легкими.

Моллюски произошли от кольчатых червей. Основные классы типа моллюсков — брюхоногие, двустворчатые, головоногие.

Класс брюхоногие

Брюхоногие, или улитки, обитают в морях, часть их приспособилась к жизни на суше или в пресных водах. Голова хорошо развита, на ней расположены одна-две пары щупалец и одна пара глаз. У большинства представителей имеется раковина. Характерная черта всех брюхоногих — асимметричность строения. Нога имеет широкую подошву, при помощи сокращений мускулатуры ноги животное медленно и плавно ползет по поверхности.

Один из представителей класса — большой прудовик (pond snail), встречающийся в пресноводных водоемах. Он покрыт спирально закрученной раковиной. Нервная система большого прудовика представлена нервными узлами, сконцентрированными в окологлоточное кольцо. Органами осязания служат чувствительные клетки, рассеянные в коже, и щупальца, у основания которых находятся глаза. По бокам тела располагаются органы равновесия — пузырьки, внутри которых имеются мелкие известковые тельца и клетки с чувствительными волосками, воспринимающими раздражение при изменении положения известковых телец в пузырьке.

Воздух через легочное отверстие поступает в особый карман мантии — легкое, стенки которого пронизаны кровеносными сосудами. Здесь происходит газообмен. Точно так же дышат наземные улитки.

Сердце состоит из предсердия и желудочка. Кровеносная система незамкнутая: кровь из сердца поступает в кровеносные сосуды, а затем изливается в пространство между органами. Отсюда кровь возвращается к органам дыхания и, окислившись, попадает в сердце. Кровь чаще всего бесцветна. Иногда в ней содержится вещество, близкое к гемоглобину.

Среди морских брюхоногих моллюсков встречаются паразитические формы. Они поселяются главным образом на коже и в полости тела у иглокожих. Паразитизм вызвал у этих моллюсков упрощение строения вплоть до утраты раковины, мантии, ноги, кровеносной и пищеварительной систем.

Speaking and Writing

17. Make a report about any invertebrate you find interesting and unusual.

Write a plan first and do not forget to mention the invertebrate's

- appearance;
- habitat;
- feeding habits;
- way of reproduction.

18. Choose any of the following ideas (or propose your own), find information and write an essay (150 — 250 words).

1. The evolutionary history of Invertebrates.
2. The most interesting representative of Invertebrates.
3. The Invertebrates importance to humans.
4. Extinct and endangered species of the Invertebrates.

Unit 9

Plants

Text 1. Plants

Text 2. Pollination

Text 3. Venus Flytrap

Text 4. Странные хищники

Working with Words

1. Study the following words.

1. nutrition	<i>n.</i> the process of providing or obtaining the food necessary for health and growth
2. nutrient	<i>n.</i> a substance that provides nourishment essential for the maintenance of life and for growth
3. rigid	<i>adj.</i> unable to bend or be forced out of shape; not flexible
4. fertilize	<i>v.</i> to put fertilizer on the soil to help plants grow
5. division	<i>n.</i> the action of separating something into parts or the process of being separated
6. anchor	<i>v.</i> to fasten something firmly so that it cannot move
7. advancement	<i>n.</i> the process of development or improvement
8. cone	<i>n.</i> a flower resembling a pine cone, especially that of the hop plant
9. pollen	<i>n.</i> a fine powdery substance, typically yellow, consisting of microscopic grains discharged from the male part of a flower or from a male cone
10. pollinate	<i>v.</i> to convey pollen to or deposit pollen on (a stigma, ovule, flower, or plant) and so allow fertilization

11. trunk	<i>n.</i> the main woody stem of a tree as distinct from its branches and roots
12. branch	<i>n.</i> a part of a tree which grows out from the trunk or from a bough
13. twig	<i>n.</i> a slender woody shoot growing from a branch or stem of a tree or shrub
14. ovary	<i>n.</i> the hollow base of the carpel of a flower, containing one or more ovules
15. timber	<i>n.</i> wood prepared for use in building and carpentry
16. vegetation	<i>n.</i> plants considered collectively, especially those found in a particular area or habitat
17. aid	<i>n.</i> help, typically of a practical nature
18. recline	<i>v.</i> to shape or force (something straight) into a curve or angle
19. conduct	<i>v.</i> to lead or guide to or around a particular place
20. bulk	<i>n.</i> the mass or size of something large

2. Make sure you know these words.

1. moss
2. liverwort
3. hornwort
4. conifer
5. fern
6. quillwort
7. horsetail
8. Gymnosperms
9. Bryophytes
10. Angiosperms
11. cone

3. Write another word with a similar meaning.

1. feed
2. help
3. stalk
4. improvement
5. happen
6. greenery
7. spread

4. Here are some of the common Latin roots. Form as many English verbs as you can using different prefixes.

Root	Meaning	Prefixes
1. spect	see, look	in-
2. vert	turn	de-
3. port	carry, take	en-
4. duc, duct	lead	re-
5. press	push	con-
6. pose, pone	place, put	ex-
		im-
		pro-
		post-

5. Match the words (1 — 7) to their definitions (a — g).

- | | |
|---------------|---------------------------------------|
| 1. rigid | a. to fix something firmly somewhere |
| 2. mature | b. empty inside |
| 3. to anchor | c. no longer young |
| 4. timber | d. plants and trees |
| 5. coal | e. stiff, hard, and difficult to bend |
| 6. vegetation | f. kind of fuel |
| 7. hollow | g. wood used for building |

6. Put the words in the correct column.

Trees	Flowers	Berries
-------	---------	---------

Poppy, birch, strawberry, carnation, oak, blackberry, pine, chamomile/ daisy, fir, cranberry, aspen, daffodil, linden(bass), ashtree/rowan, violet, raspberry, willow, dandelion, cloudberry, poplar, tulip, bilberry/whortleberry, chestnut, sunflower.

7. Complete the sentences with the correct words.

<i>to rub tubes insects mammals pollination nectar hairs</i>
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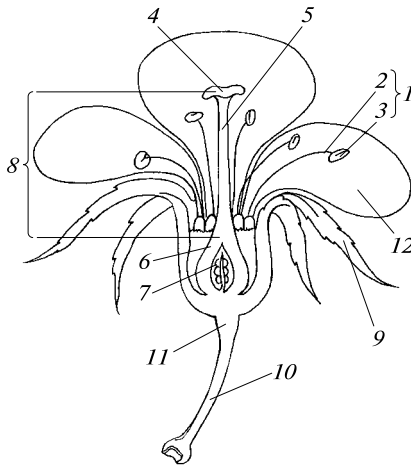
Many flowers have modifications which adapt them to . . . **1** . . . by only one type or species of insect. Honeysuckle with its narrow deep petal . . . **2** . . . are likely to be pollinated only by moths or butterflies whose long “tongues” can reach down the tube to the . . . **3**

Foxgloves need to be visited by fairly large . . . **4** The petal tube is often lined with dense . . . **5** . . . , which impede small insects that would take the nectar without pollinating the flower. A large bumblebee, however, pushing into the petal tube, is forced . . . **6** . . . against the anthers and stigma.

Many tropical flowers are adapted to pollination by birds or even by . . . **7** . . . , e.g. bats and mice.

8. Label the parts of the flower.

Stigma, carpel, ovary, anther, filament, style, ovule, stamen, sepal, petal, receptacle, peduncle.



Working with Word Combinations and Sentences

9. Give the English equivalents of the following word combinations.

Способ питания, неограниченный рост, деление клеток, жесткие стенки, двигательный орган, цветковые растения, развить специальные клетки, выполнять функции, перемещать питательные вещества, наземный ареал, обширная корневая система, впитывать воду, значительное эволюционное развитие, увеличить ширину, значительное многообразие, специализированная проводящая система.

10. Translate into English.

Тканью называется группа клеток, структурно и функционально взаимосвязанных друг с другом, сходных по происхождению, строению и выполняющих определенные функции в организме. Ткани возникли у высших растений в связи с выходом на сушу и наибольшей специализации достигли у покрытосеменных, у которых их выделяют до 80 видов. Важнейшими тканями растений являются образовательные, покровные, проводящие, механические и основные. Они могут быть простыми и сложными. Простые ткани состоят из одного вида клеток (например, колленхима, меристема), а сложные — из различных по строению клеток, выполняющих кроме основных и дополнительные функции (эпидерма, ксилема, флоэма и др.).

Working with Texts

11. Read and translate the text.

Text 1

Plants

A. Plants (kingdom Plantae) are multicellular, eukaryotic life forms fundamentally characterized by (1) an almost exclusively photosynthetic mode of nutrition, in which the plants produce chemical energy (in the form of sugars) from water, minerals, and carbon dioxide with the aid of pigments and the radiant energy of the Sun, (2) essentially unlimited growth at localized regions of cell divisions called meristems, (3) cells that contain cellulose in their walls and are therefore more or less rigid, (4) the absence of organs of locomotion, resulting in a more or less stationary existence, (5) the absence of sensory and nervous systems, and (6) life histories that show an alteration of haploid and diploid generations (the dominance of one over the other is taxonomically significant).

B. Angiosperms are members of the more than 250,000 species of flowering plants, the largest and most diverse group within the kingdom Plantae. Angiosperms represent approximately 80 percent of all the known green plants now living. The angiosperms are vascular seed plants in which the ovule (egg) is fertilized and develops into a seed in an enclosed hollow ovary. Fruits are derived from the maturing floral organs of the angiospermous plant and are therefore characteristic of angiosperms.

C. The specialization of the plant body, which has evolved as an adaptation to a principally terrestrial habitat, includes extensive root systems that anchor the plant and absorb water and minerals from the soil; a stem that supports the growing plant body; and leaves, which are the principal sites of photosynthesis for most angiospermous plants. Another significant evolutionary advancement over the nonvascular and the more primitive vascular plants is the presence of localized regions for plant growth, called meristems and cambia, which extend the length and width of the plant body, respectively.

D. The angiosperms dominate the Earth's surface and vegetation in more environments, particularly terrestrial habitats, than any other group of plants. As a result, angiosperms are the most important ultimate source of food for birds and mammals, including humans. In addition, the flowering plants are the most economically important group of green plants, serving as a source of pharmaceuticals, fiber products, timber, ornamentals, and other commercial products.

E. Bryophytes are nonvascular plants, in which all cells in the plant body participate in every function necessary to support, nourish, and extend the plant body (e.g. photosynthesis and cell division). Bryophytes are among the simplest of the terrestrial plants. Most representatives lack complex tissue organization, yet they show considerable diversity in form. They are widely distributed throughout the world and are relatively small compared with most seed-bearing plants. Most are 2—5 centimeters tall or, if reclining, generally less than 10 centimeters long. The phylum Bryophyta includes three main evolutionary lines: the mosses, the liverworts, and the hornworts.

F. In gymnosperms (e.g. conifers), the other large group of vascular seed plants, the seeds do not develop enclosed within an ovary but are usually borne exposed on the surfaces of reproductive structures, such as cones, that originally produced the spores. It was in 1825 that the Scottish botanist Robert Brown first distinguished gymnosperms from angiosperms. Currently, about 60—70 genera are recognized, with a total of 700—800 species.

G. Lower vascular plants are any of the spore-bearing vascular plants, including the ferns, club mosses, and horsetails.

Vascular plants are those that possess a specialized conducting system for the transport of water, minerals, and food materials, as opposed to the more primitive bryophytes—mosses and liverworts—which lack such a system.

12. Give a title to each paragraph (A—G).

13. Pair work. Ask and answer six questions to Text 1.

14. Read the texts using your dictionary. Retell one of the texts.

Text 2

Pollination

The transfer of pollen from the anthers to the stigma is called pollination. Cross-pollination—when the pollen grains are carried away on the bodies of insects or simply blown by the wind and may land on the stigma of another flower. In self-pollinating plants the pollen comes from the same flower or another flower of the same plant.

Wind-pollinated flowers are adapted to their method of pollination by producing the large quantities of light pollen. They have anthers and stigmas which project outside the flowers. Some grasses have anthers which are not rigidly attached to the filaments and can be shaken by the wind. The stigmas of grasses are feathery and act as a net which traps passing pollen grains.

Grasses, cereals, and many trees are pollinated not by insects, but by wind currents. The flowers are often quite small and inconspicuous. They produce no nectar.

The anthers and stigma are exposed to the air. The pollen grains, being light and smooth, may be carried long distances by the wind and some of them will be trapped on the stigmas of other flowers.

Insect-pollinated flowers are considered to be adapted in various ways to their method of pollination. In the course of evolution the structure and physiology of a flower have been modified in ways which improve the chances of successful pollination by insects.

Most insect-pollinating flowers have brightly colored petals and scent, which attract a variety of insects. Some flowers produce nectar.

Text 3

Venus Flytrap

Flytraps actually get a good deal of their sustenance like other plants do, through the process of photosynthesis. However in addition to synthesizing glucose, plants also need to make amino acids, vitamins, and other cellular components to survive. To accomplish this, plants need additional nutrients like:

- nitrogen — to make amino acids, nucleic acids, proteins;
- phosphorus — as part of the energy-carrying ATP molecule;
- magnesium — as a co-factor that helps many enzymes function;
- sulfur — to make some amino acids;
- calcium — as an enzyme co-factor and to make plant cell walls;
- potassium — to regulate water movement in and out of the plant.

In the bogs favored by Venus Flytraps, the soil is acidic, and minerals and other nutrients are scarce. Most plants can't survive in this environment because they cannot make enough of the building blocks necessary for growth. The Venus Flytrap has evolved the ability to thrive in this unique ecological niche by finding an alternate means of getting key nutrients like nitrogen. Living creatures like insects provide a good source of the nutrients missing from the soil, and they also contain additional energy-laden carbohydrates.

In the case of the Venus Flytrap, the leaves forming the trap secrete a sweet nectar that draws in insects searching for food.

When an insect lands or crawls on the trap, it is likely to run into one of six short, stiff hairs on the trap's surface. These are called trigger hairs, and they serve as a primitive motion detector for the plant. If two of these hairs are brushed in close succession, or one hair is touched twice, the leaves close down upon the offending insect within half a second.

If there is no further stimulation of the hair, the trap stays in its partially shut state until tension can be re-established in the leaves of the trap. This process takes about 12 hours, at which point the leaves spread apart again. The unwanted object either falls out as the leaves reopen or is blown out by the wind.

Once the trap fully closes, the leaves form an airtight seal so that:

- digestive fluids and insect parts are kept inside the trap;
- bacteria and molds can't get in.

To make sure that the insects are contained within the trap, the edges of the leaves have finger-like cilia that lace together when the leaves press shut. These long, hair-like projections make the plant look like it has spiny teeth; but the cilia are really only used to latch the trap shut.

Once the insect is firmly ensconced in the trap, the process of digestion can begin. The trap secretes acidic digestive juices that:

- dissolve the soft tissues and cell membranes of the food;
- serve as an antiseptic to kill small amounts of bacteria inadvertently eaten or sealed in with the food.

The process continues until all that is left of the insect is its hard exoskeleton. Once the nutrients are depleted from the acidic bath, the plant reabsorbs the digestive fluid. This serves as a signal to reopen the trap, and the remains of the insect are usually either washed away in the rain or blown away by the wind.

15. Translate into English.

Text 4

Странные хищники

Растения-хищники представлены практически во всех экосистемах — от Арктики до тропиков. Особенно много их на юго-западе Австралии. Некоторые распространены довольно широко, в то время как ареал других ограничен. Венера мухоловка, например, растет лишь в Северной и Южной Каролине. Особенно многочисленны хищники во влажной местности: на болотах и топях — здесь они испытывают постоянный дефицит минеральных веществ, в первую очередь азота. Восполнить его удается благодаря способности ловить живую добычу. Впрочем, и традиционный для растений способ питания — фотосинтез — они также используют.

Большинство насекомоядных растений — многолетники с прикорневой розеткой листьев, преобразованных в ловушки. Различают три вида ловушек: липкие, захлопывающиеся и ловушки-сосуды. При этом любая из них — это всегда только видоизмененные листья или их отдельные части, а не цветки, как может показаться на первый взгляд. Для привлечения насекомых у хищников существует множество средств: яркая окраска листьев, пьянящий аромат, сладкий нектар и другие.

Оказавшись в ловушке-сосуде, насекомые тонут в жидкости, которая ее наполняет, или разлагаются под действием пищеварительных соков, попав на «липучку». Далее растения выделяют кислоту, разрушающую покровы жертвы, и пищеварительные ферменты, разла-

гающие ткани на более простые элементы. Всасывание питательных веществ происходит через клеточные стенки ловушек.

В тропической Азии, на Сейшельских островах, на Мадагаскаре и в Северной Австралии обитают самые мощные из всех хищников — представители рода непентес (*Nepenthes*).

Лист непентеса состоит из трех частей. В основании — широкая пластинка, поддерживающая фотосинтез. Средняя часть надлена чувствительностью, дающей возможность растению обвивать листья деревьев. И наконец, верхушечная — кувшинчик с крышечкой — для ловли насекомых. Кувшинчики окрашены в яркие цвета. Иногда в них попадает крупная добыча: грызуны, жабы и даже птицы. Однако основным источником питания все же остаются насекомые.

Над устьем расположена неподвижная крышка, защищающая содержимое кувшина от дождевой воды. Добыча, привлекаемая цветом, запахом и нектаром, соскальзывает в кувшин, так как его внутренняя поверхность очень скользкая. Попадая в жидкость, содержащую ферменты и кислоты, добыча полностью переваривается в течение 5—8 часов. Остается только хитиновый покров. Впрочем, непентес может выделять фермент, способный растворить даже хитин.

Speaking and Writing

16. Make a report about any plant you find interesting and unusual. Write a plan first and do not forget to mention the plant's

- appearance;
- habitat;
- feeding habits;
- way of reproduction.

17. Choose any of the following ideas (or propose your own), find information and write an essay (150—250 words).

1. Plants: humans' best friends.
2. Plants: humans' enemies.
3. Examples of adaptation among plants.
4. Plants and global warming.

Unit 10

Fungus

Text 1. Fungus

Text 2. Yeasts

Text 3. Bat Death Mystery Solved

Text 4. Питательные свойства грибов

Working with Words

1. Study the following words.

1. yeast	<i>n.</i> a microscopic fungus consisting of single oval cells that reproduce by budding; capable of converting sugar into alcohol and carbon dioxide
2. lack	<i>v.</i> to not have something that you need, or not have enough of it
3. numerous	<i>adj.</i> great in number; many
4. restrict	<i>v.</i> to put a limit on; keep under control
5. tubular	<i>adj.</i> of or involving tubules or other tube-shaped structures
6. complicated	<i>adj.</i> difficult to understand or deal with, because many parts or details are involved
7. budding	<i>adj. (of a plant)</i> having or developing buds
8. fission	<i>n.</i> the process of dividing a cell into two or more parts
9. germinate	<i>v. (of a seed or spore)</i> begin to grow and put out shoots after a period of dormancy
10. confine	<i>v.</i> to keep someone or something within the limits of a particular activity or subject
11. regard	<i>v.</i> to consider or think of in a specified way
12. discard	<i>v.</i> to get rid of someone or something as no longer useful or desirable
13. malady	<i>n.</i> a disease or ailment
14. consumption	<i>n.</i> the action of using up a resource
15. mill	<i>n.</i> a building equipped with machinery for grinding grain into flour

16. eliminate	<i>v.</i> completely to remove or get rid of something
17. precisely	<i>adv.</i> exactly and correctly
18. thread	<i>n.</i> a long, thin strand of cotton, nylon, or other fibres used in sewing or weaving
19. kernel	<i>n.</i> a softer, usually edible part of a nut, seed, or fruit stone contained within its shell
20. harvest	<i>v.</i> to gather crops from the fields
21. yield	<i>n.</i> the amount of profits, crops etc that something produces
22. release	<i>n.</i> when a chemical, gas etc is allowed to flow out of its usual container
23. brewer's yeast	<i>n.</i> a yeast which is used in the brewing of top-fermenting beer and is also eaten as a source of vitamin B

2. Make sure you know these words.

1. fungus (*pl.* fungi)
2. Mycota
3. Mycelium
4. Thallus
5. hyphae
6. sclerotium (*pl.* sclerotia)
7. lysergic acid
8. psychedelic
9. mildews
10. molds
11. enzyme
12. morel
13. prickly cup
14. death cup
15. toadstool
16. field/meadow mushroom
17. flour
18. rye

3. Form nouns and adjectives from the verbs given. Pay attention to the suffixes.

Noun	Verb	Adjective
	apply	
	mature	
	observe	
	contaminate	

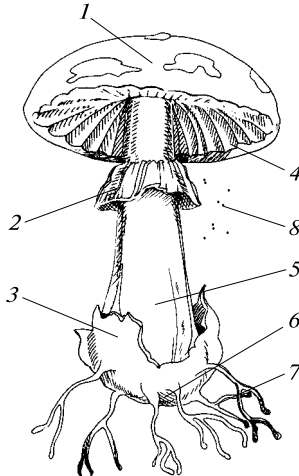
Noun	Verb	Adjective
	discover	
	eliminate	
	replace	
	consume	
	know	
	brew	

4. Match the words (1 — 7) to their definitions (a — g).

- | | |
|---------------|---|
| 1. yield | a. to collect a crop |
| 2. yeast | b. powder made by crashing grains |
| 3. to lack | c. fungi used for making bread or beer |
| 4. to discard | d. cows and bulls |
| 5. cattle | e. to get rid of something |
| 6. flour | f. an amount of crop produced |
| 7. to harvest | g. when you don't have enough of something you need |

5. Look at the picture and label the parts of the mushroom.

Cap, ring, volva, gills, mycelium, stem, spores, hypha.



6. Complete the sentences with the words from the box.

obtain hemicelluloses disease absorb extracellularly carbon dioxide insoluble source

Unlike green plants, which use . . . **1** . . . and light as sources of carbon and energy, respectively, fungi meet these two requirements by assimilating preformed organic matter; carbohydrates are the preferred nutrient . . . **2** Fungi can readily . . . **3** . . . and metabolize a variety of soluble carbohydrates, such as glucose, xylose, sucrose, and fructose, but are also characteristically well equipped to use . . . **4** . . . carbohydrates like starches, cellulose, . . . **5** . . . , and lignin. To do so, they must first digest these polymers . . . **6** Saprobic fungi . . . **7** . . . their food from dead organic material; parasitic fungi do so by feeding on living organisms (usually plants), thus causing . . . **8**

Working with Word Combinations and Sentences

7. Give the English equivalents of the following word combinations.

Составлять отдельное царство, общие характеристики, вегетативный рост, многочисленные грибы, широкое применение, хлебная плесень, разветвленные волокна, жесткие стенки клетки, размножаться почкованием, замедлять рост, неизбежное загрязнение, чашки Петри, загадочное заболевание, потребление хлеба, уничтожить болезнь, ядовитые органические соединения, собирать зерно, пасти скот, выпускать споры, сокращение урожайности, контролировать кровотечение, батон хлеба, кисть винограда, фундаментальные знания, пивные дрожжи, заложить основу.

8. Read the definitions and write the corresponding names of the mushroom's parts.

Part	Definition
1	Microscopic seeds acting as reproductive agents; they are usually released into the air and fall on a substrate to produce a new mushroom.
2	Axis supporting the mushroom's cap.
3	Fertile spore-producing part of the mushroom, located under the cap.
4	Tangle of hyphae created through spore germination, from which the aboveground part of the mushroom develops.
5	Microscopic filament, often white, that draws water and the organic matter necessary for mushroom development.
6	Remnant of a membrane that completely covered the immature mushroom and ruptured as the stem grew.

Part	Definition
7	Membrane located under the cap and circling the stem; remnant of a membrane that covered the gills of the immature mushroom and ruptured as the cap grew.
8	Differently shaped and coloured upper part of the mushroom that protects the gills; it usually resembles a headdress, hence its name.

9. Explain the concepts given in your own words.

1. contamination
2. taxonomic kingdom
3. alkaloid
4. brewer
5. mutant
6. fetus
7. hemorrhage

10. Translate the text into Russian.

In 1951, a strange disease broke out in the small French village of Pont-Saint-Esprit, and several persons died. Doctors were baffled by the mysterious malady until it was recognized as a form of “St. Anthony’s fire”—ergotism—that had resulted from eating bread made from contaminated flour. Ergotism was prevalent in northern Europe in the Middle Ages, particularly in regions of high rye-bread consumption; modern grain-cleaning and milling methods have practically eliminated the disease.

The cause of ergotism is ergot—a fungus. More precisely, ergot is a sclerotium (*pl.* sclerotia), a special part of a fungus that develops on grasses and especially on rye. The wind carries the fungal spores to the flowers of the rye, where the spores germinate, infect, and destroy the ovaries of the plant, and replace them with masses of microscopic threads cemented together into a hard fungal structure shaped like a rye kernel but considerably larger and darker. This is ergot, and it contains a number of poisonous organic compounds called alkaloids. A mature head of rye may carry several ergots in addition to non-infected kernels. When the grain is harvested, much of the ergot falls to the ground, but some remains on the plants and is mixed with the grain. If the ergot is not removed before milling, the ergotized flour would be converted into bread and other food products and consumed; St. Anthony’s fire—for which no cure is known—is the result. In the spring, when the rye is in bloom, the ergot remaining on the ground produces tiny, black, mushroomlike bodies that expel large numbers of spores to start a new series of infections.

Among the many interesting chemicals in ergot is lysergic acid, the active principle of the psychedelic drug lysergic acid diethylamide (LSD). Here, then, is a single fungus that can reduce crop yields, cause abortion in cattle, sicken and sometimes kill people, and be used as a source of LSD. On the credit side, ergot provides medical science with drugs useful in inducing labor in pregnant women and in controlling hemorrhage after birth.

Working with Texts

11. Read and translate the text.

Text 1

Fungus

A. A fungus (*pl.* fungi) is any of about 50,000 species of organisms of the kingdom Fungi, or Mycota—including yeasts, rusts, smuts, mildews, molds, and mushrooms. They are among the most widely distributed organisms on Earth and are of great importance. Many fungi are free-living in soil or water; others form parasitic or symbiotic relationships with plants or animals.

Historically, the fungi were included in the plant kingdom, but because they lack chlorophyll and the organized plant structure of stems, roots, and leaves, they are now considered to constitute a separate kingdom. Fungi are eukaryotic organisms having two common characteristics: anatomically, their principal mode of vegetative growth is through mycelium; physiologically, their nutrition is based on absorption of organic matter.

B. A typical fungus consists of a mass of branched, tubular filaments enclosed by a rigid cell wall. The filaments, called hyphae (*sing.* hypha), branch repeatedly into a complicated, radially-expanding network called the mycelium, which makes up the thallus, or undifferentiated body, of the typical fungus. Some fungi, notably the yeasts, do not form a mycelium but grow as individual cells that multiply by budding or, in certain species, by fission. The mycelium grows by utilizing nutrients from the environment and, upon reaching a certain stage of maturity, forms—either directly or in special fruiting bodies—reproductive cells called spores. The spores are released and dispersed by a wide variety of passive or active mechanisms.

C. In 1928, a green mold accidentally grew in a culture dish of Staphylococcus bacteria that the bacteriologist Alexander Fleming was studying in a London hospital. The fungus colony that developed inhibited the growth of the bacteria. Such unavoidable contamination certainly had occurred many times before in laboratories throughout the world. Fleming, however, carefully recorded his observation and in 1929 published a scientific report announcing the discovery of penicillin, the first of a series of

antibiotics — many of them derived from fungi — that have revolutionized medical practice.

D. The systematic study of fungi began 250 years ago, but humans have been indirectly aware of fungal activity since the first loaf of bread was baked and the first tub of grape was turned into wine. Yet, even now, few people realize that they are almost constantly either benefited or harmed by these organisms. Together with bacteria, fungi are responsible for the disintegration of organic matter and the release, into the soil or atmosphere, of the carbon, oxygen, nitrogen, and phosphorus that otherwise would be forever locked up in undecomposed organic matter. Fungi are essential to many household and industrial processes, notably the making of bread, wine, beer, and certain cheeses. They are used in the production of a number of organic acids, enzymes (biological catalysts), and vitamins and are the sources of a number of antibiotics besides penicillin. Fungi are also used as food: mushrooms and truffles.

E. Studies of fungi have greatly contributed to the accumulation of fundamental knowledge in biology. Current knowledge of biochemistry and cellular metabolism was derived in part from studies of ordinary baker's or brewer's yeast. Some of these pioneering discoveries were made at the end of the 19th century and continued during the first half of the 20th. From 1920 through the 1940s, geneticists and biochemists who studied mutants of the red bread mold, *Neurospora*, established the one-gene — one-enzyme theory and laid the foundation of modern genetics.

12. Find key sentences in each paragraph.

13. Match the titles (1 — 5) to the passages (A — E).

1. Discovery of Penicillin.
2. General Features of Fungi.
3. Importance of Fungi for Biological Research.
4. Name and Classification.
5. Worldwide Distribution.

14. Pair work. Ask and answer six questions to Text 1.

15. Read the texts using your dictionary. Retell one of the texts.

Text 2

Yeasts

Yeasts are any of certain economically important single-celled fungi, most of which are in the class Ascomycetes, only a few being Basidiomycetes. Yeasts are found worldwide in soils and on plant surfaces and are especially

abundant in sugary mediums such as flower nectar and fruits. There are hundreds of varieties of ascomycetan yeasts; the types commonly used in the production of bread, beer, and wine are selected strains of *Saccharomyces cerevisiae*.

Yeasts reproduce asexually by budding: a small bump protrudes from a parent cell, enlarges, matures, and detaches. A few yeasts reproduce by fission, the parent cell dividing into two equal cells. Some yeasts are dangerous pathogens of humans and other animals (e.g. *Candida albicans*, *Histoplasma*, *Blastomyces*).

In food manufacture, yeast is used to cause fermentation and leavening. The fungi feed on sugars, producing alcohol (ethanol) and carbon dioxide; in beer and wine manufacture, the former is the desired product, in baking, the latter. In sparkling wines and beer, some of the carbon dioxide is retained in the finished beverage. The alcohol produced in bread making is driven off when the dough is baked. The fermentation of wine is initiated by naturally occurring yeasts present in the vineyards.

Yeast is 50 percent protein and is a rich source of vitamins B1, B2, niacin, and folic acid. Brewer's yeast is sometimes eaten as a vitamin supplement.

In commercial production, selected strains of yeast are fed a solution of molasses, mineral salts, and ammonia. When growth ceases, the yeast is separated from the nutrient solution, washed, and packaged. Yeast for baking is sold in compressed cakes containing starch or in a dry granular form mixed with cornmeal.

Text 3

Bat Death Mystery Solved

Bats are getting moldy and dying, and scientists have identified the culprit in the deadly mystery.

The killer is a member of a group of fungi called *Geomyces*. This white, powdery-looking fungus coats the muzzles, ears, and wings of bats and has meant death for more than 100,000 of the night flyers in the northeastern United States.

Bats covered with the fungus, a sickness now called white-nose syndrome, were first spotted in Howes Cave near Albany, N.Y., during the winter of 2006. At that time, field biologists reported caves that were typically covered with hibernating bats had loads of vacancies, which the scientists assume is because the bats either died or were flitting around in search of food. In one case, a cave floor was littered with dead bats.

Since then, scientists have estimated drastic declines in populations of cave-hibernating bats in Connecticut, Maine, New York, and Vermont. In some caves, more than 75 percent of the bats have perished.

Fungi in general do best in moist environments, and so it's no surprise that the researchers found more infected bats in the most humid caves. In

addition, this particular fungus can survive at temperatures between 2 degrees to 15 degrees Celsius, which are typical in caves.

The bats also lower their core body temperatures to match that of the caves, making their bodies perfect hideouts for the fungi. But bats have done this for millions of years. They have hibernated in these same caves using the same physiological mechanism, dropping their heart rates down, not eating, dropping their core body temperature down, and they didn't use to get moldy.

Why now? The bats may have ingested some environmental contaminant that is causing them to starve, or pesticides may have wiped out their food source, keeping the bats from fattening up before entering caves for hibernation. Their emaciated bodies would then be susceptible to invasion by the fungus.

16. Translate into English.

Text 4

Питательные свойства грибов

Ценность грибов как пищевого продукта связана со своеобразием их химического состава. В частности, основная часть углеводов содержится в них в форме гликогена — животного крахмала, подобного тому, который откладывается в печени животных. Данные химического состава грибов показывают, что они содержат все необходимые организму человека вещества (белки, жиры, углеводы, минеральные соли, витамины), имеют низкую калорийность, однако даже в небольшом количестве вызывают чувство сытости. В состав грибов входят азотистые вещества, в том числе белковые соединения. Азотистых веществ в них больше, чем в мясе, яйцах, горохе, ржи. Одни виды грибов богаче белками, другие несколько беднее. Белковые вещества в грибах распределены неравномерно. В шляпках их больше, чем в ножках.

Грибы являются настоящей кладовой полезных веществ, поэтому вегетарианские рецепты блюд с грибами заслуживают особого внимания. Количество белков в свежих грибах достигает 2—5 %, а в сушеных — 16—25 %. По содержанию белка и составу аминокислот грибы ближе к ценным овощам, чем к мясу. В телах грибов обнаружено 18 аминокислот, восемь из которых являются незаменимыми, так как не могут образовываться в человеческом организме и поступают только с пищей. Ценные вкусовые и питательные свойства съедобных грибов объясняются составом их плодовых тел. В грибных клетках и тканях содержится много воды — 80—90 %. Сухое же вещество представлено преимущественно белками. Этим-то и оправдывается распространенное название грибов «лесное мясо». Это ставит грибы в ряд особенно важных продуктов питания. Опорной частью грибных

тканей является грибная клетчатка, которая содержит сложный белок фунгин, или мицетин, — вещество, идентичное хитину, из которого состоят надкрылья жуков, панцирь ракообразных.

Speaking and Writing

17. Make a report about any fungus you find interesting and unusual. Write a plan first and do not forget to mention the fungus's

- appearance;
- habitat;
- feeding habits;
- way of reproduction.

18. Choose any of the following ideas (or propose your own), find information and write an essay (150 — 250 words).

1. Fungi: Humans' best friends.
2. Fungi: Our enemy.
3. Mushrooms as a part of our menu.
4. Extraordinary features of fungi.

ORGANISMS AND THEIR ENVIRONMENT

Unit 11

Ideas About Evolution

Text 1. Ideas About Evolution

Text 2. Erasmus Darwin

Text 3. Alfred Russel Wallace

Text 4. Чарлз Дарвин

Working with Words

1. Study the following words.

1. put forward	<i>phr. v.</i> to suggest a plan, proposal etc for other people to consider or discuss; to propose
2. arrange	<i>v.</i> to put things in a neat, attractive, or required order
3. according to	<i>prep.</i> in a way that agrees with a system or plan, or obeys a set of rules
4. increase	<i>v.</i> to become or make greater in size, amount, or degree
5. origin	<i>n.</i> the point or place where something begins, arises, or is derived
6. propose	<i>v.</i> to suggest something as a plan or course of action
7. point out	<i>phr. v.</i> to tell someone where something is or to stress something important
8. suggest	<i>v.</i> to tell someone about someone or something that is suitable for a particular job or activity; to think
9. habitat	<i>n.</i> the natural home or environment of an animal, plant, or other organism
10. acquire	<i>v.</i> to obtain or get something or being given it
11. crust	<i>n.</i> the outermost layer of rock of which a planet consists, especially the part of the Earth above the mantle

- | | |
|----------------|---|
| 12. wipe out | <i>phr. v.</i> to destroy, remove, or get rid of something completely |
| 13. breed | <i>v.</i> to keep animals or plants in order to produce babies or new plants, especially ones with particular qualities |
| 14. assume | <i>v.</i> to think that something is true, although you do not have definite proof |
| 15. clinch | <i>v.</i> to finally agree on something or get something after trying very hard |
| 16. emerge | <i>v.</i> to move out of or away from something and become visible |
| 17. complexity | <i>n.</i> the state of being complicated |
| 18. due to | <i>prep.</i> because of something |
| 19. pronounced | <i>adj.</i> very great or noticeable |

2. Word-building.

Noun	Verb	Adjective
	believe	
		heritable
complexity		
	shape	
origin		
		selective
mutation		

3. Match the words (1 — 7) to their definitions (a — g).

- | | |
|-----------------|--|
| 1. origin | a. the thick outer surface of the Earth |
| 2. crust | b. to combine together to form a whole |
| 3. similar | c. to show, to stress something |
| 4. to breed | d. the place or moment where something begins to exist |
| 5. to point out | e. not exactly the same |
| 6. to wipe out | f. to destroy something completely |
| 7. to make up | g. to produce a new sort of animal or plant |

4. Complete the sentences with the words from the box.

*liquid blend evolutionist scientific theory belief appeals
heredity ancestors*

The belief that . . . **1** . . . was transmitted from the parents to offspring by “blood,” was accepted by most 19th-century biologists, the . . . **2** . . . Charles Darwin being included among these.

