МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РОССИЙСКОЙ ФЕДЕРАЦИИ
ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ ОБРАЗОВАТЕЛЬНОЕ
УЧРЕЖДЕНИЕ ВЫСШЕГО ПРОФЕССИОНАЛЬНОГО ОБРАЗОВАНИЯ
«САМАРСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ»

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BIOLOGY

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Учебное пособие подготовлено с соответствии с Государственным стандартом высшего профессионального образования и типовой программой вуза.

Целью пособия является развитие коммуникативных умений и навыков различных видов речевой деятельности, а также навыков реферирования научной литературы.

Пособие состоит из вводного урока и 10 разделов, каждый из которых включает оригинальный текст по теме раздела, а также комплекс условно-речевых и речевых упражнений, образцы коммуникативных ситуаций диалогической и монологической речи, а также блок упражнений, направленных на развитие навыков письменной речи, развивающих умения находить в тексте нужную информацию, составлять письменное сообщение по ключевым словам или плану, пользоваться различными жанрами письменных сообщений. Аудиоматериалы позволяют студентам ознакомиться с различными стилями разговорной речи

Пособие рассчитано на работу в аудитории (совместно с преподавателем) и дома (самостоятельно), предназначено для студентов биологического факультета.

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DEAR FRENDS!

Entering the Samara State University has to be one of the most important events in your life. It is a step into another world. You will discover new knowledge, new skills and new opportunities. You will learn more about the world and nature.

You will grow in intellect, in competence and in confidence owing to the English language.

I wish you success in your work.

The author

INTRODUCTORY LESSON

VOCABULARY

Ex. l. Read and memorize the following words:

• science *n* наука • level *n* уровень • unit n единица • cell *n* клетка • living being живое существо • application применение • research *n* исследование • earth *n* земля

Ex. 2 .Memorize the meaning of the following verbs:

• to study — изучать, учить, учиться • to associate — ассоциировать, соединять • to contain — содержать, вмещать • to limit — ограничивать • to make progress — делать успехи

Ex.3. Read the following international words. Translate them without a dictionary paying attention to the part of speech:

biology *n,* planet *n,* organism *n,* structure *n,* system n, function n, medicine *n,* individual *a,* characteristic *a.*

Ex.4. Form the adjectives and the nouns with the help of the suffixes (ic)al, -ist from the nouns given below according to the models. Mind the stress in the derivative adjectives:

Model:
a) biology n + -(ic)al - biological *a*
b) biology *n* + -ist - biologist *n*

anatomy, botany, cytology, histology, chemistry, zoology, physiology, ecology.

READING

TEXT

THE STUDY OF LIFE

Biology is the science of life.

Life can be divided at many levels. Its smallest unit is the individual cell. Its largest unit is the whole complex of living beings associated with the planet Earth.

Between these levels there are others. Living organisms contain many structures and systems, each has its characteristic, important function.

The practical applications of biology are unlimited. As the result of biological research great progress has been made especially in medicine and agriculture.

COMPREHENSION

Ex. 1. Answer the following questions:

1. What is biology? 2. What is the smallest unit of life? 3. What do living organisms contain? 4. Each system and structure has its characteristic function, hasn't it? 5. Are the practical applications of biology limited? 6. In what branches of science has great progress been made as the result of biological research?

GRAMMAR

Word order
Question forms

Ex. 1. Put the words in the right order and ask the question.

1 been / have / where / you
2 do / postcards / sell / you
3 belong / calculator / does / this / to / who
4 are / here / how / long / staying / you
5 is / like / new / office / what / your
6 are / flights / full / of / the / which
7 carnival / does / start / the / time / what
8 decided / has / holiday / Nancy / on / what

Ex.2. Put in the correct question word or phrase.

1…… is this building? ~ It's about two hundred years old.
2 ……does your team play in? ~ Red.
3…….bag are you carrying? ~ Judy's.
4 ……money do you earn? ~ About £250 a week.
5……..…hand do you write with? ~ My right hand.
6……..….of shop do you work in? ~ A toy shop.
7 …….first stepped on the moon? ~ Neil Armstrong, wasn't it?
8 …….is your mother? ~ She's much better, thank you.
9 …… is it to the post office? ~ About two hundred metres.

10 ……do you take a holiday? ~ Once a year.

11…….name will you give the baby? ~ We haven't thought of one yet.

Ex.3. Write the questions to which the underlined words are the answers.

1 The Smiths have got three cars.
2 Janet works at the supermarket.
3 Andrea is learning English because she will need it in her job.
4 The film was really romantic.
5 The meeting will take place next Tuesday.
6 Tessa switched off the computer.

Ex. 4. Rupert is at a job interview. Someone is asking him questions. Write the questions.

Interviewer: *Where do you live?*
Rupert: Oh, I live in Longtown.

1.Interviewer:……
Rupert: I'm twenty-three.

2. Interviewer.....……
Rupert: Yes, I went to college.

3. Interviewer: .....……
Rupert: My interests? I don't have any, really.

4. Interviewer: .....
Rupert: Which company? Oh, I work for BX Electric.

5. Interviewer: ……
Rupert: Nothing. There's nothing I don't like about my job.

LISTENING

You heard some of the people introduce themselves. Listen and answer the questions.

1. What are the people going to do?
2. How long will it take?
3. Which of the people do you hear?
4. Who's Bessie?

Ex. 1. Complete the table.

Name	Nationality	Occupation
1 Marie	*British*	*Expedition guide*
2		
3		
4		
5		

Ex. 2. Listen again and check your answers. What other information does each person give? How would you introduce yourself to the group?

Ex. 3. Here are some questions for finding out more information about someone. Complete the questions. Can you add any more? Work with a partner. Ask and answer the questions.

- Have you ever ...?
- Do you ... ?
- How long ... ?
- Who ...?
- Did you ... ?
- Where ... ?
- What kind of... ?
- How many ... ?
- Have you got... ?
- Can you ... ?
- Why ...?
- What are your ... ?
- Would you ... ?

WRITING

INFORMAL LETTER

Write a letter to a friend who you haven't been in touch with for a long time. Give your news, describe some things that you have done recently, and say what your future plans are. Ask about his/her news and family. Try to arrange to meet somewhere. Remember to put your address and the date in the top right-hand corner of your letter.

Write 100–140 words.

Remember the rules of letter writing.

UNIT 1

HISTORY OF BIOLOGY

VOCABULARY

Ex. l. Match these words with their definitions.

a) life cycle, observation, successor, property, formulate, pollen, contribution, foundation, treat, classify, inheritance, natural selection, field, principle, advance, scholar, genetics

b) found in flowers, sth given to help, progress, what is passed down from one generation to the next, characteristic, from birth to death, develop an idea, what you see, sb who follows, a fine yellow powder found in flowers, give medical help, process according to which only the strongest species survive, put into groups, basic idea, academic area, basis, the study of how characteristics are passed from one generation to another, improvement

Ex. 2. Find antonyms in the list below, arrange them in pairs:

1) theory, to obtain, rapidly, experimentator, to finish, to increase, new, experienced, unknown, wide, passive, to enable, high, complicated;

2) simple, low, practice, to give, to disable, active, slowly, theoretician, narrow, famous, to start, to decrease, old, inexperienced.

READING

Before you read

Discuss these questions with your partner.

- What can you see around you that is living?
- What can you see that is not living?
- What can living things do that non-living things can’t?
- Can you classify living things?

TEXT

HISTORY OF BIOLOGY

Biology means *the study of life* and it is the science which investigates all living things. For as long as people have looked at the world around them, people have studied biology. Even in the days before recorded history, people knew and passed on information about plants and animals. Prehistoric people survived by learning which plants were good to eat and which could be used for medicine. Farming would not have developed if they had not begun to understand which animals could produce food like milk and eggs.

In the past, more than 2000 years ago, people in the Middle East understood the part that insects and pollen played in the life cycle of plants. The ancient Egyptians studied the life cycle of insects and were particularly interested in the changes they went through as they grew from larvae to adult insects. The ancient Mesopotamians even kept animals in what were the earliest zoological gardens. The ancient Greeks, too, were greatly interested in understanding the world around them. Aristotle recorded his observations of plants and animals, and his successor, Theophrastus, wrote the first books on plant life, which made a very important contribution to the study of botany.

After the fall of the Roman Empire, the centre of the scientific world moved to the Middle East.

The Arab scholar Al-Jahiz wrote the *Book of Animals* in the 9^{th} century. He was just one of a great number of Arabic, Persian and Turkish scientists who set out the foundations for the modern science of biology. Later still, in Europe, particularly in Germany, scholars such as Albertus Magnus discussed the properties of life. Magnus wrote seven books on plants and twenty- six on animals.

Modern biology really began in the 17^{th} century. At that time, Anton van Leeuwenhoek, in Holland, invented the microscope and William Harvey, in England, described the circulation of blood. The microscope allowed scientists to discover bacteria, leading to an understanding of the causes of disease, while new knowledge about how the human body works allowed others to find more effective ways of treating illnesses. All this new knowledge needed to be put into order and in the 18^{th} century the Swedish scientist Carl Linnaeus classified all living things into the biological families we know and use today.

In the middle of the 19^{th} century, unnoticed by anyone else, the Austrian monk Gregor Mendel, created his Laws of Inheritance, beginning the study of genetics that is such an important part of biology today. At the same time, while travelling around the world, Charles Darwin was formulating the central principle of modern biology - natural selection as the basis of evolution.

It is hard to believe, but the nature of viruses has become apparent only within the last half of the 20th century and the first step on this path of discovery was taken by the Russian botanist Dmitry Ivanovsky in 1892.

In the 20th century, biologists began to recognize how plants and animals live and pass on their genetically coded information to the next generation. Since then, partly because of developments in computer technology, there have been great advances in the field of biology; it is an area of ever-growing knowledge.

COMPREHENSION

Ex. 1. Read the text and decide if the following statements are true or false.

1. The earliest people must have known about plants or they would have died.
2. The Egyptians were interested in changing the way insects lived.
3. Europeans learnt all they knew about biology from the Middle East.
4. The microscope allowed biologists to treat illnesses.
5. Darwin's theory was one of the most important in biology.
6. The study of biology hasn't changed at all over the centuries.

Ex. 2. Translate the Sentences into Russian

1. Biology studies all living things on our planet.
2. In the past people were interested in understanding the world around them and learning about plants and animals.
3. Modern biology began to develop in the 17th century.
4. The microscope was invented by van Leeuwenhoek and allowed scientists to discover the world of microorganisms.
5. In the 18th century, Linnaeus set the foundations of the modern system of the classification of living things.
6. The Laws of Inheritance and the principle of natural selection were formulated in the 19th century.
7. Nowadays our knowledge in the area of biology is increasing rapidly due to computer technology.

Ex. 3. Make up 5 questions to the text and ask your partner to answer them.

Ex. 4. Divide the text into logical parts and state the general idea of each part.

GRAMMAR

The noun

Ex. 1. Give the plural.

a) a baby, a plant, a lemon, a peach, a banana, и brush, a star, a mountain, a tree, a shilling, a king, the waiter, the queen, a man, the man, a woman, a woman, an eye, a shelf, a box, the city, a boy, a goose, the watch, a mouse, a dress, a toy, the sheep, a tooth, a child, a deer, the life, a tomato, a secretary, a crowd, the airport, a theatre, the tornado, a shop, the tragedy.

b) this magazine, that sticker, this stamp, that sandwich, this poster, this teacup, this egg, that wall, that picture, this foot, that mountain, this lady, that window, this man, that match, this knife, this book, this family, this pie, that answer, that apartment, that teacher, that comedy.

c) 1. This is a spider. 2. That is a snail. 3. This is a star. 4. This is a film star. 5. That is a cartoon. 6. This is a boy. 7. This is a baby. 8. That is a plate. 9. That is a flower. 10. That is a bookshelf. 11. Is this a sofa? 12. Is this a bookcase? 13. Is this a man? 14. Is that a ball? 15. Is that a train? 16. Is that a plane? 17. Is the window open? 18. Is the door closed? 19. Is the boy near the window? 20. That is not a king. 21. That is not a queen.

Ex. 2. Join the two (or three) nouns. Sometimes you have to use -'s or -s'; and sometimes you have to use ... of ...

1. the owner/that car ---the owner of that car
2. the mother/Ann --- Ann's mother
3. the jacket/that man ---
4. the top/the page ---
5. the daughter/Charles ---
6. the cause/the problem ---
7. the newspaper/yesterday ---
8. the birthday/my father ---
9. the name/this street ---
10. the toys/the children ---
11. the new manager/the company ---
12. the result/the football match ---
13. the garden/our neighbours ---
14. the ground floor/the building ---
15. the children/Don and Mary ---

Ex. 3. What is another way of saying these things? Use -'s.

1. a hat for a woman - a woman's hat
2. a name for a boy ---
3. clothes for children ---
4. a school for girls ---
5. a nest for a bird ---
6. a magazine for women ---

LISTENING

Before you listen

Discuss these questions with your partner.

1. Do you know what a germ is?
2. What can you say about their size and shape?
3. What do you know about the classification of germs?

Ex. 1. Listen to this lesson about germs. Circle the correct word or phrase to make true statements.

1. The teacher believes people **rightly / mistakenly** / **rarely** think all germs are bad.
2. Germs don't live on **microbes** / **animals** / **people**.
3. **Some** / **all** / **few** germs are responsible for illnesses.
4. There are four basic types of **fungi** / **protozoa / germ.**
5. Germs are only **round / mostly long and thin / different shapes.**

WRITING

FORMAL LETTERS

Ex. 1. Read Nancy's letter of application to Worldwatch. Put one word into each gap. Compare your answers with a partner.