The blood . . . **3** . . . of heredity, if this notion can be dignified with such a name, is really a part of the folklore antedating . . . **4** . . . biology. It is implicit in such popular phrases as “half blood,” “new blood,” “blue blood.” It does not mean that heredity is actually transmitted through the red . . . **5** . . . in blood vessels; the essential point is the . . . **6** . . . that a parent transmits to each child all its characteristics and that the hereditary endowment of a child is an alloy, a . . . **7** . . . of the endowments of its parents, grandparents, and more remote . . . **8** This idea . . . **9** . . . to those who pride themselves on having a noble or remarkable “blood” line.

Working with Word Combinations and Sentences

5. Give the English equivalents of the following word combinations.

Обрести форму, различные источники, выдвинуть идею, возрастающая сложность, в соответствии с Библией, увеличиться в размере, различные требования, удовлетворять запросы, из-за воздействия окружающей среды, выраженные изменения, приобретенные характеристики, слои горных пород, катастрофа мирового масштаба, с другой стороны, земная кора, разводить голубей, сходная карьера, основной источник.

6. We know that scientific ideas could be:

- put forward;
- proposed;
- accepted;
- classified.

Continue the list.

7. Translate into English.

Первые эволюционные идеи выдвигались уже в античности, но только труды Чарлза Дарвина сделали эволюционизм фундаментальной концепцией биологии. Хотя единой и общепризнанной теории биологической эволюции до сих пор не создано, сам факт эволюции сомнению ученых не подвергается, так как имеет огромное число прямых подтверждений.

В середине XX века на основе теории Дарвина сформировалась синтетическая теория эволюции (сокращенно СТЭ). СТЭ является в настоящее время наиболее разработанной системой представлений о процессах видообразования. Основой для эволюции по СТЭ

является динамика генетической структуры популяций. Основным движущим фактором эволюции считается естественный отбор. Однако наука не стоит на месте, и передовые теоретические разработки отличаются от первоначальных постулатов синтетической теории эволюции. Существует также группа эволюционных представлений, согласно которым видообразование (ключевой момент биологической эволюции) происходит быстро — за несколько поколений. При этом влияние каких-либо длительно действующих эволюционных факторов исключается.

Working with Texts

8. Read and translate the text.

Text 1

Ideas About Evolution

Ideas — including scientific ones — occur in different places, with different people, and at different times. And no new theory emerges from a vacuum of ideas, but rather takes shape from various sources. Many people in the past had put forward the idea of evolution. Aristotle (384 — 322 B. C.) classified animals and arranged them in a series of increasing complexity. Bishop Ussher in 1650 had calculated that — according to Bible — the Earth was created in 4004 B. C., which made it about 6,000 years old. This time was far too short for evolution to have occurred. Now the Earth is thought to be 4.6 billion years old.

The grandfather of Charles Darwin — Erasmus Darwin (1731 — 1802) — put forward his own theory of evolution. He believed that God had created the first simple organisms. These organisms evolved into new species. By this time, a study of the Earth's surface was beginning to show that it had its origin hundreds of millions of years ago.

Lamarck (1744 — 1829) proposed an interesting theory of “Transformism.” He suggested that animals have an innate tendency to increase in size and complexity. He also pointed out that different environments made different demands on the individuals, which then evolved to meet these needs. Lamarck's theory suggested that due to environmental pressures certain organs would be used more (or less) than others. For example, a mole's eyes were diminished in size and function through disuse in the underground habitat. For this kind of evolution to work, it is essential for each modification to be passed on to the offspring. And with each new generation the modification becomes more pronounced. This belief in the inheritance of acquired characteristics persisted until the 1900s.

There were two schools of thought about evolution in general. Geological studies showed that the Earth's crust was made up of distinct layers of rock, with different fossils in each layer. Believers in catastrophism thought that this represented a series of worldwide disasters in which living organisms were wiped out and new forms created.

Uniformitarians, on the other hand, thought that the forces which shaped the Earth's crust in the past were no different from those in action today, e.g. mountain building, erosion, volcanic activity, and that they formed a continuous process.

Charles Darwin (1809—82) combined his own experience as a breeder (he bred pigeons), his observations as a naturalist and ideas of other scientists and philosophers into a new theory. He assumed that the better adapted varieties would be “selected” by pressure of the environment. Darwin also was sure that these “selected variations” should be heritable. But he didn't know how these variations were passed on to the offspring.

Alfred Russel Wallace (1823—1913) made a career of a naturalist, which was very similar to Darwin's. He made a voyage to the Amazon basin, Malaysia, and the East Indies. Wallace, like Darwin, had read Thomas Malthus, and formulated a theory of natural selection.

Darwin's book was widely read, but his theory of natural selection was opposed by many members of the scientific world and is not accepted by some religious groups even today. The theory was clinched only in the 1900s, when Mendel's papers were re-discovered. It was then realized that mutations were the principal source of Darwin's “variations” and genetics could explain how they were inherited.

9. Pair work. Ask and answer six questions to Text 1.

10. Summarize the information from the text about one of the concepts and add some additional data.

1. Transformism.
2. Evolutionism.
3. Blood theory.
4. Natural selection.
5. Creationism.

11. Read the texts using your dictionary. Retell one of the texts.

Text 2

Erasmus Darwin

Erasmus Darwin was a prominent English physician, grandfather of the naturalist Charles Darwin and the biologist Francis Galton.

Educated at the universities of Cambridge (1750—54) and Edinburgh (1754—56), Darwin opened a successful medical practice in Lichfield. He soon built a reputation as a practitioner of such talent that George III offered him a position as his personal physician in London. Darwin declined to make the move, however.

A freethinker and radical, Darwin often wrote his opinions and scientific thoughts in verse. In *Zoonomia or the Laws of Organic Life* (1794—96), he advanced his own concepts of evolution, which were similar to those of J.-B. Lamarck. He believed that species modified themselves by adapting to their environment in a purposive way. It is as a transitional figure that Erasmus Darwin is primarily important. He embodied the attitudes and values of 18th-century materialism, but his conclusions concerning evolution were drawn from simple observation and were rejected by the more sophisticated of the 19th-century scientists, his grandson Charles foremost among them. Here is his rendering of the idea as versified in the *Temple of Nature*:

“Organic life beneath the shoreless waves
Was born, and nursed in Ocean’s pearly caves;
First forms minute, unseen by spheric glass,
Move on the mud, or pierce the watery mass;
These, as successive generations bloom,
New powers acquire and larger limbs assume;
Whence countless groups of vegetation spring,
And breathing realms of fin, and feet, and wing.
Thus the tall Oak, the giant of the wood,
Which bears Britannia’s thunders on the flood;
The Whale, unmeasured monster of the main;
The lordly lion, monarch of the plain;
The eagle, soaring in the realms of air,
Whose eye, undazzled, drinks the solar glare;
Imperious man, who rules the bestial crowd,
Of language, reason, and reflection proud,
With brow erect, who scorns this earthy sod,
And styles himself the image of his God—
Arose from rudiments of form and sense,
An embryon point or microscopic lens!”

Text 3

Alfred Russel Wallace

Alfred Russel Wallace was the eighth of nine children. His formal education was limited to six years at the one-room Hertford Grammar School. Although his education was curtailed by the family’s worsening financial situation, his home was a rich source of books, maps, and gardening activities, which Wallace remembered as enduring sources of learning and pleasure.

Living in London, he was keen on self-education, read books and attended lectures by prominent philosophers that formed the basis of his religious skepticism and his reformist and socialist political philosophy.

He also read works and attended lectures on phrenology and mesmerism, forming an interest in nonmaterial mental phenomena that grew increasingly prominent later in his life.

Unemployed, and ardent in his love of nature, Wallace traveled to Brazil in 1848 as self-employed specimen collector. Wallace spent a total of four years traveling, collecting, mapping, drawing, and writing in unexplored regions of the Amazon River basin. Unfortunately except for one shipment of specimens sent to his agent in London, however, most of Wallace's collections were lost on his voyage home when his ship went up in flames and sank. Nevertheless, he managed to save some of his notes before his rescue and return journey. From these he published several scientific articles, two books. These won him acclaim from the Royal Geographical Society, which helped to fund his next collecting venture, in the Malay Archipelago.

Wallace spent eight years in the Malay Archipelago, from 1854 to 1862, traveling among the islands, collecting biological specimens for his own research and for sale, and writing scores of scientific articles on mostly zoological subjects. Among these were two extraordinary articles dealing with the origin of new species. Wallace proposed that new species arise by the progression and continued divergence of varieties that outlive the parent species in the struggle for existence. In early 1858, he sent a paper outlining these ideas to Darwin, who saw such a striking coincidence to his own theory that he decided to present two extracts of his previous writings, along with Wallace's paper, to the Linnean Society. The resulting set of papers, with both Darwin's and Wallace's names, was published as a single article in 1858.

Wallace returned to England in 1862 an established natural scientist and geographer, as well as a collector of more than 125,000 animal specimens. He married and raised three children. Wallace published a highly successful narrative of his journey. In several articles from this period on human evolution and spiritualism, Wallace parted from the scientific naturalism of many of his friends and colleagues in claiming that natural selection could not account for the higher faculties of human beings.

He also lectured in the British Isles and in the United States and traveled on the European continent. In addition to his major scientific works, Wallace actively pursued a variety of social and political interests. In writings and public appearances, he opposed vaccination, eugenics, and vivisection while strongly supporting women's rights and land nationalization. Foremost among these commitments was an increasing engagement with spiritualism in his personal and public capacities.

His engagement with progressive politics and spiritualism likely contributed to his lack of employment and to his somewhat peripheral status in the historical record.

12. Translate into English.

Text 4

Чарлз Дарвин

Поворотным моментом в биографии Дарвина было его пятилетнее (1831 — 1836) кругосветное путешествие на корабле «Бигл» в качестве натуралиста.

Во время путешествия Дарвин собрал богатейшие зоологические, палеонтологические, ботанические и геологические коллекции. Находясь в Южной Америке, он сравнивает останки вымерших ленивцев и броненосцев с ныне живущими видами и устанавливает их родство. На вулканических Галапагосских островах Дарвин обнаруживает нигде более не встречающиеся, но очень похожие на южноамериканские виды птиц, черепах, ящериц. Весь собранный материал можно разделить на три группы.

Первая группа фактов свидетельствовала об исторической связи между вымершими и современными животными. В геологических слоях Южной Америки Дарвин обнаружил скелеты ископаемых ленивцев, поразительно сходных со скелетами особей ныне живущего вида этой же группы, обитающего на той же территории. Заметно различались скелеты изученных видов лишь размерами. Преемственность в строении между вымершими и существующими видами, их прошлое и настоящее обитание на одной территории, как отмечал Дарвин в дневнике, «прольет когда-нибудь больше света на вопрос о появлении и исчезновении организмов на земной поверхности, чем какой бы то ни было другой разряд фактов».

Вторая группа обнаруженных Дарвином фактов, опровергающих концепцию постоянства видов, относилась к закономерностям географического распределения животных. При сравнении фауны южного и северного материков Америки обнаружили существенные различия в их видовом составе. В Южной Америке обитают броненосцы, ленивцы, муравьеды, тапиры и другие типичные для этого материка животные, а в Северной Америке совершенно другие виды. Причиной такого разделения видового состава фаун, по мнению Дарвина, были географические преграды, в частности обширное плоскогорье в районе Мексики.

Третью группу фактов, свидетельствовавших в пользу идеи эволюции, Дарвин собрал при исследовании фауны островов Галапагосского архипелага. Эти острова населены многими эндемичными видами. При сходстве с материковыми формами островные виды существенно отличаются от них. Резкие различия наблюдались и внутри островных групп животных. Особенно бросались в глаза различия между видами вьюрков (finch) по форме и величине клюва, отмечались и постепенные переходы в изменчивости этих признаков.

Дарвин также подметил территориальную приуроченность каждого вида вьюрков к определенному острову. Наблюдения над вьюрками послужили затем одним из исходных пунктов для формулировки принципов постепенной изменчивости признаков в пределах данной группы и территориальной разобщенности видов.

Speaking and Writing

13. Make a report about any scientist you find interesting, for example:

- 1) Aristotle;
- 2) Bishop Ussher;
- 3) Thomas Malthus;
- 4) Jean-Baptiste Lamarck;
- 5) Gregor Johann Mendel;
- 6) Erasmus Darwin;
- 7) Charles Darwin;
- 8) Alfred Russel Wallace.

Choose one name, find some information and make a report, presenting the main ideas of this scientist.

14. Write an essay (150—250 words), giving the biography of the scientist mentioned above or another person whose ideas you find interesting.

Unit 12

Ecosystems

Text 1. Ecosystems
Text 2. Human Interference
Text 3. Coral Reefs
Text 4. Экосистемы

Working with Words

1. Study the following words.

1. affect	<i>v.</i> to do something that produces an effect or change in something or in someone's situation
2. encompass	<i>v.</i> to include a wide range of ideas, subjects etc
3. constituent	<i>adj.</i> being one of the parts of something
4. maintain	<i>v.</i> to keep something at the same level or rate
5. sustain	<i>v.</i> to make something continue to exist or happen for a period of time; to maintain
6. decompose	<i>v.</i> to make or become rotten, to decay
7. graze	<i>v.</i> to put (cattle, sheep etc) to feed on grassland
8. account	<i>v.</i> to give a satisfactory explanation of why something has happened or why you did something
9. consequently	<i>adv.</i> as a result
10. disrupt	<i>v.</i> to interrupt (an event, activity, or process) by causing a disturbance or problem
11. magnitude	<i>n.</i> the great size or importance of something
12. extend	<i>v.</i> to spread from a central point to cover a wider area
13. succession	<i>n.</i> a number of people or things of a similar kind following one after another
14. barren	<i>adj. (of land)</i> too poor to produce much or any vegetation

2. Make sure you know these words.

1. geosphere
2. biosphere
3. autotroph
4. heterotroph
5. abiotic
6. tertiary
7. oscillate
8. detritus

3. Using the following prefixes, form new words from these words.

- | | |
|-----------------|--------|
| 1. relationship | inter- |
| 2. lying | under- |
| 3. direct | in- |
| 4. act | non- |
| 5. living | re- |
| 6. arrange | de- |
| 7. compose | over- |
| 8. connect | un- |
| 9. lap | |
| 10. like | |
| 11. turn | |
| 12. placement | |
| 13. stable | |

4. Define the following words.

1. to affect
2. to decompose
3. to store
4. succession
5. loss
6. chain
7. lipids

5. Complete the sentences with the words from the box.

recent loss main without globalwarming plants surface whales

Krill feed on phytoplankton, microscopic, single-celled . . . **1** . . . that drift near the ocean's . . . **2** . . . and live off carbon dioxide and the sun's rays. They in turn are the . . . **3** . . . item in the diets of literally hundreds of different animals, from fish and birds to . . . **4** . . .

Simply put, . . . **5** . . . krill, most of the life forms in the Antarctic would disappear.

Alarmingly, there are . . . **6** . . . studies that show Antarctic krill stocks may have dropped by 80 percent since the 1970s. Scientists attribute these declines in part to ice cover loss caused by . . . **7** . . . This ice . . . **8** . . . removes a primary source of food for krill: icealgae.

Working with Word Combinations and Sentences

6. Give the English equivalents of the following word combinations.

Лежащие в основе принципы, взаимодействовать напрямую, основываться на, абиотические составляющие, основные силы, поток энергии, круговорот питательных веществ, основной источник, сложные органические соединения, составить пищевую цепочку, последнее звено, расход энергии, голые скалы, поток лавы, относительно нестабильная экосистема, высокопродуктивная экосистема, многообразие видов.

7. Make sure that you understand these verbs with prepositions and write sentences, incorporating them.

To be based on, to contain within, to categorize into, to be capable of, to convert into, to build up, to feed on, to compose of, to make up, to account for, to store in, to incorporate into, to break down.

8. Translate into English.

Экосистема — природный комплекс, образованный живыми организмами (биоценоз) и средой их обитания, связанными между собой обменом веществ и энергии. Примеры экосистем — пруд с обитающими в нем растениями, рыбами, беспозвоночными животными, микроорганизмами, донными отложениями, с характерными для него изменениями температуры, количества растворенного в воде кислорода, состава воды и т. п., с определенной биологической продуктивностью; лес с лесной подстилкой, почвой, микроорганизмами, с населяющими его птицами, травоядными и хищными млекопитающими, с характерным для него распределением температуры и влажности воздуха, света, почвенных вод и других факторов среды, с присущим ему обменом веществ и энергии.

Working with Texts

9. Read and translate the text.

Text 1

Ecosystems

An ecosystem is a complex of living organisms, their physical environment, and all their interrelationships in a particular unit of space.

The principles underlying the study of ecosystems are based on the view that all the elements of a life-supporting environment of any size, whether natural or man-made, are parts of an integral network in which each element interacts directly or indirectly with all others and affects the function of the whole. All ecosystems are contained within the largest of them, the ecosphere, which encompasses the entire physical Earth (geosphere) and all of its biological components (biosphere).

An ecosystem can be categorized into its abiotic constituents, including minerals, climate, soil, water, sunlight, and all other nonliving elements, and its biotic constituents, consisting of all its living members. Linking these constituents together are two major forces: the flow of energy through the ecosystem and the cycling of nutrients within the ecosystem.

The fundamental source of energy in almost all ecosystems is radiant energy from the sun. The energy of sunlight is used by the ecosystem's autotrophic, or self-sustaining, organisms. Consisting largely of green vegetation, these organisms are capable of photosynthesis—i.e. they can use the energy of sunlight to convert carbon dioxide and water into simple, energy-rich carbohydrates. The autotrophs use the energy stored within the simple carbohydrates to produce the more complex organic compounds, such as proteins, lipids, and starches, that maintain the organisms' life processes. The autotrophic segment of the ecosystem is commonly referred to as the producer level.

Organic matter generated by autotrophs directly or indirectly sustains heterotrophic organisms. Heterotrophs are the consumers of the ecosystem; they cannot make their own food. They use, rearrange, and ultimately decompose the complex organic materials built up by the autotrophs. All animals and fungi are heterotrophs, as are most bacteria and many other microorganisms.

Together, the autotrophs and heterotrophs form various trophic (feeding) levels in the ecosystem: the producer level, composed of those organisms that make their own food; the primary-consumer level, composed of those organisms that feed on producers; the secondary-consumer level, composed of those organisms that feed on primary consumers; and so on. The movement of organic matter and energy from the producer level through various consumer levels makes up a food chain. For example, a typical food chain in a grassland might be grass (producer) → mouse (primary consumer) → snake (secondary consumer) → hawk (tertiary consumer). Actually, in many cases the food chains of the ecosystem overlap and interconnect, forming what ecologists call a food web. The final link in all food chains is made up of decomposers, those heterotrophs that break down dead organisms and organic wastes.

As energy moves through the ecosystem, much of it is lost at each trophic level. For example, only about 10 percent of the energy stored in grass is incorporated into the body of a mouse that eats the grass. The remaining 90 percent is stored in compounds that cannot be broken down by the mouse or is lost as heat during the mouse's metabolic processes. Energy losses of similar magnitude occur at every level of the food chain; consequently, few food chains extend beyond five members (from producer through decomposer), because the energy available at higher trophic levels is too small to support further consumers.

The orderly replacement of one ecosystem by another is a process known as ecosystem development, or ecological succession. Succession occurs when a sterile area, such as barren rock or a lava flow, is first colonized by living things or when an existing ecosystem is disrupted, as when a forest is destroyed by a fire. The succession of ecosystems generally occurs in two phases. The early, or growth, phase is characterized by ecosystems that have few species and short food chains. These ecosystems are relatively unstable but highly productive, in the sense that they build up organic matter faster than they break it down. The ecosystems of the later, or mature, phase are more complex, more diversified, and more stable. The final, or climax, ecosystem is characterized by a great diversity of species, complex food webs, and high stability. The major energy flow has shifted from production to maintenance.

10. Give the definitions of the following concepts from Text 1.

1. Ecosystem.
2. Abiotic constituents.
3. Biotic constituents.
4. Autotrophs.
5. Heterotrophs.
6. Trophic level.
7. Food chain.
8. Decomposer.
9. Nutrients.
10. Ecological succession.

11. Answer the questions and do the assignments to Text 1.

1. How does energy flow through communities?
2. What is a trophic level?
3. How do nutrients move within ecosystems?
4. What trophic levels do you know?
5. Give your own example of a food chain.
6. Explain the phases of ecological succession.

12. Read the texts using your dictionary. Retell one of the texts.

Text 2

Human Interference

Human interference in the development of ecosystems is widespread. Farming, for example, is the deliberate maintenance of an immature ecosystem—one that is highly productive but relatively unstable. Sound management of ecosystems for optimal food production should seek a compromise between the characteristics of young and mature ecosystems, and should consider factors that affect the interaction of natural cycles. Short-term production can be maximized by adding energy to the ecosystem in the form of cultivation and fertilization. Such efforts, however, can hinder efficient energy use in the long run by producing an imbalance of nutrients, an increase in pollutants, or a heightened susceptibility to plant diseases as a consequence of intensive inbreeding of crops.

Although an awareness of the interdependence between human society and its environment was already prominent in ancient philosophy and religion, the formulation of the basic principles of systems ecology as a scientific discipline began in the late 19th century. During the second half of the 20th century, the study of ecosystems has become increasingly sophisticated and is now instrumental in the assessment and control of the effects of agricultural development and industrialization on the environment. On farms, for instance, it has shown that optimal long-term production of pasturage requires a moderate grazing schedule in order to ensure a steady renewal of the moisture and nutrient content of the soil and has emphasized the need for multiple-use strategies in the cultivation of arable lands. Systems ecology has been concerned with the consequences of accumulated insecticides and has provided a way of monitoring the climatic effects of atmospheric dust and carbon dioxide released by the burning of fossil fuels (e.g. coal, oil, and natural gas). It has helped to determine regional population capacities and has furthered the development of recycling techniques that may become essential in humanity's future interaction with the environment.

Text 3

Coral Reefs

Coral reefs are created by animals and plants. In warm tropical waters, with just the right combination of bottom depth, wave actions, and nutrients, specialized algae and corals build reefs from their own calcium carbonate skeletons. Coral reefs are most abundant in tropical waters of the Pacific and Indian Oceans, the Caribbean, and the Gulf of Mexico as far north as southern Florida, where the maximum water temperatures range between 22 °C and 28 °C.

Reef-building corals are involved in a mutualistic relationship with unicellular algae called dinoflagellates, which live embedded in the coral tissue. These corals grow best within the photic zone at depths of less than 40 meters, where light can penetrate and allow their algal partners to pho-

tosynthesize. The algae benefit from the high nitrogen, phosphorus, and carbon dioxide levels in the coral tissues. In return, algae provide food for the coral and help produce calcium carbonate, which forms the coral skeleton. Coral reefs provide an anchoring place for many other algae, a home for bottom-dwelling animals, and shelter and food for the most diverse collection of invertebrates and fish in the oceans. The Great Barrier Reef in Australia is home to more than 200 species of coral alone, and a single reef may harbor 3,000 species of fish, invertebrates, and algae.

Coral reefs are extremely sensitive to certain types of disturbance, especially silt caused by soil eroding from nearby land. As silt clouds the water, light is diminished and photosynthesis reduced, hampering growth of the corals. The reef may eventually become buried in mud, the corals smothered, and the entire marvelous community of diverse organisms destroyed. Erosion from construction, roadways, and poor land management has produced enough silt to ruin several reefs near Honolulu, Hawaii. The reef inhabitants have been replaced by large numbers of sediment-feeding invertebrates such as sea cucumbers. In the Philippines logging has dramatically increased erosion, so coral reefs (as well as rain forests) are being destroyed. Another hazard is sewage and runoff from agriculture, which fertilizes near-shore ocean water, causing eutrophication and a dense growth of algae. The algae block sunlight from the coral's dinoflagellates and thereby deprive the corals of nutrients. Decaying algal bodies also deplete the water of oxygen, killing the coral.

Still another threat to the reef communities is overfishing. In at least 80 countries, a variety of species, including mollusks, turtles, fish, crustaceans, and even corals, are being harvested from reefs faster than they in replace themselves. Many of these species are sold to shell collectors and aquarium owners in developed countries. In some tropical countries, dynamite is used to kill coral reef fish, destroying entire sections of the coral reef community in the process. Tropical fish collectors often use poison to stun the fish before collecting them, having most dead. The removal of predators from reefs may disrupt the ecological balance of the community, allowing an explosion in populations of coral-eating sea urchins.

As with rainforests, both protection and sustainable use are crucial to the survival of these fragile and diverse ecosystems. Carefully regulated harvesting and tourism produce far more economic benefits than do activities that destroy the reefs.

13. Translate into English.

Text 4

ЭКОСИСТЕМЫ

Экологическая система (экосистема) — совокупность популяций различных видов растений, животных и микробов, взаимодействующих между собой и окружающей их средой таким образом, что эта

совокупность сохраняется неопределенно долгое время. Примеры экологических систем: луг, лес, озеро, океан. Экосистемы существуют везде — в воде и на земле, в сухих и влажных районах, в холодных и жарких местностях. Они по-разному выглядят, включают различные виды растений и животных. Однако в «поведении» всех экосистем имеются и общие аспекты, связанные с принципиальным сходством энергетических процессов, протекающих в них. Одним из фундаментальных правил, которым подчиняются все экосистемы, является принцип Ле Шателье — Брауна: при внешнем воздействии, выводящем систему из состояния устойчивого равновесия, это равновесие смещается в направлении, при котором эффект внешнего воздействия ослабляется.

При изучении экосистем анализируют прежде всего поток энергии и круговорот веществ между соответствующими биотопом и биоценозом. Экосистемный подход учитывает общность организации всех сообществ независимо от местообитания. Это подтверждает сходство структуры и функционирования наземной и водной экосистем.

По определению В. Н. Сукачева, биогеоценоз — это совокупность однородных природных элементов (атмосферы, горной породы, растительности, животного мира и мира микроорганизмов, почвы и гидрологических условий) на определенном участке поверхности Земли.

Термины «экологическая система» и «биогеоценоз» не являются синонимами. Экосистема — это любая совокупность организмов и среды их обитания, в том числе, например, горшок с цветком, муравейник, аквариум, болото, пилотируемый космический корабль. У перечисленных систем отсутствует ряд признаков из определения Сукачева, и в первую очередь элемент «гео» — Земля. Биоценозы — это только природные образования. Однако биоценоз в полной мере может рассматриваться как экосистема.

Самая крупная природная экосистема на Земле — это биосфера. Граница между крупной экосистемой и биосферой столь же условна, как и между многими понятиями в экологии. Различие преимущественно состоит в таких характеристиках биосферы, как глобальность и большая условная замкнутость. Прочие же экосистемы Земли существенно практически не замкнуты.

Биомы — наиболее крупные наземные экосистемы, соответствующие основным климатическим зонам Земли (пустынные, травянистые, лесные); водные экосистемы — основные экосистемы, существующие в водной сфере (гидросфере).

Каждый биом включает в себя ряд меньших по размеру, связанных между собой экосистем. Четкие границы между экосистемами встречаются редко, обычно между ними находится зона со своими особенностями.

На границе двух экосистем, например на опушке леса, одновременно встречаются представители лесных и луговых видов. Контраст-

ность среды, а потому большее обилие экологических возможностей порождает «сгущение жизни», называемое правилом краевого эффекта (edge effect) или правилом экотона. Хорошо известно, что на опушках леса жизнь богаче, а в его глубине, как и в середине луга, она менее разнообразна.

Speaking and Writing

14. Make a report about any ecosystem you find interesting and unusual. Write a plan first and do not forget to mention the ecosystem's

- location;
- inhabitants;
- condition;
- human impact;
- future prospects of development.

15. Choose any of the following ideas (or propose your own), find information and write an essay (150—250 words).

1. The artificial ecosystem: myth or reality?
2. One of food chains.
3. The ecosystem we live in.
4. Climate changes and the biosphere.

Unit 13

Extinction of Species

Text 1. Extinction

Text 2. Grizzly Bear

Text 3. Dinosaurs

Text 4. Динозавры

Working with Words

1. Study the following words.

- | | |
|----------------|--|
| 1. invade | <i>v.</i> to go into a place in large numbers, especially when you are not wanted |
| 2. sight | <i>n.</i> the physical ability to see, vision |
| 3. consider | <i>v.</i> to think carefully about something, typically before making a decision |
| 4. willing | <i>adj.</i> someone who is eager to help etc and does not have to be persuaded |
| 5. sacrifice | <i>n.</i> the act of offering something to a god, especially in the past, by killing an animal or person in a religious ceremony |
| 6. inclination | <i>n.</i> a tendency to think or behave in a particular way |
| 7. deserve | <i>v.</i> to have earned something by good or bad actions or behaviour |
| 8. deliberate | <i>adj.</i> fully considered, not impulsive |
| 9. worthwhile | <i>adj.</i> if something is worthwhile, it is important or useful, or you gain something from it |
| 10. brink | <i>n.</i> the verge of a particular situation or action, typically one that is unwelcome |
| 11. sheer | <i>adj.</i> nothing other than, pure |
| 12. insatiable | <i>adj.</i> (of an appetite or desire) impossible to satisfy |

13. deprive	<i>v.</i> to prevent someone from having something, especially something that they need or should have
14. appreciate	<i>v.</i> to understand how good or useful someone or something is
15. reduction	<i>n.</i> the action or fact of making something smaller or less in amount, degree, or size
16. precipitation	<i>n.</i> rain, snow, sleet, or hail that falls to or condenses on the ground
17. alter	<i>v.</i> to change, or to make someone or something change
18. trap	<i>v.</i> to catch someone or something by forcing them into a place from which they cannot escape
19. illegal	<i>adj.</i> not allowed by the law
20. exterminate	<i>v.</i> to destroy completely
21. submerge	<i>v.</i> to cover something completely with water or another liquid

2. Match A and B to make word combinations.

A

1. genetic
2. outer
3. deliberate
4. numerous
5. natural
6. powerful
7. current

B

- a. space
- b. resources
- c. variety
- d. weapon
- e. situation
- f. intent
- g. opportunities

3. Word-building.

Noun	Verb	Adjective
		attributable
resourcefulness		
inclination		
	ignore	
expansion		
	pollute	
		relative

4. Explain the following words.

1. to force something to do something
2. to eliminate

3. to deserve
4. to appreciate
5. deliberate
6. trap
7. to invade

5. Complete the sentences with the words from the box.

*survive original crops timber landscape intrude environment
disappear island majority natural habitats*

The . . . **1** . . . of species facing extinction today are endangered because of destruction of . . . **2** . . . habitats. Building roads, parking lots, and buildings; clearing forests to grow . . . **3** . . . or graze domestic animals; and logging forests for . . . **4** . . . all take their toll on natural habitats. Draining marshes converts aquatic . . . **5** . . . to terrestrial ones, while building dams floods terrestrial habitats.

Most organisms require a particular type of . . . **6** . . . , and habitat destruction reduces their biological range and ability to . . . **7**

Humans often leave small, isolated patches of natural . . . **8** . . . that are completely surrounded by roads, fields, and buildings. Like a land mass that is surrounded by water, an isolated habitat is referred to as an . . . **9** Species from the “developed” landscape may . . . **10** . . . into the island. As a result habitat fragments often support only a fraction of the species found in the . . . **11** . . . , unaltered environment. Such fraction may occur in greatly reduced number or even . . . **12** . . . altogether.

Working with Words and Word Combinations

6. Give the English equivalents of the following word combinations.

Значительно ускорить, вторгаться в область, в настоящий момент, исследовать глубины, производство оружия, приносить жертву, заслуживающий доверия, приложенные усилия, стоящий проект, привести на грань вымирания, ненасытный аппетит, столкнуться с опасностью, уничтожение мест обитания, нарушение природного баланса, полностью оценить, нестабильность экосистем, неиспользованные возможности, столкнуться с проблемой.

7. Define the following concepts.

1. Endangered species.
2. Extinction.
3. Introduction of species.

4. Deforestation.
5. Global warming.

8. Make sure that you understand these verbs with prepositions and write sentences, incorporating them.

To contribute to, to depend on, to wipe out, to be caused by, to be driven to, to differ from, to be aware of, to deprive of.

9. Translate into English.

Вымиранию подвержены группы разных размеров и разных рангов. Нам представляется полезным выделить пять уровней вымирания:

- 1) вымирание вида на большей части его ареала;
- 2) вымирание вида в целом;
- 3) вымирание филетических групп относительно низкого таксономического ранга, например родов или семейств;
- 4) вымирание групп высокого ранга, таких как отряды и классы;
- 5) массовое вымирание, охватывающее много разных групп в данную эпоху.

Мы можем установить причину вымирания, если она представляет собой прямое или косвенное следствие деятельности человека в историческое время. Известно, например, что странствующий голубь, бескрылая гагара и многие другие виды птиц, а также бизон на большей части своего некогда обширного ареала вымерли по вине человека.

Working with Texts

10. Read and translate the text.

Text 1

Extinction

A. Extinction, the death of species, occurs when the last individual member of a species dies. A natural biological process, extinction has been greatly accelerated by human activities. The increasing human population has forced us to spread into almost all areas of Earth. Wherever humans invade an area, the habitats of many plants and animals are disrupted or destroyed, which can contribute to their extinction.

B. Biodiversity is the variety of living organisms and of the ecosystems in which they live. Biodiversity includes the number of different species, the genetic variety within a species, and the variety of interactions within and among ecosystems.

Biodiversity is currently decreasing at an alarming rate. It is likely that thousands of species will be eliminated within the next few decades. As many as one-fourth of Earth's plant families may be extinct by the end of the 21st century. And countless animal species that depend on those plants for food and habitat will probably also become extinct.

C. There have been periods of mass extinction, such as that which wiped out the dinosaurs during the Cretaceous era, 65 million years ago. But the current situation differs from the previous periods in several respects. First, its case is directly attributable to human activities. Second, it is occurring in a tremendously compressed period of time.

D. As we all know, our resourcefulness has enabled us to construct massive industrial and educational centers, explore the depths of Earth's oceans and the mysteries of outer space, and manufacture weapons powerful enough to make all species including ourselves on the planet extinct. Unfortunately, we have been so busy with our own interests that we have lost sight of the fact that we might consider sharing some of Earth's resources with other species.

The key question is whether or not we have taken this problem seriously yet. We are fairly well aware of how we have polluted our environment, but at least that's a trend that can be reversed if we are willing to make the sacrifices needed to clean up the air and waterways we have dirtied.

E. Interestingly, man has shown an inclination toward preserving some of Earth's more charismatic creatures such as whales, polar bears, chimpanzees, and bald eagles in recent years, and he deserves credit for the exceptional efforts involved. The problem, however, is that while the attention was focused on such worthwhile projects, it's probable that several thousand other species disappeared during that time.

Relatively few creatures are facing dangers because of the activities of persons with direct or deliberate intent to kill them. Instead, species are being eliminated through the activity of many millions of people who are unaware of the "spill-over" consequences of their complex lifestyles. Thus, we can say that while we are not deliberately destroying our world, it's also a fact that we have made it virtually impossible for some species to coexist with us.

F. Species become endangered and extinct for a variety of reasons, including the destruction or modification of habitats and the production of pollution. Humans also upset the natural balance by introducing new, exotic species or by controlling native pests or predators. Illegal hunting and uncontrolled commercial harvesting are also factors.

Organisms are important natural resources that are not fully appreciated. The current reduction in biodiversity caused by extinction of many species results in the increased instability of ecosystems and in lost opportunities and lost solutions to future problems.

The world's forests provide many environmental services as well as commercially important timber and numerous recreational opportunities. The greatest problem facing forests today is deforestation, the temporary or permanent removal of forests.

Production of atmospheric pollutants that trap solar heat in the atmosphere will probably heavily affect Earth's climate in the nearest future. Global warming and the accompanying changes in precipitation patterns could alter food production, destroy forests, reduce biological diversity, and submerge coastal areas.

11. Pair work. Ask and answer six questions to Text 1.

12. Find key sentences in each paragraph and give the paragraphs (A—F) appropriate titles.

13. Read the texts using your dictionary. Retell one of the texts.

Text 2

Grizzly Bear

One of the largest members of the bear family, the grizzly may exceed 1,000 pounds and stretch up to eight feet tall. Grizzlies are generally brownish in color, and adults often have white-tipped hairs along the back, a distinction that resulted in the common name "silvertip."

While the silver tipped fur, the large size, and a hump on the back are all considered characteristics of the grizzly, the best way to distinguish the species is by its concave muzzle or snout. That differs from the rounded snout of the more common black bear. In addition, the grizzly's claws on the front feet are much longer than the hind claws.

Although its name came from its grizzled coat and not its fearsome temper, authors have depicted the grizzly as a terrifying animal that followed the herds of bison and attacked men without provocation. Even today, grizzlies fear no other animal in the wild, and they're capable of hunting and killing most animals.

The federal government now lists the grizzly as threatened in the United States outside of Alaska, and it's classified as endangered in Colorado. The last documented grizzly in Colorado was killed in 1979, and two others were killed in 1951.

Conflicts with man and the civilization of wilderness areas resulted in the elimination of the grizzly from Colorado. There's little chance that any grizzly bears still exist in the state.

Text 3

Dinosaurs

A misconception commonly portrayed in popular books and media is that all the dinosaurs died out at the same time—and apparently quite

suddenly — at the end of the Cretaceous Period 65 million years ago. This is not entirely correct, and not only because birds are a living branch of dinosaurian lineage. The best records, which are almost exclusively from North America, show that dinosaurs were already in decline during the latest portion of the Cretaceous. The causes of this decline, as well as the fortunes of other groups at the time, are complex and difficult to attribute to a single source. In order to understand extinction, it is necessary to understand the basic fossil record of dinosaurs.

It was not only the dinosaurs that disappeared 65 million years ago at the Cretaceous — Tertiary, or K — T, boundary. Many other organisms became extinct or were greatly reduced in abundance and diversity, and the extinctions were quite different between, and even among, marine and terrestrial organisms. Land plants did not respond in the same way as land animals, and not all marine organisms showed the same patterns of extinction. Some groups died out well before the K — T boundary, including flying reptiles (pterosaurs) and sea reptiles (plesiosaurs, mosasaurs, and ichthyosaurs). Strangely, turtles, crocodylians, lizards, and snakes were either not affected or affected only slightly. Effects on amphibians and mammals were mild. These patterns seem odd, considering how environmentally sensitive and habitat-restricted many of these groups are today.

Whatever factors caused it, there was undeniably a major, worldwide biotic change near the end of the Cretaceous. But the extermination of the dinosaurs is the best-known change by far, and it has been a puzzle to paleontologists, geologists, and biologists for two centuries. Many hypotheses have been offered over the years to explain dinosaur extinction, but only a few have received serious consideration. Proposed causes have included everything from disease to heat waves and resulting sterility, freezing cold spells, the rise of egg-eating mammals, and X rays from a nearby exploding supernova. Since the early 1980s, attention has focused on the so-called asteroid theory put forward by the American geologist Walter Alvarez, his father, physicist Luis Alvarez, and their coworkers. This theory is consistent with the timing and magnitude of some extinctions, especially in the oceans, but it does not fully explain the patterns on land and does not eliminate the possibility that other factors were at work on land as well as in the seas.

14. Translate into English.

Text 4

Динозавры

Динозавры, делящиеся на два отряда, Saurischia и Ornithischia, занимали доминирующее положение среди наземных животных на всем протяжении мезозоя. За эту эру возникло большое разнообразие форм. По своим размерам эти формы варьировались от мелких до таких гигантов, как бронтозавр и тиранозавр, а по типу питания —

от травоядных до хищников. Динозавры были распространены по всему земному шару и доминировали на суше в течение более чем 100 млн лет.

Затем в позднем меловом периоде вся группа динозавров исчезла из палеонтологической летописи. Вымирание произошло за относительно короткий по геологическим масштабам времени период, но все же исчезновение различных форм было разделено промежутками в сотни тысяч и миллионы лет.

По вопросу о причинах вымирания динозавров существуют различные мнения. Согласно одной школе этой причиной было изменение климата. Другая школа выдвигает на первый план биотические факторы, такие как истребление млекопитающими яиц динозавров, конкуренция со стороны млекопитающих, чрезмерное уничтожение растительности динозаврами и заболевания. Третья школа постулирует физическую катастрофу в масштабах всего земного шара.

Уолтер Альварес предлагает собственное объяснение массового вымирания. Слой пыли, образовавшийся в результате столкновения с астероидом, преградил доступ солнечному свету и подавил фотосинтез как у наземных растений, так и у морских водорослей на год или на несколько лет. За этим последовала голодная смерть морских и наземных животных, сначала растительных, а затем хищников. В этой гипотезе есть несколько слабых мест.

Исчезновение какого-либо вида в одном или нескольких местонахождениях ископаемых не означает, что данный вид вымер. В других местах популяции этого вида могли выжить.

Остается неясным, мог ли постулируемый слой пыли подавить фотосинтез в такой степени, чтобы вызвать голод в широких масштабах. Облака пыли, возникавшие при очень сильных извержениях вулканов в исторические времена, ограничивали доступ солнечного света и вызывали понижение температуры в областях, удаленных от вулкана, но не приводили к полному прекращению фотосинтеза или вымиранию растительных видов в столь отдаленных областях.

Астероидная гипотеза требует допустить, что все вымирания произошли за короткое время, измеряемое годами или десятилетиями, непосредственно следовавшими за катастрофой. Однако одновременность вымираний не была доказана. Как свидетельствуют имеющиеся данные, некоторые группы, в том числе динозавры и фораминиферы, исчезали постепенно на протяжении длительного геологического времени.

Большинство эволюционистов-биологов предпочитают ту или иную разновидность климатической или комбинированной климато-биологической теории массового вымирания в меловом периоде. Поздний мел был временем поднятия материков, горообразовательных процессов, вулканической активности и изменений климата. По меркам мелового периода климат стал неровным. Изменение физической среды влечет за собой множественные биотические события.

Изменяется конкурентное равновесие между видами, в результате чего одни виды получают преимущество, а другие оказываются в невыгодном положении, что ведет к замещению видов. Вымирание видов при этом должно быть избирательным, постепенным и растянутым во времени, что и наблюдается на самом деле.

Speaking and Writing

15. Make a report about any problem, connected with extinction, you find interesting and unusual. Write a plan first and do not forget to mention

- causes of the problem;
- current situation;
- ways of solving the problem;
- your opinion.

16. Choose any of the following ideas (or propose your own), find information and write an essay (150 — 250 words).

1. Endangered species.
2. Extinction.
3. Introduction of species.
4. Deforestation.
5. Global warming.
6. Human impact.
7. Are we to be blamed?

Unit 14

Adaptations

Text 1. Community Interactions and Adaptations

Text 2. The Camel

Text 3. Adaptations to Thin Air

Text 4. Адаптация

Working with Words

1. Study the following words.

1. thus	<i>adv.</i> as a result or consequence of this, therefore
2. simultaneous	<i>adj.</i> occurring, operating, or done at the same time
3. exert	<i>v.</i> to use your power, influence etc in order to make something happen
4. adept	<i>n.</i> a person who is skilled or proficient at something
5. endow	<i>v.</i> to make someone or something have a particular quality, or to believe that they have it
6. stripe	<i>n.</i> a line of colour
7. stealth	<i>n.</i> cautious and surreptitious action or movement
8. stalk	<i>v.</i> to follow a person or animal quietly in order to catch and attack or kill them
9. emit	<i>v.</i> to send out gas, heat, light, sound etc
10. evasive	<i>adj.</i> Doing something to avoid a dangerous situation
11. erratically	<i>adv.</i> not arranged in order
12. jam	<i>v.</i> to change the form of (an electrical signal or sound wave) during transmission, amplification, or other processing

13. resemble	<i>v.</i> to have a similar appearance to or qualities in common with (someone or something), look or seem like
14. surroundings	<i>n.</i> the objects, buildings, natural things etc that are around a person or thing at a particular time
15. render	<i>v.</i> to provide or give (a service, help etc)
16. plain	<i>adj.</i> not decorated or elaborate, simple or basic in character
17. flee	<i>v.</i> to leave somewhere very quickly, in order to escape from danger
18. ambush	<i>v.</i> to make a surprise attack on (someone) from a concealed position
19. thorn	<i>n.</i> a stiff, sharp-pointed woody projection on the stem or other part of a plant
20. swallow	<i>v.</i> to make food or drink go down your throat and towards your stomach
21. deter	<i>v.</i> to stop someone from doing something, by making them realize it will be difficult or have bad results
22. milkweed	<i>n.</i> a herbaceous plant with milky sap, some kinds of which attract butterflies or yield a variety of useful products
23. bountiful	<i>adj.</i> large in quantity, abundant
24. tough	<i>adj.</i> (of a substance or object) strong enough to withstand adverse conditions or rough handling
25. blade	<i>n.</i> a single thin flat piece of grass
26. grind	<i>v.</i> to reduce something to small particles or powder by crushing it

2. Make sure you know these words.

1. cheetah
2. mimicry
3. natural selection
4. adaptation
5. coevolution

3. Match a word in A to a similar word in B.

A

1. to endow

B

- a. disguise

- | | |
|---------------|---------------|
| 2. predator | b. to release |
| 3. camouflage | c. to escape |
| 4. to flee | d. bountiful |
| 5. venom | e. to retain |
| 6. to deter | f. hunter |
| 7. to emit | g. powerful |
| 8. abundant | h. to provide |
| 9. strong | i. to locate |
| 10. to store | j. poison |

4. Match A and B to make word combinations.

A

1. keen
2. to zero in
3. warning
4. complex
5. abdominal
6. to tolerate
7. evasive

B

- a. on the prey
- b. chamber
- c. poison
- d. eyesight
- e. action
- f. adaptations
- g. call

5. Give the definitions of the following words.

1. plain
2. to conceal
3. to resemble
4. thorn
5. to swallow
6. abundant
7. tough

6. Complete the sentences with the words from the box.

*habitat relative tolerating adapted extreme locomotion
changes observations comparing*

When biologists say that a plant or animal is . . . **1** . . . to its habitat, they usually mean that, in the course of evolution, . . . **2** . . . have occurred in the organism which make it more successful in exploiting its . . . **3** . . . , e.g. animals finding and digesting food, selecting nest sites or hiding places, or plants exploiting limited mineral resources or . . . **4** . . . salinity or drought. Sometimes, just by looking at an organism and . . . **5** . . . it with

related species, it is possible to make reasoned guesses about adaptation. For example, there seems little doubt that the long, hair-fringed hind legs of a water beetle are adaptations to . . . 6 . . . in water when compared with the corresponding legs of a land-living . . . 7

By studying animals which live in . . . 8 . . . habitats, it is possible to suggest ways in which they might be adapted to these habitats, especially if the . . . 9 . . . are supported by physiological evidence.

Working with Word Combinations and Sentences

7. Give the English equivalents of the following word combinations.

Взаимодействующие популяции, поддерживать баланс, способность выживать, участники естественного отбора, защита от хищников, унаследованные характеристики, противостоять воздействию окружающей среды, маскирующие пятна, подстергать добычу, обнаружить добычу, испускать сигналы, высокочастотные сигналы, чувствительные уши, иметь большое сходство, оставаться неподвижным, убежать от хищников, предупредительная раскраска, изобилие растений, обилие пищи, по крайней мере, обескуражить хищника.

8. Give the definitions of the following concepts.

1. Coevolution.
2. Competition.
3. Predation.
4. Parasitism.
5. Mutualism.
6. Mimicry.
7. Adaptation.
8. Natural selection.

9. Translate into English.

Приспособленность — соответствие признаков организма (внутреннего и внешнего строения, физиологических процессов, поведения) среде обитания, позволяющее выжить и дать потомство. Например, водные животные имеют обтекаемую форму тела; лягушку делает незаметной на фоне растений зеленая окраска спины; ярсное расположение растений в биогеоценозе дает возможность эффективно использовать солнечную энергию для фотосинтеза. Приспособленность помогает выжить организмам в тех условиях, в которых она сформировалась под влиянием движущих сил эволюции.

10. Read and translate the text.

Community Interactions and Adaptations

A. An ecological community consists of all the interacting populations within the ecosystem. Community interactions such as predation, parasitism, and competition help limit the size of populations. The interacting web of life that forms a community tends to maintain a balance between resources and the number of individuals consuming them. When populations interact with one another, influencing each other's ability to survive and reproduce, they serve as agents of natural selection. For example, in killing prey that are easiest to catch, predators leave behind those individuals with better defenses against predation. These individuals leave the most offspring, and over time their inherited characteristics increase within the prey population. Thus, as community interactions limit population size, they simultaneously shape the bodies and behaviors of the interacting populations. The process by which two interacting species act as agents of natural selection to one another over evolutionary time is called coevolution.

The most important community interactions are competition, predation, parasitism, and mutualism. Their importance is illustrated by the adaptations that have evolved under the environmental pressures exerted by these interactions over evolutionary time.

B. To survive, predators must feed and prey must avoid becoming food. Therefore, predator and prey populations exert intense environmental pressure on one another, resulting in coevolution. As prey become more difficult to catch, predators must become more adept at hunting. Environmental pressure endowed the cheetah with speed and camouflage spots, and its zebra prey with speed and camouflage stripes. It has produced the keen eyesight of the hawk and the warning call of the ground squirrel, the stealth of the jumping spider and mimicry of the fly it stalks.

C. Most bats are nighttime hunters that navigate and locate prey by echolocation. They emit extremely high-frequency and high-intensity pulses of sound and, by analyzing the returning echoes, create an image of their surroundings and nearby objects.

Under environmental pressure from this specialized prey-location system, certain moths have evolved simple ears that are particularly sensitive to the frequencies used by echolocating bats. When they hear a bat, these moths take evasive action, flying erratically or dropping to the ground. Some moths have evolved a way to jam the bats' echolocation mechanism by producing their own high-frequency clicks. In response, when hunting a clicking moth, a bat may turn off its own sound temporarily and zero in on the moth by following the moth's clicks. These interactions illustrate the complexity of coevolution adaptations.

D. Both predators and prey have evolved colors, patterns, and shapes that resemble their surroundings. Such disguises render animals inconspicuous even when they are in the plain sight.

Some animals closely resemble specific objects such as leaves, twigs, bark, thorns, or even bird droppings. Camouflaged animals tend to remain motionless rather than to flee their predators.

E. Mimicry refers to a situation in which a species evolves to resemble something else. For example, once warning coloration evolved, there rose a selective advantage for tasty, harmless animals to resemble poisonous ones. The deadly coral snake has brilliant warning coloration and the harmless mountain king snake avoids predation by resembling it.

F. Both predators and prey have evolved a variety of toxic chemicals for attack and defense. The venom of spiders and poisonous snakes serves both to paralyze prey and to deter its predators. Many plants produced defensive toxins. For example, lupins produce alkaloids which deter attack by the blue butterfly, whose larvae feed on the lupin's buds.

Certain mollusks, including squid and octopus, emit clouds of ink when attacked. These "smoke screens" confuse their predators and mask their own escape.

G. Plants have evolved a variety of chemical adaptations that deter their herbivorous "predators." Many, such as the milkweed, synthesize toxic and distasteful chemicals. Animals rapidly learn not to eat foods that make them sick, and so milkweeds and other toxic plants suffer little nibbling. Consequently, such plants are often very abundant; any animal immune to the plant poisons enjoys a bountiful food supply. As plants evolved toxic chemicals for defense, certain insects evolved increasingly efficient ways to detoxify or even make use of the chemicals. The result is that nearly every toxic plant is eaten by at least one type of insect. For example, monarch butterflies lay their eggs on milkweed; when their larvae hatch, they consume the toxic plant. The caterpillars not only tolerate the milkweed poison but also store it in their tissues as a defense against their own predators. The stored toxin is even retained in the metamorphosed monarch butterfly.

Grasses have evolved tough silicon (glassy) substances in their blades, discouraging all herbivorous predators except those with strong, grinding teeth and powerful jaws. Thus, grazing animals have come under environmental pressure for longer, harder teeth. An example is the coevolution of horses and the grasses they eat. On an evolutionary time scale, grasses evolved tougher blades that reduce predation, and horses evolved longer teeth with thicker enamel coatings that resist wear.

11. Match the titles (1—7) to the paragraphs (A—G).

1. Chemical Warfare.
2. Bats and Moths Have Evolved Counteracting Strategies.

3. Camouflage Conceals Both Predators and Their Prey.
4. Importance of Community Interactions.
5. Some Organisms Gain Protection Through Mimicry.
6. Plants and Herbivores Have Many Evolutionary Adaptations.
7. Predator—Prey Interactions Shape Evolutionary Adaptations.

12. Pair work. Ask and answer six questions to Text 1.

13. Read the texts using your dictionary. Retell one of the texts.

Text 2

The Camel

The camel is adapted to survive in a hot, dry, and sandy environment. Adaptive physical features are the closable nostrils and long eyelashes, which help keep out wind-blown sand. The feet are broad and splay out under pressure, so reducing the tendency to sink into the sand. The thick fur insulates the body against heat gain in the intense sunlight.

Physiologically, the camel is able to survive without water for 6—8 days. Its stomach has a large water-holding capacity, though it drinks to replace water lost by evaporation rather than in anticipation of water deprivation.

The body temperature of a “thirsty” camel rises to as much as 40 °C during the day and falls to about 35 °C at night. The elevated daytime temperature reduces the heat gradient between the body and the surroundings, so less heat is absorbed. A camel is able to tolerate water loss equivalent to 25 percent of its body weight, compared with humans for whom a 12 percent loss may be fatal. The blood volume and concentration are maintained by withdrawing water from the body tissues.

The nasal passages are lined with mucus. During exhalation, the dry mucus absorbs water vapor. During inhalation the now moist mucus adds water vapor to the inhaled air. In this way, water is conserved.

The role of the camel’s humps in water conservation is more complex. The humps contain fat and are therefore an important reserve of energy-giving food. However, when the fat is metabolized during respiration, carbon dioxide and water (metabolic water) are produced. The water enters the blood circulation and would normally be lost by evaporation from the lungs, but the water-conserving nasal mucus will trap at least a proportion of it.

Text 3

Adaptations to Thin Air

Prehistoric and contemporary human populations living at altitudes of at least 2,500 meters above sea level may provide unique insights into human evolution, reports an interdisciplinary group of scientists.

Indigenous highlanders living in the Andean Altiplano in South America and in the Tibetan Plateau in Asia have evolved three distinctly different

biological adaptations for surviving in the oxygen-thin air found at high altitude.

The Andean and Tibetan plateaus rise some 4 kilometers above sea level. As prehistoric hunter-gatherers moved into these environments, they encountered desolate landscapes, sparse vegetation, little water, and a cold, arid climate.

In addition, early settlers to the high plateaus likely suffered acute hypoxia, a condition created by a diminished supply of oxygen to body tissues. At high altitudes, the air is much thinner than at sea level. As a result, a person inhales fewer oxygen molecules with each breath.

Symptoms of hypoxia, sometimes known as mountain sickness, include headaches, vomiting, sleeplessness, impaired thinking, and an inability to sustain long periods of physical activity. At elevations above 7,600 meters, hypoxia can kill.

The Andeans adapted to the thin air by developing an ability to carry more oxygen in each red blood cell. That is: They breathe at the same rate as people who live at sea level, but the Andeans have the ability to deliver oxygen throughout their bodies more effectively than people at sea level do.

They have higher hemoglobin concentrations in their blood. Hemoglobin is the protein in red blood cells that ferries oxygen through the blood system. Having more hemoglobin to carry oxygen through the blood system than people at sea level counterbalances the effects of hypoxia.

Tibetans compensate for low oxygen content much differently. They increase their oxygen intake by taking more breaths per minute than people who live at sea level.

In addition, Tibetans may have a second biological adaptation, which expands their blood vessels, allowing them to deliver oxygen throughout their bodies more effectively than sea-level people do.

Tibetans' lungs synthesize larger amounts of a gas called nitric oxide from the air they breathe. One effect of nitric oxide is to increase the diameter of blood vessels, which suggests that Tibetans may offset low oxygen content in their blood with increased blood flow.

14. Translate into English.

Text 4

Адаптация

Адаптацией в биологии называется развитие любого признака, который способствует как выживанию вида, так и его размножению. Адаптации бывают морфологическими, физиологическими или поведенческими.

Морфологические адаптации включают изменения формы или строения организма. Твердый панцирь черепах, обеспечивающий

защиту от хищных животных, является примером такой адаптации. Физиологические адаптации связаны с химическими процессами в организме. Запах цветка, например, служит для привлечения насекомых и тем самым способствует опылению растения. Поведенческая адаптация связана с определенным аспектом жизнедеятельности животного. Зимний сон у медведя является типичным примером поведенческой адаптации. Большинство адаптаций представляет собой сочетание вышеперечисленных типов.

Чтобы понять, как происходит адаптация к окружающей среде, необходимо рассматривать не только животное или растение в целом, но и генетическую основу адаптации.

Адаптация может рассматриваться как процесс, с помощью которого генетический материал повышает свои шансы на сохранение в последующих поколениях. Чтобы передать генетический материал, особь любого вида должна иметь возможность питаться, дожить до периода размножения, оставить потомство и затем распространить его на возможно большей территории.

Все виды живых организмов определенным образом приспосабливаются к тому, чтобы обеспечивать себя питанием. Ястребы имеют острые когти для захватывания добычи. Их глаза расположены в передней части головы, что позволяет им точно оценивать расстояние до жертвы — качество, необходимое для охоты при полете на большой скорости. Дарвиновы вьюрки — группа близкородственных видов птиц с Галапагосских островов — представляют собой классический пример высокоспециализированной адаптации к разным способам питания. Благодаря тем или иным адаптивным морфологическим изменениям в строении клюва одни виды вьюрков стали зерноядными, другие — насекомоядными.

Разнообразные способы получения питательных веществ можно наблюдать не только у животных, но и у растений. Многие из них, например бобовые, развили симбиотические, т.е. взаимовыгодные, отношения с бактериями: бактерии переводят атмосферный азот в химическую форму, доступную для растений, а растения предоставляют бактериям энергию.

Факторы окружающей среды нередко ставят живые организмы в трудные условия. Например, животным и растениям часто приходится приспосабливаться к крайним значениям температуры. Животные спасаются от холода, используя изолирующий мех или перья, мигрируя в места с более теплым климатом или впадая в зимнюю спячку. Большинство растений переживает холода, переходя в состояние покоя, эквивалентное спячке у животных.

В жару охлаждение животного происходит за счет потоотделения или частого дыхания, увеличивающего испарение. Некоторые животные, в особенности пресмыкающиеся и земноводные, способны впадать в летнюю спячку, которая по сути аналогична зимней, но вызвана жарой, а не холодом.

Растения могут до некоторой степени поддерживать свою температуру, регулируя интенсивность испарения, которое имеет то же охлаждающее действие, что и потоотделение у животных.

Speaking and Writing

15. Make a report about any particular case of adaptation you find interesting and unusual. Write a plan first and do not forget to mention

- participants of adaptation;
- essence of interaction;
- causes and results;
- specific features.

16. Choose any of the following ideas (or propose your own), find information and write an essay (150—250 words).

1. Coevolution.
2. Competition.
3. Predation.
4. Parasitism.
5. Mutualism.

Unit 15

Global Conservation

Text 1. Global Conservation

Text 2. Wildlife Conservation

Text 3. The Human Impact on the Environment

Text 4. Дальневосточный леопард

Working with Words

1. Study the following words.

1. turbulent	<i>adj.</i> characterized by conflict, disorder, or confusion; not stable or calm
2. fare	<i>v.</i> to perform in a specified way in a particular situation or over a particular period <i>adj.</i> faring
3. obvious	<i>adj.</i> easily perceived or understood, clear, self-evident, or apparent
4. margin	<i>n.</i> the edge or border of something
5. concern	<i>n.</i> a feeling of worry about something important
6. quixotic	<i>adj.</i> extremely idealistic, unrealistic, and impractical
7. stride	<i>n.</i> a long, decisive step
8. impair	<i>v.</i> to damage something or make it not as good as it should be
9. deteriorate	<i>v.</i> to become progressively worse <i>n.</i> deterioration
10. expedient	<i>n.</i> a quick and effective way of dealing with a problem
11. treasury	<i>n.</i> the funds or revenue of a state, institution, or society
12. weaken	<i>v.</i> to make or become weaker in power, resolve, or physical strength

13. abandon	<i>v.</i> to go away from a place, vehicle etc permanently, especially because the situation makes it impossible for you to stay; to leave
14. prohibit	<i>v.</i> to formally forbid something by law, rule, or other authority; to ban
15. subsidy	<i>n.</i> money that is paid by a government or organization to make prices lower, reduce the cost of producing goods etc
16. sanctuary	<i>n.</i> an area for birds or animals where they are protected and cannot be hunted, a refuge
17. adverse	<i>adj.</i> preventing success or development; harmful; unfavourable <i>adv.</i> adversely
18. offset	<i>n.</i> a consideration or amount that diminishes or balances the effect of an opposite one <i>adj.</i> offsetting
19. deplete	<i>v.</i> to reduce the amount of something that is present or available <i>n.</i> depletion
20. game farm	<i>n.</i> a farm stocked with a variety of wild animals, usually with facilities for visitors to observe or hunt the animals
21. rear	<i>adj.</i> at the back
22. waterfowl	<i>n.</i> ducks, geese, or other large aquatic birds, especially when regarded as game
23. prominent	<i>adj.</i> important, famous
24. perpetuate	<i>v.</i> to make something continue indefinitely

2. Write synonyms of the following words.

- | | |
|-----------------|-------------------|
| 1. to begin | 7. to impair |
| 2. to follow | 8. to exterminate |
| 3. to add up | 9. to emphasize |
| 4. quixotic | 10. deterioration |
| 5. to influence | 11. to raise |
| 6. essential | 12. to offset |

3. Match the words (1 — 7) to their definitions (a — g).

- | | |
|-------------|---|
| 1. obvious | a. ability to live or exist in difficult conditions |
| 2. survival | b. to become worse |
| 3. doubt | c. healthy, in good condition |

- | | |
|-------------------|---|
| 4. to deteriorate | d. to give particular stress to something |
| 5. to emphasize | e. clear to anyone |
| 6. to weaken | f. a feeling of not being certain |
| 7. sound | g. to make someone or something less strong |

4. Complete the sentences with the words from the box.

*single treating possible values contains result scientific
plants maintained resources*

Conservation is of great . . . **1** . . . value. Because relatively little is known about the past, present, and . . . **2** . . . future of the biosphere, natural outdoor laboratories, including areas of undisturbed nature, must be . . . **3** . . . in order to conduct the studies needed to acquire knowledge. Moreover, there are many natural . . . **4** . . . with undiscovered scientific and technological . . . **5** If, for example, all apparently worthless rosy periwinkle . . . **6** . . . had been destroyed, an important drug used in . . . **7** . . . leukemia would not have been discovered. Because each wild plant and animal . . . **8** . . . a storehouse of genetic and biochemical information, the loss of a . . . **9** . . . species might . . . **10** . . . in the loss of information that could ultimately have great value for mankind's welfare or survival.

Working with Word Combinations and Sentences

5. Give the English equivalents of the following words and word combinations.

Неспокойные времена, следить за прогрессом ежедневно, очевидная важность, на грани выживания, выражать обеспокоенность, ощущение безопасности, необходимо для выживания, обогащение, сиюминутные выгоды, истребление вида, нацеленный на защиту окружающей среды, предотвратить ухудшение, масштабное уничтожение, ослаблять страну, неограниченный рост населения, плохо оснащенный, истощенные земли, исправлять ущерб, запрет ловли животных, ограничения на охоту, легальные способы, строго ограничивать, восстановление ареалов, выращенный в неволе, обеспечить местом.

6. Define the words in English and use them in the sentences of your own.

To report back, to add up, to turn on, to be in doubt, to authorize, to abandon, to restock.

7. Translate into English.

Пятнадцать процентов видов позвоночных животных, обитающих в России, и 4 % произрастающих в ней видов высших растений считаются редкими или находятся под угрозой исчезновения. Наиболее опасна для них утрата мест обитания. Среди других угроз — нелегальная торговля, загрязнение среды, изменение климата, нерациональное использование природных ресурсов.

8. Explain these concepts in your own words.

1. Deteriorated lands.
2. Country's natural resources.
3. Baglimits.
4. Gamefarm.
5. Sanctuary.
6. Legal tools in wildlife conservation.

Working with Texts

9. Read and translate the text.

Text 1

Global Conservation

A. Science might seem a strange place for conservation to begin, but in today's turbulent times, most people do not have the time to know nature. It is mainly scientists who follow nature's daily progress and report back about how nature is faring. If you add up all the places in which people live, work, turn on their lights, and drive their cars and trucks, the human footprint touches more than three-quarters of Earth's land surface. People influence almost all—98 percent—of the places where we can grow wheat, rice, and corn.

The Wildlife Conservation Society believes that it is not too late to save wildlife and wild places, that some of the greatest work in field conservation is yet to come.

B. Although the importance of conservation may seem obvious, most of the world's people live too close to the margin of existence to exercise concern for anything more than their immediate survival and wellbeing. Planning for the future becomes difficult when the present itself is in doubt, and activities that could help tomorrow's generations may seem quixotic to those for whom survival is at stake. Thus, while conservation has made great strides in some areas of the world, it is still too soon for people to have any feeling of security about the future of the environment.

C. It is often regarded as essential to the survival or the enrichment of an individual or a group to use resources in such a way as to realize immediate

gains or profits. Such activities, however, may impair the future productivity of an area of land, exterminate a species, or destroy the usefulness of a site for any other purpose. In such a situation the short-term, private view conflicts with the long-term, public view.

As long as human populations were small and the pressures upon the environment were limited, conflicts between long-term and short-term interests made little difference. Deteriorated lands could be abandoned and new lands found because there was sufficient time to permit natural repair of environmental damage. Presently, however, with great and increasing numbers of people on a planet of limited capacity, conservationists are insisting that the difference between short- and long-term points of view should be resolved in favor of actions that guarantee the survival of mankind.

D. Wildlife-conservation techniques have counterparts in forestry and in soil, water, and landscape conservation. They include prohibitions and controls, restoration, subsidy, sanctuary, and public ownership.

The oldest forms of prohibitions and controls are those that regulate hunting, fishing, and trapping. Especially useful were those limitations on hunting that protected animals during the breeding season. Baglimits—i. e. limits on the number of animals that can be taken by an individual hunter, fisher, or trapper—are also important conservation tools.

Among the most important modern legal tools in wildlife conservation are those laws that protect threatened and endangered species. In the United States, for example, the Endangered Species Act makes it illegal to hunt, trap, or collect endangered animals and plants.

Artificial methods of offsetting resource depletion include programs of population restocking and habitat restoration. Gamefarms and fish hatcheries, which provide stocks of popular game species, are long-established tools of wildlife management. Of more recent development are those programs designed to restock wild populations of endangered species with individuals raised in captivity.

Sanctuaries—also called preserves, reserves, and refuges—have been prominent in wildlife conservation since the mid-19th century.

E. Sanctuaries and the large national parks have provided the protection and space critically needed in America and Africa by the larger predators and grassland-dwelling big game and the freedom from human interference needed by nesting birds during the breeding season; in the United States they also give migratory waterfowl at least partial relief from hunting pressure. In the United States, public ownership, which usually accompanies the establishment of sanctuaries, facilitates the management of wildlife and cover resources to an extent seldom possible on privately owned lands.

Public ownership finds its soundest manifestations in the development of sanctuaries and in the preservation of wildlife in national parks, though government ownership of forests in Canada and the United States also helps maintain various species of wildlife.

10. Match the titles with the paragraphs (A—E).

1. Sanctuaries.
2. Conservation Techniques.
3. The Scientific Approach.
4. Short-term Versus Long-term Views.
5. Conflicting Attitudes and Issues.

11. Pair work. Ask and answer six questions to Text 1.

12. Read the texts using your dictionary. Retell one of the texts.

Text 2

Wildlife Conservation

Wildlife conservation is the regulation of wild animals and plants in such a way as to provide for their continuance as a natural resource. Animal-conservation problems vary widely depending on the type of animal (whether, for example, it is exploited primarily for commercial or recreational reasons, whether or not it is free to range over national boundaries) and on the social and economic conditions of various countries. In many countries, game animals are widely hunted by sportsmen, over both private and public lands; thus an outstanding factor in wildlife conservation in such regions is the licensing and supervision of hunters. Game birds and mammals whose migrations take them across national boundaries require an international conservation effort. Marine mammals and fish also present the need for international agreement and legislation because they live in waters that know no national boundaries and are exploited commercially by fishermen from many countries. Small mammals that are trapped for their furs must be protected by domestic laws, but seals are the subject of international agreement. Saltwater fish, exploited mainly for commercial reasons, are protected by international agreement; but the exploiters of freshwater fish, chiefly anglers who fish for recreation (except in such large inland water areas as the Great Lakes), are licensed and controlled domestically.

Ethical considerations appear to occupy a central position in wildlife-conservation thinking, but their development has been delayed by the fact that people for so many generations had to fight against nature. The disappearance of the mammoth taught no lessons; the disappearance of the passenger pigeon did. Convinced of the enormous destructive power of humankind, pioneer conservationists of the early 20th century emphasized the ethical responsibility of their own generation to conserve natural resources for posterity.

Text 3

The Human Impact on the Environment

During the past 2,000 years, the world has lost, through extinction, well over 100 species or subspecies of mammals. Approximately two-thirds of

these losses have occurred since the mid-19th century, most since the beginning of the 20th. In addition to those mammals already extinct, many others are vanishing or threatened.

The primary factor in the depletion of the world's fauna has been modern human society, operating either directly through excessive commercial hunting or, more disastrously, indirectly through invading or destroying natural habitats, placing firearms in the hands of peoples who previously were without them, or introducing to the native fauna of certain areas (Australia and various islands) more aggressive exotic (nonnative) mammals. Except in the West Indies, comparatively few species seem to have died out within the past 2,000 years from such natural causes as evolutionary senility, disease, or climatic change.

Animal protection must begin with the conservation of the habitat—the area where animals feed, rest, and breed. This naturally involves the preservation of much besides the animal population itself, including conservation of vegetation cover and soil. The comparatively new science of ecology focuses on the association of living things in natural communities and their mutual interdependence and on the possibility of preserving the conditions under which the variety and abundance of natural living forms may continue to exist. But the immense growth of the world's human population and its expanding economic needs, fostering the consequent extension and intensification of industry and agriculture, have encroached upon remaining natural habitats throughout the world. This has been accompanied by the introduction of new types of cultivation, by the drainage of marshes, by the general lowering of the water table, by pollution of rivers and lakes, by destruction of woodlands, and by indiscriminate use of insecticides and herbicides. In many parts of the world there has also been widespread destruction of forests and other great belts of natural vegetation.