17 Hillside Rd
Chesswood
Herts. WD3 5LB
Tel 01923 284171
Fax 01923 286622

Thursday 17 January

David Benton
Worldwatch UK Ltd
357 Ferry Rd
Basingstoke
RG2 5HP

Dear Mr. Benton

I saw your_____for a Business Journalist in today's Guardian newspaper. I am very_____in the job and I think that I have many of the necessary_____.

I _____ politics and modern languages at Oxford University. I am in_____French, German and Spanish. I have_____widely in Europe and South America, and _____worked as a business journalist for the BC_____the last five years.

I enclose a copy of my curriculum vitae. I look forward _____hearing from you soon. Please let me know if you need more information.

Yours sincerely
Nancy Mann

Ex. 2. Look at Nancy's letter again.

- In what other ways can you begin and end formal letters?
- Where is Nancy's address written? Where is the address of the company she's writing to?
- In what other way can you write the date?
- Where does Nancy sign her name?
- Where does she print her name?
- There are three paragraphs. What is the aim of each one?

Ex. 3. Write a letter of application for the following job in the Daily News.

TRANS-GLOBE
COACHES
want
TRAVEL COURIERS
In • Europe • the Far East • North and South America
Have you got good interpersonal skills?
Can you speak two or more languages?
Do you want to see the world?
Please apply with CV to
The Personnel Manager
Trans-Globe Coaches
Victoria Square
London SW1 6VC

UNIT 2

BIOLOGY TODAY

VOCABULARY

Ex. 1. Give the Russian equivalents:

the science of life, fossil organisms, evolution, a fundamental science, a motive force, contemporary animals, genetics.

Ex. 2. Find synonyms in the list below, arrange them in pairs:

1) device, research, technology, branch, obtain, importance, collaborator, team, to collect, data, to be engaged in, rapidly;

2) quickly, instrument, technique, to be busy with, field, to get, significance, information, to gather, coworker, group, investigation.

Ex. 3. Complete the sentences below with words:

threatened, adapt, mammal, species, cell, environment, composition, diseases, crops, building blocks

1. Unfortunately, the growth of cities often means wildlife is with extinction.
2. A ……is an animal that feeds its babies milk.

3. Farmers that grow……like cereals and vegetables normally have to work very hard.

4. The smallest, basic structural and functional unit of life is a……

5. Serious illnesses are known as ..... .

6. What something is made of is its …… .

7. It's amazing how animals can …….to changes in their living conditions.

8. There are many different ……..of butterfly.

9. Humankind's actions have often had a negative effect on the…….

10. The most basic parts of something can be called……

READING

TEXT

Before you read

Discuss these questions with your partner.

1. What careers in biology can you think of?
2. Do you like any of them? Which ones and why?
3. Are there any areas of biology that you do not find interesting?
4. What areas of biology do you consider the most important for human society nowadays? Why?

BIOLOGY TODAY

Dear Students,

I am writing this letter to welcome all of you who are about to begin your first year course in Biology here at the university. You might think it is a little early for me to ask you to think about what you will do when you leave here in three years' time. However, our science, like any other] has so many different areas it is impossible for you to study them all. The first thing you will need to think about is specialising. This letter is to offer you some suggestions to think about for your future.

As you know, there are four main areas of biology that we shall concentrate on in the coming years. Biology can be divided into zoology, the study of animal life, and botany, the study of plant life. We shall also study molecular biology, the study of how the building blocks of living things, the cells, work. Another topic of interest is genetics, how biological information is passed on from one generation to the next: that is, inheritance. You should

specialise, but you will also need to know about all of these four areas of study. Plants and animals do not live separately from each other; all living things are made up of cells and one of the things genetics tells us is how plants and animals adapt to the conditions around them.

So what about after the course is over and you have graduated in Biology? Can you have a career in biology? For those who choose to specialise in genetics or molecular biology there are important career opportunities in medicine. At the present time, there is a great deal of research going on in gene therapy where biologists are working with doctors and chemists to find new ways of treating diseases. Other biologists are looking at ways of changing the genetic composition of the plants we grow for food; of making them more able to fight diseases and at the same time produce more food.

We are experiencing a period of climatic change too, and this is having an effect on the way animals and plants live. The science of ecology is becoming more and more important; biologists who specialise in zoology are working in many parts of the world. Some are working to protect species like the tiger, which are seriously threatened by climate change. Others are investigating wildlife from the smallest insects to the largest mammals, trying to understand how they all live together. Botanists are looking at the effect new types of food crops have on the environment and how changes in that area can affect our general health. There is even a new area of biology called astrobiology, which is looking at the possibilities of life on other planets - but perhaps that is something for the more distant future.

Whatever you specialise in, as long as there is life on this (or any other) planet, there is work for a biologist.

Good luck and enjoy your studies!

Jean Shearer Professor of Biology

COMPREHENSION

Ex. 1. Answer the questions in your own words.

1. What four areas can biology be divided into?
2. If you are interested in cells, which area should you study?
3. How can zoologists help animals in the wild?
4. In what way can botanists protect people and the environment?
5. What is astrobiology?

Ex. 2. Discuss these questions with your partner.

1. How important do you feel the study of biology is for our world today?
2. Would you prefer not to study it? Why?
3. Are there any areas of biology which you think are more important than others?

Ex. 3. Translate the Sentences into Russian

1. Nowadays biology has so many different areas that it is impossible for one person to study them all.
2. Students should study the four main areas of Biology: zoology, botany, molecular biology and genetics.
3. Genetics studies inheritance and how living things adapt to their surroundings.
4. There are plenty of career opportunities for those with a degree in Biology.
5. Medicine needs talented scientists to carry out research in areas such as gene therapy and virus infections.
6. The world is experiencing a period of climatic change and it is the work of scientists to predict the consequences of this.
7. Ecology studies the environment and the way plants, animals and humans live together and affect each other.

SPEAKING

Prepare a short presentation to answer the question: 'What is biology?'

Use the information in both texts.
Talk about:

- what the study of biology includes
- the four main areas of biology
- where biologists work
- what biology informs us about

First complete these notes. Use them in your presentation.

Biology: The study of.....
There are four main areas:
.....is about ……
.....is about……
Molecular biology is about …… .is about inheritance.
Biologists work in .....,and……
In conclusion, biology is about……
…. .

GRAMMAR

The articles

Ex. 1. Complete this true story. Put in a/an or the.

A man decided to rob (1) ..... bank in the town where he lived. He walked into (2) bank and handed (3) ..... note to one of (4)..... cashiers. (5)…….. cashier read (6)…… .. note, which told her to give (7)..…….. man some money. Afraid that he might have (8)…… gun, she did as she was told. (9) ..... man then walked out of (10)…….. building, leaving (11).....note behind. However, he had no time to spend (12)…….money because he was arrested (13) ..... same day. He had made (14) ..... mistake. He had written (15)..... note on (16)..... back of (17)……. envelope. And on (18) ..... other side of (19)..... envelope was his name and address. This clue was quite enough for (20)..... detectives on the case.

Ex.2. Complete the conversations. Put in a/an or the.

Laura: Look outside. *The* sky is getting very dark.
Trevor: I hope there isn't going to be *a* storm.

1 Mike: I'm going out for ..... walk. Have you seen my shoes?
Harriet: Yes, they're on ..... floor in ..... kitchen.

2 Melanie: Would you like..... tomato? There's one in ..... fridge.
David: Oh, yes, please. I'll make myself ..... cheese and tomato sandwich.

3 Sarah: If you're going into .....city centre, can you post these letters for me?
Mark: Yes, I'll take them to .....main post office.

4 Rita: I've got ..... problem with my phone bill. Can I see someone about it?
Receptionist: Yes, go to ..... fifth floor .....lift is along the corridor.

5 Tom: I didn't know Melanie had..... dog.
David: It isn't hers. She's just taking it for a walk while .....owner is away.
6 Vicky: I've got ..... headache. I've had it all day.
Rachel: Why don't you go to .....health centre? It's open until six.

Ex. 3. How much do you know about geography? Put in these names: Andes, Brussels, Irish Republic, Italy, Lake Michigan, River Nile, North, Pennsylvania, Tasmania, United Kingdom, West Indies. Decide if you need the.

1. Harrisburg is the capital of *Pennsylvania.*
2. Dublin is in *the Irish Republic.*
3. Chicago lies on the shore of .....
4. Sicily is a part of.....
5. ..... .are a mountain range in South America.
6. ……is England, Scotland, Wales and Northern Ireland.
7. ..... is an island to the south of Australia.
8. Jamaica is an island in.....
9. …….. flows through Egypt.
10. ..... is the capital of Belgium.
11. Manchester is in..... of England.

Ex. 5. Complete the story about the theft of a river barge. Put in a, an, one or the.

This is a true story about (1) ..... man who chose (2).....worst possible time for his crime. It happened in London in (3) ..... summer of 1972. (4) ..... man stole a barge on (5)... .. River Thames (in case you don't know, (6)…….. barge is a river boat used for carrying goods). (7) ..... owner of (8) .....…….. barge soon discovered that it was missing and immediately informed (9) ..... police so that they could look for it. Normally (10)…… river is quite (11) .....busy place, and it would be difficult to find what you were looking for. On this day, however, there was (12) .....dock strike, and so there was only (13)……barge on (14) ..... river. (15) .....thief was quickly found and arrested.

Ex. 5. Some of these sentences are correct, and some have a word which should not be there. If the sentence is correct, put a tick {V). If it is incorrect, cross the unnecessary word out of the sentence and write it in the space.

1. The space capsule came down in the Pacific. V
2. My new job starts in the April. *the*
3. I was so tired I went to bed at nine.
4. We had a very good lunch in the company canteen.
5. The life just isn't fair sometimes.

6. What the clever children you have!
7. We went out and bought some pictures.
8. Tessa was still working at the midnight.
9. I drive past the hospital every morning.
10. A one boy was much taller than all the others.

LISTENING

Before you listen

Discuss these questions with your partner.

1. How many mammals can you name? Name as many mammals as you can.
2. How many insects can you name?
3. Can you name living things that you can only see under a microscope?
4. What do you know about protozoa such as amoebas?

Ex.1. Listen to this class discussion about protozoa and correct the following statements.

1. The word protozoa means microorganisms.
2. One of protozoa's ecological functions is to produce bacteria.
3. Paramecium have a simple internal organisation and a fixed shape.
4. All protozoa are parasites and live in humans or animals.
5. Protozoa can only feed by taking in nutrients through the cell mouth.

WRITING

Write a letter to your tutor telling him or her which areas of Biology you would like to specialise in and why. Use these notes to help you.

Dear Mr / Mrs (tutor's surname),
Writing to tell you choices I have made
Specialise in: (one or two of the main areas)
Reasons for choosing: interested in (plants animals / laboratory work / latest ideas / your own ideas)
Possible career choices: what I hope to do when I graduate (medicine / ecology / agriculture / your own idea)
Offer to meet and discuss choices: I would lie your advice and hope we can ...
Yours sincerely,
(your full name: first name + surname)

Write 100-140 words.

UNIT 3

LIFE ORIGIN

VOCABULARY

Ex. 1. Find the Russian equivalents for the following:

to compel, account, to evolve, prevalent, dilemma, to touch, protein, gene, to imply, realm, universe, emerge.

Ex. 2. Find the English equivalents to the following:

сталкиваться с таинством, быть непреодолимой загадкой, выражать мнение, составить мнение, развиваться (эволюционировать), объяснение, научная фантастика, разумное существо, распространенная теория, возникать в результате, совпадать, образовываться или присоединяться, подвергаться мутации, живое состояние материи, широкое распространение, подразумевать (допускать).

READING

TEXT

HOW DID LIFE BEGIN?

Scientists face many mysteries, but there is none so compelling as the mystery of how life on Earth began. The great religions have their own accounts of Creation (it has been done by the God and it took him seven days, according to the Bible, to create the world), but scientists have never able to construct a complete account of the way and moment when dead molecules came together to form organisms that could feed, grow, reproduce and evolve. Nevertheless recent work has suggested some promising theories.

Some new explanations are associated with science fiction. Astronomers Ered Hoyle and N.C. Wickramasinghe suppose that organic molecules fell to the Earth from comets - and indeed meteorites containing organic substances have been found. Biologists Francis Crick and Leslie Qrgel think that Earth might have been seeded with life by some intelligent beings from advanced planets.

The more prevalent theories, however, do not depend on extraterrestrial intervention. They fall into two main categories the view that life began almost

as soon as Barth formed, and the view that life emerged in the result of some chemical reactions in the prehistoric oceans on Earth.

At a symposium chemist Carl Woese of the University of Illinois suggested that life on Earth coincided with the birth of the planet. To his mind, dusty water droplets could have collected the chemicals that rapidly evolved into life. Other chemists think creation took millions of years. Earth began with an atmosphere containing almost no oxygen, but mostly water vapor, methane, carbon dioxide and ammonia. It is simple to make prelife molecules with these gases, suppose Stanley Miller and Harold Urey of the university of Chicago. Chemist Sidney Fox of the University of Miami thinks life began with a protein droplet, perhaps on a volcano.

However the elements of life formed or joined, the more fundamental question goes deeper than chemistry. Theories face a chicken-and-egg dilemma: which came first, an isolated bag of proteins or a naked gene. The question touches the definition of life: is the key feature of life the ability to eat and grow, as proteins do, or to reproduce and evolve, as genes do?