Great Britain passed through two centuries of so-called game protection, the original purpose of which was to create artificially high populations of grouse, pheasant, and other sporting species and, at the same time, to reduce the populations of such predators as the weasel, otter, wildcat, and badger, as well as birds of prey including owls. This alteration of the natural equilibrium had many other consequences, particularly in agriculture and forestry. The rabbit and wood pigeon population increased rapidly and caused widespread damage. In some places in Great Britain the landscape was changed by the planting of woods and the creation of other new areas, including artificial lakes for wildfowl—all with the purpose of creating larger populations of certain species for sport. As a result, the game species did exceptionally well while the total wildlife resources experienced varied fortunes. The modern view is different: total wildlife conservation is rapidly replacing game protection.

13. Translate into English.

Text 4

Дальневосточный леопард

Дальневосточный леопард — самый северный подвид леопарда. Он отличается густым длинным мехом, особенно заметным в зимнем наряде, и относится к числу красивейших и наиболее редких форм кошек мировой фауны. Дальневосточный леопард занесен в Красную книгу России и международную Красную книгу.

К сожалению, уже сегодня положение с дальневосточным леопардом можно считать катастрофическим: за последние 20 лет площадь обитания леопарда в России уменьшилась почти вдвое, а численность сократилась в десятки раз и составляет всего лишь около 30 особей. В Китае, по данным последних учетов, обитает не более 10 зверей, в Корее достоверных данных о присутствии леопарда нет. Таким образом, по самым оптимистическим оценкам, численность всей мировой популяции дальневосточного леопарда составляет не более 40 особей.

Наблюдаемая на протяжении века тенденция изменения ареала и численности леопарда выглядит угрожающей. Не имеет надежной защиты и последнее убежище дальневосточного леопарда в России — крайний юг Приморского края. Продолжаются вырубки лесов; систематическое выжигание растительности; реконструкция и прокладка дорог; уничтожение особей, наносящих ущерб поголовью пятнистых оленей в парках; попадание леопардов в петли и капканы, предназначенные для других видов животных. Учащаются случаи целенаправленного браконьерства, стимулируемого модой на шкуры и спросом на части тела зверей, которые используются в качестве сырья для приготовления лекарственных препаратов в восточной медицине. На значительной части заселенной леопардами территории ведутся охота на копытных и капканный промысел, осуществляется неконтролируемый сбор лекарственных растений, что создает мощный фактор беспокойства.

Такое бездумное варварское уничтожение природы при хозяйственном освоении территорий и возрастающее браконьерство могут стать причиной исчезновения дальневосточного леопарда навсегда. Все эти факты заставляют относиться к сохранению дальневосточного леопарда и среды его обитания с особым вниманием и требуют активного принятия мер.

Speaking and Writing

14. Make a report about any endangered animal you find interesting and unusual. Write a plan first and do not forget to mention the animal's

- appearance;

- habitat;
- feeding habits;
- way of reproduction;
- why it is endangered;
- what chances of survival it has.

15. Choose any of the following ideas (or propose your own), find information and write an essay (150 — 250 words).

1. Conservation is vital for humans.
2. Efforts in vain.
3. Conservation in Russia.
4. Your opinion and ideas of conservation.

Section 1

Present Forms of the Verb (1)

The Present Simple Tense

Образование:

I/you/we/they **work**.

He/she/it **works**.

Do you **work**? / **Does** he **work**? — Yes, I **do**. / No, he **doesn't**.

I **do not (don't)** **work**.

He **does not (doesn't)** **work**.

The Present Simple используется:

- для выражения постоянного состояния, повторяющегося или повседневного действия:

*Biology students **study** botany and zoology during the first academic year at MSU;*

- для описания законов природы и непреложных истин:

*Bacteria **fall** into a category of life called the Prokaryotes. Air **enters** the body of an insect through the breathing pores, called spiracles;*

- в расписаниях (движения самолетов, поездов и т. д.):

*The flight for London **departs** at 7.30 am. School **starts** at 8.30 am.*

На **the Present Simple** указывают такие наречия, как *always, usually, often, sometimes, occasionally, rarely, seldom, never* и т. п., которые занимают позицию перед смысловым глаголом, но после глагола *be*, вспомогательного глагола *do* и модальных глаголов (*can, should* и др.):

*Wolves **usually** attack in groups.*
*I am **often** late for classes.*
*He doesn't **always** tell the truth.*
*Interspecies hybrids that are easily bred by humans can **seldom** live in the wild.*
*You should **never** touch this device.*

Выражения, которые состоят из нескольких слов, такие как *once a week, three times a month, every other day, in the morning* и др., занимают позицию в начале или в конце предложения:

*Biology students work in laboratories **every other day**.*
***In the morning** they usually prepare for the experiments.*

The Present Continuous Tense

Образование:

to be (в настоящем времени, в требуемом лице и числе) +
+ **-ing form of the verb**

I am feeding dolphins at the moment.

He/she/it **is lying** in the sun.

We/you/they **are feeding** dolphins at the moment.

Is he **feeding** dolphins now? — Yes, he **is**. / No, he **isn't**.

He **is not (isn't) feeding** dolphins at the moment.

The Present Continuous используется:

- для выражения действия, совершающегося в момент речи, а также для выражения длительного действия, совершающегося в настоящий период, хотя и не обязательно в момент речи:

***Ann is reading** in the library at the moment. A group of scientists **are working** on the environmental project this year;*

- для выражения действия, которое к моменту речи уже запланировано и произойдет в ближайшем будущем, особенно если уже принято решение о месте и времени совершения действия:

***Michael is reporting** his diploma project at 2 tomorrow afternoon (время и место действия уже известны);*

- для описания меняющихся ситуаций или действия в развитии:
***More and more species are disappearing** as a result of human activities;*

- с наречиями *always, constantly* и т. п. для выражения негативного отношения к постоянно повторяющемуся действию:

***You are always interrupting** the lecturer (It annoys me).*

Существуют глаголы, которые обычно не используются во временах группы **Continuous**. К ним относятся:

- глаголы, выражающие предпочтения говорящего: *like, love, enjoy, prefer, adore, dislike, hate, want, wish* и т. п.:

*Many people **prefer** to watch TV rather than play sports;*

- глаголы, выражающие чувства: *see, hear, smell, taste, sound, feel, look* и т. п.:

*I **see** a squirrel in that tree;*

- глаголы мыслительной деятельности: *know, believe, understand, remember, forget, realize, seem* и т. п.:

*They don't **seem** to be happy;*

- некоторые другие глаголы, такие как *belong, contain, include, fit, need, notice, cost, mean, owe, own, require, weigh* и др.:

*If a dog roars at you, it **means** it might attack.*

Некоторые глаголы используются как в **Simple**, так и в **Continuous**, но имеют в них разное значение. Сравните:

1. *I **think** (= это мое мнение) these plants need watering. We **are thinking** (= размышляем) of our next project.*
2. *Ian **has** (= имеет) a dog and a cat. We **are having** (= едим) breakfast.*
3. *He **appears** (= выглядит) to be nervous. He **is appearing** (= примет участие) in the next conference.*
4. *I **see** (= понимаю) what you mean. I can **see** (= вижу) a huge bear in the distance. I **am seeing** (= встречаюсь) my supervisor tomorrow morning.*

EXERCISES

1. Complete the sentences with the verbs in the correct form: the Present Simple or the Present Continuous Tense.

What Dragonflies See—and How

Dragonflies . . . **1** . . . (help) scientists to learn more about how animals and humans . . . **2** . . . (see). These insects are especially favorable for such studies because of their huge eyes with large cellular components. They . . . **3** . . . (study) the eyes of adults and nymph dragonflies for their sensitivity to light and their ability to discriminate different colors.

Insects . . . **4** . . . (have) both simple eyes and large compound eyes with thousands of separate transparent facets. Under each facet . . . **5** . . . (be) a cluster of light-sensitive receptor cells, like the retinal rods or cones of the vertebrate eye. The eye of the dragonfly . . . **6** . . . (have) more of these facets—from 10,000 to 20,000 in each compound eye—than any other insect. The dragonfly's different eyes, and different regions of the same eye, . . . **7** . . . (contain) different combinations of receptor cells.

Three simple eyes (ocelli), which . . . **8** . . . (remain) from the nymph stage, are most sensitive to ultraviolet light and blue-green light. In contrast, the dorsal (upper) part of the adult's compound eye . . . **9** . . . (be) most sensitive to violet light; the ventral (lower) part of the same eye . . . **10** . . . (be) most sensitive to ultraviolet, blue-green, and yellow. While the dragonfly . . . **11** . . . (fly), it . . . **12** . . . (depend) largely on the ventral part of each compound eye, which . . . **13** . . . (cover) the terrain in front, to both sides and down.

Incidentally, the dragonfly . . . **14** . . . (spend) its entire adult life in the air. These insects . . . **15** . . . (be) so modified for a flying life that they can no longer walk. They . . . **16** . . . (capture) their food, . . . **17** . . . (recognize) their mates, and even . . . **18** . . . (drop) their eggs onto the water while flying.

2. Complete the questions to the text and answer them.

1. Why dragonflies interesting scientists?
2. What type of eyes have?
3. How many facets have?
4. Which most sensitive ultraviolet light?
5. Which most sensitive violet light?
6. How see?
7. How much time the air?
8. Can walk?
9. What while flying?

3. Complete the sentences with the verbs in the correct form: the Present Simple or the Present Continuous Tense.

1. The heart (pump) blood through the circulatory system all round the body.
2. Today in the laboratory students (carry out) an experiment.
3. The explanation (be) not evident enough.
4. By weighing the leaves at the start and at the end of the experiment we (obtain) quite accurate data, showing the result of evaporation.
5. It is a dry season now, and wildebeests (migrate) in search of green grass.
6. Luminous bacteria (live) in symbiosis with different marine animals.
7. The zoo (open) at 9 am.
8. The experiment . . . (start) at 12.00 tomorrow.
9. It is spring now. Birds (sing) and (build) nests.
10. More and more species (die out) because people (destroy) their habitats.

4. Complete the sentences with the verbs in the correct form: the Present Simple or the Present Continuous Tense.

1. With what man (think)? — He (think) with the brain.
2. Where hares (live)? — They (live) in the woods.
3. Animals (not speak).
4. Fish (breathe) with gills and (swim) with fins.
5. Plants (not move) about. They (have) no power of locomotion.
6. The horse (be) a domestic animal.
7. The fox (be) a domestic animal? — No, it (not be).
8. The fox (live) in water? — No, it (not do).

5. Translate into English.

1. На нашей планете живет много животных.
2. Атмосфера и почва Земли пригодны для жизни.
3. Биосфера полна живых организмов.
4. Биосфера включает в себя все живые и неживые объекты на нашей планете.
5. Мы знакомы со многими формами жизни на Земле, но некоторые формы жизни все еще нам неизвестны.
6. Иногда живые организмы выглядят как неживые, а неживые — как живые.
7. В отличие от неживых организмов живые организмы растут и размножаются.
8. Продолжительность жизни некоторых живых существ превышает сто лет, а некоторые живут меньше дня.
9. Изучать жизнь очень интересно.

Section 2

Present Forms of The Verb (2)

The Present Perfect Tense

Образование:

have/has + **past participle**

I/we/you/they **have repaired/bought** the car.

He/she/it **has cooked/eaten** the soup.

Has she **cooked/eaten** the soup? — Yes, she **has**. / No, she **hasn't**.

She **has not (hasn't) cooked/eaten** the soup.

The Present Perfect используется:

- для выражения действий, которые начались в прошлом и все еще продолжаются в настоящий момент. В данном случае часто используются предлоги *since* и *for*.

*They **have lived** in Moscow for twenty years;*

- для выражения действия, которое завершилось в недавнем прошлом, но своим результатом связано с настоящим. Точное время совершения действия в данном случае не важно.

*I **have finished** the report and I'm ready to hand it in to the supervisor.*

*Peter **has revised** a lot for the exam (So he is ready now).*

Но: *Peter **revised** a lot for the exam yesterday;*

- для выражения одного или нескольких действий, которые произошли за период, не оконченный к настоящему моменту (*this morning/evening/year/today* и т. п.):

*The group of students **have examined** 10 mice in the laboratory today.*

На **the Present Perfect** указывают: *for, since, already, yet, always, ever, never, just, so far, today, this morning/evening/year, how long, recently, lately* и др.

The Present Perfect Continuous Tense

Образование:

have/has + been + -ing form of the verb

I/you/we/they **have been working** for an hour.

He/she/it **has been working** for an hour.

Has she been working since 10 am? — Yes, she **has**. / No, she **hasn't**.

She **has not (hasn't) been working** for an hour.

The Present Perfect Continuous используется:

- чтобы подчеркнуть длительность действия, которое началось в прошлом и все еще продолжается вплоть до настоящего момента, особенно с такими словами и выражениями, как *since, for, all day, half an hour* и т. п.:

*My dog **has been sleeping** the whole evening today (The dog is still sleeping);*

- для выражения действия, которое началось и длилось некоторое время в прошлом. Такое действие может быть завершено или не завершено к настоящему моменту, но его результат очевиден:

*Two deer **have been fighting** for an hour, and the defeated one is that with a broken horn.*

С **the Present Perfect Continuous** используются: *for, since, how long, lately, recently.*

EXERCISES

1. Complete the sentences with the verbs in the correct form: the Present Simple, the Present Perfect or the Past Simple Tense.

Interferon

Virus diseases . . . **1** . . . (plague) mankind for thousands of years, but, until recently, no medical treatment for them . . . **2** . . . (be) available. Although the use of vaccines almost . . . **3** . . . (eliminate) several major viral diseases such as polio and smallpox, medical research . . . **4** . . . (provide) no means for treating virus diseases already established in the body. No drugs . . . **5** . . . (be) made available for combating viruses even though drugs such as penicillin have been used so effectively against bacterial infections.

Ever since 1957, when interferon was discovered, there . . . **6** . . . (be) the hope that this natural antiviral substance produced by cells might provide an effective treatment for a broad range of virus diseases that are not subject to control by antibiotics. Not for the first time firm evidence has been presented that an animal's body can be stimulated to produce enough interferon to cure an acute infection. An eye disease in rabbits was treated by administering an agent that . . . **7** . . . (raise) the animals' interferon level and . . . **8** . . . (clear) up the infection.

Interferon . . . **9** . . . (be) a protein, produced by cells under virus attack, that in turn apparently . . . **10** . . . (give) rise to a factor that limits the spread of the virus. The interferon system has been demonstrated in the laboratory and in human beings, but the body's own system often . . . **11** . . . (not produce) enough interferon to overcome an established infection. Treatment with prepared interferon can prevent many viral infections and . . . **12** . . . (have) some protective effect when it is given after inoculation with a virus and before the onset of disease, but it is hard to accumulate enough prepared interferon to treat an established infection.

Many workers in virology, biochemistry, and molecular biology . . . **13** . . . (study) interferon, and out of this research . . . **14** . . . (come) the rationale for an entirely new approach to the treatment of viral dis-

ease — induction of the synthesis of interferon in the body in order to stimulate the cell's natural defense mechanism.

2. Complete the sentences with the verbs in the correct form: the Present Simple, the Present Perfect Continuous or the Present Perfect Tense.

1. Men (dig) up fossils for centuries, but it is only in the last two hundred years that they generally (recognize) as the remains of living things.
2. If disturbed, earwigs run away very quickly, but if they (hide) in a lettuce, they cling on tenaciously, and they manage to keep afloat in water for quite a while.
3. A smoke cloud darkened the sky, and the earth (tumble) for days.
4. The seals (breathe) through tiny cracks in the ice. This conclusion is proved by Arctic explorers and research workers who (study) the northern hunting grounds.
5. Mankind (eat) corn for so many hundreds of years that today we (think) of it as just another fine vegetable.

3. Form sentences using the following words and the Present Perfect Continuous Tense.

to discuss — two hours

We have been discussing this question for two hours already.

1. to study English — three years
2. to read the book — since 6 o'clock
3. to grow crocuses — five years
4. to translate — two hours
5. to play the piano — since the morning
6. to wait — half an hour

4. Translate into English.

1. Человек приручал животных с древних времен.
2. Мичурин работал над улучшением сортов фруктов в течение всей своей жизни.
3. Я уже несколько лет развожу розы в своем саду.
4. Поверхность земли непрерывно меняется в течение миллионов лет ее существования.
5. В Европе пчелы опыляют крокусы в течение февраля и марта.
6. Мы ждем тебя с 9 утра. Почему ты так опаздываешь?
7. В течение многих лет лягушки являются объектом для наблюдений и проведения экспериментов.
8. Во Франции некоторые виды лягушек используются в пищу с древнейших времен.

Section 3

Past Forms of the Verb

The Past Simple Tense

Образование:

I/he/she/it/we/you/they **lived/came**.

Did she **live/come**? — Yes, she **did**. / No, she **didn't**.

She **did not (didn't) live/come**.

The Past Simple используется:

- для выражения действий, которые произошли в указанное или хорошо известное время в прошлом:

*He caught the bus **10 minutes ago** and now is heading for the railway station;*

- для выражения последовательных действий в прошлом:

*She got up, **had** breakfast and **left** home;*

- для выражения привычных действий в прошлом. В данном случае можно использовать выражение *used to*:

*This bird **inhabited (used to inhabit)** Europe two hundred years ago.*

The Past Continuous Tense

Образование:

was/were + **-ing form of the main verb**

I/he/she/it **was** / We/you/they **were working**.

Was she / **Were** they **working**?—**Yes**, she **was**. / **No**, they **weren't**.

She **was not (wasn't) working**. / They **were not (weren't) working**.

The Past Continuous используется:

- для выражения действия, протекавшего в определенный момент в прошлом. При этом начало и конец действия неизвестны.

*At 5 o'clock yesterday evening the students **were working** in the laboratory;*

- для выражения действия, которое протекало в определенный момент в прошлом и было прервано другим, коротким действием. Для выражения длительного действия в данном случае используется **the Past Continuous**, короткого — **the Past Simple**:

*It **started** (короткое действие) to rain when we **were feeding** (длительное действие) chickens, and we made off;*

- для выражения одного или более длительных действий, происходивших в прошлом одновременно:

*The birds **were chirping**, the leaves **were rustling** while we **were lying** in the sun;*

- для того, чтобы описать обстановку или место действия в начале повествования, до основных событий:

*That cold winter morning Tom **was chopping** firewood. The wind **was slowing**, and the snow **was falling**.*

The Past Perfect Tense

Образование:

had + past participle

She **had lived/driven**.

Had she **lived/driven**?—Yes, she **had**. / No, she **hadn't**.

She **had not (hadn't) lived/driven**.

The Past Perfect используется:

- для выражения действия, которое произошло до другого действия в прошлом или до указанного времени в прошлом:

*We **had finished** feeding birds when it began to rain;*

- для выражения действия, которое закончилось и результат которого очевиден в прошлом:

*The group of students **had done** well in the contest and was happy to be awarded as winners.*

*They **had cleaned** the cage. It **looked** perfect.*

С **the Past Perfect** используются: *after, already, before, for, since, just, when, till/until, by, by the time, never* и др.

*The expedition **had already** covered hundreds of miles, but they still were very far from their destination.*

*The team **had never** got such impressive results.*

*The mushroom looked unfamiliar. I **had never** seen it **before**.*

*The park had looked nice **until** people left litter everywhere.*

The Past Perfect Continuous Tense

Образование:

had + been + -ing form of the verb

She **had lived/driven**.

Had she been working?—Yes, she **had**. / No, she **hadn't**.

She **had not (hadn't) been working**.

The Past Perfect Continuous используется:

- для того, чтобы подчеркнуть длительность действия, которое началось и закончилось в прошлом до другого действия или до указанного момента в прошлом. Обычно используется с предлогом *since* или *for*:

He had been searching for this article on the Internet for a week before he found an appropriate one;

- для выражения действия, которое длилось некоторое время и результат которого в прошлом очевиден:

They had been treating an injured dog for a month, and eventually it recovered.

He had been repairing the car since early morning. He was dreadfully tired.

С **the Past Perfect Continuous** используются: *for, since, before, until, how long* и др.

EXERCISES

1. Complete the sentences with the verbs in the Past Simple Tense.

Lister, the Founder of Antiseptic Surgery

Sir Joseph Lister (1827—1912) . . . **1** . . . (make) a notable contribution in the field of surgery. In 1867, while Lister . . . **2** . . . (be) a professor of surgery in the University of Glasgow, he . . . **3** . . . (begin) to experiment with the use of carbolic acid in the treatment of wounds. Prior to that time there was always a great danger of gangrene after operations. In the beginning, he . . . **4** . . . (apply) concentrated carbolic acid to the wound. Gangrene . . . **5** . . . (not develop), but that method . . . **6** . . . (be) exceedingly painful and often . . . **7** . . . (result) in large, ugly scars. What he . . . **8** . . . (do) to avoid these results? He . . . **9** . . . (saturate) silk gauze with the acid and . . . **10** . . . (apply) the gauze to the wound, a method that . . . **11** . . . (prove) far more successful. Next Lister . . . **12** . . . (direct) attention to the materials that he . . . **13** . . . (use) when he . . . **14** . . . (stitch) wounds.

Later he . . . **15** . . . (begin) to use catgut which he . . . **16** . . . (treat) with sulfur and chromium as the most reliable material. . . . **17** . . . he (do) anything else? Yes, he . . . **18** . . . (do). In 1869, Lister . . . **19** . . . (turn) his attention to the destruction of harmful bacteria in the air. Before he . . . **20** . . . (perform) an operation, he . . . **21** . . . (spray) the atmosphere with a weak solution of carbolic acid. Then he . . . **22** . . . (begin) to sterilize everything he used in the operation itself. His next step, therefore, . . . **23** . . . (be) to develop a technique for using antiseptics on the hands, dressings, sponges, bandages, and surgical instruments.

2. Translate the text, using the Present Simple, the Past Simple and the Present Perfect Tenses.

Более ста лет тому назад в водах Тихого океана, омывающих Га- лапагосские острова, которые находятся около экватора у Южно- Американского континента, появился английский корабль «Бигл». Чарлз Дарвин, двадцатилетний натуралист, находился на борту этого корабля. Его целью было изучение богатой фауны островов. Именно здесь, в этом заброшенном среди океана мирке, родилась у молодого ученого идея эволюции видов. Идею эту подсказал ему (как говорил сам Дарвин) вьюрок галапагосский (Darwin's finch). Дело в том, что вьюрки, обитающие на каждом из островов, отличались друг от друга. С тех пор имя этой птички связано с важнейшей из биологических теорий.

3. Make sentences from the following words, using the Past Simple and the Past Continuous Tenses.

1. When Paul | come | we | have coffee.
2. I | walk home | when | it | start | to rain.
3. While | Henry | travel | in the mountains | he | see | a Yeti.
4. The students | play | a game | when | the professor | arrive.
5. Cora | read | a letter | when | Jimmy | phone | her.
6. When | the starter | fire | his pistol | the race | begin.

4. Match halves of the sentences from A and B columns, using *when* or *while*.

A

1. I was waiting at the bus stop
2. We were flying over the sea
3. I was doing aerobics
4. They were walking through the jungle
5. He was having lunch with his boss

B

- a. I saw the left wing was on fire.
- b. I found a purse of money.
- c. she heard a noise downstairs.
- d. I twisted my ankle.
- e. he broke her favourite vase.

- | | |
|---------------------------|---|
| 6. She was reading in bed | f. he split red wine over her white suit. |
| 7. He was washing up | g. Sue nearly stood on a snake. |

5. Complete the sentences with the verbs in the correct form: the Past Simple or the Past Perfect Tense.

After the Anteater
(from Gerald Durrell)

A few words about the author

Gerald Durrell (1925—95) was an English naturalist, zookeeper, conservationist, author, and television presenter. He founded what is now called the Durrell Wildlife Conservation Trust and the Jersey Zoo on the Channel Island of Jersey, but is perhaps best remembered for writing a number of books based on his life as an animal collector and enthusiast. He was the youngest brother of the novelist Lawrence Durrell. Durrell founded the Jersey Zoological Park in 1958 to house his growing collection of animals. As the zoo grew in size, so did the number of projects undertaken to save threatened wildlife in other parts of the world.

To capture a giant anteater . . . **1** . . . (be) one of my reasons for going to the Rupununi, for we . . . **2** . . . (hear) that they were much easier to catch in the grassland than in the forests of Guiana.

So for three days after our arrival at Karanambo we . . . **3** . . . (do) nothing but talk and think about anteaters, until eventually McTurk . . . **4** . . . (promise) to see what he could do about the matter. One morning just after breakfast a short Amerindian . . . **5** . . . (materialize) in front of the house, in the silent way these people do. He . . . **6** . . . (have) a bronze, Mongolian-looking face and dark slit eyes. To anyone who . . . **7** . . . (expect) a fierce warrior, clad in a vivid feather headdress, he would have been a great disappointment. As it was, he . . . **8** . . . (have) an air of dour confidence about him, which I . . . **9** . . . (find) comforting.

“This is Francis,” said McTurk. “I think he knows where you might find an anteater.”

We . . . **10** . . . (discover) after some questioning that Francis DID know where an anteater was, having seen one some three days before, but whether it . . . **11** . . . (be) still there or not was another matter. McTurk . . . **12** . . . (suggest) that Francis should go and see, and, if the creature was still hanging around, he would come and fetch us and we would have a try at catching it. Francis . . . **13** . . . (smile) shyly and . . . **14** . . . (agree) to the plan. He . . . **15** . . . (go) off and . . . **16** . . . (return) the next morning to say that he . . . **17** . . . (be) successful: He . . . **18** . . . (find) where the anteater was living, and was willing to lead us there next day.

Section 4

Future Forms of the Verb

The Future Simple Tense

Образование:

I/we **shall/will** + **infinitive without to**

В современном британском варианте английского языка в 1-м лице допустимо употреблять как *shall*, так и *will*.

He/she/it/you/they **will** + **infinitive without to**

Tomorrow we **will dissect** the frog's leg to study femoral nerves.

Will you **be** ready for tomorrow's report?

I **shall not (shan't)** / They **will not (won't)** study ethology in the next semester.

The Future Simple используется:

- для предсказания будущего, обычно с глаголами *think, believe, hope, doubt, expect* и др., выражениями *be sure, be afraid* и др., а также с наречиями *probably, perhaps, certainly* и т. п.:

*I hope they **will come** on time;*

- для сообщения внезапного решения:

*Is this pencil yours? — No. — Then I **will take** it;*

- для выражения обещаний, угроз, просьб, предупреждений и предложений:

*I **will phone** as soon as I arrive in St Petersburg (promise);*

- для описания действий (ситуаций), которые обязательно произойдут в будущем и которые невозможно контролировать:

*Kate **will be** twenty next Friday.*

The Future Continuous Tense

Образование:

I/we **shall/will** + **be** + **-ing form of the verb**

He/she/it/you/they **will** + **be** + **-ing form of the verb**

I/he/they **will be working**.

Will I/he/they **be working**?—Yes, I/he/they **will**. / No, I/he/they **won't**.

I/he/they **will not (won't) be working**.

The Future Continuous используется:

- для выражения длительного действия, которое будет происходить в указанный момент в будущем:

*This time next month I **shall be swimming** in the Black Sea;*

- для выражения обычного или запланированного хода событий в будущем:

*I **will be seeing** the whole group at the weekly meeting (arrangement).*

The Future Perfect Tense

Образование:

I/we **shall/will + have + past participle**

He/she/it/you/they **will + have + past participle**

I/he/she/they **will have done** the test.

Will I/he/she/they **have done** the test?—Yes, I/he/she/they **will**. /

No, I/he/she/they **won't**.

I/he/she /they **will not (won't) have done** the test.

The Future Perfect используется:

- для выражения действий, которые будут завершены к определенному моменту в будущем:

*I **will have finished** revising before the exam. He **will have come** by now (He hasn't come yet but will be in any minute);*

- со следующими словами и выражениями: *before, by, by the time, till/until* (только в отрицательных предложениях):

*You **won't have finished** reading this book **until** the end of the week.*

The Future Perfect Continuous Tense

Образование:

I/we **shall/will + have + been + -ing form of the verb**

He/she/it/you/they **will + have + been + -ing form of the verb**

I/you/we/they **will have been doing**.

Will I/you/we/they **have been doing**?—Yes, I/you/we/they **will**. /

No, I/you/we/they **won't**.

I/you/we/they **will not (won't) have been doing**.

The Future Perfect Continuous используется, чтобы подчеркнуть длительность действия, которое будет завершено к определенному моменту в будущем. В данном случае используются предлоги *for . . . by*:

I will have been doing the research for five years by the end of the year.

Выражение будущего времени с помощью оборота **be going to**

Оборот **be going to** используется:

- для выражения планов и намерений:

He is going to take a postgraduate course. (Он собирается . . .);

- для предсказаний, связанных с ближайшим будущим и основанных на очевидных фактах:

The clouds are dark, it is going to rain.

EXERCISES

1. Complete the sentences with the verbs in the correct form: the Present Simple or the Future Simple Tense.

Watch Tadpoles Grow

If you look in a pond, you . . . **1** . . . (see) in a shallow water great lumps of jelly. That . . . **2** . . . (be) the frog's spawn. Mother frog . . . **3** . . . (lay) up to 800 eggs. Don't think she . . . **4** . . . (take) care of them. She . . . **5** . . . (leave) them, floating on the surface to look after themselves as soon as the eggs are laid. Then in a few days, if you look at an egg, you . . . **6** . . . (notice) a black spot, at first about the size of a pin head, soon beginning to grow bigger and become shaped like a bean. Then you . . . **7** . . . (begin) to recognize which is its head and which is its tail. It . . . **8** . . . (wiggle) about in the jelly and free itself from it. For a few days, the baby tadpole . . . **9** . . . (hang) about on the jelly. It . . . **10** . . . (need) no food at this time; it . . . **11** . . . (have) not even a mouth yet. But you . . . **12** . . . (see) soon how it begins to wriggle its tail. Let us look at it in three days. . . . **13** . . . it (change)? Yes, it . . . **14** It . . . **15** . . . (begin) to swim around and nibble at the plants. It . . . **16** . . . (not feed) on jelly any more. The tadpoles . . . **17** . . . (grow) larger very quickly. At first they . . . **18** . . . (have) feathery gills on the sides of their heads, but after three weeks the gills . . . **19** . . . (disappear). Their eyes . . . **20** . . . (grow) larger, and their color . . . **21** . . . (become) lighter.

What . . . **22** . . . these signs (tell) you? They . . . **23** . . . (tell) you that now, when they are about six weeks old, they . . . **24** . . . (need) a “meat” diet. When the tadpoles are ready for it, they . . . **25** . . . (come) close to tiny worms and nibble at them. Soon you . . . **26** . . . (see) a great change come over the tadpoles. First back legs, then front legs . . . **27** . . . (grow). They . . . **28** . . . (start) to come to the surface for air, because they . . . **29** . . . (breathe) now with lungs. The tails . . . **30** . . . (become) shorter, and after ten to twelve weeks the tadpoles . . . **31** . . . (turn) into frogs.

2. Complete the sentences with the verbs in the correct form: the Future Simple, the Future Continuous or the Future Perfect Tense.

1. We (study) ethology in the next semester.
2. In several millions of years, the Red Sea (become) a new ocean.
3. Dumping of creosote into the river led to extinction of all species of fish. Our team (conduct) an intense study on reintroduction of different species of fish.
4. There’s an epidemic among insects this year, so many chicks of insect-eating birds (die).
5. Tomorrow we (dissect) the frog’s leg to study femoral nerves.
6. The next meeting (be) on Wednesday at 4 pm.
7. The robins have finished building the nest, and now the female bird (lay) eggs.
8. I (write) the plan by the end of the week.
9. The British oil company promised to stop the oil leakage by July. But by this time, the catastrophe (cover) the entire Mexican Bay.
10. The forest on the part of the slope has been burned down. The soil must be strengthened by the 15th of this month because by then rains (start) and it will be washed away.
11. We (monitor) the ecosystem of the swamp for three years by the end of this May.
12. The number of lemmings (increase) for two years after the present decline.
13. The astronauts who will take off tomorrow (stay) on the space station for four months. During this time, they (conduct) many experiments.
14. When the answer from the Ministry comes, I (dig) out the bones of dinosaurs in the Gobi desert.
15. Grizzly bears (fish) on the rifts during salmon spawning period. They (eat) fish and spawn while they have the opportunity.

3. Translate into English.

1. Мы собираемся провести этот эксперимент на следующей неделе.
2. Птенцы деревенской ласточки (*Slirundo rustica*) оперились и вот-вот вылетят из гнезда.
3. Доклад профессора Северцева состоится завтра в 11:00.
4. Пройдет восемь лет, и этот лиственный лес непременно станет смешанным.
5. Если рядовой павиан в присутствии вожака первым подходит к пище или ухаживает за самками, значит он собирается бросить ему вызов.
6. Это единственный источник воды в радиусе 20 километров. Стоит только подождать, и здесь побывают все местные животные.
7. Цветы этого растения откроются ровно в 6 часов утра. Еще Линней использовал их в качестве биологических часов.

Section 5

Articles

Неопределенный артикль a/an

A + согласный звук

An + гласный звук

A/an используется:

- с существительными, упоминаемыми в речи впервые:
*I saw **a** bird in the tree.*
*I've found **an** umbrella in the wardrobe;*
- при отнесении существительного к какому-либо классу однородных предметов, но не к виду или роду в биологии! См. раздел «Определенный артикль **the**».
***An** antelope is a mammal;*
- с существительными, определяемыми прилагательным:
*Kate is **a** beautiful girl;*
- с существительными, выражающими количество:
***a** dozen, **a** hundred, **a** few, **a** little, **a** lot;*
*There are **a** dozen eggs in this box;*
- вместо *per*:
*I'm paid four hundred pounds **a** week;*

- с глаголами *be* and *have (got)*:
*I have **a** dog. It is **an** Alsatian.*

Определенный артикль **the**

The используется:

- с существительными, обозначающими людей и предметы, которые ранее уже упоминались в речи:

*I can show you my two sisters. **The** girl on the right is Susan, **the** girl on the left is Ann;*

- с существительными, которые ранее не упоминались, однако очевидны из контекста:

*Where is **the** money I gave you yesterday?*

***The** book I told you about is on sale now;*

- перед существительными, единственными в своем роде:

***the** Sun, **the** Moon, **the** centre of the city;*

***The** Moon revolves round **the** Earth;*

- перед существительными в единственном числе, обозначающими биологический род или вид:

***The** kangaroo is a national symbol of Australia;*

- если существительное определяется порядковым числительным или прилагательным в превосходной степени:

***The** first wealth is health.*

*This is **the** shortest way to the station;*

- перед существительными, обозначающими вещество, если речь идет об определенном количестве этого вещества, что можно видеть из контекста:

*Pass **the** milk, please.*

***The** water in the glass is very cold;*

- перед существительными, обозначающими части суток:

*I get up at seven in **the** morning;*

- с географическими названиями рек (**the** Volga); морей (**the** Baltic Sea); океанов (**the** Pacific); каналов (**the** Panama Canal); горных цепей (**the** Urals); групп островов (**the** Bahamas); пустынь (**the** Gobi); стран, если в название страны входит существительное, определяющее ее государственный строй, например: *states, republic, emirates* и т. п. (**the** United States of America), или если название страны представляет собой существительное во множественном числе (**the** Netherlands);

- при обозначении специфических объектов:
*I've seen **the** Leaning Tower of Pisa;*
- перед существительными в словосочетаниях с предлогами *of* и *which*:
*Moscow is **the** capital of Russia;*
- с титулами, должностями, званиями и т. п. (***the** Pope, **the** President, **the** Prince of Wales*).