Most scientists, however, believe that the essence of life is evolution, which requires genes. Genes make exact copies of themselves and undergo the mutations and natural selection that produce higher and higher organisms. Among these scientists are Leslie Orgel of the Salk Institute, A.I. Oparin, Russian biochemist. In his book "The Origin of Life" A.I. Oparin wrote:" The origin of life was a transmition from organic to biological chemistry, from lifeless to living matter, from the inanimate to animate realm of nature". According to his theory life arose on earth because of the widespread distribution of carbon, an element with an exceptional tendency to combine with other substances.

All these theories imply that if it happened here, it could happen elsewhere in the universe.

COMPREHENSION

Ex. 1. Answer the following questions:

1. What kind of mystery scientists face is the most compelling?
2. What is the great religions point of -view on the problem?
3. What explanations are associated with science fiction?
4. What about the more prevalent theories, what categories do they fall in?
5. What is the essence of these theories?
6. What is the most fundamental question scientist decide?
7. What do most scientist believe?
8. What did A.I. Oparin write in his book on the problem?

9. Why carbon is considered the most important element in the process of life's origin?

10. All these theories imply that life could originate elsewhere in the universe, don't they?

Ex. 2. Translate the Sentences into Russian

1. There is none so compelling as the mystery of how life on Earth began.
2. Some new explanations are associated with science fiction.
3. Life on Earth coincided with the birth of the planet.
4. Life began with a protein droplet, perhaps on a volcano.
5. The question touches the definition of life.
6. The origin of life was a transmition from organic to biological chemistry, from lifeless to living matter, from the inanimate to animate realm of nature. It has been done by the God and it took him seven days, according to the Bible.

Ex. 3. Give a talk on the origin of life on Earth.

GRAMMAR

The adjective

Ex. 1. Write the comparative form of the words in brackets.

They've made these chocolate bars *smaller* (small).
Sport is *more interesting* (interesting) than politics.
1. Can't you think of anything ..... (intelligent) to say?
2. Well, the place looks.....(clean) now.
3. Janet looks …… (thin) than she did.
4. You need to draw it……. ..... (carefully).
5. The weather is getting ..... (bad).
6. The programme will be shown at a ..... (late) date.
7. I can't stay .....(long) than half an hour.
8. A mobile phone would be a ..... (useful) present.
9. I'll try to finish the job ..... (soon).
10. It was …… (busy) than usual in town today.

Ex. 2. Write the superlative form of the words in brackets.

It's the *shortest* (short) day of the year.
It's the *most beautiful* (beautiful) building in the world.
1. That was the..... (funny) film I've ever seen.
2. It was the ……. ..... (horrible) feeling I've ever had.
3. Have you read her ……. ..... (recent) book?
4. It's the ..... (large) company in the country.
5. It was the …….(boring) speech I've ever heard.
6. You've got the ..... (far) to travel.

Ex. 3. Read this part of Tessa's letter to her friend Angela about her new job. Then look at the answers after the letter and write the correct answer in each space.

My new job is great. I like it (0) much better than my old one. The people here are (1) ……than I expected. Luckily my new boss isn't as rude (2) ……my old boss, Mrs. Crossley, was. I hated her. She was the (3) …… friendly person I've ever met. Everyone here is older (4)…… . In fact I'm the youngest person (5)…… the office. But I don't mind.

The good thing about the job is that I get a (6)……more money, although not much more than I did before. The bad thing is that the journey isn't (7)…… simple as it was in my old job, where the bus took me straight there. Now I have to change buses. But I'm allowed to start work early. The earlier I leave home, (8) .....… the journey is because the buses aren't so crowded.

0 a) more b) most c) much d) very
1 a) more nice b) most nice c) nicer d) nicest
2 a) as b) so c) than d) that
3 a) least b) less c) less and less d) so
4 a) as I b) as me c) than I d) than me
5 a) from b) in c) of d) out of
6 a) bit b) less c) lot d) much
7 a) as b) less c) more d) same
8 a) more easier b) more easy c) the easier d) the easy

LISTENING

Before you listen

Discuss these questions with your partner.

1. What is extinction?
2. Give examples of extinct animals.
3. Do you know of any animals that are in danger of becoming extinct?
4. How can they be saved?

Listen to the extract from a lecture about immunisation. Then listen again and fill in the gaps in the typescript.

Historically, being immunised against diseases is a relatively new thing but that doesn't mean the idea hadn't been thought of before. If we go as far back as 429 BC, the historian Thucydides noted that after a (1)…….. plague in Athens, those who survived did not become infected again. This was at a time before there was even recognition of such things as (2)…… and viruses.

Nowadays, we take it for granted that we will be vaccinated and avoid diseases like polio but how many of us actually stop to ask ourselves what is behind the (3)……
we have? How does vaccination work? Basically, it is the process by which a person is exposed, that is, made open to an agent so that his or her immune system develops against that agent. The immune system makes antibodies which fight against infection.

Once the human immune system is exposed to a disease, it is able to act against any future infection. Vaccination exposes a person to an immunogen - something which helps develop immunity - in a controlled way by using a (4)……. dose so he or she doesn't become ill while being immunised.

The good thing about a vaccination programme is that it can limit the spread of a disease among a population, reducing the risk for people who have not been vaccinated so we have something which is known as herd (5)…….. . That means when the number of non-immune people has dropped to a certain level, the disease will disappear from the whole population. This is how nowadays we have achieved the elimination of many diseases.

WRITING

Write a simple curriculum vitae, following a standard format.

CV
Name: Robert John Adams
Address: 1084 Franklin Avenue, Los Angeles, USA

Telephone number: 213 851 0890

Date of birth: Exactly 32 years
Nationality: British
Marital status: Married
Education: St Martin's School for Boys, Birmingham; University of Oxford;
Qualifications: A levels in English, Spanish, History and Economics; BA in Law; Diploma in International Law
Present position: Teacher of International Law at Central College for Legal Studies
Previous employment: Legal adviser for international company in London for five years
Additional skills and interests: cycling, judo (black belt) computers, keeping fit.

CURRICULUM VITAE

Name: **.....……..**

Address:**…….**

Telephone number:**……...**

Date of birth: **……...**

Nationality:**. ……..**

Marital status: **……..**

Education:**.. ……..**

Qualifications:**……..**

Present position:**……**

Previous employment:**……...**

Additional skills and interests**:……..**

Referees:……...…

UNIT 4

THE CELL

VOCABULARY

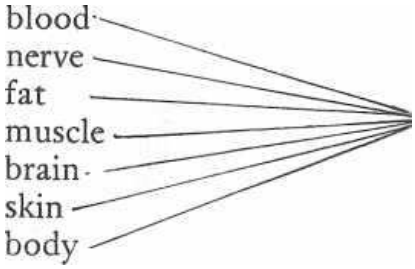
Ex. 1. Read and memorize the following words:

• blood n кровь • body n тело • brain n мозг •drop n капля • size n размер • shape n форма •nucleusи- ядро, pi. nuclei• fat n жир • fiber n волокно, фибра, нить • digestion n пищеварение • excretion n выделение • reproduction n размножение • human being человек • average a средний • advanced a передовой, прогрессивный • tiny a крошечный • dense a плотный • thick a толстый • thin a тонкий • thread-like a нитевидный, волокнистый • multiply размножаться • exist v существовать • vary v меняться, изменять(ся), отличаться • contract v сокращаться • abandon v отказывать, оставлять.

Ex. 2. Read the following international words. Translate them without dictionary. Mind the part of speech they belong to:

bacteria *n,* human *a,* special *a,* specialize *v,* group *n, v,* complex *n, a,* matter *n,* protoplasm *n,* cytoplasm *n,* moment *n,* protein n, impulse *n,* photosynthesis *n,* muscle *n,* form *n, v,* process *n,* , material *n,* method *n.*

Ex. 3. Translate the following word combinations. Mind the attributive usage of the nouns (stone wall-construction):



Ex. 4. Pay attention to the ways some terminological adjectives are formed. Translate the derivatives into Russian:

a) nucleus n + -ar - nuclear *a*
cell *n* + -(ul)ar - cellular *a*
muscle *n* + -ar - muscular *a*
molecule n + -ar - molecular *a*

b) *multi-*
uni- cellular
sub-

Ex. 5.

a) Memorize the synonyms:
to consist of –
to be composed of - состоять из
to be made up of -

b) Translate the sentences into Russian:
1. All living things are composed of cells. 2. Multicellular organisms are made up of a number of cells. 3. The human being is made up about 50,000,000,000,000 cells. 4. Microorganisms are made up single cells, they are unicellular organisms. 5. Tissues consist of group of cells of similar shape, size and function.

READING

Before you read

Discuss these questions with your partner.

1. Can you draw a cell and label its parts?
2. What part contains hereditary information?
3. Have you ever seen a cell under the microscope?
4. Do you remember your impressions?

TEXT

THE CELL

A cell is a tiny unit which constitutes the core of all living things: human, animal, plant or microbe. It was an English mathematician and physicist called Robert Hooke who, in 1665, first recorded his observations of cells under a microscope and published them in a book entitled *Micrograpliici.* Hooke noted that there are single-celled organisms, such as the amoeba, and multi-celled organisms, such as man. In the latter type of organism, it was revealed that the cells are grouped together to form different types of tissues, and the tissues then form organs.

The structure of a cell appears very simple. It is a jelly-like mass, called protoplasm, enclosed by a wall, with a central nucleus. Although research continued into the structure and function of cells, it was not until the late 19th century that a process of staining and fixing tissues was developed. This made it possible for scientists to preserve the cells for more detailed observation under a microscope. It was then discovered that new cells are formed by the division of old ones, and that each cell has its own lifespan. In other words, a cell is born (created), feeds, produces waste, grows, splits to create new cells or disintegrates and dies. Each cell has a specific function and specific characteristics, for example, muscle cells stretch and nerve cells carry information.

Stem cells are central to this infrastructure. These cells provide a remarkable repair system for the body, as they are able to develop into any type of cell. They can continue to redivide as often as possible to replace damaged or dying cells. The cells created from the division of a stem cell can remain stem cells, or become any of the other specific cells (blood cells, brain cells or other) in the organism. The key to the division process lies in the nucleus. The nucleus splits into two identical parts in the shape of rods or threads, which break away in opposite directions and form new nuclei. At this point the cell itself divides and two new cells are born. The rods or threads are called chromosomes. Each chromosome is made up of links of protoplasm called genes joined together in a chain. It is the genes that determine the essence of each cell and its particular characteristics. The number of chromosomes found in a particular organism always remains the same, but it will vary depending on the species; human beings have 48, for example, and sugar cane over 200.

COMPREHENSION

Ex. 1. Read the text and answer the questions in your own words.

1. How do organs form in multi-celled organisms?
2. What stages/processes does a cell's lifespan include?
3. Why are stem cells important?
4. What happens to the two identical *threads* or *rods* the nucleus splits up into?
5. What are chromosomes?

Ex. 2. Complete the sentences with the words

chromosomes, multi-celled, single-celled, protoplasm, tissues, nucleus, stem cell

1. .....are found in cells and pass on information.
2. ……bacteria are organisms.

3. .....….organisms consist of more than one cell.

4. Cells of the same structure and function that are grouped together form……

5. …….is the jelly-like mass that fills a cell.

6. The cell's hereditary material is stored in its……..

7. Every single cell in the body is born by a……

Ex. 3. Translate the Sentences into Russian

1. The smallest unit of living matter that can exist by itself is the cell.
2. Robert Hooke, an English mathematician and physicist, was the first to see cells under a microscope and noted that there are single-celled and multi-celled organisms.
3. In multi-celled organisms, cells similar in form and structure are usually grouped together into different types of tissue.
4. A cell contains a nucleus; this is found in the protoplasm, which is enclosed by a wall.
5. Every cell goes through the same stages of a life cycle: it is born, feeds, grows, splits to create new cells and dies.
6. Stem cells are cells that have the remarkable potential to develop into many different cell types in the body. They can continue to redivide as often as possible to replace damaged or dying cells, denes are the *units of heredity* found in chromosomes, which are found in the nucleus.

Ex. 4. Give the synonyms.

to multiply –
to consist of –
matter –
living organism –

Ex. 5. Render the contents of the text in 10 sentences.

GRAMMAR

The pronoun

Ex. 1. A group of friends are going on a coach trip together. They're meeting at the coach stop. Complete the conversation. Put in a personal pronoun (I, me, you, etc) or a reflexive pronoun (myself, yourself, etc).

Polly: Where's Martin?

Rupert: He's ill. I spoke to (0) *him* yesterday. He was feeling a bit sorry for (1)……..

Polly: Oh, poor Martin. And what about the twins?

Peter: (2) ……..came with Janet and me. (3) .....…..…...gave (4)…… a lift.

Janet: Yes, the twins came with (5) .....in the car.

Tessa: I hope they're going to behave (6) .....

Janet: Oh, I'm sure they will.

Rupert: (7)……. '11 be nice to have a day out. (8)……..... say it's going to stay sunny.

Polly: I'm sure we'll all enjoy (9).....

Peter: Where's Anna?

Tessa: Oh, she's here somewhere. I spoke to (10).....……. a moment ago.

She was standing right next to (11) .....

Ex. 2. Decide which word is correct.

0 I can't go to a party. I haven't got *anything* to wear.

a) anything b) everything c) something d) nothing

1. Take care, won't you, Anna? Look after .....

a) you b) your c) yours d) yourself

2. Yes, ...would be lovely to see you again.

a) it b) that c) there d) you

3. If you want some apples, I'll get you .....at the shop.

a) any b) it c) one d) some

4. We've brought some food with.....

a) me b) ourselves c) us d) we

5. Who does this CD belong to? ~..... I've just bought it.

a) I b) Me c) Mine d) Myself

6. The shop doesn't sell new books. It on\y sells old.....

a) of them b) ones c) some d) them

7. Is …….. ..... a post office near here, please?

a) here b) it c) there d) this

8. The two girls often wear .....clothes.

a) each other b) each other's c) themselves d) themselves'

9. Have you had enough to eat, or would you like something…… ?

a) another b) else c) new d) other

Ex. 3. Put in some, any or no.

1. She helped me borrow ... more money.
2. There is hardly ... a place in this house where we can talk alone.
3. ... boy at the school had ever taken a scholarship to the university.
4. It meant real hardship to my mother unless I earned ... money at once.

5. My mother hoped that perhaps the school had .funds to give me a grant.
6. It was unlikely that ... of the guests would takeparticular notice of it.
7. They understood each other without . words.
8. There isn't ... boot-polish in this tin.
9. You have . fine flowers in your garden.

LISTENING

Before you listen

Discuss the following with your partner.

1. How is DNA useful to different people in different occupations?
2. Talk about: archaeologists, doctors, the police

Ex. 1. Listen to a talk. Then complete the information about DNA.

1. Each strand has about…….. billion letters of coding.
2. We inherit the information from our …….
3. DNA will be useful in the future for …… care.
4. The Y chromosome comes from our……..
5. Archaeologists use DNA found in people's…….
6. The police get information from DNA found at a …….

WRITING

SENDING A FAX

Ex. 1. Janet Cooper wants to go to Spain on holiday with her family. She decides to fax the receptionist at the Hotel Plaza in Alicante to see if they have the accommodation she requires. Look at the information on this page, and fill in the first part of Janet's fax. She will get all the information on one page. The code for Spain from the UK is 00 34.

Ex. 2. Write out the words of Janet's fax message in the correct order.

HOTEL PLAZA

This luxury hotel is situated on the water's edge of one of the most beautiful beaches in Spain.

For reservations and enquiries:
phone (6)527 21 56
fax (6)527 15 02

Janet and Peter Cooper
8 Fast Lane
Chesswood
Herts
WD5 8QR
tel 01923 284908
fax 01923 285446

4 June

Dear Lynette
It was lovely to see...
Love,
Ganet

FAX TRANSMISSION

From _____
To _____
For the attention of _____
Message

_____
_____
_____
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_____

Yours faithfully
Janet Couper

Page 1 of _____
Date _____
To fax no_____
From fax no _____

a) rooms hotel I to some would like reserve at your
b) in 28 July We on Alicante are arriving
c) ten hope stay to We for nights leaving 7 August on
d) and husband like room I My double balcony a would with preferably a
e) require Our a two teenage daughters twin room
f) are all en-suite that We understand your bedrooms
g) you this confirm Could?
h) a sea view possible Is have it rooms to with?
i) available if me let you Please for know have dates these rooms
j) grateful if I be would also me you could tell room each price the of
k) from I forward look you to hearing

UNIT 5

THE VARIETY OF LIFE

VOCABULARY

PLANTS AND ANIMALS. SIMILARITY AND DIFFERENCE

Ex. l. Read and memorize the following words:

• inhabit *v* жить, обитать, населять • respect я 1) уважение 2) отношение • ingest *v* глотать, проглатывать • liquid *a* жидкий • waste и отходы, отбросы; • eliminate ***v*** *физиол.**),*** выделять • vapour пар, испарение • solution *n* раствор • male *a* мужского пола, мужской • female женского пола, женский • responce n реакция

Ex. 2. Translate the following international words:

cross *v,* absorb *v,* primary *a,* filter n, mechanism *n,* absolutely transport *n,* stimuli *n,* emotion *n,* unique *a,* gravity *n,* cybernetics,sensor *n,* practice *n,* hydrosystem n, instrument n

Ex. 3. Read the following verbs with the suffix -ize and give the Russian for them:

to organize, to specialize, to acclimatize, to fertilize, to oxidize, utilize, to parasitize, to evaporize, to hypothesize.

Ex. 4. Read and translate the words with the same root. Guess their meaning.

a vapour *n* — пар evaporate *v,* evaporation *n,* evaporative *v,* evaporator *n,* evaporize *v;* evaporable *a*

Ex. 5. Match the pairs of synonyms from a) and b). Use a dictionary if necessary. Write them down and memorize:

a) perform *v,* eliminate *v,* evidence*n,* current *n,* observe *v,* assess *v,* elaborate *v,* basic *a,* involve *v,* convert *v,* utilized *v;*

b) release *v,* accomplish *w,* work out *v,* determine *v,* flow *n,* main a, use *v,* change *v,* include *v,* watch *v,* proof *n.*

Ex. 6. Match the pairs of antonyms. Use a dictionary if necessary. Write them down and memorize:

a) physical *a,* negative *a,* similar *a,* loss *n,* utilize *v,* liquid *a,* artificial *a,* rule *n,* male *n,* exhale *v*

b) inhale *v,* female *n,* exception n, mental *a,* natural *a,* solid *a,* waste *v,* positive *a,* gain *n,* different *a.*

Ex. 7. Read and memorize the following terms:

chlorophyll, carbohydrate, autotrophic, fungi - *pl. om* fungus, - hydrolysis, ammonium, urea, urine, pollen, ovule, holozoic, holophytic, saprozoic.

Ex. 9. Read and remember the names of

a) basic life functions of organisms:

nutrition *n* — питание, digestion *n* — пищеварение, excretion *n* — выделение, respiration *n* — дыхание, reproduction — размножение, sensation n — ощущение;

b) senses:

touch — осязание, sight — зрение, smell — обоняние, taste — вкус, hearing — слух.

READING

TEXT

PLANTS AND ANIMALS LIFE FUNCTIONS

1. *What is the basic difference between plants and animals?*

More than a million different kinds of plants and animals inhabit the earth. Plants and animals differ greatly in appearance, size, shape, colour. These differences are clearly seen if you compare grasses, trees, flowers, on the one hand, and various insects, birds, fishes, men, on the other hand. The basic difference between plants and animals lies in the unit of structure and function — the cell. Plant cells have a cell wall which is actually non-living in chemical nature. Animal cells do not have that. But in spite of[1] the difference all living organisms are similar in many respects. Plants and animals perform several

common functions. These are called life functions. One way of studying animals and :. ants is to begin with their life functions.

2. *What are the main types of nutrition?*

Three main types of nutrition are known for living organisms, Holozoic nutrition is demonstrated by most animals which ingest plants or other animals through a mouth or oral opening and in this way obtain he energy that they require.

Saprozoic nutrition is characteristic of those organisms that have no oral opening, but absorb liquid food directly into their cells from the environment or from some other organism which they parasitize.

Holophytic nutrition, known as photosynthesis, is demonstrated by those green plants that contain chlorophyll. These living plants have the ability to use chlorophyll in the presence of light to combine water and carbon dioxide into simple and complex carbohydrates which they utilize as food.

3. *What substances accelerate the chemical reactions during the process of digestion?*

Digestion is a process in living organisms where in complex food materials are converted to simpler compounds. The simplification of these compounds is accomplished by the chemical addition of water, in order for this process to occur at low temperatures, special substances called enzymes accelerate the chemical reactions. Once the simple compounds have been formed by hydrolysis, the food is oxidized (combined with oxygen) to obtain energy, and waste products are subsequently created. This oxidative process occurs within the protoplasm of the pros.

4. Are the waste products eliminated in plants and animals in the same way?

The waste products that are produced by digestion in plants are water and carbon dioxide. These are eliminated directly from the cell into the environment as water vapour and gas, respectively, without the need of special excretory organs. In addition to carbon dioxide and water, animals produce a waste known as urea which is an ammonium compound containing nitrogen. Special organs are utilized to remove this waste from the body. In complex animals such as man, urea leaves the body as urine, a form of dilute urea plus other waste salts. Although we eliminate part of the carbon dioxide and water as gas and water vapour when we ’’exhale”, other water is used in the filtering mechanism of our kidneys and is eliminated as part of the urine. Thus the process of digestion occurs in plants and animals in essentially the same manner, except that different foods may be utilized by each, and the waste are eliminated in different ways.

5. *Why is respiration closely connected to digestion?*

Respiration is the exchange of the gases oxygen and carbon dioxide in living organisms. This is closely related to the process of digestion, because oxygen is used and carbon dioxide is eliminated. Carbon dioxide is poisonous to animals, and therefore is a waste product. In plants carbon dioxide is needed in photosynthesis to produce food, and subsequently oxygen becomes a waste product. Both plants and animals require oxygen in the process of digestion. Animals are absolutely dependent on plants for oxygen, as well as for the basic compounds which yield the energy in the food cycles of which plants and animals are a part.

6. *What is fertilization?*

Reproduction in plants and animals is similar in some respects, yet different in others. Some one-celled plants and animals reproduce simply by division of the cell so that a new organism is formed. Other plants and animals grow a bud, a group of specialized cells which eventually separate from the parent body to become a separate organism. Some plants such as ferns and fungi produce tiny specialized cells, each of which grows to be a new plant. Still other plants and animals produce specialized cells, two of which fuse — one from the male organism and the other from the female — to form the new individual. In both plants and animals the fusion process of these two specialized cells is called fertilization. In animals various means are used to bring these two specialized cells —the male sperm and the female egg or ovum — together. In plants, because they are incapable of movement from one place to another, the manner of bringing these two specialized cells together is accomplished in a variety of unique ways. The transfer of the pollen (the male cell) to the ovule (the female cell) is accomplished by wind or insects and sometimes by birds and other animals. In some cases gravity plays a part, and in aquatic plants the pollen may be carried by water currents. In any case, the transfer of the pollen is known as pollination.

7. *What senses does the nervous system of animals involve?*

Plants and animals respond to stimuli, although plants do not possess c nervous system like that of most animals. Some evidence is available to demonstrate that plants have ’’emotions” and react negatively or positively to noise stimuli. Some plants demonstrate ’’sleep movements” wherein their leaves roll up when the temperature changes or when they are touched. In Mimosa the leaves may respond to a stimulus such touch within a few seconds. The response is not from a nervous reaction, but from a condition known as ’’turgor”, which is a loss or gain of water in certain cells.

In animals the nervous system may be most complex, involving the senses of touch, sight, smell, taste, and hearing.

COMPREHENSION

Ex. 1. Match the word and its definition making use of the text:

Respiration	is	the process of fusion of two specialized male and female cells, the exchange of the gases.
Pollination		the exchange of the gases oxygen and carbon dioxide in living organisms.
Fertilization		the transfer of the pollen.
Digestion		an example of halophytic nutrition.
Photosynthesis		the process of converting complex food materials into simpler compounds.

Ex. 2. Translate the Sentences into Russian

1. Plants and animals differ greatly in appearance, size, shape, colour.
2. Photosynthesis, is demonstrated by those green plants that contain chlorophyll.
3. The waste products that are produced by digestion in plants are water and carbon dioxide.
4. Both plants and animals require oxygen in the process of digestion.
5. Reproduction in plants and animals is similar in some respects, yet different in others.
6. In animals the nervous system may be most complex, involving the senses of touch, sight, smell, taste, and hearing.

Ex. 3. Find the key sentence in each paragraph of the text.

Ex. 4. State the general idea of each part.

GRAMMAR

Word formation

Ex. 1. Complete the tables and mark the stress on each word. Guess the noun formed from them.

Verb	*Noun*
educate	
improve	
jog	
govern	
spell	
hesitate	

Adjective	*Noun*
stupid	
dark	
weak	
similar	
punctual	
sad	

Ex. 2. Write an adjective (or adjectives) formed from these nouns or verbs.

danger	care
attract	thou
create	politi
cloud	enjoy
suit	pain

Ex. 3. How many of these words can form opposites with the suffix -less?

wonderful, useful, careful, beautiful, awful

LISTENING

Listen to the discussion between a teacher and some students about extinction. Then listen again and fill in the gaps in the sentences.

1. The Tasmanian tiger looked like a dog with a…….. head.
2. It was called a tiger because it had on ……..... its body.
3. The ..... who arrived in Tasmania killed it.
4. The Tasmanian tiger was a very…… animal.
5. The last one died in ..... - in a zoo.
6. The Tasmanian tiger was declared extinct in…… .

WRITING

You have received a letter from your English-speaking pen friend, Ben.

…I've just been to the zoo. What lovely animals are there! Bears, tigers and even sharks! When I look at them in the zoo I can hardly imagine that they could be dangerous or eat other animals…

… What do you think is better for animals – to live in the zoo or in the wild, why? What animals are common in your region? Have you ever seen any animal in the wild? …

Write him a letter and answer his 3 questions.
Write 100–120 words. Remember the rules of letter writing.

UNIT 6

EVOLUTION

VOCABULARY

Ex. 1. Memorize the following words:

• care *v* 1) заботиться, беспокоить(ся), тревожить(ся) • offer предлагать • convince *v* убеждать • relate *v* относится к чему-л. • be related to быть связанным, • float *v* плавать, держаться на поверхности • descend *v* происходить • descendant *n* потомок • rule *v* править, управлять • gradual *a* постепенный • heredity *n* наследственность • afford иметь возможность, быть в состоянии, позволить себе • raise *v* растить, выращивать • transmit *v* передавать • breed (bred, bred) *v* разводить, выращивать • origin *n* происхождение • evidence *n* доказательство • put forward *v* выдвигать *(теорию, идеи)* • to cope with *v* справиться с чем-л. • to admit *v* признавать, допускать.