Опускается, если за титулом следует имя собственное (*President Putin*);

- с названиями кинотеатров (***the** Odeon*), театров (***the** Royal Shakespeare Theatre*), музеев (***the** Hermitage*), галерей (***the** Tretyakov Gallery*), газет (***the** Times*), кораблей (***the** Titanic*);
- с названиями музыкальных инструментов, танцев (***the** piano, **the** waltz*);
- перед фамилиями, употребленными во множественном числе для обозначения членов одной и той же семьи; перед названиями музыкальных групп и других коллективов (***the** Ivanous, **the** Beatles*);
- перед названиями народов, национальностей (***the** Japanese*).
- перед прилагательными, которые в предложении выступают в роли существительных для обозначения группы людей (***the** poor, **the** sick, **the** young, **the** disabled, **the** unemployed, **the** homeless*);
- перед словами *beach, station, cinema, theatre, coast, country(side), ground, jungle, seaside, weather, shop, world, city, sea* и др.:
*I like spending weekends in **the** countryside.*

Нулевой артикль

Нулевой артикль используется:

- с неисчисляемыми существительными, а также с исчисляемыми существительными общего значения во множественном числе:
Unemployment is a serious problem.
I hate spiders;
- с именами собственными:
Ann studies in Moscow;
- с названиями средств транспорта, когда мы говорим о них в общем (***by** train, **by** plane/ **by** car, **on** foot*):
*He travels **by** plane a lot* (но: *He got on board **the** plane to London*);

- с названиями болезней:

*He has got **cancer/malaria**.*

Но: *flu/the flu, measles/the measles, mumps/the mumps.*

EXERCISES

1. Put in *a/an* or *the* where necessary.

... **1** ... Britain, in which ... **2** ... fifty million people live and work, is ... **3** ... land of ... **4** ... great variety. There are many large cities, but they are surrounded with ... **5** ... quiet countryside. There are ... **6** ... plains in ... **7** ... east, hills in ... **8** ... centre and southwest, and ... **9** ... mountains in ... **10** ... north. Some parts of ... **11** ... country are almost without ... **12** ... trees while others have ... **13** ... great forests, ... **14** ... south is ... **15** ... land of ... **16** ... rivers, but Scotland is ... **17** ... land of ... **18** ... lakes.

One of ... **19** ... first things noticed by ... **20** ... visitors in ... **21** ... England is ... **22** ... greenness of ... **23** ... land. They then complain (as ... **24** ... British themselves do) about ... **25** ... rain that causes it. Never can ... **26** ... British feel certain about ... **27** ... tomorrow's weather; seldom it is ... **28** ... same in all parts of ... **29** ... country. On one day ... **30** ... certain place may be white with ... **31** ... snow; but half ... **32** ... day's journey away, and one can see ... **33** ... trees in blossom. And sometimes, in one small part of ... **34** ... country ... **35** ... weather will change between ... **36** ... hot and cold, ... **37** ... rain and ... **38** ... sun three or four times during ... **39** ... day.

2. Put in *a/an* or *the* where necessary.

Nature's Lovable Teddy Bears

... **1** ... Cuddle koala bear of Australia is sometimes called ... **2** ... living teddy bear. Only found in ... **3** ... Australia, koalas are also called ... **4** ... "native bear" and "kangaroo bear."

The koala, however, is not really ... **5** ... bear; like the kangaroo and the opossum, it is ... **6** ... marsupial. Because of its cuddly appearance, it has been used as a model for our stuffed toy teddy bears.

... **7** ... koala is dressed in ... **8** ... coat of thick fur, it has ... **9** ... round roly-poly body, ... **10** ... short legs, ... **11** ... small eyes, ... **12** ... rubber-like protruding black nose and ... **13** ... large fluffy ears.

... **14** ... healthy specimen weighs about 30 lb and stands about two feet. Its bright eyes constantly look at ... **15** ... world with a surprised expression. And koalas really enjoy being cuddled like teddy bears.

Very few of these living teddy bears have been exported to ... **16** ... zoos outside Australia because of ... **17** ... food they need to keep alive.

They flourish only when they can dine on . . . **18** . . . leaves of certain eucalyptus trees, which grow only in Australia. Other food is poisonous to them, resulting in . . . **19** . . . death.

Koalas get all . . . **20** . . . moisture they need from . . . **21** . . . leaves they consume, which is about 1 kg . . . **22** . . . day. They seldom drink any liquids, and their name “koala” comes from . . . **23** . . . native expression meaning “no drink.”

. . . **24** . . . giant tree may provide shelter and food for several koalas, but generally they live one to . . . **25** . . . tree. They are not even likely to be on visiting terms with their next-tree neighbor, living rather solitary lives except at mating time.

. . . **26** . . . mother koala bear, like the kangaroo, has . . . **27** . . . built-in nursery. When baby koala is born, he is sheltered for several months in his mother’s pouch. After that . . . **28** . . . young koala buries its hooked claws in its mother’s fur and rides pick-a-back.

When . . . **29** . . . danger threatens and . . . **30** . . . mother has to climb quickly, . . . **31** . . . young one climbs around to mother’s back, so as not to be in her way. There it hangs on securely while mother koala climbs to . . . **32** . . . safety.

If . . . **33** . . . young koala is disobedient, . . . **34** . . . mother knows what to do. She turns . . . **35** . . . naughty koala over her . . . **36** . . . knee and spansk him with . . . **37** . . . flat of her paw. And no matter how he wails, mother continues her punishment till she feels he’s had enough. Young koalas grow to . . . **38** . . . maturity in about four years and, if all goes well, will live about 20 years.

. . . **39** . . . koala bears are very friendly and amiable. . . . **40** . . . hunters took . . . **41** . . . advantage of this and almost killed them all off for their fur.

Now they are considered one of Australia’s most prized animals, and . . . **42** . . . Australian Government has laws to protect them.

Their popularity with . . . **43** . . . children is understandable. With fluffy ears, shoe-button eyes and furry body, they look like . . . **44** . . . teddy bears that have escaped from . . . **45** . . . playroom.

Section 6

Countable and Uncountable Nouns

Исчисляемые существительные

Исчисляемыми существительными называются существительные, обозначающие предметы, которые можно сосчитать.

Исчисляемые существительные имеют форму единственного и множественного числа: *a student, many students*.

С исчисляемыми существительными используются глаголы в единственном и множественном числе:

The rose is a beautiful flower.

Roses are beautiful flowers.

С исчисляемыми существительными используются числительные:

There are five roses in the vase.

Перед исчисляемыми существительными в единственном числе всегда употребляются *a/an/the/his* и др.:

This is an apple.

Перед исчисляемыми существительными во множественном числе могут использоваться *some, any, many, few, no* и др., однако такие существительные могут употребляться и самостоятельно:

There are few apples on the table.

Неисчисляемые существительные

Неисчисляемыми существительными называются существительные, обозначающие предметы или явления, количество которых невозможно определить посредством конкретного числа. Их можно подразделить на следующие категории:

- **вещества** (газы, жидкости, твердые материалы): *water, blood, coffee, butter, oxygen, iron, air* и др.;
- **науки и учебные предметы**: *Mathematics, Physics, Chemistry, Geography* и др.;
- **языки**: *Russian, English, German, Spanish* и др.;
- **болезни**: *flu, measles, chickenpox, mumps* и др.;
- **виды спорта**: *football, basketball, cycling, athletics, rugby* и др.;
- **природные явления**: *snow, gravity, darkness, sunlight, fog* и др.;
- **собирательные существительные**: *furniture, jewellery, money, rubbish, cutlery, stationery, crockery* и др.;
- **абстрактные существительные**: *knowledge, education, justice, freedom, love* и др.;
- **некоторые другие существительные**: *accommodation, advice, anger, applause, intelligence, progress, health, wealth, life, time, luck, peace, shopping, traffic, trouble, truth, work, courage, evidence* и др.

Неисчисляемые существительные употребляются только с глаголом в единственном числе и не употребляются с артиклем *a/an*, который исторически произошел от числительного *one*.

Некоторые неисчисляемые существительные имеют окончание *-s*, однако рассматриваются всегда как неисчисляемые и употребляются с глаголом в единственном числе:

Your news is awful to hear.

Billiards is a rather popular game.

Количественные местоимения

С исчисляемыми существительными используются: *several*, (a) *few*, *many*.

С неисчисляемыми существительными употребляются: (too) *much*, (a) *little*.

Lots of, *a lot of*, *some*, *any*, *no*, *plenty of* используются как с исчисляемыми, так и с неисчисляемыми существительными (*some* обычно используется в утвердительных предложениях, *any* — в вопросительных и отрицательных).

Часто количество того, что обозначается неисчисляемым существительным, можно выразить исчисляемым существительным типа *килограмм*, *упаковка*, *кусок* и пр.:

a piece of furniture/advice/news/information;

a bar of soap/chocolate;

a lump of sugar/gold/wood;

a flash of lightning/hope;

a clap/roll of thunder;

a can of Coke;

a carton of milk/juice;

a tube of toothpaste;

a kilo of meat/cheese;

a slice/piece/loaf of bread;

a game of football.

Существительные, которые обозначают предметы, состоящие из двух частей (*pajamas*, *trousers*, *shorts*, *tights*, *scissors*, *pliers*, *binoculars*, *glasses* и др.), приравниваются к существительным во множественном числе и согласуются с глаголами во множественном числе.

Собирательные существительные (*audience*, *class*, *committee*, *crew*, *crowd*, *family*, *jury*, *government*, *team*, *staff* и др.) могут согласовываться с глаголами как в единственном, так и во множественном

числе в зависимости от того, рассматриваем ли мы обозначаемых ими лиц как группу в целом или как некоторое количество ее представителей:

*The team won the game and **was** given a prize.* (the whole group)

*The team **were** invited to a theatre that evening.* (all members of the team)

Встречаются существительные, которые могут быть как исчисляемыми, так и неисчисляемыми, однако их значение при этом меняется:

*The **glass** is clean. I've just washed it up.* (an item of dishes)

*I don't see well in these **glasses**. I'll go to the optician.* (spectacles)

*This sculpture is made of **glass**.* (material)

*Ann has long straight **hair**.* (all hair on the head)

*Ann has some grey **hairs** though she is young.*

*Your **room** is rather large.*

*There isn't enough **room** for our new equipment in the laboratory.* (space)

*Mrs Smith has a lot of **experience** in programming.* (length of time)

*There were many lucky **experiences** during the expedition.* (events)

*There is a **custom** to eat pancakes on the Shrovetide.* (tradition)

***Customs** is an authority or agency in a country responsible for collecting and safeguarding customs duties and for controlling the flow of goods in and out of a country.* (an official institution on the border)

*I haven't got enough **time** to get to work without being late.*

*How many **times** has Tom come late to work?* (occasion)

EXERCISES

1. Put the following nouns into the Countable or Uncountable group.

Flower, fruit, foot, animal, life, thing, protoplasm, chemistry, body, air, cell, earth, biology, water, liquid, fish, hare, plant, hair, blood, thought, mind, skin.

2. Complete the sentences with the words from the box.

much many few a little some a few

1. nests of the eagle become so heavy in years that they place a great strain on the tree.
2. On warm days our bodies lose water.
3. Snowdrops set seeds, and their reproduction depends on their bulbs.
4. While birds of species nest in trees, live in the tree top.
5. It took the work of minds and hands to answer this question.
6. The artichoke was brought to Europe from North America in 1616, and the sunflower later.
7. Is there snow in the fields in winter?
8. The weather is bad, and there are children in the park.
9. We have minutes to tell you about this interesting animal.
10. She has many English but French books.
11. There are good books in this big and rich library.
12. In spring, there is water in this little river, and there is very water in it in summer.

3. Translate into English.

1. У него очень мало друзей.
2. Есть ли зимой снег в лесу? — Если этот лес в Италии, то зимой там немного снега.
3. В Московском зоопарке есть несколько редких птиц.
4. У нас сейчас мало работы.
5. В этой комнате мало света.
6. У меня есть много книг о жизни животных.
7. У некоторых животных очень чувствительные (sensitive) уши. Например, у всех лошадей уши очень чувствительные.
8. В этой работе почти нет ошибок.
9. Мало кто может сказать, что он действительно счастлив.
10. Некоторые млекопитающие живут в море.

4. Choose the correct word in brackets.

1. Nobody can find out (something/anything) about when the exams will be.
2. Have you got (some/any) time free on Thursday afternoon?
3. Is there (something/anything) we should bring to the party?
4. I had three sets of house keys, and I can't find (some/any) of them now.
5. Hardly (some/any) of the smaller cars have enough leg room for Jill.
6. Do you know if (some/any) of the Morrises are coming on Sunday?

7. Can I get you (some/any) coffee? I've just made (some/any).
8. I doubt that there's (something/anything) we can do now.
9. Never trust (somebody/anybody) who has a perfectly tidy desk.
10. Helen can ride a bike without (some/any) help now.
11. Harriet has got (some/any) beautiful jewellery, but she never wears (some/any).
12. He refuses to have (something/anything) to do with his family now.

Section 7

Degrees of Comparison

Степени сравнения прилагательных и наречий

Прилагательные и наречия имеют три степени сравнения: **положительную, сравнительную и превосходную**.

Положительная степень указывает на качество предмета и соответствует словарной: *difficult, tiny, young, often*.

Для односложных прилагательных и наречий, а также двусложных прилагательных, оканчивающихся на *-y*, сравнительная степень образуется путем добавления суффикса *-er*, превосходная — суффикса *-est* (при этом последняя *e* опускается, последняя *y* меняется на *i*):

small — smaller — the smallest;

simple — simpler — the simplest;

soon — sooner — the soonest;

tasty — tastier — the tastiest.

Если прилагательное или наречие состоит из двух или более слогов (при этом прилагательное не оканчивается на *-y*), сравнительная степень образуется путем добавления слова *more*, превосходная — *most*, которые ставятся перед прилагательным или наречием:

dependent — more dependent — the most dependent;

boring — more boring — the most boring;

firmly — more firmly — the most firmly.

Некоторые двусложные прилагательные и наречия (такие как *clever, shallow, narrow, stupid, friendly, often, quickly, slowly* и др.) образуют степени сравнения обоими способами:

clever — *cleverer* — *the cleverest* / *clever* — *more clever* — *the most clever*;

slowly — *slower* — *the slowest* / *slowly* — *more slowly* — *the most slowly*.

Степени сравнения прилагательных и наречий — исключений

good/well	better	the best
bad/badly	worse	the worst
much/many	more	the most
little	less	the least
far	further/farther	the furthest/the farthest

В английском языке имеются наречия, форма которых не отличается от формы соответствующих прилагательных. Различить их можно только на основе их функций в предложении: прилагательное относится к существительному, а наречие — к глаголу:

*It was **early** spring.* / *He **got up early**.*

*He **drew a straight line**.* / *He **went straight** home.*

Часто встречаются сравнительные обороты:

- **Сравнительная степень** + *than* используется для сравнения двух людей или предметов. При этом для уточнения могут также употребляться слова *even*, *a lot*, *much*, *far*, *a bit*, *a little*, которые подчеркивают отличие лица, предмета, явления:

*The planets of the solar system are **smaller than** the stars.*

*Your briefcase is **more expensive than** mine.*

*This girl is **far taller than** her boyfriend.*

- **Превосходная степень** + *of/in* используется для того, чтобы выделить человека, предмет или явление из группы, в которую они входят:

*Paul is **the tallest boy of all**.*

*This building is **the most beautiful in** our city.*

*A cell is **the smallest unit of** life.*

- *By far* + **превосходная степень** означает абсолютное выделение лица, предмета, явления из группы:

*The white bear is **by far the largest** bear in the world.*

- *As* + **положительная степень** + *as*; *not so/as* + **положительная степень** + *as* — *такой же . . . как, не такой . . . как*:

A wolf is not as large as a tiger.

- **The + сравнительная степень . . . , the + сравнительная степень . . . — чем . . . , тем . . . :**

The harder the task is, the more interesting it seems to me.

- **Twice/ten times и т. п./half + as + положительная степень + as** выражает количественное сравнение:

This cottage is half as big as ours.

Petrol is three times as expensive as it was a few years ago.

EXERCISES

1. Use the words given in brackets in the correct form.

1. The blood in the arteries is (light) than that in the veins.
2. She is the (good) friend of mine.
3. Are you (young) than your sister? — No, I am two years (old) than she is.
4. What part of the brain is developed (well) of all?
5. (early) man resembled the modern man very closely.
6. This text is the (difficult) of all.
7. Our metabolism is not normal if our body gets (little) oxygen.
8. He speaks English (badly) than his brother.
9. The (good) calcium food is milk and its products, like cheese.
10. Cerebrum is (large) and (good) developed section of the brain in all animals.
11. Cerebrum of man — which controls reasoning, memory and speech — is (large) part of the brain and is much (large) than the cerebrum of all other animals.
12. The (small) unit of the nervous system is a neuron or nerve cell.
13. Microscopic blood vessels, the capillaries, provide the connection between arteries and veins and from the point of view of circulatory function are (important) structures of the circulatory system.
14. Fossil skulls and other skeletal structures indicate that (early) man, our ancestor, bore some resemblance to (little) highly specialized primate mammals, the anthropoid apes.

2. Complete the sentences with the words from the box.

As . . . as (3) the deeper . . . the less the more . . . the better is not so . . . as
--

1. The the water is, the light is able to pass through it.
2. The apple is one of those trees whose blossoms are almost pleasing its taste.
3. The blood in the veins bright in the arteries.
4. Every living thing is made of cells whether it is large an oak tree or an elephant or small the amoeba, which has only a single cell.
5. scientists—doctors, biologists, chemists—know about our bodies, they can figure out how to keep people strong and healthy.

3. Use the words given in brackets in the correct form.

Are Animals Proud—Like People?

Do animals like people, take personal pride in being (big, small, tough, fierce, fast, slow), or whatever characteristic that best distinguishes each species?

. (large) of all the animals is the elephant, whose ringing trumpet call proudly proclaims its boastful challenge for the whole animal kingdom to produce something on four legs more majestic in size.

In sharp contrast, the shrew is (small) mammal, and shows its pride in its fierce, fearless and quarrelsome character.

. (tall) animal, of course, is the giraffe. Although a giraffe cannot make a sound to express its gratification at being (tall) animal creature, it can proudly look down from its impressive height upon all the rest of us.

“Proud as a peacock” aptly describes (proud) of all feathered creatures, the peacock, as it displays its great vanity and brilliant feathers in a promenade of pride.

The duckbill looks (queer) and resembles a duck more than anything else in its composite make-up.

One wonders whether the anteater is boastful over its associates, if any, of having (small) brain of any animal? That, however, is one of its distinctions—the other being that the anteater is the only creature that exists entirely on ants.

4. Translate into English.

1. Воздух за городом чище, чем в городах.
2. Кит — самое большое млекопитающее на земле.
3. Двигаясь, мы потребляем гораздо больше кислорода, чем когда мы находимся в покое.
4. Чем больше азотистых соединений находится в почве, тем лучше урожай зерновых.

5. Красные кровяные тельца (клетки) живут не так долго, как мускульные клетки.
6. Рысь (а lynx) — такой же свирепый зверь, как тигр, а некоторые даже говорят, что еще свирепее, хотя она меньше его.
7. Эта книга о жизни в море менее интересна, чем та, которую ты давал мне в прошлом году.
8. Мы вдыхаем больше кислорода, чем выдыхаем, и мы вдыхаем меньше углекислого газа, чем выдыхаем.
9. На большой высоте трудно дышать, так как там меньше кислорода.
10. Голод уменьшается по мере того, как мы едим.

5. Translate into English.

Всякая химическая реакция, в том числе и реакция соединения с кислородом, идет тем энергичнее, чем больше поверхность соприкосновения реагирующих тел.

Красные тельца у человека и млекопитающих много мельче, чем у рыб, земноводных и птиц. Это значит, что одно и то же количество гемоглобина имеет у человека большую поверхность, чем у низших позвоночных, а следовательно, быстрее соединяется с кислородом и лучше снабжает им организм.

Таким образом, у человека в связи с большей, чем у животных, потребностью организма в кислороде изменилась величина красных кровяных телец. Это еще один пример тесной связи между функцией и строением.

Section 8

Conditional Sentences

Условные предложения

В английском языке существует четыре типа условных предложений.

Тип 0 (изъявительное наклонение)

Общие истины	
<i>If</i> + Present Simple	Present Simple
<i>If you heat water to 100 °C, it boils.</i>	

Тип 1 (изъявительное наклонение)

Достаточно реальная ситуация, которая может возникнуть в настоящем или будущем	
<i>If</i> + Present Simple/Present Continuous/Present Perfect/Present Perfect Continuous (все формы настоящего времени)	<i>will/can/could/may/might/must/should</i> + инфинитив без <i>to</i> /повелительное наклонение
<p><i>If the weather is fine during our summer practice, we will be able to finish the work earlier.</i></p> <p><i>If he has finished doing his homework, he can go out with friends.</i></p> <p><i>If you have questions, ask me.</i></p> <p><i>If you have been preparing for the test for so long, you must be ready for it.</i></p>	

Тип 2 (условное наклонение)

Воображаемое или невероятное условие в настоящем или будущем	
<i>If</i> + Past Simple/Past Continuous	<i>would/could/might</i> + инфинитив без <i>to</i>
<p><i>If I were¹ you, I would try to enter MSU.</i></p> <p><i>If species weren't becoming extinct continuously, we wouldn't have this big problem now.</i></p> <p><i>If he knew the answer to this question, he wouldn't look so depressed and helpless now.</i></p>	

¹ Во всех лицах, как правило, используется **were** вместо **was**.

Тип 3 (условное наклонение)

Нереальное условие, относящееся к прошлому	
<i>If</i> + Past Perfect/Past Perfect Continuous	<i>would/could/might</i> + <i>have</i> + past participle
<p><i>If I had entered MSU last year, I could have been proud of myself.</i></p>	

Предложения смешанного типа

Встречаются также **предложения смешанного типа**, в которых главное и зависимое предложения относятся к разным типам:

If I were you (type 2), I wouldn't have missed the previous lecture (type 3).

If she hadn't missed the lecture yesterday (type 3), she wouldn't be busy trying to decipher my handwriting now (type 2).

Вместо *if* могут использоваться другие союзы и выражения, такие как *unless (= if not), providing/provided (that), so/as long as, on condition (that), what if, suppose/supposing, otherwise (if not), but for, even if, in case of, in the event of* и др.:

Unless you work hard, you will fail the exam.

But for you, nobody would have watered my plants and they would have withered and died. (If you hadn't helped, . . .)

In the event of finding something interesting, report immediately.

Suppose/Supposing we don't find anything interesting, what shall we report?

Providing/Provided (that) we have all necessary materials, we will finish the experiment on time.

EXERCISES

1. Complete the sentences with the verbs in the correct form. Use the Present Simple Tense, First and Second Conditionals.

Contact with The World

If we . . . **1** . . . (have) no sense cells, we . . . **2** . . . (know) anything outside ourselves. Our sense cells . . . **3** . . . (be) truly our contact with the outside world. Because we . . . **4** . . . (have) them, we can see, hear, smell, taste. We can also feel pressure, heat, and cold. We can tell whether we are lying down or standing up. We . . . **5** . . . (know) whether we are still or moving.

In each of these "sensations," not only our sense cells themselves . . . **6** . . . (be) active but also parts of the brain. In fact each different sensation . . . **7** . . . (consist) of some activity in a special part of the cerebrum. Each type of sensation . . . **8** . . . (be) the result of nerve impulses that started in a special sense cell. If you . . . **9** . . . (shake) hands with a friend, you . . . **10** . . . (may) start impulses from three different kinds of cells in your hand. The pressure of his hand against yours . . . **11** . . . (start) an

impulse from pressure-feeling cells. If his hand . . . **12** . . . (be) cold, it . . . **13** . . . (start) an impulse from the cells which respond to cold (if his hand . . . **14** . . . (be) hot, a different sort of cells . . . **15** . . . (be) stimulated). If he . . . **16** . . . (grip) your hand too hard and . . . **17** . . . (hurt) you, an impulse is started in some of the nerve endings in the skin. These nerve impulses . . . **18** . . . (travel) through the nerve coils to their special parts of the cerebrum, and you . . . **19** . . . (have) these three “sensations”—pressure, cold, and pain. The same kind of thing . . . **20** . . . (happen) when you . . . **21** . . . (hear) a loud noise or a beautiful piece of music, or when you . . . **22** . . . (see) a traffic light or a chair or words in a book. This sense-cell-to-nerve—cell-to-cerebrum process is the way we can tell the qualities of the world around us—whether it is light or dark, hot or cold, whether something is sweet or sour.

2. Complete the sentences with the verbs in the correct form.

1. If I (be) not so busy last Sunday, I (go) to see my friend.
2. The children (swim) in the river and lie in the sun when they (come) here in July.
3. As soon as my brother (pass) his examinations next year, he (go) to Berlin.
4. The tadpole (become) a baby frog after it (begin) to breathe with lungs.
5. Young frogs (not return) to the pond until they (be) ready to mate.
6. If they (know) that before, they (take) measures.
7. Unless one or the other cardinal birds (die), they (remain) mated for life.
8. If you (tread) on an open electric wire, it (give) you an electric shock.
9. If my cactus plant (not have) a rare disease, it (not die).
10. If the skin of the earthworm (dry) up, the animal (die) from inability to carry on respiration.
11. If you (ring) me up yesterday, I (tell) you something very important.

3. Translate into English.

Планета Земля имеет огромные размеры и находится на расстоянии приблизительно 93 млн миль от Солнца. Если бы Земля вращалась вокруг Солнца по своей орбите длиной 584 млн миль намного быстрее, ее орбита стала бы более длинной и Земля отдалилась бы от Солнца на намного большее расстояние. А если бы она слишком далеко отошла от небольшой обитаемой зоны, все виды жизни на Земле прекратили бы свое существование. Если бы планета Земля

двигалась по своей орбите намного медленней, она приблизилась бы к Солнцу, что также привело бы к исчезновению жизни.

Путешествие Земли вокруг Солнца, которое занимает 365 дней 6 часов 49 минут и 9,54 секунды (звездный год), всегда происходит с точностью до одной тысячной секунды. Если бы средняя годовая температура Земли изменилась хотя бы на несколько градусов, большинство форм жизни в конце концов погибли бы от перегрева или замерзания. Такая перемена нарушила бы водно-ледниковый баланс и другие важнейшие балансы, что привело бы к катастрофическим последствиям. Если бы планета Земля вращалась по своей оси медленнее, вся жизнь со временем вымерла бы либо от замерзания ночью (из-за недостатка солнечного тепла), либо от перегрева днем (из-за жара от Солнца).

Section 9

The Infinitive and the Gerund

Употребление инфинитива и герундия

Инфинитив употребляется:

- для выражения намерения, цели:

*He went to the laboratory **to do** some experiment;*

- после прилагательных, описывающих чувства (*happy, glad, sorry* и др.):

*She was **happy to enter** MSU;*

- после прилагательных, описывающих желание или нежелание говорящего делать что-либо (*anxious, eager, reluctant* и др.):

*He was **reluctant to write** the report;*

- после прилагательных, описывающих характер или поведение говорящего (*clever, mean, kind* и др.):

*He was **kind to help** me;*

- после определенных глаголов (*agree, appear, decide, deserve, expect, hope, seem, promise, refuse* и др.):

*He **decided to stay** at home;*

- для выражения особенных предпочтений говорящего (после *would like, prefer, love* и др.):

*I **would like to finish** with all exams this week;*

- после *too* и *enough*¹:
He is not old enough to drive;
- для выражения неожиданного и нежелательного результата (обычно с *only*):
They arrived at the faculty only to know that the lecture had been cancelled;
- после *be + first/second . . . /next/last* и т. п.:
He was the first to bring books back to the library;
- после ряда глаголов и выражений, таких как *ask, learn, find out, want to know, decide, explain* и др., если за ними следует вопросительное слово (*who, how, what* и др., кроме *why*):
He wanted to know where to find the rest of the group.
Но: *I want to know why he didn't come.*

Герундий употребляется:

- как отглагольное существительное:
Swimming is useful for health;
- после определенных глаголов (*admit, appreciate, avoid, consider, continue, delay, deny, discuss, escape, excuse, finish, forgive, involve, mention, risk, spend, regret, admit, suggest, imagine, resist, report, tolerate, understand, keep (= continue)* и др.):
They suggested going to the zoo;
- для выражения предпочтений общего плана, после глаголов *dislike, enjoy, like, hate, love, prefer* и др.:
I prefer reading to watching TV;
- после глагола *go*, если далее обозначается вид деятельности человека:
Once a week they go fishing;
- после предлогов:
He was accused of breaking all flasks;
- после выражений *be busy, it's no use, it's (not) worth, there is no point in, can't help, have difficulty (in), have trouble, be/get used to, be/get accustomed to*:
This book is not worth reading;

¹ *Too* ставится **перед** прилагательными и наречиями и имеет отрицательный оттенок значения:

She is too young to go to school.

Enough ставится **после** прилагательных и наречий, но **перед** существительными:

He has saved enough money to go on holiday abroad. He is not intelligent enough to continue education after school.

- после глаголов восприятия: *hear, listen to, see, notice, watch, feel* и др., если действие находится в развитии и еще не окончено:

*I saw Helen **talking** on the phone.*

Однако эти же глаголы сочетаются с инфинитивом без частицы *to* (bare infinitive), если описывают уже завершённое действие:

*I saw Bob **finish** the test.* (действие завершено)

Глаголы, после которых может употребляться как инфинитив, так и герундий **без изменения смысла предложения**:

- *begin, start, continue, intend, bother, propose*:

*They continued **working/to work** on the project;*

- *advise, allow, encourage, recommend, permit* (употребляются с инфинитивом, если за ними следует дополнение или имеют форму пассивного залога):

*The teacher **recommended us to use** this particular textbook.*

*We were **recommended to use** this particular textbook.*

*The teacher **recommended using** this particular textbook.*

Глаголы, после которых может употребляться как инфинитив, так и герундий, однако при этом **смысл предложений разный**:

- *remember* + **infinitive** = не забыть:

*Mary **remembered to take** her dog for medical examination;*

remember + **gerund** = помнить (относится к прошлому):

*I **remember inoculating** this Petri dish yesterday, but nothing has grown on it;*

- *regret* + **infinitive** = сожалеть о чем-либо в настоящем (с глаголами *say, tell, inform*):

*I **regret to tell** you that many bats died of this disease;*

regret + **gerund** = сожалеть о чем-либо в прошлом:

*I **regret forgetting** to lock the cage yesterday;*

- *be sorry* + **infinitive** = извиняться за что-либо в настоящем:

*I'm **sorry to bother** you but the batch of lab rats you ordered has just arrived;*

be sorry + **gerund** = извиняться за что-либо в прошлом:

*He was **sorry for not listening** to the lecturer carefully enough;*

- *stop* + **infinitive** = остановиться с какой-либо целью:

*He **stopped to mark** the location of the nest on his map;*

stop + **gerund** = прекратить делать что-либо:

*They **stopped marking** frogs by cutting off their fingers, because the bioethics committee forbade it;*

- **try + infinitive** = сделать все возможное:
*Ted wants to be an ornithologist and now **tries to identify** birds by their voices;*
try + gerund = предпринять попытку (в эксперименте):
*We **tried keeping** Guinea pigs and chinchillas together. They ignored each other;*
- **mean + infinitive** = намереваться сделать что-либо:
*He is learning to dive because he **means to participate** in the expedition to underwater caves;*
mean + gerund = включать, вовлекать:
*Being a student at a Biological Faculty **means working** hard for five years.*

ФОРМЫ ИНФИНИТИВА

Active:

- **Simple Infinitive**
*Ann **wants to observe** wolves' behaviour for her diploma research. (future)*
*Ann **intends to enter** a postgraduate course. (future)*
- **Continuous Infinitive: to be + present participle**
*She is believed **to be working** in the library.*
- **Perfect Infinitive: to have + past participle**
*Everyone in the group **claims to have attended** the lecture.*
- **Perfect Continuous Infinitive: to have been doing**
Употребляется с такими глаголами, как *appear, believe, claim, expect, seem, know*, а также с **модальными глаголами**:
*She is dirty in paint. She **seems to have been painting** the wall.*

Passive:

- **Simple Infinitive: to be + past participle**
*She is glad **to be accepted** to MSU.*
- **Perfect Infinitive: to have been + past participle**
*He is said **to have been invited** to the project.*

EXERCISES

1. Use the verbs from the box and complete the sentences according to the pattern:

Verb + *to*

*offer agree refuse plan arrange hope aim learn deserve
effort forget attempt manage fail promise, threaten seem
appear tend pretend claim ask decide know remember
explain understand wonder would like prove turn out etc*

1. They repeat the tests.
2. We to get up later at weekends.
3. Students take blood samples.
4. Each year migratory birds escape the winter.
5. This evidence is insufficient and it prove the hypothesis.

2. Use the verbs from the box and your own ideas to complete the sentences according to the pattern:

Verb + (object) + *to*

*want expect ask help mean would like would prefer tell
order remind warn force invite enable persuade teach
get advise allow permit forbid etc*

1. These experience teaches us to
2. The lecturer advised us to
3. I would prefer to
4. These results enable scientists to
5. Poachers were forced to

3. Use your own ideas to complete the sentences.

1. To find the mass of the electron
2. To test the accuracy of the method
3. To explain the pressure of gases
4. To decompose the matter
5. One way of obtaining hydrogen is to
6. The difficulty will be to

4. Translate the sentences into Russian.

1. The first scientist to discover this phenomenon was Pasteur.
2. The problem to consider next is concerned with pollution.
3. There are many problems to be solved.
4. We can find many examples to illustrate the rule.
5. They have a lot of work to do in the years to come.

5. Complete the sentences using the gerund.

1. I don't mind . . .
2. My colleague suggested . . .
3. Yesterday students practised . . .
4. Recently he has given up . . .
5. Don't postpone . . .

6. Use your own ideas to complete the sentences.

1. Naturalists spent time . . .
2. Suspected company admitted . . .
3. I regret . . .
4. It keeps . . .
5. Would you mind . . .

7. Complete the sentences with the verbs in the correct form.

Water Lily

The most familiar and beautiful of pond blossom is the pure white water lily. The big, round, flat . . . **1** . . . (float) lily pads represent the pond's most important "community centers." They operate as . . . **2** . . . (land) fields for dragonflies of many species and are also the favorite spots for green frogs and young bull-frogs.

The leaf and stem are slippery with algae. Often with a magnifying lens one can . . . **3** . . . (discover) numerous little red hairs, which wave constantly but never in unison. They are little worms, that live on . . . **4** . . . (decay) organic matter. Water lilies have exquisite blossoms of pink and yellow, and they have roots . . . **5** . . . (anchor) to the bottom.

White water lilies have a curious habit of . . . **6** . . . (open) about 6 o'clock in the morning, . . . **7** . . . (close) around midnight, and . . . **8** . . . (wake) up again at the same time next morning. None lasts more than three days, even though they do get six hours sleep. But fresh buds keep . . . **9** . . . (come) to the surface.

8. Translate into English.

1. Приходя в парк, он обязательно кормит птиц.
2. Проведение экспериментов необходимо для каждого ученого.
3. Он не мог не задать этот вопрос.
4. Пока человеку не удалось добиться контроля над силами природы.
5. При проведении экспериментов необходимо точно фиксировать результаты.
6. Ученые столкнулись с трудностями при определении видовой принадлежности этого животного.

7. Маловероятно, чтобы это животное дало потомство в неволе.
8. Многие соединения распадаются при нагревании до высоких температур.
9. Обладая способностью к передвижению, животные могут искать себе пищу и убежище.

9. Translate into English.

Значение красных кровяных телец заключается в том, что они переносят кислород. В их состав входит гемоглобин. Это соединение белка с особым красящим веществом, содержащим железо. Гемоглобин очень легко вступает в реакцию с кислородом. Кровь переносит это соединение из легких в ткани, где гемоглобин отдает кислород.