Ex. 2. Read and translate the following international words. Mind the part of speech:

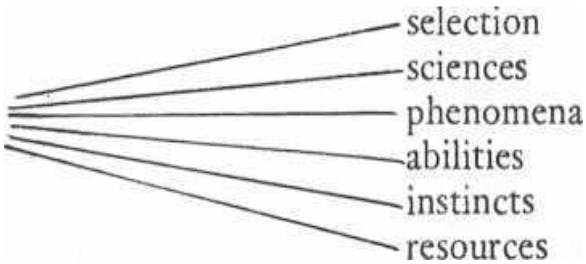
naturalist *n,* experiment *n,* post *n,* career *n,* scorpion *n,* amphibian *n,* reptile n, argument *n,* climate] *n,* race *n,* 'tendency *n,* universal *a,* critical, academy *n,* expedition *n,* colleague n, alpine *a,* plateau n, sensational *a,* 'tropical *a,* subtropical *a,* relief *n*

Ex. 3. Translate the following a) words with the same root, b) word combinations, c) sentences:

a) nature *n,* natural *a,* unnatural *a,* naturally *adv,* naturalist *n,* naturalize *v;*

b) wild nature, human nature, the forces of nature, the balance of nature, the nature of things, a return to nature, nature conservation, a young naturalists station;

natural



c) 1. It is interesting to watch animals living in their natural state. 2. It is natural for a bird to fly. 3. Ch. Darwin developed the theory of evolution and natural selection. 4. Young Darwin liked to read books of the great naturalists. 5. Gerald Durrell is a well-known English naturalist and writer. 6. Her hair curls naturally. 7. She speaks and behaves naturally. 8. He laughs unnaturally. 9. ’’Naturalize” means acclimatize an animal or plant into another (part of a) country. 10. There are many young naturalists stations in our republic.

Ex.4. Form the nouns from the following verbs according to the model. Translate the derivatives:

Model: inform + -ation - информировать

select *v* — отбирать, distribute *v* — распределять, attract *v* — привлекать, preserve *v* — сохранять, found *u* — основывать, contribute *v* — делать вклад, describe *v* — описывать, represent *v* — представлять, adapt *v* — адаптироваться, produce *v* — производить, explain *v* — объяснять.

Ex. 5. Match the pairs of synonyms from a) and b). Use a dictionary if necessary. Write them down and memorize.

a) evolution *n,* species *n,* environment n, trait *n,* heredity *n,* origin n, descends, afford *v,* raise *v,* rule *v,* graduate *v,* cause *v,* influence *v,* naturalize *v,* collect *v,* transmit *v,* develop *v,* put forward *v;*

b) descent n, inheritance *n,* surrounding n, development *n,* kind *n,* strain *n,* rear, to be able *v,* govern *v,* induce *v,* affect *v,* hand down *v,* gather *v,* acclimatize *v,* bring forward *v,* originate *v,* finish *v,* evolve *v.*

READING

TEXT

CHARLES DARWIN (1809-1882)

Charles Darwin was one of the most influential and prolific scientists of the nineteenth century. He has been written about so extensively by twentieth-century historians that a "Darwin industry" of secondary literature has arisen. His grandfather was the celebrated author Erasmus and his father Robert practised medicine very successfully in Shrewsbury. Darwin also studied medicine at Edinburgh from 1825-27, but finding his studies uncongenial, transferred to Cambridge to train as a clergyman. Adam Sedgwick and John Henslow (who suggested the Beagle Voyage) were early scientific influences on

Darwin. To the dismay of his father, many of Darwin's activities at Cambridge clearly fell into the category of extra-curricular, including rat-catching, shooting, and beetle collecting: "I will give a proof of my zeal: one day, on tearing off some old bark, I saw two rare beetles and seized one in each hand; then I saw a third and new kind, which I could not bear to lose, so that I popped the one which I held in my right hand into my mouth. Alas it ejected some intensely acrid fluid, which burnt my tongue so that I was forced to spit the beetle out, which was lost, as well as the third one".

Darwin served as a naturalist aboard H.M.S. Beagle from 1831-36, visiting South America and the Pacific islands. Darwin collected specimens and observed variations in related species of birds and animals. He read the first edition of Charles Lyell's *Principles of Geology* on the voyage and became convinced of the immensity of geologic time, a time period which would allow natural selection to take place. Upon his return, he married his cousin Emma Wedgwood and published several volumes describing the scientific findings of the Beagle voyage, including *The Zoology of the Voyage of the H.M.S. Beagle* (1839-43), *Journal of Researches into the Geology and Natural History of the Various Countries Visited by H.M.S. Beagle* (1839), *Geological Observations on the Volcanic Islands Visited During the Voyage of H.M.S. Beagle, Together With Some Brief Notices of the Geology of Australia and the Cape of Good Hope* (1844), and *Geological Observations on South America* (1846). Darwin also advanced his original theory of the structure and distribution of *Coral Reefs* (1842), arguing that atolls developed by the deposition of polyp skeletons on gradually subsiding underlying strata, rather than on submerged volcanic craters at a fixed depth, as Lyell had proposed. He then spent eight years classifying the subclass Cirripedia, or the barnacles. At this time, Darwin began to suffer from the mysterious recurrent illness—perhaps Chagas' disease, hypochondria, overwork, or a neurological disorder—which forced him into a reclusive life at Downe in Kent. He eventually sought relief in hydrotherapathy.

Through observation of the similarities between extinct and related living species in South America, Darwin began to question the orthodox position that species had remained unchanged since first placed on earth by God. In 1837, Darwin started the first of a series of Transmutation *Notebooks* on the species question which later evolved into the 1842 and 1844 drafts of an essay which Darwin called "my big book" on species, later to be rewritten as *The Origin of Species*, with the first two chapters eventually forming *The Variation of Animals and Plants Under Variation* (1868). Darwin's reading of Thomas Malthus's *Essay on Population* demonstrated to him that population growth would always outstrip food supply, inevitably resulting in competition for limited resources. Those individuals possessing the traits, produced by random variation, which best allowed the organism to survive would pass these traits to their offspring, ensuring the survival of these traits and thereby slowly modifying the species to the extent that intermediate varieties would supplant or exterminate the parent

type. For this process, Darwin adopted Herbert Spencer's phrase "survival of the fittest," although the fit should not be seen as qualitatively "better" than other individuals, but simply as those which are naturally selected by the environment to leave more offspring. As Robert Young has shown, Darwin was led to the idea of natural selection by the example of artificial selection of domestic animals in which breeders selected animals for specific desirable traits. In Darwin's scheme, nature simply acts as an unconscious and more perfect selector. Darwin investigated artificial selection in his *The Variation of Animals and Plants Under Domestication* (1868); he also bred pigeons himself, joined breeding societies, and like his cousin Francis Galton, circulated questionnaires to plant and animal breeders.

In 1858, the English naturalist Alfred Russel Wallace sent Darwin an essay from Malaysia entitled "On the Tendency of Varieties to Depart Indefinitely from the Original Type" (see the Wallace selections below). Darwin immediately recognized his own views on species transmutation in Wallace's work. Subsequently, Joseph Hooker and Charles Lyell arranged a meeting of the Linnean society at which Wallace's and Darwin's ideas were jointly presented. A year later, Darwin published his *Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life.* The book sold out instantly and at the 1860 Oxford meeting of the BAAS, Thomas Huxley defended Darwin's views against Bishop Samuel Wilberforce and the theologians who were shocked by the implication (not stated by Darwin) that man and apes shared a common origin and that Paley's natural theology with its purposeful creator was no longer tenable. Darwin eventually applied his evolutionary views to mankind in *The Descent of Man* (1871), stating clearly that man had evolved from lower life forms. It must be pointed out that Darwin had no clear conception of how characters were transmitted from parent to offspring, as knowledge of genetic inheritance had to wait until the twentieth century with the rediscovery of the work of Gregor Mendel. By 1900, Darwin's theories were being disputed from a number of quarters and his pangenesis theory of blending inheritance had to be abandoned in the twentieth century in favour of particulate inheritance by genes.

Darwin's *Descent of Man, and Selection in Relation to Sex* introduced the concept of sexual selection—an intra-species mechanism operating between males and females—which like natural selection modified species over time and produced sexual dimorphism, to the extent, as Darwin points out, that sometimes males and females of the same species had been assigned to different genera by various naturalists. The topic of sexual selection has recently been of great interest, and Nancy Etcoff's *Survival of the Prettiest* (1999) provides a bibliography of scientific and popular writings on the evolutionary role of beauty and the factors believed to be involved in mate selection in humans and animals, Carl Jay Bajema has in addition compiled an anthology of pre-1900 essays on *Evolution by Sexual Selection Theory Prior to 1900* (1984) which

supplements Bernard Campbell's edition of modern essays entitled *Sexual Selection and the Descent of Man, 1871—1971* (l972).

Darwin's final works include *On the Various Contrivances by which British and Foreign Orchids are Fertilized by Insects (*1862), *The Expression of the Emotions in Man and Animals* (1872), *Insectivorous Plants* (1875), *The Movements and Habits of Climbing Plants* (1875), *The Effects of Cross and Self Fertilization in the Vegetable Kingdom* (1876), *The Different Forms of Flowers on Plants of the Same Species* (1877), *The Power of Movement in Plants (1880), and The Formation of the Vegetable Mould Through the Action of Worms* (1881). Darwin's complete works have been edited by Paul H. Barrett and R.B. Freeman for Pickering and Chatto. Darwin's Autobiography, with deleted passages restored by Nora Barlow, remains a classic of scientific biography.

In spite of continuing bouts of poor health, Darwin lived out another decade in his country home in Kent, enjoying being with his family and working on further minor biological projects. When he died in April 1882, there was a remarkable outpouring of tributes from far and wide and the science community in London quickly arranged, with the family's eventual consent, that Darwin be buried in Westminster Abbey, beneath the monument to Newton. Was he not 'the greatest Englishman since Newton'? Had he not given 'exactly the same stir, the same direction, to all that is most characteristic in the intellectual energy of the nineteenth century, as did Locke and Newton in the eighteenth?

COMPREHENSION

Ex. 1. Translate the Sentences into Russian

1. Charles Darwin was one of the most influential and prolific scientists of the nineteenth century.
2. Darwin also studied medicine at Edinburgh from 1825-27.
3. Darwin served as a naturalist aboard H.M.S. Beagle from 1831-36, visiting South America and the Pacific islands.
4. Darwin collected specimens and observed variations in related species of birds and animals.
5. Darwin investigated artificial selection in his *The Variation of Animals and Plants Under Domestication.*
6. Darwin was led to the idea of natural selection by the example of artificial selection of domestic animals in which breeders selected animals for specific desirable traits.

Ex. 2. Answer the following questions.

1. What education did Charles Darwin get?
2. What was the greatest event of his life, lasting from December 1831 to October 1836? Why?

3. When was Darwin’s main work on species published?
4. Where did he present the topic of sexual selection?
5. What are the weak points in Darwin’s theory *Descent of Man*?

Ex. 3. Choose the statement you think to be correct.

1. Darwin was born
a) in the family of brilliant lawyers
b) in the family of notable doctors
c) in the family of a poor leather worker

2. Darwin suffered from
a) hypochondria
b) cancer
c) tuberculosis

3. In *Variation of Animals and Plants Under Domestication* Darwin investigated
a) the structure and distribution of coral reefs
b) artificial selection
c) the physical laws of muscle contraction

Ex. 4. Review the text.

GRAMMAR

The active voice

Ex. 1. Complete the conversations. Put in the correct form of each verb.

A: Are you ready?
B: I won't be a moment. *I'm doing* (I / do) my hair.

1 A: Could you tell me your address?
B: Well,…….. (I / live) in a friend's house at the moment.
Luckily.....……. .....(I / find) a place of my own now, but I can't move in until next week.

2 A: Is this your CD?
B: No, it isn't mine…….....(I / think)……(it / belong) to Peter.

3 A: Can I borrow your calculator, please?

B: Well,…… (I / use) it to work out these figures at the moment…….. (I / want) to finish doing them, now that…… (I / start).

4 A: Why can't you wash your dirty plates sometimes? ..... (you / leave) them in the sink most of the time.

B: OK, sorry. The last few weeks ..... (I / have) so little time.....(I / rush) around all the time.

Ex. 2. Read the story and write the missing words. Use one word only in each space.

One day a man was (0) *walking past* a house in Bournemouth when he (1)…….....a woman's voice shouting for help. The man (2) .....……. someone (3) probably trying to murder her. He ran to a phone box and (4) the police. The police came quite quickly, but by now the shouting had (5) . However, the man (6) .....……. quite sure that he (7)…… heard cries for help. When the police (8)…….. on the door, there was no answer. So they broke down the door and went in. Inside the house was a woman who had just (9)…….. out of the shower. She explained to the police that she had (10)…… singing along to the Beatles song 'Help!'.

Ex. 3. Write a second sentence so that it has a similar meaning to the first. Begin with the word in brackets.

Our trip to Africa was in October. (We ...) *We went to Africa in October.*

1. We've had ten hours of rain. (It...)
2. It's the right thing to do in my opinion. (I ...)
3. Our sofa is in a different place now. (We ...)
4. It was breakfast-time when Susan rang. (I ...)
5. Their game of badminton is always on Tuesday. (They ...)

Ex. 4. Write the correct answer in each space.

This isn't my first visit to London. *I've been* here before.
a) I'm b) I've been c) I was

1. I've got my key. I found it when..... for something else.
a) I looked b) I've looked c) I was looking

2. Sorry, I can't stop now. ..... to an important meeting.
a) I go b) I'm going c) I've gone

3. I can't get Tessa on the phone..... all afternoon.
a) I'm trying b) I try c) I've been trying

4. The bank told me last week there was no money in my account. it all.
a) I'd spent b) I spent c) I was spending

5. There's a new road to the motorway. ..... it yesterday.
a) They'd opened b) They opened c) They've opened

Ex. 5. Some of these sentences are correct, and some have a word which should not be there. If the sentence is correct, put a tick (V). If it is incorrect, cross the unnecessary word out of the sentence and write it in the space.

Martin has changed his mind about next weekend. V
We were enjoyed the holiday very much. *were*
1. Nancy is practicing on the piano.
2. It was lucky that we had been decided to buy our tickets in advance.
3. We were riding our bikes when suddenly I was felt a pain in my leg.
4. We are go camping for three weeks every summer.
5. They have planted some new trees last year.
6. I suddenly realized I had been walking in the wrong direction.
7. Did you know that Anna has been won a prize?
8. No one told me that the goods had arrived the week before.

Ex. 6. Read the news report and write the missing words. Use one word only in each space.

The Maxi-Shop company is (0) *going* to build a huge new shopping centre on the edge of Millingham, it was announced yesterday. There (1)..... be at least three hundred shops, including some big department stores. When the project (2)…… complete, there (3) be hundreds of new jobs for local people. But not everyone is happy. 'We're (4) to fight this plan,' said a spokesperson for the local Environment Group. We think what is going (5)…….. happen to our countryside. When shopping malls (6)…….. covered the whole country, there (7)……. be no green fields left. So we're (8)……. a protest meeting tomorrow evening at the town hall. It (9)…….. at half past seven.' Owners of shops in the town centre are also unhappy. 'The new centre (10)……. ..... take our customers away,' said one of them.

Ex. 7. Look at the answers below and write the correct answer in each space.

A: Let's go to the carnival, shall we?
B: Yes, good idea. I expect *it'll be* fun.
a) it'll be b) it's c) it's being

1 A: Could I have a word with you, please?

B: Sorry, I'm in a big hurry. My train..... in fifteen minutes.

a) is going to leave b) leaves c) will leave

2 A: Have you decided about the course?

B: Yes, I decided last weekend. ..... for a place.

a) I apply b) I am to apply c) I'm going to apply

3 A: I'm trying to move this cupboard, but it's very heavy.

B: Well, ... you, then.

a) I help b) I'll help c) I'm going to help

4 A: Is the shop open yet?

B: No, but there's someone inside. I think .....

a) it opens b) it's about to open c) it will open

5 A: Do you mind not leaving your papers all over the table?

B: Oh, sorry. I'll take them all with me when .....

a) I go b) I'll go c) I'm going

6 A: It's a public holiday next Monday.

B: Yes, I know. ..... anything special?

a) Are you doing b) Do you do c) Will you do

LISTENING

Before you listen

Discuss these questions with your partner.

1. What does evolution mean?
2. Do you know anything about Charles Darwin?
3. What do you know about natural selection?

Listen to a talk about Darwin. Then decide if the following sentences are true or false, according to the speaker.

1. Darwin wrote two famous books.
2. Darwin's theory was very popular in his time.
3. Differences between fossils and modern animals helped him form the Theory of evolution.

4. Natural selection meant the healthiest specimens would survive.

5. An adaptation was inherited and decreased an organism's chances of survival.

WRITING

A DESCRIPTION OF A FAMOUS PEOPLE

Before you write

Ex. 1. Choose one of the famous biologist to write about and list three or four reasons why you think he \ she deserves the title.

Ex. 2. Now write your entry for the competition. Make sure you develop the topic sentences which start each paragraph. Link your paragraphs with one of these phrases:

THE FIRST POINT: First\ Firstly\ First of all\ My first point\reason is that…

SUBSEQUENT POINTS: Secondly\ Thirdly…\Also…\In addition to this…\Another thing\point\reason is …

THE LAST POINT: Finally\Lastly…\As well as all this…\My final point\reason is that…

UNIT 7

GREGOR MENDEL. GENETICS.

VOCABULARY

Ex. 1. Read and memorize the following words:

• duplicate *v* воспроизводить, повторять в точности • chain *n* цепь • creature *n* существо • variety *n* разнообразие • notice *v* замечать • split (split, split) *v* расщеплять (ся) • join *v* присоединятся • possess *v* обладать, владеть • attach *v* укреплять, присоединять • arise *v* возникать • match *v* соответствовать • transmit *v* переносить • determine *v* определять • undergo (underwent, undergone) *v* подвергаться, • fertilize *v* оплодотворять • inherit *v* наследовать • occur *v* случаться, происходить • to be in charge of отвечать за что-л.

Ex. 2. Read the following international words. Translate them:

reason *n,* fix *v,* collect *v,* original *a,* characteristic *n,* manufacture, separate *v,* act *v,* model *n,* guide *n,* pigment *n,* fragment *n*

Ex. 3. Read correctly the following terms:

chromatin *n,* chromosome *n,* gene *n,* cytoplasm *n,* ribosome *n,* melanin *n,* tyrosinase *n,* mutation *n,* mutant.

Ex. 4. Match these words with their definitions.

A changed	1 blend
B children	2 altered
C combine	3 hypotheses
D theories	4 ratio
E relative amount	5 offspring
F element	6 successive
G think of	7 particle
H find	8 trace
I following	9 come up with

Ex. 5. Check you understand the key words.

genetics, inheritance, anatomic, notional, chromosomes, DNA, proteins, genes, genome, ethical, cloning, relativity

Ex. 6. Read the following words of the same root. Determine the part of speech they belong to. Guess their meaning:

a) create, creation, creator, creative, creatively, creature;
b) origin, originate, original, originally, originality.

Ex. 7. Form the nouns from the following verbs with the help of the suffix -ion/-ation. Read and translate them into Russian. Mind the stress in the derivatives:

Model: react *v* + -ion - reaction *n*
реагировать реакция

determine *v* + -ation - determination *n*
определять определение

dictate, collect, create, originate, separate, form;

Ex. 8. Choose the antonyms of the following words. Translate them:

a) to attach, to arise, to survive, to join, to inherit, to put together, variety, perfect

b) to disjoin, to die, to detach, to take apart, monotony, to disinherit, imperfect, to disappear

TEXT 1

Before you read

Discuss these questions with your partner.
1. Do you have plants at home?
2. Do you have a kitchen garden?
3. What do you know about selection of plants?
4. Have you ever conducted an experiment?

GREGOR MENDEL

Gregor Mendel was born on 20th July, 1822, and died on 6th January, 1884. He was a biologist and botanist whose scientific research showed that inheritance proceeds according to certain scientific laws.

Mendel was a brilliant student and his family encouraged him to study, but they were very poor so Mendel entered a monastery in 1843. There he taught Mathematics, Physics and Greek to high school students. Eight years later, in 1851, the monastery sent him to the University of Vienna where he was able to continue his education. In 1853, he returned to the monastery and began teaching and researching again.

Mendel's theories of heredity based on his work with pea plants are well known to students of Biology. But his findings were so different from the accepted views on heredity at the time that his work was ignored until long after his death. His paper, *Experiments in Plant Hybridisation*, in which he described how traits were inherited, has become one of the most influential publications in the history of science.

Mendel was the first person to trace the characteristics of successive generations of an organism. In Mendel's day, a number of hypotheses had been suggested to explain heredity. The most popular one was the so-called *blending theory*. According to this theory, inherited traits blended from generation to generation. For instance, a red rose crossed with a white rose would, over time, produce a pink rose. Another theory put forward by Charles Darwin was called

pangenesis. This stated that there were hereditary particles in our bodies, and that these particles were affected by our actions. The altered particles could be inherited by the next generation. These theories were disproved by Mendel.

The first thing he noticed when he began his experiments was that traits were inherited in certain numerical ratios. This observation led him to come up with the idea of the dominance of genes and he tested it in peas. For seven years he crossed thousands of plants to prove the Laws of Inheritance. From his experiments, Mendel developed the basic laws of heredity. Those laws are the following: that traits do not combine, but are passed whole from generation to generation (which disproved the blending theory and Darwin's theory); each member of the parental generation passes on only half of its hereditary information to each offspring (with certain traits dominant over others); and different offspring of the same parents receive different sets of hereditary information.

Mendel's research formed the beginnings of the modern science of genetics. Genetic theory has had a huge impact on our lives. Many diseases, for example haemophilia, are known to be inherited, and family histories can be traced to determine the probability of passing on a hereditary disease. Scientists can now design plants that are easier to grow, or which can produce more food. This practical side of the results of Mendel's research is being used to improve the way we live.

TEXT 2

GENETICS

Genetics is the science of inheritance. It studies the cells and the anatomical and functional characteristics transmitted from parents to children.

A cell is an intelligent organism made from atoms. We are made from more than sixty billion cells. There are cells to make bones, muscles, blood and so on. In the nucleus of every cell there are twenty-three pairs of chromosomes, half of them are from the mother and the other half are from the father. Chromosomes are made of DNA (deoxyribonucleic acid) and protein. Each chromosome contains many genes in its DNA. The DNA carries the instructions to construct a human being.

Each species has its own set of genes. The different combinations of genes determine the characteristics of each individual. With the exception of identical twins, nobody in the world has the same combination of genes and this is what makes everyone a unique individual. What all humans *do* have in common is the genome, that is, we all have the same number of chromosomes and the same genetic material. There are no superior or inferior genes.

Genetic manipulation refers to human intervention in the design or function of the cells. Many people oppose it. They argue that the main problem

is that man can be both a master and a monster. At an institute of pharmaceutical engineering in Virginia, USA, scientists injected pigs with a human gene that produces a protein called Factor VIII. This protein makes the blood thicker and helps patients with hemophilia. The fourth generation of these pigs will possibly produce enough Factor VIII in their milk to supply the world's demand. On the other hand, through genetic manipulation people could select spermatozoids and decide the sex of their future babies. This alters the course of nature and for many people it has ethical implications.

Cloning is another important topic. From a few cells scientists can produce cartilage. This will probably soon help people who don't have a part of their face, like an ear, after an accident. But in the future we could clone and manipulate people.

Our problem is always the same. People disagree about what is ethical and what is not.

COMPRIHENSION

Ex. 1. Read text 1 and choose the best title for each paragraph. There is one title which you do not need to use.

PARAGRAPH 1 ……..	A The experiment
PARAGRAPH 2……	B His studies
PARAGRAPH 3 ……...	C Genetics today
PARAGRAPH 4 ……...	D A modern science
PARAGRAPH 5 ……..	E An important paper
PARAGRAPH 6 ……..	F Different theories
	G Gregor Mendel, the scientist

Ex. 2. Read text 2 carefully, and then answer the multiple choice questions.

1. In the nucleus of every cell there are
   a) 46 chromosomes
   b) 50 chromosomes
   c) 54 chromosomes

2. The characteristics of each individual depend on
   a) the combination the genes
   b) the genome
   c) the chromosome

3. Which of the following best describes genetic manipulation?
   a) heart transplant
   b) cloning
   c) plastic surgery

Ex. 3. Translate the Sentences into Russian.

1. His scientific research showed that inheritance proceeds according to certain scientific laws.
2. Mendel's theories of heredity based on his work with pea plants are well known to students of Biology.
3. Inherited traits blended from generation to generation.
4. Traits were inherited in certain numerical ratios.
5. This observation led him to come up with the idea of the dominance of genes and he tested it in peas.
6. Mendel's research formed the beginnings of the modern science of genetics.

Ex. 4. Discuss these questions with your partner.

1. How are characteristics passed on from generation to generation?
2. How does modern science change this? Why?

Ex. 5. Review the text.

SPEAKING

Ex. 1. Debate on advantages and disadvantages of genetic manipulation. Use the following information as a guide.

Advantages
- Restore some parts of your body
- Can help to treat an illness
- Choose future baby's sex

Disadvantages
- Expensive
- Can produce population imbalance

Example:
Student A: Genetic manipulation can restore some parts of your body.
Student B: Yes, but it's very expensive. Only rich people can do that.

Ex. 2. Prepare a short presentation on the topic: 'Theories of inheritance'.

Talk about:
- Mendel's theory
- Mendel's experiment
- theories that were disproved
- cells, chromosomes and genes

First complete these notes.
Use them in your presentation.

Mendel's theory: Mendel stated that…….
Mendel's experiment: Mendel conducted experiments on……
Disproved theories: The theories that Mendel disproved were……
and…… .
What are cells? How is genetic information passed on?

Remember to:
- read the texts carefully
- underline the parts containing the information you need
- use your own words; do not copy everything from the texts
- stick to the point

Speaking tips
- Refer to your notes.
- Do not read out a long monologue.
- Express yourself clearly and concisely.

GRAMMAR

The passive voice

Ex. 1. Rewrite these sentences beginning with the underlined words.

Thieves robbed a woman.
A woman was robbed.

1. They may ban the film.
2. They offered Nancy a pay increase.
3. We need to correct the mistakes.
4. Someone reported that the situation was under control.
5. They are testing the new drug.
6. We haven't used the machine for ages.

Ex. 2. Write a second sentence so that it has a similar meaning to the first. Use the word in brackets.

We have to test these products, (be)
These products have to be tested.