Кровь, насыщенная соединением гемоглобина с кислородом, называется артериальной; она имеет алую окраску. Кровь, в которой гемоглобин освобожден от кислорода, приобретает темно-красный цвет и называется венозной.

Кислород, принесенный красными кровяными тельцами в ткани, участвует в тех процессах, при которых высвобождается энергия, необходимая для работы мышц, сердца, пищеварительного канала и т.д.

Section 10

Modals

В английском языке есть группа глаголов, которые выражают не действие, а только отношение к нему со стороны говорящего. Они называются **модальными глаголами**. С их помощью говорящий показывает, что то или иное действие возможно или невозможно, обязательно или ненужно и т.д. К числу модальных глаголов относятся: *can, could, may, might, must, ought to, have to, be to, shall, should, will, would, need*.

Модальные глаголы всегда стоят перед другим глаголом.

Модальные глаголы не могут следовать в предложении один за другим:

*He **must be able** to succeed in this test.*

*The text is easy. Everybody **will be able** to translate it.*

Они не изменяются по лицам, числам и временам (кроме *have to, be to, need*).

За модальными глаголами (кроме *ought to, have to* и *be to*) следует bare infinitive (инфинитив без *to*).

Для того чтобы образовать вопрос, необходимо поменять местами модальный глагол и подлежащее (кроме *have to, be to, need*).

Отрицательная форма образуется путем добавления частицы *not* непосредственно после модального глагола. Вспомогательные глаголы не используются (кроме *have to, be to, need*).

You ought to follow the plan of the experiment precisely.

I can't (cannot) run fast.

You mustn't make noise in the library.

Употребление основных групп модальных глаголов

Модальные глаголы, выражающие способность к совершению действий (ability)

Значение	Глагол	Примеры
Общая способность к действию	<i>Can</i>	I can ride a horse. Can you drive a car? I can't walk so fast!
Принятие решений	<i>Can</i>	We can complete these papers now, if you like. Can we complete the papers next week? No, we cannot postpone it that long.
Способность в прошлом	<i>Could</i>	I could read when I was only four. Could you draw well when you were a child? He could not drive two years ago.
Способность в настоящем или будущем либо в гипотетических ситуациях	<i>Could</i>	If only I could speak French! You could not be so busy! Could you be a bit more polite?
Способность в гипотетических ситуациях прошлого	<i>Could</i> + perfect infinitive	I could have watched the movie, but I decided to buy the CD.

Модальные глаголы, выражающие просьбу и/или разрешение (permission)

Значение	Глаголы	Примеры
Просьба и получение разрешения	<i>May, could, can</i>	May/could/can I see the doctor, please? You may/can/could go after you finish the test.

Модальные глаголы, выражающие совет и критику (advice and criticism)

Значение	Глаголы	Примеры
Необходимость дать совет или попросить совета	<i>Should, ought to</i>	You should/ought to see the doctor.
Критика совершенных в прошлом действий	<i>Should/ought to + perfect infinitive</i>	She should/ought to have made more revising before exams.

Модальные глаголы, выражающие обязательства и необходимость (obligation and necessity)

Значение	Глаголы	Примеры
Обязанность или необходимость совершения каких-либо действий	<i>Must, have to, need to</i>	We must/have to/need to pass this exam by the end of the month.
Отсутствие обязанности или необходимости совершения каких-либо действий	<i>Needn't, don't have to, don't need to</i>	She needn't/doesn't have to/doesn't need to pay museum entrance fee for her children.
Обязанность совершения каких-либо действий в прошлом	<i>Had to</i>	They had to wear uniform.
Отсутствие обязанности совершения каких-либо действий в прошлом	<i>Needn't + perfect infinitive, didn't have to, didn't need to</i>	We needn't have gone/didn't have to/didn't need to do those tests.

Модальные глаголы, выражающие разную степень уверенности и определенности (degrees of certainty)

Значение	Глаголы	Примеры
Уверенность в настоящем или в целом	<i>Must, can't, couldn't</i>	That must be our hotel. This can't/couldn't be our hotel.
Уверенность в прошлом	<i>Must/can't/couldn't + perfect infinitive</i>	She must have been in a lot of pain. She can't/couldn't have taken the whole pack of painkillers!
Вероятность тех или иных действий в настоящем, будущем или в целом	<i>Should, ought to, be to</i>	You ought to/should/are to feel better in a few days.
Вероятность тех или иных действий в прошлом	<i>Should ought to/be to + perfect infinitive</i>	He ought to/should have arrived ages ago. I wonder why he didn't. They were to have been married last month, but had to postpone the marriage.
Возможность тех или иных действий в настоящем, будущем или для ситуации в целом	<i>Could, may, might</i>	If I were you, I would not touch this snake. It may/could/might be dangerous.
Возможность тех или иных действий в реальном прошлом	<i>Could/may/might + perfect infinitive</i>	He could/may/might have written that letter last week.
Возможность тех или иных действий в гипотетическом прошлом	<i>Could/might + perfect infinitive</i>	We took a taxi to the airport, otherwise we could/might have been late.

EXERCISES

1. Complete the sentences with the verbs from the box (some of the verbs could be used more than once).

need has to are to may must cannot is able to can

Helping Things to Grow

Growing plants . . . **1** . . . sunlight, carbon dioxide gas from the air, and water from the soil. . . . **2** . . . they get anything else? Certainly. Plants . . . **3** . . . get other things from the soil, especially potassium, nitrogen and phosphorus, if they are to thrive.

Soil contains some of these materials, but farmers . . . **4** . . . get good yields of crops if they do not put extra amounts on the fields when they sow the seeds in spring.

Wheat, barley and oats take a lot of nitrogen from the soil, and so the farmer . . . **5** . . . use a lot of nitrogen fertilizers (ammonium, sulphate or nitrate) when he plants these crops. Another way of putting nitrogen into soil is by growing beans, peas and clover. There are bacteria living in the roots of these plants that take nitrogen gas out of the air and change it into nitrogen fertilizer in the soil. After growing clover—for the farm animals—the farmer . . . **6** . . . grow a good crop of wheat the next year in the same fields, and he . . . **7** . . . not put any nitrogen fertilizer in the soil.

There are tiny plants (plankton) growing on the surface of the sea. What . . . **8** . . . they got for their growth? They . . . **9** . . . the same materials for growth as the plants we . . . **10** . . . see on land. There is plenty of potassium in sea water, but not much nitrogen or phosphate, so if we add fertilizers there will be a bigger growth of these tiny plants.

But why . . . **11** . . . we care about plants growing in the sea? Small sea plants in turn are eaten by fish. If there are more plants (plankton) there will in time be more and bigger fish for us to catch and eat. The scientists . . . **12** . . . to increase the fish in the open sea.

2. Complete the sentences with the verbs from the box in the correct form.

<i>can be able to have to must</i>

1. Muscle cells live for a long time, but nerve cells cannot.
2. Leukocytes , like Amoeba, to ingest solid particles.
3. To carry out its functions the blood be made to circulate throughout the body.
4. All forms of animals digest food, because most forms of food are insoluble and therefore pass through walls of the digestive tract into the blood stream.
5. If we begin working out routes of migration of birds in the British Isles, we shall include lakes and river valleys in all directions.
6. The necessary supply of oxygen for breathing be got from the air, or, in the case of aquatic animals, from the air dissolved in the surrounding water.

3. Offers and suggestions.

Write your own sentences according to the following patterns.

1. Would you like . . . ? (offer)
2. Let's . . . (suggestion)
3. Shall we . . . ? (suggestion)
4. Can I help you . . . ? (offer informal)
5. If you don't mind . . . (offer informal)
6. Why don't we . . . ? (suggestion)
7. How about . . . ? (suggestion)

4. Advice and Criticism.

Complete the sentences with the verbs in brackets according to the patterns:

***should/ought to* + infinitive**

***should/ought to* + perfect infinitive**

1. You (cut) down on the amount of chocolate you eat.
2. He (make) more of an effort with his work.
3. Do you think I (be) in a hurry with this report?
4. Anna (take) part in that conference last month.
5. Mike (include) more articles in the bibliography.
6. Conservationists (take) more decisive measures to prevent the oil spill.

5. Permission.

Ask for permission using the following patterns:

Can/Could/May/Might I . . . ?

Can I speak to you for a second?

Could I interrupt you for a second?

May I/might I have a day off?

1. Can I use . . . ?
2. Can I take . . . ?
3. Could I ask . . . ?
4. Could I suggest . . . ?
5. May I take . . . ?
6. Might I postpone . . . ?

6. Translate into English.

1. Растения должны получать азот из почвы.
2. Мы сможем выловить больше рыбы, если в море будет больше планктона.
3. Мы не сможем получить хороший урожай, если не внесем удобрения в почву.
4. После клевера вы можете не вносить азотных удобрений на это поле на будущий год.

5. Сможет ли этот молодой ученый возглавить экспедицию?
6. Мне пришлось изменить план статьи.
7. Почему Листеру пришлось отказаться от применения концентрированной карболовой кислоты?
8. Погода, возможно, изменится.

7. Translate into English.

Вода

Вода (оксид водорода) — химическое вещество в виде прозрачной жидкости, не имеющей цвета (в малом объеме), запаха и вкуса (при стандартных условиях). Около 71 % поверхности Земли покрыто водой (океаны, моря, озера, реки, льды).

Вода может являться хорошим сильнополярным растворителем и в природных условиях всегда содержит растворенные вещества (соли, газы).

Вода имеет ключевое значение в создании и поддержании жизни на Земле, в химическом строении живых организмов, в формировании климата и погоды. Ни одно растение и ни одно животное не может жить без воды. Она является наиважнейшим пищевым веществом для всех живых существ на планете Земля.

Вода на Земле может существовать в трех основных состояниях: жидком, газообразном и твердом — и приобретать различные формы, которые могут одновременно соседствовать друг с другом: водяной пар и облака в небе, морская вода и айсберги, ледники и реки на поверхности земли, водоносные слои в земле. Вода способна растворять в себе много веществ, приобретая тот или иной вкус.

Section 11

Emphasis

Эмфатические конструкции

Эмфатической конструкцией называют такую синтаксическую конструкцию, которая служит для выделения того или иного члена предложения. Существует несколько типов эмфатических конструкций.

- **Усилительное *do*** (в утвердительных предложениях в **Present Simple** и **Past Simple**): *do/does/did* + infinitive.

При переводе такой конструкции перед смысловым глаголом добавляются слова *действительно, фактически, на самом деле, все же*. Иногда усиление сказуемого передается интонационно:

*The above law **does** hold.*

- **Обратный порядок слов.**

Обратный порядок слов широко используется в английском языке для того, чтобы подчеркнуть значение второстепенных членов предложения. Выделяемый член предложения выносится на первое место, и это часто приводит к обратному порядку слов. *Perhaps **nowhere** have been achieved better results than in this field of science.*

Обратный порядок слов может быть вызван употреблением некоторых наречий и союзов:

not only . . . but (also) — не только . . . но и

hardly . . . when — едва . . . как

scarcely . . . when — едва . . . как

no sooner . . . than — как только

only — только

never — никогда

nowhere — нигде

***Not only** does H_2O act as an oxidizing agent, **but it also** acts as a reducing agent.*

***Not until** Dalton made his famous discovery did scientists realize the importance of this law.*

Часты случаи вынесения на первое место в предложении причастия I, входящего в состав формы **Continuous**, и причастия II или прилагательного, которое также является частью сказуемого. Перевод таких предложений следует начинать с дополнения или обстоятельства, стоящего после выделенного слова:

***Confirming** this possibility is another fact.*

***Related** to the chemical activity are many other effects.*

***Important** for this method was the following point.*

Обратный порядок слов употребляется в эмфатических предложениях, вводимых союзом *so*, *neither* или *nor*.

Союзы *neither* и *nor* переводятся *а также не, и не*, причем отрицание относится к глаголу:

***Nor** should we forget the importance of this word.* (А также не следует забывать о важности данного слова.)

Союз *so* переводится *так же как и*:

*He was late, **and so** was his friend.* (Он опоздал, так же как и его друг.)

- **Эмфатические уступительные предложения.**

В эмфатических уступительных предложениях на первом месте находится именная часть сказуемого, выраженная прилагательным или причастием, с последующим союзом *as*, *though* или с предшествующим *however*:

Hard as it is, we must do this work.

Late though it was, the sun was still in the sky.

However cold this winter is, the one of 1941 was still colder.

Уступительные придаточные предложения, выражающие дополнительный оттенок возможности, начинаются с местоимения или наречия в сочетании с *ever*:

I am right, whatever other people may say.

Whoever else may object, I shall approve.

Запомните значения следующих уступительных союзов, местоимений и наречий:

as — как ни; как бы ни; какой

however — ни; какой бы . . . ни; хотя

though (although) — хотя и

whoever — кто (бы) ни; всякий, кто

whatever — что (бы) ни; все, что; какой (бы) ни; всякий, который

wherever — где (бы) ни; всюду, где; куда (бы) . . . ни; всюду, куда

whenever — когда (бы) ни; всякий раз, когда

however that may be — как бы то ни было

- **Двойное отрицание.**

Отрицание *not* в сочетании с отрицательной приставкой прилагательного или наречия усиливает любые члены предложения, кроме подлежащего и дополнения. Такое сочетание обычно переводится *довольно, весьма, вполне*:

The case is not improbable. (Такой случай представляется весьма вероятным.)

- **Эмфатическое сочетание *it is . . . that/which/who*.**

Сочетания *it is . . . that*, *it is . . . which*, *it is . . . who* могут выделять любой заключенный между компонентами этого сочетания член предложения, кроме сказуемого. Дополнительный акцент на слове или группе слов (эмфаза) в русском языке передается словом *именно*.

It is these properties of crystals that are the most important.
(Именно эти свойства кристаллов представляются наиболее важными.)

Признаком того, что *that* — часть эмфатического оборота, является возможность убрать рамочную конструкцию *it is . . . that* без искажения смысла предложения, лишь сняв эмфазу. Приведенный выше пример примет вид

These properties of crystals are the most important.

Одним из вариантов эмфатической конструкции с сочетанием *it is . . . that* является выделение обстоятельства времени, которому предшествует эмфатическое сочетание *not until*. Сочетание *it was not until . . . that* не переводится, а перед выделяемым обстоятельством времени добавляются слова *только; только после; только тогда, когда*.

It was not until 1953 that this book was published. (Эта книга была опубликована только после 1953 года.)

It was not until Reontgen discovered X-rays that scientists began to take interest in this subject. (Только после того как Рентген открыл излучение, названное позже его именем, ученые проявили интерес к этому предмету.)

EXERCISES

1. Add *do* to emphasize.

1. These galaxies are too far to be seen, but calculations prove that they exist.
2. Sometimes an apple a day keeps the doctor away!
3. Although many people find Arahnids disgusting, some like spiders.
4. You find the story unbelievable, but it makes sense.

2. Translate the sentences, paying attention to emphasis.

1. This field does not affect the forward motion of the electrons but does act upon the transverse motion.
2. Not all metals react with acids, and when they do, the gas evolved is not always hydrogen.
3. Gold usually occurs in the natural state while iron does not.
4. The individual electrons do not move even approximately independent of the another as do, for example, the planets in the solar system.
5. Copper does not combine with oxygen when cold, but it does do so slowly when heated.
6. The beta rays which do pass through the aluminium do not ionize the gas as profusely as do the alpha rays.

7. Most authorities agree that catalysts do in some manner combine with the substance or substances upon which their catalytic influence is exerted.

3. Reverse the word order to make sentences without emphasis.

1. Not only do mice act as pests, but they also act as dangerous disease carriers.
2. Not until Pavlov published his famous work did scientists realize the importance of this discovery.
3. Related to this gene expression are many other effects.
4. Important for his work was the new evidence.
5. Darwin was the author of the natural selection theory, and so was Wallace.
6. Belonging to the class Amphibia are all the Anurans, Apodas and Caudatas.
7. Of great significance is the fact that this species has poisonous glands.
8. In ancient times doctors had no knowledge of hygiene, neither had they any means of sterilization.
9. Nowhere can we see such a rapid progress of science as in gene engineering.
10. Not only does the newly developed medicine improve blood circulation, it also prevents blood clotting.

4. Translate the sentences, paying attention to emphasis.

1. Hard as it is, we must do our duty.
2. However hot this summer is, the next one can be even hotter.
3. Whatever your considerations are, they cannot be taken into account.
4. Whoever the author of this article may be, he should be more graphic.
5. Whatever their causes, the consequences are the same.
6. Lister was right, whatever other doctors might say.
7. Strange as it may seem, some frogs freeze solid when hibernate.

5. Translate the sentences, paying attention to the prefixes.

1. Mars and Venus have atmospheres not dissimilar to ours.
2. River and lake deposits not uncommonly contain remains of organisms which inhabited waters.
3. It seems not at all unlikely that many of the lower animal forms also have the power to make a similar distinction.
4. The advances of modern science in the production of a wide range of experimental temperatures are thus seen to be not inconsiderable.

6. Translate the sentences, paying attention to the negative constructions.

1. These factors are not as uncommon as we have thought.
2. It seems not at all unlikely that some representatives of those rare species could be found in remote parts of the island.
3. It is not unusual to observe this rodent feeding.
4. The failure of the project does not seem unfair.

7. Translate the sentences, paying attention to the construction *it is . . . that/which/who*.

1. It is these properties of the substance that are most important.
2. It was the English naturalist Charles Darwin who first published the book about evolution of species.
3. It was from experiments with peas that Mendel first derived laws of heredity.

Section 12

Passive Forms of the Verb

Образование:
to be + past participle

К пассивным формам глагола относятся:

1. The Present Simple Tense: *am/is/are + past participle*
(далее pp)
*The human brain **is made** of nerve tissue.*
2. The Present Continuous Tense: *am/is/are being + pp*
*These burglars **are being questioned** now.*
3. The Past Simple Tense: *was/were + pp*
*All letters **were posted** yesterday.*
4. The Past Continuous Tense: *was/were being + pp*
*These burglars **were being questioned** this time yesterday.*
5. The Future Simple Tense: *will be + pp*
*That film **will be shown** on TV next month.*
6. The Present Perfect Tense: *have / has / been + pp*
*Her bicycle **hasn't been repaired** yet.*

7. The Future Perfect Tense: *will have been* + pp
*Her bicycle **will have been repaired** by the end of the week.*
8. The Present infinitive: *(to) be* + pp
*Her bicycle **must be repaired**.*
*Her bicycle **needs to be repaired**.*
9. The Perfect infinitive: *(to) have been* + pp
*Her bicycle **must have been repaired** last week.*
10. -ing form: *being* + pp
*I don't like **being stared at**.*
11. Modals: modal + *be* + pp
*All letters **must be posted** today.*

Пассивные формы употребляются:

- когда лицо, совершающее действие, неизвестно, не важно или очевидно из контекста:
*My car **was stolen** yesterday* (лицо не известно).
*Exotic fruit **are grown** in hot countries* (лицо не важно).
*The criminals **were caught** in the centre of the city* (лицо очевидно — полиция);
- когда акцент делается на действии, а не на лице, совершающем его. Этот прием используется в заголовках газет, инструкциях, рекламе и т. п.:
*A new building for the university dormitory **will be opened** next year;*
- когда мы не хотим называть лицо, виновное в совершении или несовершении того или иного действия:
*The windows in this room **have not been cleaned*** (вместо того чтобы сказать: *You haven't cleaned the windows*).

При переводе предложения из активного залога в пассивный происходит следующее:

- **дополнение** предложения в активном залоге становится **подлежащим** предложения в пассивном залоге;
- **подлежащее** предложения в активном залоге в пассивном залоге может опускаться или превращаться в **агента**, совершающего действие, с предлогом *by* перед ним;
- глагол предложения в активном залоге становится причастием прошедшего времени.

Сравните:

*The students **examined** mice behaviour.*
*Mice behaviour **was examined** by the students.*

Только переходные глаголы (т.е. глаголы, за которыми следует прямое дополнение) могут быть переведены из активного залога в пассивный:

*All students **handed** in the reports.*

*The reports **were handed in** by all students.*

Непереходные глаголы не имеют пассивных форм:

Children go to school every day.

Агент вводится предлогами *by* (лицо или предмет, совершившие действие) и *with* (с помощью чего было совершено действие): *The door was unlocked **by** Tom **with** a key.*

Слова *people, one, somebody/someone, they, he* и т.п. обычно не используются в качестве агентов, так как не несут какой-либо конкретной информации.

После глаголов *make, hear, see, help* в пассивном залоге употребляется инфинитив:

*The teacher **made me learn** the poem.*

*I **was made to learn** the poem.*

В случае глаголов с предлогами в пассивном залоге эти предлоги следуют непосредственно за причастием, образованным от данного глагола:

*They **blamed him for** theft.*

*He **was blamed for** theft.*

В случае с глаголами, которые могут иметь при себе два дополнения (*allow, award, bring, buy, feed, grant, lend, hand, offer, pass, promise, read, show, take, teach* и др.), могут быть образованы две пассивные формы. Однако предпочтительнее начинать предложение с указания на лицо, а не на предмет:

Active: *Tom gave **me a gift**.*

Passive: а) *I **was given a gift** by Tom (предпочтительнее).*

б) *A **gift was given** to me by Tom.*

EXERCISES

1. Complete the sentences with the verbs in the Present Simple Passive Tense.

The process of taking food into the body . . . **1** . . . (call) ingestion. The food . . . **2** . . . (break) into relatively small pieces in the mouth by chewing, and these fragments are then . . . **3** . . . (break) down into simpler substances by the processes of digestion. Digested food . . . **4** . . . (absorb) from the digestive tract by the blood and . . . **5** . . . (distribute) to the cells of the body. Its incorporation into the protoplasm of these cells . . . **6** . . . (call) assimilation.

Not all the material that . . . **7** . . . (ingest) can be digested. So the substances, such as cellulose, cannot . . . **8** . . . (digest) by man and must therefore . . . **9** . . . (discard) as wastes. This process, involving the passage of undigested materials from the body, . . . **10** . . . (know) as egestion. Ingestion, digestion, and egestion are functions of specialized organs referred to collectively as the digestive system. This system . . . **11** . . . (make) up of the alimentary tract, that includes the mouth, teeth, tongue, pharynx, esophagus, stomach, small intestine, large intestine, and anus. The accessory organs and glands . . . **12** . . . (connect) with the tract or . . . **13** . . . (locate) within its walls—the salivary glands, pancreas, liver, the glands of the stomach, and the glands of the small intestine.

The major organs of the alimentary tract lie inside the body in a tube—within-a-tube arrangement. The outer tube . . . **14** . . . (make) up of the skin and the muscle layers just under it. The inner tube . . . **15** . . . (form) by the organs of the alimentary tract, which are hollow, their walls . . . **16** . . . (compose) of layers of muscle. The space between the two tubes . . . **17** . . . (call) the coelom or body cavity and . . . **18** . . . (line) with a thin membrane, the peritoneum.

2. Complete the sentences with the verbs in the correct form: the Present Simple Passive or the Past Simple Passive Tense.

1. All living things (characterize) by the presence of a complex substance called protoplasm.
2. Protoplasm first (recognize) as a living substance by the French zoologist Dujardin in 1835.
3. All metabolic reactions (make) possible by special types of proteins called enzymes.
4. Many characteristics of protoplasm may (study) in living organisms of small size.
5. The oxygen used up in the respiration of plants and animals (restore) through the process of photosynthesis.
6. Carbon dioxide (absorb) from the atmosphere through the stomata of the leaves.
7. Several kinds of animals (domesticate) by the late Stone Age.
8. Snowy owls most often (see) along seacoasts and lake shores.

3. Complete the sentences with the verbs in the correct form: Passive or Active.

Atmospheric Nitrogen

The greater part of the atmosphere . . . **1** . . . (consist) of nitrogen, but the nitrogen, which . . . **2** . . . (require) by plants and animals to build

up their tissues, is never available in sufficient quantities. This is due to the fact that free nitrogen cannot . . . **3** . . . (use) for this purpose. It can . . . **4** . . . (assimilate) only when it . . . **5** . . . (combine) with other chemical elements.

However, the bodies of animals . . . **6** . . . (be) unable to make free nitrogen combine in this way. If it were not for bacteria in the soil, the world's supply of combined nitrogen would soon . . . **7** . . . (exhaust).

Certain bacteria, which . . . **8** . . . (find) in the roots of some varieties of plants, fix the free atmospheric nitrogen and combine it with other elements such as carbon, oxygen and hydrogen. Plants . . . **9** . . . (use) this combined nitrogen to build their tissues.

Certain other bacteria that . . . **10** . . . (find) in the soil combine the free atmospheric nitrogen with hydrogen to make ammonia, which they . . . **11** . . . (use) to form their own protoplasm. When these bacteria . . . **12** . . . (die), the nitrogenous compounds . . . **13** . . . (remain) in the soil and . . . **14** . . . (be) available for the nutrition of other plants.

4. Complete the sentences using the Passive.

- | | |
|--|----------------------|
| 1. English (speak)
all over the world. | am/are/is + pp |
| 2. Excuse the mess; the house
(be) painted. | am/are/is being + pp |
| 3. I (invite), but I went anyway. | was/were + pp |
| 4. I felt if I (watch). | was/were being + pp |
| 5. Mary (tell)? | have/has been + pp |
| 6. I knew why I (choose). | had been + pp |
| 7. You (tell) when the time comes. | will be + pp |
| 8. Everything (do) by tomorrow. | will have been + pp |

5. Rewrite the sentences in Passive.

- I have just finished the work.
- I think we shall have received the letter by Monday.
- I had already written the composition when you came.
- We heard that she had accepted the invitation.
- The use of sulfa drugs has reduced considerably the death rate from pneumonia.
- Chemotherapy has made much progress since World War II.
- Lately scientists have developed some extremely valuable antibiotics.
- Will the director have signed the document by three o'clock?—Yes, he will.
- He has translated two articles on physiology.
- They have offered him a good job.

6. Translate into English.

1. Студентам-медикам преподают латынь.
2. Теперь во всем мире говорят по-английски.
3. Вчера нам показали необычный эксперимент.
4. Моему другу предложили очень интересную работу.
5. Здание университета построено три века тому назад.
6. Положительные атомы водорода притягиваются к отрицательным атомам кислорода.
7. Без хлорофилла пища не может вырабатываться в растениях.
8. Этот детеныш орангутанга был конфискован у браконьеров и помещен в центр реабилитации.
9. Растения в эксперименте выращивались на кварцевом песке, в который добавляли растворы солей разных концентраций.
10. Рентгеноструктурный анализ молекулы ДНК был впервые осуществлен Уотсоном и Криком.
11. Кем был введен термин «геоботаника»?
12. Гидрофон был установлен, чтобы слышать песни китов.
13. Новая оранжерея строится второй год.
14. К которому часу работа будет закончена?
15. Письмо еще не отправлено.
16. Этот антибиотик был недавно получен в Институте антибиотиков.
17. Новые лекарственные сульфпрепараты успешно использовались последнее время для лечения многих заболеваний.
18. До того как Пастер открыл способ лечения гидрофобии, раны людей, укушенных бешеной собакой или волком, прижигались раскаленным железом.
19. К 8 часам все вопросы были решены.
20. Ваша работа еще не напечатана.

Section 13

Sequence of Tenses

1. Если в главном предложении глагол-сказуемое стоит в одной из форм настоящего времени, то глагол-сказуемое в придаточном предложении может стоять в любой временной форме, которая требуется по смыслу:

*He says that he **was** busy yesterday.*

*He says that he **will be** busy tomorrow.*

*He says that he **is** busy.*

2. Если в главном предложении глагол-сказуемое стоит в одной из форм прошедшего времени, то в придаточном предложении глагол-сказуемое нужно употреблять также в одной из форм прошедшего времени, а именно:

а) если действие придаточного предложения происходит одновременно с действием главного предложения, то в **the Past Simple** или **the Past Continuous**:

He told me that he studied here.

She said she was preparing for a report;

б) если действие придаточного предложения предшествует действию главного предложения, то в **the Past Perfect** или **the Past Perfect Continuous**:

The rector said that the Moscow Higher Women's Courses had been reorganized into the Second Moscow State University;

в) если действие придаточного предложения относится к будущему времени, то в форме **the Future-in-the-Past**, которая образуется от соответствующих форм **Future Tenses**, но вместо вспомогательных глаголов **shall** и **will** употребляются **should** и **would**:

I thought I would know the way this time, but I was wrong.

3. В следующих случаях правило согласования времен не соблюдается, т.е. независимо от временной формы глагола-сказуемого в главном предложении в придаточном предложении глагол-сказуемое употребляется в любой временной форме, которая требуется по смыслу:

а) если в состав сказуемого в придаточном предложении входит один из следующих модальных глаголов: **must**, **ought to**, **should**:

I knew that he must come to the Academy by 3 o'clock;

б) если в придаточном предложении сообщается об общеизвестном факте или неопровержимой истине:

The teacher told the pupils that Novosibirsk stands on both banks of the River Ob.

EXERCISES

1. Put the italicized verbs in the Past and rewrite the sentences, paying attention to the Sequence of Tenses.

1. Nick *asks* when fresh newspapers will be brought.
2. I *am asked* when the lecture begins.
3. She *is* sure that they got tickets for the concert yesterday.
4. I *hope* that your brother will come to our party.
5. I *think* he has passed his examinations very well.
6. He *says* that he no longer lives there.

7. We *know* that he is busy now.
8. She *says* she is going to apply for the job.

2. Make a report about a conference. The subject of the conference: *How We Can Save the Environment*. Tell about the following issues, using such phrases as *Scientist from Brasilia said . . .*, *African conservationists propose . . .*, *Dr Nert claims that . . .*, *Participants suggested . . .* etc.

1. We protect wild animals' natural habitats.
2. Some animals may become extinct.
3. Governments should reduce exhaust of harmful fumes.
4. Can we put stricter laws into effect?
5. We encourage people to use environmentally friendly products.
6. We don't pollute the water or damage the ozon layer.
7. More people should use public transport or bicycles.
8. What is done to encourage factories to recycle?

3. Translate into English.

1. Он сказал, что будет делать доклад в понедельник.
2. Меня спросили, опытный ли он преподаватель.
3. Твоя сестра сказала, что видела новую пьесу на прошлой неделе.
4. Докладчик спросил нас, идем ли мы на лекцию.
5. Агентство Рейтер сообщило, что были проведены уникальные опыты с корой головного мозга.
6. Репортеры интересовались, много ли времени потребовалось ученому, чтобы сформировать у мыши условный рефлекс на звук.
7. Ученый ответил, что много времени у него отнял сам эксперимент.
8. Журналисты спросили, каковы достоинства нового способа исследования внешнего и внутреннего торможения условного рефлекса.

Section 14

Reported Speech

Косвенная речь используется, когда необходимо передать слова другого лица. Для передачи косвенной речи часто используются такие глаголы, как *tell*, *say*, *speak*, *notice*, *remark*, *exclaim*, *add*, *inform*, *remind*, *explain* и др.

Прямая речь	Косвенная речь	Примеры
Present Simple	Past Simple	Nick said: "Sometimes I come home late." Nick said that sometimes he came home late.
Present Continuous	Past Continuous	Nick said: "My sister is studying French." Nick said that his sister was studying French.
Present Perfect	Past Perfect	Nick said: "My friend has just arrived from Paris." Nick said that his friend had just arrived from Paris.
Present Perfect Continuous	Past Perfect Continuous	Nick said: "I've been running this business for three years." Nick said that he had been running that business for three years.
Past Simple	Past Perfect	Nick said: "I didn't write that letter." Nick said that he had not written that letter.
Past Continuous	Past Perfect Continuous	Nick said: "I was watching TV yesterday evening." Nick said he had been watching TV the previous day.
Past Perfect	Past Perfect	Nick said: "I had read lots of articles before I completed my report." Nick said that he had read lots of articles before he completed his report.
Past Perfect Continuous	Past Perfect Continuous	Nick said: "I had been looking for that article for weeks before I found it." Nick said that he had been looking for that article for weeks before he found it.
<i>Will</i>	<i>Would</i>	Nick said: "I will go to Italy." Nick said that he would go to Italy.

<i>Can</i>	<i>Could</i>	Nick said: "I can write the article." Nick said that he could write the article.
<i>Must/have to</i>	<i>Had to</i>	Nick said: "I have to leave early." Nick said that he had to leave early.
<i>May</i>	<i>Might</i>	Nick said: "I may return later." Nick said that he might return later.

При использовании косвенной речи часто бывает необходимо изменить слово или словосочетание, указывающее на место или время:

Прямая речь	Косвенная речь
Here	There
Now	Then
Tomorrow	The next/following day
Tonight	That night
Next week/month/year	The following week/month/year
Yesterday	The day before/the previous day
Last week/month/year	The week/month/year before the previous week/month/year
Ago	Before/previously

Для того чтобы перевести в косвенную речь **общий вопрос (yes/no question)**, необходимо использовать слова *if, whether*:

"Do you live here?" he asked.

*He asked me **whether** I lived there.*

EXERCISES

1. Put the words and phrases in the proper column after the verbs of speaking they go together with.

You, something important, a word, English, to a friend, no, about simple things, to the brother that dinner is ready, this in Russian, a story, me to

prepare all my papers for the exam, the difference between a rat and a mouse, little, in public, quickly and loudly, us some good news.

Speak	Talk	Say	Tell

2. Rewrite the sentences as the Reported Speech.

Прямая речь	Косвенная речь
1. "Tiny yeast germs cause fermentation!" Pasteur exclaimed. 2. "So, these tiny cells may be the cause of diseases," he wrote in his diary. 3. "I will find the cause of diseases and produce substances effective in curing them," he once said to his colleague.	Pasteur discovered that . . . He concluded that . . . Pasteur began to hope that . . .

3. Complete the sentences with the verbs from the box.

say report exclaim state
ask reply tell

- "The weather is getting better," he to me.
- "How are you?" my friend me.
- "I am all right, thank you," I
- "Ouch! I've burnt my finger!" father
- "The experiments have been successful," professor Quirk at the conference.
- "So, this substance cannot be used in medicine," the scientist
- "I am going away for a few days," she us.

4. Rewrite the sentences from Exercise 3 in the Reported Speech.

5. Complete the sentences using your own ideas.

- He told us that . . . had become . . .
- We were happy that . . . would go . . .
- The Mars station reports that . . . walked . . .
- The congress stated that . . . were punished . . .
- We understood that . . . hadn't said . . .

6. He asked me why . . . was . . .
7. We decided that . . . should pay . . .

6. Rewrite the sentences as the Reported Speech, mind the Sequence of Tenses.

1. I said to him: "Don't open the window."
2. "Stay in bed for two days," the doctor said.
3. "The experiment is to be stopped," the physiologist said.
4. All my friends asked me, "How long did you stay in the South?"
5. I asked my friends, "Will you attend the lecture on 'Conditioned Reflexes'?"
6. "The operation was very difficult," the physician reported.
7. "Can you prove your idea?" the reporter asked me.
8. "This is absolutely senseless!" my colleague exclaimed.

7. Translate into English.

1. Он спросил, когда будут известны результаты эксперимента.
2. Пастер надеялся, что сможет найти причину болезни бешенства и средство излечения ее.
3. Я думала, что они все еще живут на юге.
4. Мы были уверены, что он скажет о своих наблюдениях в докладе.
5. Мне сказали, что кто-то ждет меня в лаборатории.
6. Ему сказали, что директор еще не подписал письмо.
7. Пастеру сказали, что бешеная собака укусила мальчика.
8. Пастер считал, что брожение вина вызывается бактериями.
9. Мы надеялись, что она примет во внимание наши замечания.
10. Я слышал, что он раньше работал в Пулковской обсерватории.

Section 15

Linking Words

Предложения можно соединять разными способами, например:

- для связи **похожих понятий (similar qualities)** используются следующие выражения:

... *and also* ... ;

... *and* ... *as well*;

... *as well as* ... ;

In addition to . . . also;

. . . both . . . and . . . ;

- для связи **противоположных понятий (opposing qualities)** используются следующие выражения:

. . . but . . . ;

. . . nevertheless/however . . . ;

Although/in spite of the fact that . . .