1. Pavarotti sang the song, (by)
2. Nigel's passport was stolen, (had)
3. They pay doctors a lot of money, (are)
4. I hope they'll interview me for the job. (to)
5. Someone was cleaning the floor, (being)
6. A mechanic is repairing Judy's car. (having)
7. Tessa lost her way. (got)
8. Everyone agreed that the plan should go ahead, (it)
9. When did they decorate your kitchen? (get)
10. They say exercise is good for you. (be)

Ex. 3. Which of the two sentences follows on best?

There's going to be a big art exhibition.
a) A lot of visitors will be attracted to it.
b) It will attract a lot of visitors.

1. Our neighbours have got a cat and a dog.
a) A lot of mice are caught by the cat.
b) The cat catches a lot of mice.

2. Last night Martin dreamt he saw his dead grandmother.
a) A white dress was being worn by the ghost,
b) The ghost was wearing a white dress.

3. We've bought a new computer.
a) It can do the job much more quickly,
b) The job can be done much more quickly.

4. My grandfather is very ill.
a) He's being looked after in the local hospital,
b) b) The local hospital is looking after him.

5. We've completed the experiment.
a) The newspapers will publish the results,
b) The results will be published in the newspapers.

LISTENING

Listen to two students discussing their homework. Then answer the questions by writing one or two words in each gap.

1. They will both write a report for their……..class.
2. The boy may write about…….. .
3. It is now possible for scientists to change information in…….. .
4. ……watermelons have been produced by scientists in their labs.
5. Scientists can use this new technology to produce more…..…… .
6. Plants can be genetically engineered to make…….. .

WRITING

Write a letter to a science museum applying for a part-time job. Use these notes to help you.

Dear (Sir/Madam),

Writing to apply for a job:

I am writing to apply for the position of…….

Why you would be suitable: interested in science (physics, biology, your own ideas):

I believe I would be suitable for the position because ……

Intend to study Science at university:

It is my intention to study Science at university, and I believe this will…….…....

Previous work experience: (laboratory / library / your own ideas)

I (have) worked in a ..... for……..years/months.

Say you are available for an interview:

I am available for an interview

Yours faithfully,

(your full name: first name + surname)

Write 100-140 words.

UNIT 8

CLONNING

VOCABULARY

Ex. 1. Match these words with their synonyms and antonyms.

Words
1. endanger
2. extract
3. unique
4. extinction
5. replica
6. particular
7. identical
8. create
9. latest
10. brilliant
11. improve
12. move ahead

Synonyms
1. recent
2. make better
3. progress
4. same
5. intelligent
6. make
7. copy
8. special
9. take out
10. threaten
11. death
12. exclusive

Antonyms
1. survival
2. original
3. protect
4. insert
5. general
6. common

7. fall behind
8. destroy
9. different
10. stupid
11. make worse
12. old

READING

Before you read

Ex. 1. Discuss these questions with your partner.

1. Do you know anything about genetic engineering?
2. Do you buy genetically modified food?
3. Would you like to clone something or someone?
4. Have you read any books - scientific or fiction - about cloning?
5. Are there any films where the issue of human cloning comes up?
6. Is cloning a matter of technology, ethics or politics?

TEXT

CLONING

It used to be only in science fiction that the , existence of a race of identical creatures could be imagined: a group of people with exactly the same hair colour, the same features and the same height. However, now this dream - or nightmare - could actually become reality. In theory, the process of creating replicas of any living being seems quite simple. First, a body cell, which contains the specific genes of a living organism, splits in two. The resulting new cells, each containing the same genes, then grow into two new, identical organisms. This process is known as cloning, and it can be applied to humans, animals, insects and plants.

Early experiments with cloning took place using the tadpoles of frogs. In 1968, Dr J.B. Gurdon of Oxford University, England, took an unfertilised frog's egg from a frog - let us call it frog number 1 - and destroyed its nucleus. This meant that he had removed all the genetic information which related to this frog. He then inserted a new nucleus extracted from a cell from another frog number 2. The tadpole which developed from the egg produced by frog number 1 was identical to frog number 2, not to frog number 1! It was not until 1996, however, in Scotland, that a group of British researchers led by Ian Wilmut achieved the

successful cloning of an adult animal. The result was Dolly, who has taken her place in the history books as the first lamb to be cloned from the DNA of an adult sheep.

Following the birth of Dolly, both scientists and ordinary people have begun to think about the possibilities of cloning. The latest technology now means that we can remove body cells from the best of our race, the brilliant scientist, the musical genius, the child prodigy, and ensure that the same genes are reproduced in as many babies as we wish. However, cloning does not mean copying.

The process actually takes its name from the Greek word *cion* which means a twig. A twig has the same genetic information as the tree it comes from, but the two look very different. In the same way, a clone shares the same genes as its donor, but its behaviour and characteristics will be different: personality will always be unique.

Science has provided us with knowledge which seems to have unlimited possibilities. We can not only make *designer* human beings, but we can also use cloning to improve health. For example, scientists predict that in the future, pigs with organs that could be used in human transplants, could be cloned. Cloning could also enable us to learn more about the embryo and how organisms develop. Cloning could put an end to the risk of extinction of the endangered species on our planet; if animals can be cloned, they need never die out.

However, the process is very controversial. Some people have asked whether a cloned individual would really be a human; would it have a soul? Would there.be relationships and responsibilities between donors and clones? What would be the position of the children of donors in relation to clones? These people are concerned that cloning, or genetic engineering, would interfere with the laws of religion or nature. Others are concerned that it might lead to attempts to alter the features of a particular race and result in a new kind of ethnic cleansing. The fact is that the new opportunities offered by science have always meant that we are faced with new ethical questions. These questions need to be discussed and evaluated before we move ahead.

COMPREHENSION

Ex. 1. Read the text and choose the best title for each paragraph. There is one title, which you do not need to use.

1. CLONING OF LIVING BEINGS
2. BENEFITS OF CLONING
3. COPYING AND CLONING
4. MORE DISADVANTAGES
5. ETHICAL PROBLEMS
6. POSSIBLE FUTURE

Ex. 2. Answer the following questions.

1. 1 When did the first attempt to create a clone take place? What happened?

2. £ Who's Dolly? Why is she famous?

3. In what ways is cloning different from copying?

4. Give one example of how cloning could be beneficial to humans.

5. What are the disadvantages of cloning from an ethical point of view?

Ex. 3. Work in pairs. Think of at least one more question to the text your partner should answer. Then change roles.

Ex. 4. Translate the Sentences into Russian.

1. Cloning is the process of growing two or more identical organisms from one cell.

2. Early successful experiments with cloning, using the tadpoles of frogs, took place in 1968.

3. The technique of tadpole cloning consisted of transplanting a frog's DNA, contained in the nucleus of a body cell, into an egg cell whose own genetic material had been removed.

4. Cloning does not mean copying: a clone shares the same genes as its donor, but its behaviour and characteristics will be different.

5. Cloning could be beneficial to humans. For example, we could use cloning to improve health; we could learn more about how organisms develop and we could put an end to the risk of extinction of endangered species.

6. The practical applications of cloning are financially promising but many ethical questions remain.

SPEAKING

Give a two-minute presentation on the benefits and problems of human being cloning. First read the text again and make notes on the following:

1. What is cloning?

2. How is cloning done?

3. benefits: medicine, saving of endangered species

4. problems: donors and clones, children of donors, religion, ethnic cleansing

Remember to:

- use key words for your notes, not complete sentences
- glance at your notes regularly

Speaking tips

- Speak in a clear voice.
- Maintain eye contact with your audience.

GRAMMAR

Sequence of tenses
Indirect speech

Ex. 1. Some of these sentences are correct, and some have a word which should not be there. If the sentence is correct, put a tick (-). If it is incorrect, cross the necessary word out of the sentence and write it in the space.

You promised you wouldn't be late.
Susan thought that I can't understand what's happening. *that*
1. Do you know me what time the coach leaves?
2. Robert wanted to know if did the price included breakfast.
3. Anna insisted on showing us her photos.
4. Someone asked us whether that we had eaten lunch.
5. Nancy told me she had started the job the week before.
6. Nigel said me he wanted to come with us.
7. My friend said she did liked her new flat.
8. Martin asked us for not to wake the baby.

Ex. 2. Decide which word is correct

What did that man say *to you?*
a) at you b) for you c) to you d) you

1. I rang my friend in Australia yesterday, and she said it …….. raining there.
a) is b) should be c) to be d) was

2. The last time I saw Jonathan, he looked very relaxed. He explained that he'd been on holiday the……. ..... week.
a) earlier b) following c) next d) previous

3 I wonder……. the tickets are on sale yet.
a) what b) when c) where d) whether

4 I told you……. switch off the computer, didn't I?
a) don't b) not c) not to d) to not

5. Someone…….....me there's been an accident on the motorway.
a) asked b) said c) spoke d) told

6. When I rang Tessa some time last week, she said she was busy…… day.
a) that b) the c) then d) this

7. When he was at Oliver's flat yesterday, Martin asked if he……. use the phone.
a) can b) could c) may d) must

8. Judy ..... going for a walk, but no one else wanted to.
a) admitted b) offered c) promised d) suggested

Ex. 3. Read the news report and write the missing words. Use one word only in each space. Sometimes there is more than one possible answer.

Police have warned people (0) *to* watch out for two men who have tricked their way into an old woman's home and stolen money. The men called on Mrs. Iris Raine and said (1)…….. ... were from the water company and wanted to check (2) .....…… ... her water was OK. They asked if (3) …… would mind letting them into her house. The woman didn't ask (4) .....see their identity cards. She said she (5) …….. . know about any problem with the water. The men explained that they (6)…… just discovered the problem but that it was very simple and (7) …… take long to check. The woman asked (8)…… the service was free, and they said yes. They (9)…… to know where the water tank was. While one man ran water in the kitchen, the other went upstairs and took several hundred pounds from a drawer in a bedroom. The men then left saying that they would return the (10)……. Day to have another look.

Ex. 4. Complete each sentence by reporting what was said to you yesterday. Use <u>said</u> and change the tense in the reported speech.

Polly: I'm really tired.
When I saw Polly yesterday, *she said she was really tired.*

1. Tessa: I feel quite excited.
When I saw Tessa yesterday,

2. Nigel: I can't remember the code word.
When I saw Nigel yesterday,

3. Robert: I won't be at the next meeting.
When I saw Robert yesterday,

4. The twins: We've got a problem.
When I saw the twins yesterday,

5. Michelle: I've been swimming.
When I saw Michelle yesterday,

6. Your friends: We would like to be in the show.
When I saw my friends yesterday,

7. Adrian: I don't need any help.
When I saw Adrian yesterday,

8. Susan: My sister is coming to see me.
When I saw Susan yesterday,

Ex. 5. Report the sentences. They were all spoken last week. Use the verbs in brackets.

Anna to Janet: Don't forget to sign the form, (remind)
Anna reminded Janet to sign the form.
Robert: What time will the office close this evening? (ask)
Robert asked what time the office would close that evening.

1. A policeman to Christopher: Stop shouting, (tell)
2. Tessa: It was me. I ate all the cake yesterday, (admit)
3. Adrian: I'm sorry I was rude, (apologize)
4. Simon to Susan: Would you like to join me for lunch? (invite)
5. Martin to Nancy: Did someone ring you an hour ago? (ask)
6. Peter: I really must leave, (insist)

LISTENING

Before you listen

Discuss these questions with your partner.
1. What does research involve?
2. What kind of person would be good at research in your opinion?

Ex. 1. Listen to a talk about the scientist Rosalind Franklin and choose the correct answer.

1. Perhaps Franklin didn't receive the recognition she deserved because
   A she was the only woman.
   B women were treated differently in the past.
   C she was only one of the people working on DNA.

2. Franklin's particular skills were
   A being a researcher.
   B interpretation and explanation of scientific results.
   C photographing crystals and explaining the photos.

3. Franklin's photo revealed
   A a new technique of crystallography.
   B the basic helix structure.
   C the atoms in a crystal.

4. Watson was interested in the photo because
   A the structure of DNA had never been seen before.
   B it could be reproduced.
   C he wanted to identify the double-helix.

5. Today Franklin is
   A regarded by all as a genius.
   B recognised as the most important contributor to DNA.
   C somebody whose role in DNA research is clear.

WRITING

Write an essay about the key events that led to the discovery of the structure and function of DNA and explain the possible applications of these findings in today's world.

Remember to:
- read the texts again
- select information that is relevant

Include some of these useful phrases in your writing:

To begin with,...
Research began with ...
Later on,...
In addition to that, ...
However, / On the other hand,...
Finally / In conclusion

PARAGRAPH 1
Introduction
What is DNA?

PARAGRAPH 2
Information about the scientists and their work (Miescher, Watson, Crick, Wilmut).

PARAGRAPH 3
Cloning (benefits & problems)

PARAGRAPH 4
Conclusion

Write 200-250 words.

UNIT 9

VLADIMIR VERNADSKY. THE THEORY OF NOOSPHERE

VOCABULARY

Ex. 1. Complete the sentences below with words from the box.

Source, commission, boundary, ore, crust, deposits, contribution, doctrine, required

1. Vernadsky's particular beliefs led him to develop his unique……
2. Rich mineral.....werefound in the area.
3. Uranium ..... ismined in Australia.
4. Vernadsky's development of the idea of the biosphere was an important…….. to science.
5. Oil is a……..of energy.
6. A .....wasorganizedto look into the position of the mine.
7. The ..... betweenthetwo spheres has been defined.
8. In the Earth's .....thereare many minerals.
9. What are the conditions …….. for a better future?