Слова-связки, которые используются для того, чтобы:

- показать последовательность событий (sequence of events):
at first, before, until, while, during, then, after, finally, as soon as, eventually, at last;
- выразить мнение говорящего (to state the personal opinion):
in my opinion, to my mind, I believe, I think, in my view, it seems to me, fortunately, unfortunately;
- выразить противоположное мнение (to introduce contrasting opinion):
it is argued that, on the other hand, contrary to, in spite of, nevertheless;
- дополнить данные или точку зрения (to add data or opinion):
nowadays, furthermore, moreover, in addition to, besides, not to mention the fact, in general, nevertheless;
- сделать вывод (to conclude):
to sum up, all in all, all things considered, in conclusion, thus, therefore, consequently, so, actually, as a result;
- объяснить причину (to explain cause):
because of, owing to, due to;
- подчеркнуть мысль (to emphasize):
obviously, clearly, in particular, needless to say.

EXERCISES

1. Insert the linking words from the box into the following sentences.

*despite due to in fact however obviously and . . . as well
because of according to moreover nevertheless as well as*

1. the appearance of instruments, geographic maps were full of mistakes.
2. one of the most popular theories about the death of the dinosaurs, the world just grew too cold for them.

3. many scientists think that a change in weather would not have been enough to kill the dinosaurs.
4. , fossils have been found that show dinosaurs could live as north as Alaska.
5. , some animals can get through a disaster better than the others.
6. The idea of a great asteroid or comet crash is interesting, , it's fascinating.
7. Scientists have studied the surface of the Earth for centuries, each year brings new information.
8. its special qualities, water supports all forms of life, influences weather and climate.
9. Waterfalls develop the presence of rocks in the river's course.
10. The atmosphere changes constantly the weather changes constantly

2. Insert the linking words from the box into the following text.

*obviously as a result so however fortunately then
immediately nowadays until now*

. . . **1** . . . the more hemoglobin you have, the more oxygen is carried to the cells of your body. . . . **2** . . . suppose that for some reason the number of red cells in your blood decreases or the amount of hemoglobin in each cell gets smaller. . . . **3** . . . the cells in other tissues all over your body get less oxygen; their metabolism is not normal, and . . . **4** . . . you get weak and pale.

It is possible, . . . **5** . . . , to be perfectly healthy and still not get enough oxygen. This happens to fliers, even though they have plenty of red cells and hemoglobin. . . . **6** . . . it is a well-established fact that the higher you fly above the Earth's surface, the thinner the atmosphere becomes. A breath of air at ten thousand feet contains far fewer molecules of oxygen than at sea level. . . . **7** . . . , at great heights most people begin to pant and feel light-headed. They are suffering from oxygen want.

. . . **8** . . . , today's airplanes have pressurized cabins for very high altitude flights. The thin outside air is compressed . . . **9** . . . it is as dense as the air we are used to breathing, and . . . **10** . . . it is pumped into the cabin. Without special cabins, fliers have to inhale oxygen from tanks instead of the thin outside air.

3. Put these words into the following text.

*well during though and but thanks to however
both . . . and according to*

The Ancient Adaptable Apple (AAA)

Does an apple a day really keep the doctor away? . . . **1** . . . , not completely, of course — . . . **2** . . . it is quite likely to postpone the need for his attentions.

. . . **3** . . . this proverb is a comparatively recent one, there is nothing new about the thought behind it.

In ancient Ireland the apple tree was the tree of immortality. . . . **4** . . . golden apples the Scandinavian gods preserved their eternal youth. The ancient Turks, too, believed that apples could restore youth; . . . **5** . . . the apple of Prince Ahmed of the “Arabian Nights” was a cure for every disorder.

The apple, which in ancient times grew wild on the shores of the Black Sea, may well have been the first fruit ever cultivated by man. . . . **6** . . . the historical sources, in Greece they were cultivated at least as far back as 600 B. C., and Cato, in his writings, named seven different varieties.

. . . **7** . . . the Roman occupation of Britain, apple trees brought over from Gaul thrived so well in Somerset that the fruit was sent back again to Rome as a rare delicacy! From this time onwards the number of varieties of cultivated apple increased rapidly. It was not until the 18th century, . . . **8** . . . , that experiments were made in cross-fertilization and the production of new varieties of apple by hybridization.

This has the dual result that we can obtain today a large variety of . . . **9** . . . eating . . . **10** . . . cooking apples; and that we can obtain them, from different countries, all the year round.

4. Translate into English, paying attention to the linking words.

Широко известно, что человек издавна использовал микробиологические процессы для приготовления хлеба, сыра, пива, вина и других продуктов. *Но* лишь в последние десятилетия успехи науки открыли возможность использовать микроорганизмы для крупного промышленного производства множества полезных веществ. *По словам специалистов*, использование биологических катализаторов — ферментов — в пищевой, текстильной, кожевенной промышленности облегчает условия труда рабочих, *а также* улучшает качество продукции, снижает ее себестоимость. *Кроме того*, бактериальные удобрения и микробиологические препараты для защиты растений от вредителей — хорошее подспорье земледельцам. *Словом*, у микробиологической промышленности большое будущее.

TESTS

ТЕСТЫ

Tests to the Lexical Module

TEST 1 (UNITS 1—3)

1. Complete the table with the singular and plural forms of the nouns.

Singular	Plural
genus
.....	species
.....	bacteria
nucleus
phylum
.....	bacilli
amphibian
.....	mitochondria

2. Match the adjectives with the nouns to construct word combinations.
Use three of these word combinations in your own sentences.

generic	experiment
terrestrial	secretion
breeding	point
temporary	name
extracellular	animals
poisonous	paralysis
scientific	fluid
cold-blooded	habitats
freezing	pond
mucous	organisms
aquatic	membrane

3. Complete the text with the words from the box.

*order defined classify features are sorted living
reproduce share capable of kingdom to identify
classification to sort offspring species scientists
to breed*

The Use of the Hierarchical Classification System

Classification helps us to impose order and a general plan on the diversity of . . . **1** . . . things. Scientists have always tried to organize and . . . **2** . . . the objects, including living organisms, around them. . . . **3** . . . can be defined as grouping organisms according to their structural similarities. This means that organisms that share similar . . . **4** . . . are placed in one group.

The groups, from largest to smallest, are arranged as follows: . . . **5** . . . , phylum, class, . . . **6** . . . , family, genus and . . . **7** The species is the smallest group of organisms. As you go through the classification hierarchy, you will see that . . . **8** . . . have used broader features to put organisms into kingdoms, which are the largest groups of organisms. When you move down towards the species, which are the smallest groups of organisms, features are becoming specific. In other words, two organisms that belong to the same species . . . **9** . . . more features than those in the same kingdom but in different species.

A species can be . . . **10** . . . as a group of organisms with similar features, and these organisms are . . . **11** . . . breeding and produce fertile . . . **12** You are probably aware of the fact that horses and donkeys belong to the same kingdom, phylum, class, order, family as well as genus, but they are from different species. Therefore, if a donkey and the horse happen . . . **13** . . . , they produce an offspring called a mule. The mule is infertile, meaning that it cannot . . . **14** . . . offspring because it is a product of organisms of different species.

Classification hierarchy has many uses. First, it helps scientists . . . **15** . . . organisms in order. Second, it helps them . . . **16** . . . new organisms by finding out which group they fit. Third, it is easier to study organisms when they . . . **17** . . . in groups.

4. Give the terms corresponding to the following definitions.

1. The science of naming, describing, and classifying organisms.
2. Ordering organisms into groups based on their similarities or relationships.
3. A form of energy produced during a nuclear reaction.
4. The central part of a living cell, containing chromosomes.
5. A long, whip-like structure that helps some bacteria to propel themselves through liquid environments.
6. A long period of time when there is little or no rain.

7. An illness that is caused by bacteria and that does not usually last a long time.
8. A serious illness that usually lasts a long time, often one that affects a particular part of the body.
9. Vertebrates distinguished by their ability to exploit both aquatic and terrestrial habitats.
10. A state of inactivity for some period, until the environment is again warm enough.

5. Explain the terms.

Genus, binominal system, virus, geobacter, predator, ailment.

6. Translate into English.

Единственный организм, способный противостоять бактериям, — это вирус. Поскольку есть бактерии, которые наносят вред здоровью человека, то, соответственно, есть вирусы, которые, убивая эти бактерии, помогают человеку выздороветь от той или иной болезни. Такие вирусы называются бактериофаги. Размером бактериофаги не более 20 нанометров. Чтобы жить и размножаться, бактериофагам нужен «хозяин» — болезнетворная бактериальная клетка. Бактериофаг находит клетку «хозяина», прикрепляется к ней и вспрыскивает свою ДНК внутрь. Клетка лопается, и появляются полсотни новых бактериофагов, которые ищут новую добычу. Это нанотехнология, созданная природой задолго до того, как на Земле появился человек. И если к антибиотикам микробы научились подбирать защиту, то с бактериофагами это не получится — точно так же, как, например, заяц никогда не сможет выработать устойчивость к волку.

TEST 2 (UNITS 4—6)

1. Complete the table with the singular and plural forms of the nouns.

Singular	Plural
larva
.....	pupae
.....	ocelli
antenna
.....	ganglia
trachea
.....	fungi
.....	opercula
.....	stimuli
aquarium

2. Form adjectives from the following nouns. Sometimes more than one adjective can be formed. Use three adjectives in your own sentences.

- | | |
|-----------|--------------|
| 1. chitin | 6. sense |
| 2. nature | 7. cartilage |
| 3. colour | 8. parasite |
| 4. horn | 9. rudiment |
| 5. nerve | |

3. Complete the text with the words from the box.

*rare migration hobby suitable landscaping brighten hawks
species birder enjoyable recreational spotting to distinguish
comparison physical experienced affordable gulls
to identify wild eyesight supplies seeds scraps to improve*

Birding

In its most basic sense, birding, or bird watching, is the . . . **1** . . . hobby of observing species of wild birds, including their . . . **2** . . . characteristics and behavior. In reality, birding is much more than a simple . . . **3** . . . , and there are many benefits of birding that can be enjoyed by both novice and . . . **4** . . . birders.

Birding Is Educational

As birders observe new . . . **5** . . . , they not only learn about different birds, but they also learn about . . . **6** . . . , bird behavior, feed preferences, courtship, and bird territories. Dedicated birders who want to attract more birds often study . . . **7** . . . and geography as well. The practice of photographing birds can lead to a study of photography, while frequent use of field guides makes birders experts in detailed observation and species . . . **8**

Birding Is Inexpensive

All it takes to get started as a birder is good . . . **9** . . . , a simple field guide (even from a used book store), and an interest in watching birds. Even birders who opt for a field bag, binoculars, and other birding . . . **10** . . . can find . . . **11** . . . options for low budgets.

Birders who choose to feed birds in their backyard also have simple, . . . **12** . . . options. Many birds are happy to feed on the ground, eliminating the need for any feeder at all. . . . **13** . . . can be inexpensive, and many birds will eat . . . **14** . . . as well.

Birding Is Challenging

Some bird species, such as sharp-shinned . . . **15** . . . and Cooper's hawks or the different species of . . . **16** . . . , can be very challenging . . . **17** . . . , and many birders feel a rush of adrenaline when they manage to add a new species to their life list. Birding organizations may organize competitions such as . . . **18** . . . the most number of birds in a specific time period or location. These types of challenges urge birders . . . **19** . . . continually their hobby, leading to even more enjoyment.

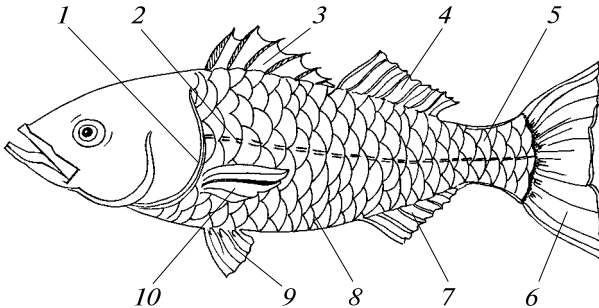
Birding Is Fun

For an enthusiastic . . . **20** . . . , nothing is more exciting than spotting a new or . . . **21** . . . bird, or learning . . . **22** . . . individual birds through their personalities. The fresh air along a birding trail can be invigorating, while the companionship of backyard birds can . . . **23** . . . any dreary day. By nurturing . . . **24** . . . birds through conservation efforts and personal birding best practices, birders can feel a sense of pride and accomplishment to be a part of one of the most popular and . . . **25** . . . hobbies in the world.

4. Give the terms corresponding to the following definitions.

1. The world's most abundant creatures, whose known species outnumber all the other animals and the plants combined.
2. Breathing pores through which air enters the body of insects.
3. A bird's horny projecting jaws.
4. A study of fishes.
5. Primitive species of insects that mature with little change in appearance except their size.
6. Some of the other insects that go through all the changes of complete metamorphosis.
7. An important part or aspect of something.
8. A structure that birds make to keep their eggs and young in.
9. The "king" of birds.

5. Label parts of the fish.



6. Explain the following words.

Aquarium, ostrich, feather, gill, imago, pest.

7. Translate into English.

Групповой интеллект животных часто превосходит умственные способности одной особи. Муравьев нельзя назвать талантливыми инженерами, архитекторами или воинами, по крайней мере каждого по отдельности. Когда нужно решить, что делать в конкретной ситуации, они впадают в растерянность. Однако колония может решать задачи, немыслимые для одного муравья: находить кратчайший путь к источнику пищи, распределять обязанности между работниками, защищать свою территорию от соседей. Кроме того, колония способна быстро и эффективно реагировать на возникающие проблемы. Все это становится возможным благодаря так называемому роевому интеллекту.

Принцип работы роевого интеллекта состоит в том, что насекомые следуют простым правилам, действуя на основании имеющейся у них ограниченной информации. Один из ключей к пониманию устройства колонии: четкое распределение обязанностей между особями. И даже если в колонии насчитывается полмиллиона особей, она прекрасно функционирует. Жизнь колонии основывается на непрерывном взаимодействии между отдельными муравьями, каждый из которых соблюдает набор простых правил. Ученые называют такую систему самоорганизующейся.

Такая система базируется на положительной (например, другие муравьи укрепляют феромонную тропу) и отрицательной (испарение феромонной тропы) обратной связи. Теоретически, если количество феромонов будет оставаться неизменным всем маршрутам, то невозможно будет выбрать путь. Однако из-за обратной связи небольшие колебания приведут к усилению одного из маршрутов.

TEST 3 (UNITS 7—9)

1. Complete the word combinations with suitable prepositions. Use three of these word combinations in your own sentences.

- | | |
|---------------------------------------|---------------------------------------|
| 1. to nourish milk | 13. to result diseases |
| 2. to distinguish features | 14. to live the coasts |
| 3. to develop the womb | 15. to contaminate waste |
| 4. to attach the body | 16. to damage gnawing |
| 5. to attribute the ability | 17. to associate humans |
| 6. to range size | 18. to move the water |
| 7. to arrange families | 19. to breathe the blowhole |
| 8. to depend mammals | 20. to dive the water |
| 9. to hunt sport | 21. to float the surface |

10. to expell the cavity
 11. to compete food
 12. to prey herds

22. to carry the womb
 23. to convert signals
 24. to refer the body mass

2. Match the adjectives to the nouns to construct word combinations. Use three of these word combinations in your own sentences.

- | | |
|--------------|---------|
| salivary | tract |
| radiant | water |
| digestive | tip |
| direct | world |
| flattened | system |
| marine | species |
| wide | cavity |
| nervous | contact |
| reproductive | range |
| gill | slits |
| numerous | glands |
| fresh | energy |

3. Choose the correct words to complete the text.

*formed less skin walking to give environment freezing
 relatively swimming spending prey blood breeds tissue
 remains insulation coat reaches den circulates relatives
 to transmit features insulating reduces supplying
 enable absorbing*

Polar Bear

The polar bear lives in the Arctic, . . . **1** . . . much of its time on snow and ice. Several physical . . . **2** . . . contribute to its adaptation to this cold . . . **3** It is a very large bear, which means that the ratio of its surface area to its volume is . . . **4** . . . small. The relatively small surface area means that the polar bear loses proportionately less heat than its more southerly . . . **5** Also its ears are small, another feature which . . . **6** . . . heat loss.

It has a thick . . . **7** . . . with long loosely packed coarse hairs (guard hairs) and a denser layer of shorter wooly hairs forming an . . . **8** . . . layer. The long hairs are oily and water-repellant and . . . **9** . . . the bear to shake off water when it emerges from a spell of . . . **10**

The principal thermal . . . **11** . . . comes from a 19-centimetre layer of fat (blubber) beneath the . . . **12** The thermal conductivity of fat is little different from any other . . . **13** . . . , but it has a limited blood supply. This means that very little warm blood . . . **14** . . . close to the skin surface.

The hollow hairs of the white fur are thought . . . **15** . . . the sun's heat to the black skin below. Black is an efficient colour for . . . **16** . . . heat. The white colour is also probably an effective camouflage when hunting its . . . **17** . . . , mainly seals.

A specific adaptation to . . . **18** . . . on snow and ice is the heat-exchange arrangement in the limbs. The arteries . . . **19** . . . the feet run very close to the veins returning . . . **20** . . . to the heart. Heat from the arteries is transferred to the veins before the blood . . . **21** . . . the feet. So, little heat is lost from the feet but their temperature is maintained above . . . **22** . . . point, preventing frostbite.

The polar bear . . . **23** . . . in winter when temperatures fall well below zero. However, the pregnant female excavates a . . . **24** . . . in the snow in which . . . **25** . . . birth and rear her two cubs. In this way the cubs are protected from the extreme cold. The female . . . **26** . . . in the den for about 140 days, suckling her young on the rich milk which is . . . **27** . . . from her fat reserves.

4. Give the terms corresponding to the following definitions.

1. Plants and trees.
2. Process in which the plant produces chemical energy from water, minerals, and carbon dioxide with the aid of pigments and the radiant energy of the Sun.
3. The process of the transfer of pollen from the anthers to the stigma.
4. The system that anchors the plant and absorbs water and minerals from the soil.
5. An enzyme co-factor important in making plant cell walls.
6. Animals without backbones.
7. Any member of a group of vertebrate animals in which the young are nourished with milk from special secreting glands of the mother.
8. Any of the most numerous of existing mammals, characterized by upper and lower pairs of ever-growing rootless incisor teeth.

5. Describe any plant. Do not forget to mention the plant's

- appearance;
- habitat;
- feeding habits;
- way of reproduction.

6. Translate into English.

Приручение и одомашнивание млекопитающих, начатое в глубокой древности, продолжается и сейчас. Полностью одомашненными можно считать те виды, которые хорошо подчиняются человеку и свободно размножаются в неволе. Таковы, например, собака, лошадь, рогатый скот и многие другие. Однако бывает и так, что одно из

указанных выше условий не выполняется. Тысячелетия назад были приручены слоны, которые послушно выполняют разнообразные работы. Но в неволе слоны практически не размножаются. Львы и тигры хорошо размножаются в неволе, но не привыкают к человеку и не могут считаться одомашненными животными. В малой степени одомашнены некоторые пушные звери, хотя в клетках они успешно размножаются. Таковы песцы, лисицы, норки, соболи и некоторые другие. Пушное звероводство возникло менее ста лет назад, и число видов, разводимых в неволе, продолжает увеличиваться. Сравнительно недавно стали разводить норок и шиншилл. Однако в результате направленного подбора и отбора, зная законы наследования признаков, за короткий срок удалось вывести ряд новых пород. Таковы, например, серебристо-черная лисица и разнообразные цветные породы норок.

TEST 4 (UNITS 10—12)

1. Using different prefixes and suffixes, create new words.

Consume, cell, solution, respect, characterize, modify, science, relative, compose, stable, direct, produce.

2. Match the verbs to the nouns to construct word combinations. Use three of these word combinations in your own sentences.

to classify	a challenge
to propose	a compromise
to meet	food
to formulate	a reputation
to build	spores
to eliminate	yield
to infect	a disease
to collect	attitudes
to expel	grain
to obtain	concepts
to seek	animals
to reduce	a theory
to consider	plants
to provide	nutrients

3. Complete the text with the words from the box.

*enzymes RNA replication multicellular species unfolding
to mean closely prokaryotes similar translation genetic
fungi nucleic replicating celled studying independently
eukaryotes evidence capabilities include transcription*

A Brief History of Life

Biologists . . . **1** . . . evolution do a variety of things: population geneticists study the process as it is occurring; systematists seek to determine relationships between . . . **2** . . . , and paleontologists seek to uncover details of the . . . **3** . . . of life in the past. Discerning these details is often difficult, but hypotheses can be made and tested as new . . . **4** . . . comes to light.

The first . . . **5** . . . molecules were most likely RNA. RNA is a . . . **6** . . . acid similar to DNA. In laboratory studies it has been shown that some RNA sequences have catalytic . . . **7** Most importantly, certain RNA sequences act as polymerases — . . . **8** . . . that form strands of RNA from its monomers. This process of self- . . . **9** . . . is the crucial step in the formation of life. This is called the RNA world hypothesis.

The common ancestor of all life probably used RNA as its . . . **10** . . . material. This ancestor gave rise to three major lineages of life. These are: the . . . **11** . . . ('ordinary' bacteria), archaeobacteria (thermophilic, methanogenic and halophilic bacteria) and eukaryotes. Eukaryotes . . . **12** . . . protists (single- . . . **13** . . . organisms like amoebas and diatoms and a few . . . **14** . . . forms such as kelp), . . . **15** . . . (including mushrooms and yeast), plants and animals.

Eukaryotes and archaeobacteria are the two most . . . **16** . . . related of the three. The process of . . . **17** . . . (making protein from the instructions on a messenger RNA template) is . . . **18** . . . in these lineages, but the organization of the genome and . . . **19** . . . (making messenger RNA from a DNA template) is very different in prokaryotes than in . . . **20** . . . and archaeobacteria. Scientists interpret this . . . **21** . . . that the common ancestor was RNA-based; it gave rise to two lineages that . . . **22** . . . formed a DNA genome and hence independently evolved mechanisms to transcribe DNA into . . . **23**

4. Explain the relationship between the following words.

1. fungus — yeast
2. mold — penicillin
3. Darwin — evolution
4. Lamarck — transformism
5. ecosystem — pond
6. food chain — detritus pathway

5. Describe any ecosystem.

6. Translate into English.

Грибы широко распространены и обитают почти во всех климатических районах. Грибы можно обнаружить в почве, пресной и соленой воде. Благодаря огромному разнообразию и исключительной способности к выживанию в разных климатических условиях грибы распространены повсеместно. Они сохраняют жизнеспособность даже при

низкой температуре. Их мало лишь в засушливых и высокогорных районах, где недостаточно влаги и кислорода.

Грибы, обитающие в домах, часто служат причиной круглогодичных аллергических заболеваний. В жилых помещениях грибов особенно много в старой мебельной обивке, комнатных увлажнителях воздуха, на занавесках для душа, сантехнике, в мусорных баках, пищевых отходах, сырых подвалах.

По типу питания грибы делятся на грибы-сапрофиты и грибы-паразиты. По морфологическим признакам все грибы делятся на грибы дрожжевые и грибы мицелиальные. Плесень — это расположенные на поверхности питательного субстрата органы размножения разных видов грибов.

Грибы — это обособленная группа одноклеточных (часто микроскопических) или многоклеточных, разнообразных по размерам и строению гетеротрофных организмов. У большинства вегетативное тело (мицелий) состоит из системы тонких ветвящихся нитей (гиф), растущих в длину и развивающихся на поверхности или внутри питательного субстрата. Ценность грибов как питательного продукта определяется наличием веществ, характерных для пищи как животного, так и растительного происхождения.

TEST 5 (UNITS 13—15)

1. Write synonyms and antonyms to the following words.

	Synonym	Antonym
predator		
abundant		
to emit		
strong		
sheer		
to alter		
outer		
to begin		
influential		
obvious		

2. Make questions out of the given words. Then answer them.

1. extinction | when | occur | does?
2. functions | are | forests | what | the main | of?

3. prey | inconspicuous | what | predators | and | features | to render | do | have?
4. environment | adapted | what | to | of | is | the camel | kind?
5. conservation | do | wildlife | include | what | techniques?
6. extinction | the world | mammals | has | through | how many | lost?

3. Complete the text with the words from the box.

*contain over lineages referred to threatened to be
since natural terrestrial times extinctions disappeared
estimated increasingly occur continents to survive history
current geological expected appeared
broadleaf located immortal*

Species Extinction. A Natural—and Unnatural—Process

The world is, and always has been, in a state of flux. Over hundreds of millions of years, . . . **1** . . . have broken apart, oceans . . . **2** . . . , mountains formed and worn away. With . . . **3** . . . change come changes in living things: species and populations disappear, and new ones emerge.

Extinction is therefore a . . . **4** . . . process. According to the fossil record, no species has yet proved . . . **5** . . . ; as few as 2—4 percent of the species that have ever lived are believed . . . **6** . . . today. The remainder are extinct, the vast majority having . . . **7** . . . long before the arrival of humans.

But the rapid loss of species we are seeing today is . . . **8** . . . by experts to be between 1,000 and 10,000 . . . **9** . . . higher than the “background” or natural extinction rate (a highly conservative estimate). Unlike the mass extinction events of geological history, the . . . **10** . . . extinction phenomenon is one for which a single species—ours—appears almost wholly responsible. This is often . . . **11** . . . as “the sixth extinction crisis,” after the five known extinction waves in geological . . . **12** . . .

The number of species known to be . . . **13** . . . with extinction has topped 16,928. Most threatened species . . . **14** . . . in the tropics, especially on mountains and on islands. Most threatened birds, mammals, and amphibians are . . . **15** . . . in Central and South America; Africa south of the Sahara; and tropical South and Southeast Asia. These realms . . . **16** . . . the tropical and subtropical moist . . . **17** . . . forests that are believed to harbor the majority of the Earth’s living . . . **18** . . . and freshwater species. Therefore, the patterns shown for mammals, birds, and amphibians are likely . . . **19** . . . most terrestrial taxonomic groups.

Extinctions are becoming . . . **20** . . . common on continents. While the vast majority of extinctions . . . **21** . . . 1500 A. D. have occurred on oceanic islands, continental extinctions are now as common as island . . . **22** Roughly 50 percent of extinctions . . . **23** . . . the past 20 years occurred on continents.

4. Explain the relationship between the following words.

1. extinction — deforestation
2. biodiversity — ecosystem
3. community — competition
4. mimicry — king snake
5. wildlife — sanctuary
6. pollution — global warming

5. Give terms corresponding to the following definitions.

1. The death of species.
2. The temporary or permanent removal of forests.
3. All the interacting populations within the ecosystem.
4. The process by which two interacting species act as agents of natural selection for one another over evolutionary time.
5. The example of community interactions.
6. A situation in which a species evolves to resemble something else.
7. An animal adapted to survive in a hot, dry and sandy environment.
8. Limits on the number of animals that can be taken by an individual hunter, fisher, or trapper.
9. The regulation of wild animals and plants in such a way as to provide for their continuance as a natural resource.
10. The area where animals feed, rest, and breed.

6. Translate into English.

Ирбис принадлежит к слабо изученным видам. Его ареал в России составляет 2—3 % современного мирового ареала, а численность — около 2 % от общей численности вида.

Среди крупных кошачьих ирбис — единственный постоянный обитатель гор Центральной Азии. Занимая верхний трофический уровень в экосистемах, он может служить своего рода видом-флагманом в отношении сохранения всего животного мира центральноазиатских высокогорий. Выживание этой редкой кошки в сильно нарушенных и деградирующих горных экосистемах крайне затруднительно или невозможно. Соответственно, сохранение жизнеспособных популяций ирбиса неизбежно сопряжено с эффективной охраной среды его обитания в целом.

В силу труднодоступности местообитаний и низкой плотности вида до сих пор слабо исследованными остаются такие важнейшие аспекты биологии ирбиса, как структура ареала, способность к расселению, сезонные перемещения, питание и охотничье поведение (в частности, степень пищевой специализации, в том числе состав и доля в добыче домашних животных), структура популяций, численность, размеры индивидуальных участков, суточный ход и многие другие, что затрудняет разработку адекватных мер охраны.

Grammar Tests

TEST 1

Present Forms of the Verb (1)
Present Forms of the Verb (2)
Past Forms of the Verb

1. Put the verbs in brackets into the Present, Past, Future Simple; the Past Continuous or the Present Perfect Passive Tense.

Sir Walter Raleigh . . . **1** . . . (be) an English traveler who . . . **2** . . . (live) in England in the days of Queen Elizabeth. He . . . **3** . . . (sail) across the seas to America in search of new lands. He . . . **4** . . . (bring) to England two very important plants: the tobacco plant and the potato plant.

When he . . . **5** . . . (be) in America, he . . . **6** . . . (learn) to smoke from the Indians.

When he . . . **7** . . . (be) back in England, he . . . **8** . . . (sit) one day in his room by the fire smoking a pipe. His old servant who . . . **9** . . . (know) nothing about tobacco or smoking, suddenly . . . **10** . . . (come) in the room and . . . **11** . . . (see) the smoke coming out of his master's mouth. He . . . **12** . . . (be) frightened; he . . . **13** . . . (think) Sir Raleigh . . . **14** . . . (be) on fire. He . . . **15** . . . (rush) out of the room, . . . **16** . . . (get) some water and . . . **17** . . . (throw) it all over his master before Sir Walter . . . **18** . . . (can) explain that he simply . . . **19** . . . (smoke).

Sir Raleigh . . . **20** . . . (bring) the potato to his country because he . . . **21** . . . (want) the people to learn how to grow potatoes. He . . . **22** . . . (say): "When the harvest . . . **23** . . . (be) poor, there . . . **24** . . . (be) no bread and we . . . **25** . . . (be) all hungry. You . . . **26** . . . (be) never hungry if you . . . **27** . . . (grow) potatoes." But people . . . **28** . . . (not like) potatoes. Nobody . . . **29** . . . (want) to eat them because nobody . . . **30** . . . (know) how to cook them.

After many years a Frenchman . . . **31** . . . (find) the best way of growing and cooking the potato. People . . . **32** . . . (begin) to eat potatoes and . . . **33** . . . (find) them good. Since that time more and more potatoes . . . **34** . . . (be grown) and . . . **35** . . . (be eaten) in Europe. The potatoes . . . **36** . . . (become) one of the most important and useful vegetables.

TEST 2

1. Future Forms of the Verb.

Put the verbs in brackets into the Future Simple, the Future Continuous or the Future Perfect Tense.

1. What we (do) to slow global warming?
2. How we (cope) with the changes we've already set into motion?
3. Different communities (make) different decisions about how to put us on a path towards a stable climate.
4. A wholesale commitment to only one practice (mean) inevitable food shortages for a world population expected to exceed 8 billion by the year 2030.
5. There (be) an oil shortage because fuel resources have been overexploited for years.
6. Videogames (be) much more absorbing than they are now: you really (live) the adventure you are playing.
7. Your shopping (deliver) to your door during the day.
8. Everything you buy (pay) for through a computer.
9. How our lives (effect) by advances in medicine?
10. How the problem of pollution (solve)?

2. Articles.

Put *a/an, the* or nothing into the gaps.

Fireflies

Fireflies are familiar, but . . . **1** . . . few people realize that these . . . **2** . . . insects are actually beetles, nocturnal members of . . . **3** . . . family Lampyridae. Most fireflies are winged, which distinguishes them from other luminescent insects of . . . **4** . . . same family, commonly known as glow-worms.

There are about 2,000 firefly species. These insects live in . . . **5** . . . variety of warm environments, as well as in . . . **6** . . . more temperate regions, and are . . . **7** . . . familiar sight on . . . **8** . . . summer evenings. Fireflies love . . . **9** . . . moisture and often live in . . . **10** . . . humid regions of Asia and the Americas. In drier areas, they are found around wet or damp areas that retain . . . **11** . . . moisture.

Everyone knows how fireflies got their name, but many people don't know how . . . **12** . . . insects produce their signature glow. Fireflies have dedicated . . . **13** . . . light organs that are located under their abdomens. . . . **14** . . . insects take in . . . **15** . . . oxygen and, inside special cells,

combine it with . . . **16** . . . substance called . . . **17** . . . luciferin to produce . . . **18** . . . light with almost no heat.

Firefly light is usually intermittent, and flashes in . . . **19** . . . patterns that are unique to each species. Each blinking pattern is . . . **20** . . . optical signal that helps fireflies find . . . **21** . . . potential mates. Scientists are not sure how . . . **22** . . . insects regulate this process to turn their lights on and off.

Firefly light may also serve as . . . **23** . . . defense mechanism that flashes . . . **24** . . . clear warning of . . . **25** . . . insect's unappetizing taste. . . . **26** . . . fact that even larvae are luminescent lends support to this theory.

Females deposit their eggs in . . . **27** . . . ground, which is where . . . **28** . . . larvae develop to . . . **29** . . . adulthood. Underground larvae feed on . . . **30** . . . worms and slugs by injecting them with . . . **31** . . . numbing fluid.

Adults despise such prey and typically feed on . . . **32** . . . nectar or . . . **33** . . . pollen, though some adults do not eat at all.

3. Countable and Uncountable Nouns.

Put in proper forms of the words in brackets, add *much, many, few, little*, if necessary.

1. Temperate grasslands, which average between 25 and 75 centimetres of rain per year, have shorter (grass) than south ones, sometimes just (millimetre).
2. There are grazing animals like (gazelle) and (deer); burrowing animals such as (mouse) and (rabbit); and predators such as (snake) and (coyote).
3. (many) of the North American prairielands have been converted into one of the richest agricultural regions on Earth.
4. The (plant) and (animal) that live in the harsh conditions of the tundra are essentially clinging to life.
5. Cities make (sense) for humans.
6. The heart pumps (blood) through the body.
7. I'm sure you'll get the job. You have (experience).
8. I need your (advice).
9. To observe birds you need (patience).
10. There is (time) before the lesson starts, let's go to the canteen.

- +1
- 2
- 3
- 4
- 5
- 6
- 7
- 8

TEST 3

Degrees of Comparison Conditionals Infinitive

1. Degrees of Comparison.

Use the words in brackets to complete the sentences.

1. (large) hot desert in the world, Northern Africa's Sahara, reaches temperatures of up to 50 degrees Celsius during the day.
2. These areas exist under a moisture deficit, which means they can frequently lose (much) moisture through evaporation than they receive from annual precipitation.
3. Deserts cover (much) than one-fifth of the Earth's land, and they are found on every continent.
4. A place that receives (little) than 25 centimetres of rain per year is considered a desert.
5. (dry) deserts get (little) than one centimeter of precipitation each year, and that is from condensed fog, not rain.
6. (much) desert birds are nomadic, crisscrossing the skies in search of food.
7. (high) temperatures may produce an increasing number of wildfires that alter desert landscapes by eliminating slow-growing trees and shrubs and replacing them with fast-growing grasses.
8. Tundras are among Earth's (cold), (harsh) biomes.
9. This allows the government and others to provide more service such as water, electricity and transportation to a (large) number of people.
10. Schools and shops in cities are (much) easily accessible than in rural areas.

2. Conditionals.

Use the verbs in brackets in the correct form.

1. There (be) no life without water.
2. If I (have) this book, I (give) it to you.
3. If I (have) time, I (complete) the experiment.
4. Unless computer techniques (develop), space research never (make) such great progress.
5. Even if we (stop) emitting greenhouse gases (GHGs) today, the Earth still (warm) by another degree Fahrenheit or so.
6. A commonly cited goal is to stabilize GHG concentrations around 450—550 parts per million. This is the point at which many be-

lieve the most damaging impacts of climate change (be) avoided.

3. Infinitive and Gerund.

Use the verbs in brackets in the correct form.

1. A lysogenic bacterial culture can be treated with radiation or mutagens, (induce) the cells (begin) producing viruses and lyse.
2. Highly voracious predators, salamanders emerge from their burrows at night (feed) on worms, insects, frogs and even other salamanders.
3. During the day these insects move little and are nearly impossible (distinguish) from the background they imitate, and that, of course, is the point: (remain) invisible to sharp-eyed predators that use vision (hunt).
4. (specialize) in zooarchaeology, the scientist has helped (launch) a new line of research.
5. After (take) precise measurements and (catalogue) her findings, she created a gallery for the collection.
6. A virus infects a bacterial cell by (attach) to the bacterial cell wall by its tail.
7. In coliphages the tail is a complex protein structure (consist) of a hollow contractile sheath, with a plate at the base that contains long protein fibres.
8. Every human alive today shares one common ancestor (arise) from Africa between fifty thousand and two hundred thousand years ago.
9. Over time, different groups of people, or haplogroups, made a decision (embark) on an epic journey (find) new places (live).
10. Grasslands in the southern hemisphere tend (get) more precipitation than those in the northern hemisphere.

TEST 4

Modals Emphasis Passive

1. Modals.

Insert the verbs from the box in the correct form.

<i>may not able to can might have been be able to</i>

1. Desert plants have to go without fresh water for years at a time.
2. Many desert plants live to be hundreds of years old.
3. The pounding of the soil by the hooves of livestock degrade the soil and encourage erosion by wind and water.
4. By 2050, a third of the people on Earth lack a clean, secure source of water.
5. These areas have two seasons: a growing season and a dormant season. During the dormant season, no grass grow because it is too cold.
6. Grasses survive fires because they grow from the bottom instead of the top.
7. In the tropics, each canopy tree release about 200 gallons (760 litres) of water each year.
8. Shrubs and spruce that previously take root on the permafrost now dot the landscape, potentially altering the habitat of the native animals.
9. Many cities in developing countries in particular are growing too rapidly for their own good, with many residents find jobs and forced to live in slums.
10. Scientists think there a cooling in the Earth's atmosphere during the Late Cretaceous Period.

2. Emphasis.

Translate and underline the Emphatic Constructions.

1. Written in our mitochondrial DNA (mtDNA) is the story of our great ancestors—from their origins in Africa to their wondrous journeys around the world.
2. Today the animal mummies are one of the most popular exhibits in the whole treasure-filled museum. Visitors of all ages, Egyptians and foreigners, press in shoulder to shoulder to get a look. Behind glass panels lie cats wrapped in strips of linen that form diamonds, stripes, squares and crisscrosses.
3. Can you guess what did happen? Animals moved out of the water onto the land. The first creatures that crawled out onto the swampy shore were not yet entirely of land animals. They were amphibians which means that they had to spend some of their life in the water.
4. They had long slim bodies and well-developed tails. They had lungs with which to breathe air and legs that could support them on solid ground. They were also too good swimmers and have spent a great deal of their time in the water, eating small fish.
5. Now, whenever the droughts were very severe and some of the ponds and rivers dried up completely, many the fish died off. But the amphibians stayed alive because they could use their legs to walk to another spot where there was some water on left.

3. Passive.

Use the verbs in brackets in the correct form.

1. The bacteriophages (discover) independently by the microbiologists F. W. Twort (1915) and Félix d'Hérelle (1917).
2. The phages much (use) in the study of bacterial genetics and cellular control mechanisms largely because the bacterial hosts so easily (grow) and (infect) with phage in the laboratory.
3. Phages (use) in an attempt to destroy bacteria that cause epidemic diseases, but this approach largely (abandon) in the 1940s when antibacterial drugs became available.
4. The possibility of “phage therapy” recently (attract) new interest among medical researchers, however, owing to the increasing threat posed by drug-resistant bacteria.
5. Bluebirds (consider) fairly common, but their numbers have declined substantially during the last century.
6. Bird populations (give) a boost by the birdhouse boxes that have become popular in many parks and backyards.
7. By the end of the Age of Fishes the land (cover) with tree-fern forests.
8. Lysis can readily (observe) in bacteria growing on a solid medium, where groups of lysed cells appear as clear areas.
9. The world’s semi-arid regions are turning into desert at an alarming rate. This process, known as “desertification,” (not cause) by drought, but usually arises from the demands of human populations that settle on the semi-arid lands to grow crops and graze animals.
10. Many trees and plants, like orchids, (remove) from the rain forest and cultivated.
11. Brazil nut tree (pollinate) by bees that also visit orchids, and its seeds (spread) by the agouti, a small tree mammal.

TEST 5

Sequence of Tenses Reported Speech Linking Words
--

1. Sequence of Tenses.

Use the verbs in brackets in the correct form.

1. I (catch) a cold, so I didn’t take part in the seminar.
2. She said she (is going) away for a few days and (phone) me when she (get) back.
3. He decided to put down the conversation he (hear).

4. The conversation ended, and the people who (are sitting) in the room, (leave).
5. He left in a hurry because the train (leave) in ten minutes.
6. He looked so level-headed that nobody could imagine he (commit) suicide.
7. He came up with the theory that a large asteroid from outer space (hit) the Earth 65 m years ago.
8. While less than one-third of the world's population (live) in cities in 1950, about two-thirds of humanity is expected to live in urban areas by 2030.
9. Urban expansion is also encroaching on wildlife habitats everywhere. Increasingly people live and work in close proximity to wild animals whose native habitats (lose) or (break up).
10. A cold wind was blowing across the plain, the once green world (fade) into a lifeless grey.

2. Reported Speech.

Rewrite the following passage in the Reported Speech, using expressions *John said, told us, asked etc.*

I have been working all night long. I had to write an article, which had to be ready early this morning. I finished at 2 o'clock and took it to the University. Would you like to see my article? Do you think you will be interested in the bacteriophages? Ok, then, I'll e-mail it to you today.

Then I went to sleep for a couple of hours. I got up at half past three, had a shower and a cup of coffee and went to the University again. Now, let's have a quick lunch together, and then I have to meet someone for an interview. Is it OK for you?

3. Linking words.

Complete the sentences with the verbs from the box.

*as well though due to while except yet
among other things in fact because of however
despite also including owing to*

1. There's recent evidence, , suggesting that over time, sustainably farmed lands can be as productive as conventional industrial farms.
2. This system, with its reliance on monoculture, mechanization, chemical pesticides and fertilizers, biotechnology, and government subsidies, has made food abundant and affordable, , the ecological and social price has been steep: erosion; depleted and contaminated soil and water resources; loss of biodiversity; deforestation; labor abuses; and the decline of the family farm.
3. Critics of sustainable agriculture claim, , that its methods result in lower crop yields and higher land use.

4. more than one billion people, one-sixth of the Earth's population, actually live in desert regions.
5. And the common conceptions of deserts as dry and hot, there are cold deserts
6. their very special adaptations, desert animals are extremely vulnerable to introduced predators and changes to their habitat.
7. Global warming threatens to change the ecology of desert.
8. Central Eurasian grasslands are referred to as steppes, in Africa they're named savannas.
9. , most grasslands are located between forests and deserts.
10. Grasslands are generally open and fairly flat, and they exist on every continent Antarctica.
11. Some rain forests, the Amazon, began experiencing drought in the 1990s, possibly deforestation and global warming.

TEST KEY

ОТВЕТЫ К ТЕСТАМ

Many of the answers will depend on students' particular knowledge. It is only possible for the key to suggest answers in some cases.

Tests to the Lexical Module

TEST 1 (UNITS 1—3)

1.

Singular	Plural
genus	genera
species	species
bacterium	bacteria
nucleus	nuclei
phylum	phyla
bacillus	bacilli
amphibian	amphibian
mitochondrion	mitochondria

2.

Generic name, terrestrial animals/habitats/organisms, breeding pond, temporary paralysis, extracellular membrane, poisonous fluid, scientific experiment, cold-blooded organisms, freezing point/fluid, mucous secretion, aquatic, habitats/organisms.

3.

1. living; 2. classify; 3. classification; 4. features; 5. kingdom; 6. order; 7. species; 8. scientists; 9. share; 10. defined; 11. capable of; 12. offspring; 13. to breed; 14. reproduce; 15. to sort; 16. to identify; 17. are sorted.

4.

1. taxonomy; 2. classification; 3. heat; 4. nucleous; 5. flagella; 6. drought; 7. infection; 8. disease; 9. amphibian; 10. hibernation.

TEST 2 (UNITS 4—6)

1.

Singular	Plural
larva	larvae
pupa	pupae
antenna	antennae
ganglion	ganglia
trachea	tracheae
fungus	fungi
operculum	opercula
stimulus	stimuli
aquarium	aquaria

2.

1. chitinous; 2. natural; 3. colourful; 4. horny; 5. nervous; 6. sensible, sensitive, senseless; 7. cartilaginous; 8. parasitic; 9. rudimental.

3.

1. enjoyable; 2. physical; 3. hobby; 4. experienced; 5. species; 6. migration; 7. landscaping; 8. comparison; 9. eyesight; 10. supplies; 11. affordable; 12. suitable; 13. seeds; 14. scraps; 15. hawks; 16. gulls; 17. to distinguish; 18. spotting; 19. to improve; 20. birder; 21. rare; 22. to identify; 23. brighten; 24. wild; 25. recreational.

4.

1. insects; 2. spiracles; 3. bill, beak; 4. Ichthyology; 5. ametabolous; 6. holometabolous; 7. feature; 8. nest; 9. eagle.

5.

1. operculum (gill cover); 2. lateral line; 3. dorsal fin; 4. fat fin; 5. caudal peduncle; 6. caudal fin; 7. anal fin; 8. photophores; 9. pelvic fins (paired); 10. pectoral fins (paired).

TEST 3 (UNITS 7—9)

1.

- to nourish **with** milk
- to distinguish **between** features
- to develop **in/within** the womb
- to attach **to** the body
- to attribute **to** the ability
- to range **in** size
- to result **into** diseases
- to live **along** the coasts
- to contaminate **with** waste
- to damage **by** gnawing
- to associate **with** humans
- to move **through/in** the water

- | | |
|--------------------------------------|---|
| 7. to arrange within families | 19. to breathe with the blowhole |
| 8. to depend on/upon mammals | 20. to dive into the water |
| 9. to hunt for sport | 21. to float on the surface |
| 10. to expell from the cavity | 21. to carry in the womb |
| 11. to compete for food | 22. to convert into signals |
| 12. to prey in herds | 23. to refer to the body mass |

2.

Salivary glands, radiant energy, digestive tract, direct contact, flattened tip, marine world, wide range, reproductive/nervous system, gill slits, numerous species, fresh water.

3.

1. spending; 2. features; 3. environment; 4. relatively; 5. relatives; 6. reduces; 7. skin; 8. insulating; 9. enable; 10. swimming; 11. insulation; 12. coat; 13. tissue; 14. circulates; 15. to transmit; 16. absorbing; 17. prey; 18. walking; 19. supplying; 20. blood; 21. reaches; 22. freezing; 23. breeds; 24. den; 25. to give; 26. remains; 27. formed.

4.

1. vegetation; 2. photosynthesis; 3. pollination; 4. roots; 5. cellulose; 7. invertebrates; 8. mammal; 9. rodent.

TEST 4 (UNITS 10—12)

2.

To classify animals/concepts, to propose a theory/a compromise, to meet a challenge, to formulate concepts/a theory, to build a reputation, to eliminate a disease, to infect plants/grain, to collect grain, to expel spores, to obtain nutrients, to seek a compromise, to reduce yield, to consider attitudes/a theory, to provide food/nutrients.

3.

1. studying; 2. species; 3. unfolding; 4. evidence; 5. replicating; 6. nucleic; 7. capabilities; 8. enzymes; 9. replication; 10. genetic; 11. prokaryotes; 12. include; 13. celled; 14. multicellular; 15. fungi; 16. closely; 17. transcription; 18. similar; 19. translation; 20. eukaryotes; 21. to mean; 22. independently; 23. RNA.

TEST 5 (UNITS 13—15)

1.

	Synonym	Antonym
predator	carnivore	prey
abundant	plentiful	poor, short

	Synonym	Antonym
to emit	radiate	attract, gather
strong	powerful	weak
sheer	pure	mixed
to alter	change	preserve
outer	outside	inner
to begin	start	finish
influential	crucial	unimportant
obvious	evident	enigmatic, unclear

2.

1. When does extinction occur?
2. What are the main functions of forests?
3. What features do predators and prey have to render inconspicuous?
4. What kind of environment is the camel adapted to?
5. What do wildlife conservation techniques include?
6. How many mammals has the world lost through extinction?

3.

1. continents; 2. appeared; 3. geological; 4. natural; 5. immortal; 6. to survive; 7. disappeared; 8. estimated; 9. times expected; 10. current; 11. referred to; 12. history; 13. threatened; 14. occur; 15. located; 16. contain; 17. broadleaf; 18. terrestrial; 19. to be; 20. increasingly; 21. since; 22. extinctions; 23. over.

5.

1. extinction; 2. deforestation; 3. constituents; 4. co-evolution; 5. predation/parasitism/competition; 6. mimicry; 7. camel; 8. baglimits; 9. restocking; 10. sanctuary.

Grammar Tests

TEST 1

1. was; 2. lived; 3. sailed; 4. brought; 5. was; 6. learned/learnt; 7. was; 8. was sitting; 9. had known; 10. came; 11. saw; 12. was; 13. thought; 14. was; 15. rushed; 16. got; 17. threw; 18. could; 19. was smoking; 20. brought; 21. wanted; 22. said; 23. is; 24. will be; 25. will be; 26. will;

27. grow; 28. did not like; 29. wanted; 30. knew; 31. found; 32. began; 33. found; 34. have been grown; 35. eaten; 36. have become.

TEST 2

1.

1. will/shall do; 2. will/shall do; 3. will make/will be making; 4. will mean; 5. will be; 6. will be, will live; 7. will be delivered/will have been delivered; 8. will be paid; 9. will be effected; 10. will be solved.

2.

Fireflies

Fireflies are familiar, but few people realize that these insects are actually beetles, nocturnal members of **the** family Lampyridae. Most fireflies are winged, which distinguishes them from other luminescent insects of **the** same family, commonly known as glowworms.

There are about 2,000 firefly species. These insects live in **a** variety of warm environments, as well as in more temperate regions, and are **a** familiar sight on summer evenings. Fireflies love moisture and often live in humid regions of Asia and the Americas. In drier areas, they are found around wet or damp areas that retain moisture.

Everyone knows how fireflies got their name, but many people don't know how **the** insects produce their signature glow. Fireflies have dedicated light organs that are located under their abdomens. **The** insects take in oxygen and, inside special cells, combine it with **a** substance called luciferin to produce light with almost no heat.

Firefly light is usually intermittent, and flashes in patterns that are unique to each species. Each blinking pattern is **an** optical signal that helps fireflies find potential mates. Scientists are not sure how **the** insects regulate this process to turn their lights on and off.

Firefly light may also serve as **a** defense mechanism that flashes **a** clear warning of **the** insect's unappetizing taste. **The** fact that even larvae are luminescent lends support to this theory.

Females deposit their eggs in **the** ground, which is where **the** larvae develop to adulthood. Underground larvae feed on worms and slugs by injecting them with **a** numbing fluid.

Adults despise such prey and typically feed on nectar or pollen, though some adults do not eat at all.

3.

1. much shorter, few millimetres
2. many gazelles and deer, many mice and rabbits, many snakes and coyotes
3. much

4. few plants and animals
5. much sense
6. much blood
7. much experience
8. advice
9. much patience
10. much, a little

TEST 3

1.

1. the largest; 2. more; 3. more; 4. less; 5. the driest, less; 6. most; 7. higher; 8. coldest, harshest; 9. larger; 10. more.

2.

1. would be; 2. have/had/had had, will/would give/would have given; 3. have/had/had had, will/would complete/would have completed; 4. are/were developed, will/would never make; 5. stop/stopped, will/would warm; 6. will/would be.

3.

1. inducing, to begin; 2. to feed; 3. to distinguish, to remain, to hunt/hunting; 4. specializing, to launch; 5. taking, cataloguing; 6. attaching; 7. consisting; 8. arising; 9. to embark, to find, to live; 10. to get.

TEST 4

1.

1. may; 2. may; 3. can/may; 4. may; 5. is able to; 6. may/can; 7. may/can; 8. were able to; 9. not able to; 10. might have been.

2.

1. is the story; 2. lie cats; 3. did happen; 4. too; 5. many the fish.

3.

1. were discovered; 2. are much used, are so easily grown, infected; 3. were used, was largely abandoned; 4. has recently attracted; 5. are considered; 6. was given; 7. was/had been covered; 8. can be readily observed; 9. is not caused; 10. are removed; 11. is pollinated, are spread.

TEST 5

1.

1. caught; 2. was going, would phone, got; 3. had heard; 4. were sitting, left; 5. was leaving; 6. would commit; 7. hit; 8. lived; 9. are lost or broken up; 10. faded.

2.

John told us he **had been working** all night long. He said he **had/had had to** write an article, which had to be ready early next morning. He said he **finished/had finished** at 2 o'clock and **took/had taken** it to the University. John asked if I **wanted** to see his article. He asked if I **was interested** in the bacteriophages and **promised** to e-mail the article to me this day.

John said he **went/had gone** to sleep for a couple of hours. He said he got up at half past three, had a shower and a cup of coffee and went to the University again. He suggested having a quick lunch together before he was to meet someone for an interview. John asked if it was OK for me.

3.

1. among other things; 2. however; 3. though; 4. in fact; 5. while/despite, as well; 6. due to; 7. also/however; 8. while; 9. however/yet; 10. except; 11. including, because of/due to/owing to.

GLOSSARY

СЛОВАРЬ

A

abandon <i>v.</i>	отвергать	anchor <i>n.</i>	якорь
abdomen <i>n.</i>	брюшко	anchor <i>v.</i>	укоренять, ставить на якорь
abundant <i>adj.</i>	изобильный	ant <i>n.</i>	муравей
accept <i>v.</i>	принимать, одобрять	ape <i>n.</i>	человекообразная обезьяна
according to <i>prep.</i>	в соответствии с	application <i>n.</i>	применение
acquire <i>v.</i>	приобретать	apply <i>v.</i>	применять; при- кладывать
adapt <i>v.</i>	приспосабли- вать(ся)	appreciate <i>v.</i>	ценить
adhere <i>v.</i>	прикреплять	armadillo <i>n.</i>	броненосец
advance <i>v.</i>	продвигать(ся)	arrange <i>v.</i>	устраивать, орга- низовывать
advancement <i>n.</i>	продвижение, прогресс	Arthropods <i>n.</i>	членистоногие
adverse <i>adj.</i>	враждебный	assess <i>v.</i>	оценивать
affect <i>v.</i>	воздействовать	assume <i>v.</i>	предполагать
afflict <i>v.</i>	поражать	assumption <i>n.</i>	предположение
aid <i>n.</i>	помощь	attain <i>v.</i>	достигать, полу- чать
aid <i>v.</i>	помогать	average <i>adj.</i>	средний, средне- статистический
ailment <i>n.</i>	заболевание	avoid <i>v.</i>	избегать
allow <i>v.</i>	позволять, разре- шать		
alter <i>v.</i>	вносить переме- ны		

B

backbone <i>n.</i>	позвоночник	blast <i>n.</i>	порыв, удар
barren <i>adj.</i>	голый, бесплод- ный	bountiful <i>adj.</i>	изобильный
bear <i>v.</i>	нести на себе	branch <i>n.</i>	ветвь
beaver <i>n.</i>	бобр	branch <i>v.</i>	ветвиться
beetle <i>n.</i>	жук	breath <i>n.</i>	дыхание
beg <i>v.</i>	просить, умолять	breathe <i>v.</i>	дышать
bill <i>n.</i>	клюв	breed <i>v.</i>	размножить(ся)
bivalve <i>adj.</i>	двустворчатый	brink <i>n.</i>	грань, край
blade <i>n.</i>	лезвие	broad <i>adj.</i>	широкий
		budding <i>n.</i>	почкование

bulk n. масса, объем
bumblebee n. шмель

burrow n. нора
burrow v. копать нору

C

captivate v. захватывать
cartilaginous adj. хрящевой
caterpillar n. гусеница
cavity n. полость; впадина
centipede n. многоножка
certain adj. определенный, данный
challenge n. вызов, трудности
chamber n. полость
cheetah n. гепард
chick n. птенец
chipmunk n. бурундук
clam n. двустворчатый моллюск
clinch v. сцеплять
cockroach n. таракан
common adj. общий, распространенный
complex adj. сложный
compound n. соединение
conceal v. скрывать
concern n. забота
concern v. беспокоиться
condition n. условие; состояние
conduct n. поведение; руководство

conduct v. проводить
cone n. шишка, конус
confine v. ставить пределы
confuse v. путать
confusion n. путаница
conifer n. хвойное дерево
consequent adj. последовательный
consider v. рассматривать; принимать во внимание

conspicuous adj. видный, заметный

constant adj. постоянный
constitute v. составлять
consume v. потреблять
consumption n. потребление
contaminate v. загрязнять
contraction n. сокращение

(*напр., мышцы*)

crust n. кора, корка
curb v. сдерживать, отсекать

current n. течение
current adj. текущий
cuttlefish n. каракатица

D

decay n. гниение
decay v. гнить
decompose v. разлагать(ся)
deliberate adj. намеренный
deplete v. истощать (*зapasы*)
deplore v. осуждать
deprive v. лишать (*чего. -л.*)
deserve v. заслуживать
deter v. сдерживать
deteriorate v. ухудшать(ся)
diminish v. уменьшать(ся)

discard v. выбрасывать
disease n. болезнь
disguise v. скрывать
disorder n. расстройство
disrupt v. разрушать
distinction n. отличие
distinguish v. отличать(ся)
diurnal adj. дневной
diverse adj. многообразный
division n. деление
domesticate v. одомашнивать
dormant adj. дремлющий

down *n.*
dragonfly *n.*
drought *n.*

пух
стрекоза
засуха

due to *prep.*
dweller *n.*

из-за; благодаря
обитатель

E

eagle *n.*
eel *n.*
eject *v.*
elaborate *adj.*
elaborate *v.*
eliminate *v.*
emerge *v.*

emit *v.*
encompass *v.*
endurance *n.*
endow *v.*
enhance *v.*
erratical *adj.*
estimate *v.*

орел
угорь
выталкивать
детальный
разрабатывать
устранять
появляться, воз-
никать
испускать
охватывать
выносливость
наделять, давать
усиливать
неравномерный
оценивать

evasive *adj.*
eventually *adv.*
exact *adj.*
exceed *v.*
excrete *v.*
exert *v.*

existence *n.*
expedient *adj.*
expel *v.*
exploit *v.*
extend *v.*
exterminate *v.*
extinct *v.*

уклончивый
в конце концов
точный
превосходить
выделять
влиять; приво-
дить в действие
существование
целесообразный
изгонять
использовать
расширять
искоренять
вымирать

F

familiar *adj.*
fare *n.*
fascinating *adj.*
feat *n.*
feat *adj.*
feather *n.*
feature *n.*
feed *v.*
fern *n.*
fertilize *v.*

fever *n.*
fin *n.*
firefly *n.*

знакомый
пища, корм
восхитительный
поступок
ловкий
перо
черта, свойство
кормить
папортник
удобрять; опло-
дотворять
лихорадка, озноб
плавник
светлячок

fission *n.*
flatworm *n.*
flee *v.*
flexible *adj.*
flock *n.*
flounder *n.*
flounder *v.*
flour *n.*
fold *n.*
fold *v.*
forage *v.*
fossil *n.*
fur *n.*

деление
плоский червь
убегать
гибкий
стая
камбала
барахтаться
мука
складка
складывать
питаться
ископаемое
мех

G

game farm *n.*
genus *n.*
germinate *v.*
gestation *n.*
gill *n.*
gland *n.*

заказник
род
прорастать
вызревание
жабра
железа

grasshopper *n.*
graze *v.*
grind *v.*
grouse *n.*
guinea pig *n.*

кузнечик
пастишь
перемалывать
куропатка
морская свинка

Н

habitat <i>n.</i>	место обитания
hagfish <i>n.</i>	миксина
hamster <i>n.</i>	хомяк
handle <i>n.</i>	рукоятка, ручка
handle <i>v.</i>	справляться
hare <i>n.</i>	заяц
harmful <i>adj.</i>	вредный
harvest <i>n.</i>	урожай
hatch <i>v.</i>	вылупляться; на- сживать
hawk <i>n.</i>	ястреб
hedgehog <i>n.</i>	еж
helical <i>adj.</i>	спиральный

I

illness <i>n.</i>	болезнь
image <i>n.</i>	образ
immature <i>adj.</i>	незрелый
impact <i>n.</i>	воздействие
impair <i>v.</i>	ухудшать
inhabit <i>v.</i>	населять, обитать
inhabitant <i>n.</i>	обитатель
inclination <i>n.</i>	склонность
include <i>v.</i>	включать в себя

J

jellyfish <i>n.</i>	медуза
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L

lack <i>v.</i>	отсутствовать
lamprey <i>n.</i>	минога
lark <i>n.</i>	жаворонок
leap <i>n.</i>	прыжок
limb <i>n.</i>	конечность
lineage <i>n.</i>	потомство; про- исхождение

M

maggot <i>n.</i>	личинка насеко- мого
magnitude <i>n.</i>	величина
maintain <i>v.</i>	поддерживать
malady <i>n.</i>	болезнь
margin <i>n.</i>	край, кромка
marmot <i>n.</i>	сурок

herd <i>n.</i>	стадо
herd <i>v.</i>	пасти
herring <i>n.</i>	сельдь
hinge <i>n.</i>	петля, шарнир
hollow <i>adj.</i>	полый, пустой
hoofed <i>n.</i>	копытное (живот- ное)
hook <i>n.</i>	крючок
horn <i>n.</i>	рог
hornwort <i>n.</i>	роголистник
huge <i>adj.</i>	огромный
humming bird <i>n.</i>	колибри

increase <i>v.</i>	возрастать
indulge <i>v.</i>	потворствовать
innate <i>adj.</i>	врожденный
insatiable <i>adj.</i>	ненасытный
insulate <i>v.</i>	изолировать
invade <i>v.</i>	вторгаться
iron <i>n.</i>	железо
irritate <i>v.</i>	раздражать
ivory <i>n.</i>	бивень, клык

K

keen <i>adj.</i>	сильный; острый
kernel <i>n.</i>	ядро, сердцевина
kingdom <i>n.</i>	царство

litter <i>n.</i>	1. потомство; 2. мусор
liverwort <i>n.</i>	печеночник
livestock <i>n.</i>	домашний скот
lysergic acid	лизергиновая кислота

marsh <i>n.</i>	болото
marsupial <i>adj.</i>	сумчатый
mature <i>adj.</i>	зрелый
maturity <i>n.</i>	зрелость
merge <i>v.</i>	погружать(ся); сливать(ся)
mildew <i>n.</i>	ложномучнистая роса

milkweed <i>n.</i>	молочай
mill <i>n.</i>	мельница
mill <i>v.</i>	молоть
moist <i>adj.</i>	влажный
mold <i>n.</i>	плесень

molt <i>v.</i>	линять
morel <i>n.</i>	сморчок
moss <i>n.</i>	мох
mucous <i>n.</i>	слизь
mussel <i>n.</i>	мидия

N

natural selection	естественный отбор
nestling <i>n.</i>	птенец
newt <i>n.</i>	тритон
nightingale <i>n.</i>	соловей
nourish <i>v.</i>	кормить

numerous <i>adj.</i>	многочисленный
nutrient <i>n.</i>	питательное вещество
nutrient <i>adj.</i>	питательный
nutrition <i>n.</i>	питание

O

obvious <i>adj.</i>	очевидный
occur <i>v.</i>	случаться
offend <i>v.</i>	обижать
offset <i>n.</i>	сдвиг
offset <i>v.</i>	смещать
offspring <i>n.</i>	потомок
origin <i>n.</i>	происхождение
oscillate <i>v.</i>	колебаться

ostrich <i>n.</i>	страус
otherwise <i>adv.</i>	в ином случае
ovary <i>n.</i>	завязь
overlap <i>v.</i>	перекрывать
ovipositor <i>n.</i>	яйцеклад
owl <i>n.</i>	сова
oyster <i>n.</i>	устрица

P

pack <i>v.</i>	паковать
paddle <i>n.</i>	весло; ласт
particular <i>adj.</i>	данный
pelt <i>n.</i>	шкура
perch <i>n.</i>	насед
perpetuate <i>v.</i>	сохранять
persist <i>v.</i>	настаивать
pest <i>n.</i>	вредитель
pigeon <i>n.</i>	голубь
pike <i>n.</i>	щука
phylum <i>n.</i>	<i>таксоном.</i> тип
plague <i>n.</i>	чума
plain <i>n.</i>	равнина
plain <i>adj.</i>	плоский; простой
platypus <i>n.</i>	утконос
poison <i>n.</i>	яд
poison <i>v.</i>	отравлять
pollen <i>n.</i>	пыльца
pollinate <i>v.</i>	опылять
porcupine <i>n.</i>	дикобраз

possess <i>v.</i>	обладать
posterior <i>adj.</i>	последующий
precipitation <i>n.</i>	осаждение, осадки
precise <i>adj.</i>	точный
prey <i>n.</i>	жертва
prey <i>v.</i>	охотиться
prohibit <i>v.</i>	запрещать
prolific <i>adj.</i>	плодовитый
prominent <i>adj.</i>	выдающийся
pronounced <i>adj.</i> , <i>p. p.</i>	выраженный
propel <i>v.</i>	двигать, толкать
propose <i>v.</i>	предлагать
prove <i>v.</i>	доказывать
provide <i>v.</i>	обеспечивать
puffer <i>n.</i>	иглобрюх
pulp <i>n.</i>	мякоть
put forward <i>v.</i>	выдвигать(ся)

R

rabies <i>n.</i>	бешенство	requirement <i>n.</i>	требование
range <i>n.</i>	ряд; область	resemble <i>v.</i>	быть похожим
range <i>v.</i>	ранжировать	resistance <i>n.</i>	сопротивление, устойчивость
rare <i>adj.</i>	редкий	respire <i>v.</i>	дышать
raven <i>n.</i>	ворон	respond <i>v.</i>	отвечать
rear <i>n.</i>	задняя часть	restrict <i>v.</i>	ограничивать
rear <i>adj.</i>	задний	retractable <i>adj.</i>	втягивающийся
rear <i>v.</i>	разводить живот- ных	reveal <i>v.</i>	обнаруживать, показывать
recline <i>v.</i>	склонять(ся)	rigid <i>adj.</i>	жесткий
reduction <i>n.</i>	сокращение	rival <i>n.</i>	соперник
regard <i>v.</i>	рассматривать как	robin <i>n.</i>	малиновка
relationship <i>n.</i>	отношения	rod <i>n.</i>	удочка
release <i>v.</i>	высвобождать	rodent <i>n.</i>	грызун
rely (on) <i>v.</i>	полагаться (на)	Rotifera <i>n.</i>	колесоватки
remarkable <i>adj.</i>	заметный	rough <i>adj.</i>	шершавый
render <i>v.</i>	возмещать; пре- доставлять	roundworm <i>n.</i>	круглый червь
reproduce <i>v.</i>	воспроизводить	ruin <i>v.</i>	разрушать
require <i>v.</i>	требовать	rye <i>n.</i>	рожь

S

sacrifice <i>v.</i>	приносить в жертву	similarity <i>n.</i>	сходство
saliva <i>n.</i>	слюна	simplicity <i>n.</i>	простота
salmon <i>n.</i>	лосось	simultaneous <i>adj.</i>	одновременный
same <i>adj.</i>	одинаковый	skull <i>n.</i>	череп
sanctuary <i>n.</i>	заповедник	slime <i>n.</i>	слизь
scale <i>n.</i>	1. чешуя; 2. шкала	slit <i>n.</i>	щель, прорезь
scholar <i>n.</i>	ученый	slug <i>n.</i>	слизень
school <i>n.</i>	косяк (рыбы)	snail <i>n.</i>	улитка
share <i>n.</i>	доля	shed <i>v.</i>	ронять, сбрасы- вать
shark <i>n.</i>	акула	span <i>n.</i>	промежуток вре- мени
shed <i>v.</i>	ронять, сбрасы- вать	sparrow <i>n.</i>	воробей
sheer <i>adj.</i>	несмешанный, чистый	spawn <i>n.</i>	икра
sheer <i>adv.</i>	абсолютно	spike <i>n.</i>	колючка
shell <i>n.</i>	раковина; скорлу- па	spiracle <i>n.</i>	дыхательное от- верстие
sight <i>n.</i>	зрение; вид	sponge <i>n.</i>	губка
significant <i>adj.</i>	значительный	soften <i>v.</i>	смягчать
similar <i>adj.</i>	похожий	spot <i>n.</i>	пятно
		spot <i>v.</i>	обнаруживать, за- мечать

square <i>n.</i>	квадрат; участок; площадь	submerge <i>v.</i>	погружать
squid <i>n.</i>	кальмар	succession <i>n.</i>	последовательность
squirrel <i>n.</i>	белка	sucker <i>n.</i>	присоска
stalk <i>v.</i>	подкрадываться	suggest <i>v.</i>	предлагать
starch <i>n.</i>	крахмал	sulphur, sulfur <i>n.</i>	сера
starfish <i>n.</i>	морская звезда	superfluous <i>adj.</i>	избыточный
stealth <i>n.</i>	уловка	supply <i>v.</i>	запасать
stem <i>n.</i>	стебель, ствол	surface <i>n.</i>	поверхность
stick <i>n.</i>	палка	surroundings <i>n.</i>	окрестности
stick <i>v.</i>	приклеивать	survive <i>v.</i>	выживать
store <i>v.</i>	хранить	suspension <i>n.</i>	задержка
stork <i>n.</i>	аист	sustain <i>v.</i>	поддерживать
strain <i>n.</i>	1. напряжение; 2. штамм	swallow <i>v.</i>	глотать
stride <i>v.</i>	шагать	swamp <i>n.</i>	болото
stripe <i>n.</i>	полоска	swarm <i>n.</i>	рой

T

tadpole <i>n.</i>	головастик	tough <i>adj.</i>	жесткий
tentacle <i>n.</i>	щупальце	trait <i>n.</i>	особенность
terrestrial <i>adj.</i>	наземный	transform <i>v.</i>	менять
thaw <i>v.</i>	оттаивать	trap <i>n.</i>	ловушка
thorn <i>n.</i>	шип	treasury <i>n.</i>	сокровище
thread <i>n.</i>	нить	treat <i>v.</i>	лечить
threat <i>n.</i>	угроза	trout <i>n.</i>	форель
tick <i>n.</i>	клец	trunk <i>n.</i>	1. ствол; 2. хобот
timber <i>n.</i>	древесина	tumble <i>v.</i>	спотыкаться
toad <i>n.</i>	жаба	turbulent <i>adj.</i>	бурный
toadstool <i>n.</i>	поганка	twing <i>n.</i>	побег

U

undergo <i>v.</i>	подвергаться (чему-л.)	ungulate <i>n.</i>	копытное (животное)
		urchin <i>n.</i>	морской еж

V

various <i>adj.</i>	разнообразный	versatile <i>adj.</i>	разносторонний
vegetation <i>n.</i>	растительность	visceral <i>adj.</i>	внутренний
venom <i>n.</i>	яд	vital <i>adj.</i>	важнейший
vent <i>n.</i>	клапан, отверстие	viviparous <i>adj.</i>	живородящий

W

wart <i>n.</i>	бородавка	whip <i>n.</i>	кнут
wasp <i>n.</i>	оса	willing <i>adj.</i>	согласный
waterfowl	водоплавающая птица	wipe out <i>v.</i>	стирать
weaken <i>v.</i>	ослаблять	withstand <i>v.</i>	противостоять
whale <i>n.</i>	кит	womb <i>n.</i>	матка
		worthwhile <i>adj.</i>	стоящий

Y

yeast <i>n.</i>	дрожжи	yield <i>n.</i>	плоды, урожай
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