Ex. 2. Read and memorize the following words and word combinations:

• to distinguish – отличать, различать • relevant – уместный • entity – сущность, реальность • will – воля •reason – разум • to prove oneself – проявлять себя • to ponder – обдумывать • to attribute great significance – придавать большое значение • atrocity – жестокость, зверство • thirst – жажда • to take measures – принять меры

READING

Before you read

Discuss these questions with your partner.
1. Are you interested in science?
2. What sort of discoveries would you like to make?
3. What do you imagine the world will be like in 50 years' time?

TEXT

VLADIMIR IVANOVICH VERNADSKY (1863 - 1945)

Throughout the entire history of mankind there have been few thinkers who could equal the Russian scientist Vladimir Ivanovich Vernadsky. He was an outstanding mineralogist, geochemist, crystallographer, theoretical geologist and the lounder of many scientific establishments. He managed to see Earth from outer space fifty years before the first space flight. He saw it not only as one of the bodies in the solar system, but distinguished continents and oceans, rocks and living things, humans, minerals, atoms and molecules; he saw that "humans for the first time are becoming a geological force, capable of changing the face of our planet."

V.I. Vernadsky was born on March 12, 1863 in the family of a political economy professor. He spent his early childhood in Kharkov. He entered grammar school in 1873. In 1876 the family moved to Petersburg. The teaching faculty of Petersburg University at that time included D.I. Mendeleyev, V.V. Dokuchayev, and others. These prominent scientists were to play a particularly important role in Vernadsky's becoming an outstanding scientist. The thirst for knowledge, the joy of being free of the musty grammar school pushed Vernadsky to lectures not only in the natural sciences branch of the physical-mathematical department but in other departments as well.

In 1885 V.I. Vernadsky graduated from the university and was given a job as a custodian of the mineralogical department. His independent work began. Many of Vernadsky's achievements have not become outdated with the passage of time; indeed they have become more relevant. I am referring to his work on the biosphere and men's global and space activity. Vernadsky spoke of turning the biosphere into a new entity, an area on the planet where human will, reason, and labour would prove themselves in a radical way (making a noosphere — a sphere of reason).

According to Vernadsky, human knowledge is not only a personal and social phenomenon but also a kind of a planetary phenomenon adjoined to the field of life. "Being part of the biosphere, man can judge the world order only by

comparing the phenomenon which he can see in it." Our current concept of the biosphere is based mainly on Vernadsky's theories.

After 1917 Vernadsky's scientific activity broadened. He took up new, highly difficult problems, put forward new ideas, wrote new books and articles on the history of minerals, on natural waters, on the circulation of the Earth's substances and gases, on space dust, geometry, the problem of time in modern science and on geochemical activity of living matter. In 1927 he organized a biogeochemical laboratory. In 1937 he addressed the international geological congress on "the significance of radioactivity for modern geology."

Till the very last days of his life Vernadsky remained on the frontiers of science: he pondered on the basics of the new teaching of the noosphere, directed the work of the committee on meteorites, researched isotope applications and worked a lot on the uranium problem. Owing to him, this country started to take measures to create an atomic industry and the raw materials basis for it. He attributed great significance to the use of nuclear energy for peaceful and creative purposes, for the creation of the noosphere.

At the age of almost 82 the scientist continued to work. The difficult war years, the newspaper reports about nazi atrocities seriously affected his health. He died on January 6, 1945. He was an inspired truth-seeker. "There is nothing stronger than the thirst for knowledge, the force of doubt...", he claimed. "We know just a small part of nature, just a tiny particle of that puzzling, murky and all-enveloping enigma, and everything that we know we have learned thanks to the dreams of the dreamers, fantasy-seekers and learned poets.

COMPREHENSION

Ex. 1. Number the events in the correct order.

- V.I. Vernadsky was taken on the staff of the mineralogical department.
- He also excelled himself as the organizer of a biogeochemical laboratory.
- Vernadsky went with his family to Petersburg.
- The difficult war years had a great influence on his health.
- Vernadsky’s major achievements of this period were books and articles on the history of minerals, on natural waters, on the circulation of the Earth's substances and gases, on space dust, geometry, the problem of time in modern science and on geochemical activity of living matter.

Ex. 2. Choose the right answer

1.Why did Vernadsky attribute great significance to the use of nuclear energy?

a) it served for peaceful and creative purposes, for the creation of the noosphere.

b) it provided "the equalizer" between the superpowers and produced an era of relative world peace at that time

c) it increased the power of his country

2. What was the contents of Vernadsky's work till the very last days of his life?

a) he developed a new theory of the origin of petroleum

b) he worked a lot to create a safe electric system

c) he worked a lot on the uranium problem

3. What is a noosphere according to Vernadsky?

a) it is the source of the extraordinary radiation

b) it is a part of modern geology

c) it is a sphere of reason

Ex. 3. Read the text attentively and answer the following questions:

1. When and where was V.I. Vernadsky born?
2. What did he recall about his family atmosphere?
3. Where did he study after the family had moved to Petersburg?
4. What famous Russian scientists worked at the Petersburg University at that time?
5. Who played an important role in Vernadsky's becoming an outstanding scientist?
6. What department did he study at?
7. When did his independent work begin?
8. Which of Vernadsky's works have become especially nowadays?
9. What is the noosphere?
10. What is our current concept of the biosphere based on?
11. What did V.I.Vernadsky do after the Great October Revolution?
12. What did he attribute great significance to?
13. When did V.I.Vernadsky die? What affected his health seriously?
14. What kind of man and scientist was V.I. Vernadsky?
15. What did he value most of all?

Ex. 4. Translate the Sentences into Russian.

1. The Russian scientist Vladimir Vernadsky made an important contribution to science when he developed the idea of the biosphere.
2. Vernadsky taught mineralogy and crystallography in the University of Moscow and became interested in geochemistry.
3. Vernadsky understood the possibility of using radioactive elements, but he also warned people that these elements were very dangerous.

4. The first uranium deposits were discovered in Russia in 1916 through Vernadsky's efforts.

5. For Vernadsky, the biosphere had existed since the very beginning of the Earth's history and it was constantly evolving.

6. Vernadsky believed that human reason, activity and scientific thought could lead to the evolution of the biosphere into the noosphere, the sphere of reason.

7. Vernadsky outlined the conditions that were required for the creation of the noosphere: equality for all people and an end to war, poverty and hunger.

Ex. 5. Render the contents of the text in 10 sentences.

GRAMMAR

Modal verbs

Ex. 1. Choose the correct item

1. I missed the last train so I ... spend the night at the station.
   A. must B. had to C. could

2. There were no seats on the bus so I ... stand.
   A. had to B. ought to C. should

3. It is 8.20 now and she ... catch the 8.15 bus.
   A. will have to B. won't be able to C. will be allowed to
4. You know Mike ... do card tricks.
   A. may B. must C. can

5. ... I use you car?
   A. may B. have C. should

6. We ... buy biscuits because granny had baked a delicious pie.
   A. didn't have to B. couldn't C. was able to

7. You .... better hurry. The train leaves in 5 minutes.
   A. did B. had to C. should

8. The government ... spend more money on hospitals.
   A. ought to B. can C. may

9. People ... drink and drive.
   A. shouldn't B. needn't C. ought not to

10. ... you speak English when you were 5?
A. had B. could C. might

11. You ... speak during the examination.
A. mustn't B. had to C. needn't

12. He ... be back in an hour. We are going to Anna.
A. is to B. has to C. must

13. Oh dear, I ... remember her address.
A. can't B. may not C. should

14. I lost all my money but fortunately I ... borrow some from my friends.
A. might B. could C. had to

15. Mike ... go fishing tomorrow morning.
A. can B. will be able to C. was able to

16. ... I use your phone, please?
A. may B. must C. should

17. She ... dance at the party because her leg was broken.
A. needn't B. will C. couldn't

18. Birds ... fly.
A. must B. should C. can

19. ... I leave the class-room?
A. may B. am C. could

20. She is a famous ballerina. She ... dance very well.
A. can B. must C. has to

21. Your father is sleeping. You ... be noisy.
A. couldn't B. mustn't C. must

22. ... you open the window, please?
A. may B. are able to C. could

23. You ... drive too fast. It's dangerous!
A. needn't B. mustn't C. can't

24. If you don't study, you ... do the test well.
A. won't be able to B. can't C. will be allowed to

25. I ... have forgotten her telephone number.
A. must B. need C. will

26. He ... have come back from Moscow but I haven't seen him yet.
A. should B. must C. may

27. He is very pale. He ... be very tired.
A. ought B. could C. must

28. He told me that I ... come here at any time.
A. might B. may C. can

29. I think it ... happen very soon.
A. can B. may C. is to

30. ... I smoke here?
A. must B. may C. should

31. She ... have been very glad to see you.
A. has to B. must C. ought to

32. I ... find this magazine in the library.
A. couldn't B. was to C. can't

LISTENING

Before you listen

Discuss these questions with your partner

1. What do you know about uranium?
2. Do you think atomic and nuclear power are safe? Why / Why not?
3. Do you know any other radioactive elements? Give examples of their application.

Ex. 1. Listen to the class discussion about uranium. Then decide if the following statements are true or false.

1. Uranium has been in the Earth's crust for a very long time.
2. Uranium entered a star that had exploded.
3. Uranium is lighter than oxygen.
4. Uranium is a source of energy.
5. A small amount of uranium can produce a great deal of oil.
6. Less carbon dioxide enters the atmosphere when we use nuclear power.

WRITING

You have received a letter from your English-speaking pen friend,

… Yesterday we had a class where we discussed different ecological problems. Our teacher suggested opening an eco-club, where we can do something useful for the environment ...

…What ecological problem do you consider the most serious? What can young people do to protect the environment? Do you think ecological problems should be discussed at school, and why?

Write him a letter and answer his 3 questions.
Write 100–120 words. Remember the rules of letter writing.

UNIT 10

ECOLOGY. ENVIRONMENTAL PROTECTION

Ex. 1. Read and memorize the following words:

• correspond (to) *v* соответствовать • preserve *v, n* 1. сохранять, оберегать; 2. заповедник • sanctuary n заповедник • suffocate *v* задыхаться • threaten *v* угрожать • conveniences *n pi.* удобства, комфорт • uproot *v* корчевать, вырывать с корнем • advance *v* наступать, продвигаться • upset *v* нарушать • legislative *a* законодательный • permissible *a* допустимый • to pass a law принимать закон • to violate a law нарушать закон • improve *v* улучшать • overcome *v* преодолевать • to do damage *v* наносить урон (ущерб) • rival *n* соперник; конкурент • danger n опасность, угроза • endanger *v* подвергать опасности, ставить под угрозу • to forsee (forsaw, forseen) *v* предвидеть • restore *v* восстанавливать

Ex. 2. Read and translate the following international words:

balance *n,* resident n, person *n,* tropical *a,* expert n, urbanization *n,* activist *n,* inspect course *n,* section n, civilization

Ex. 3. Match the pairs of synonyms:

a) despite *adv,* variation *n,* destroy *v,* sanctuary *n,* ensure *v,* decrease *v,* waste *v,* devour *v,* protection *n,* to violate a law, upset *v.*

b) squander *v,* reduce *v,* eat *v,* change *n,* devastate *v,* in spite of *adv,* to break a law, preserve *n,* provide *v,* defence *n,* disturb *v.*

Ex. 4. Match the pairs of antonyms:

a) significant *a,* compatible *a,* pure *a,* permissible *a,* valuable *a,* appear *v,* to preserve natural balance;

b) invaluable *a,* impermissible *a,* disappear *v,* impure *a,* to upset natural balance, insignificant *a,* incompatible *a.*

Ex. 5. Read the following phrases. Mind the stress and the rhythm. Translate the phrases into Russian:

a) 'qualitative 'changes, biological requirements, untouched by civilization, 'tropical 'rain 'forests, 'climate variations, to up'set the 'balance, the 'principles of 'using 'nature, the 'capitalist relations of production, a 'nongovernmental organization, 'rational utilization of 'natural recourses;

b) to disappear from the 'face of the 'earth, to 'save from extinction, the 'natural preserve 'staff, the 'course of the environmental protection, to 'run the 'forestry;

Ex. 6. Read the definitions of the following notions. Learn them by heart, be able to use them in a talk.

1. *Environment.* The active items of the surroundings of an organism that affect the organism. Factors in the environment include temperature, humidity, the presence of other organizes and the presence of physical objects; all these can have an effect on the behavior and existence of the organism.

2. *Ecology* is the study of the relationship of plants and animals to their surroundings; the plants and animals are mainly considered in communities, and all surroundings, both inanimate and animate, are included in the study.

3. *Pollution.* The process of making an environment unhealthy or impure.

4. *Pollution.* The presence in soil, water or air of substances harmful to health, or objectionable to human beings or animals.

5. *Contamination.* The presence in any substance (particularly food or water) of causative agents of disease.

READING

TEXT

POLLUTION OF THE ENVIROMENT

Pollution is the introduction of contaminants into the natural environment that cause adverse change. It can take the form of chemical substances or energy, such as noise, heat or light. Pollutants, the components of pollution, can be either foreign substances/energies or naturally occurring contaminants.

Pollution started from prehistoric times when man created the first fires. It became a popular issue after World War II, due to radioactive fallout from atomic warfare and testing.

Growing evidence of local and global pollution and an increasingly informed public over time have given rise to environmentalism and the environmental movement, which generally seek to limit human impact on the environment.

Forms of pollution

The major forms of pollution are listed below along with the particular contaminant relevant to each of them:

- Air pollution is the release of chemicals and particulates into the atmosphere. Common gaseous pollutants include carbon monoxide, sulfur dioxide, chlorofluorocarbons and nitrogen oxides produced by industry and motor vehicles. Photochemical ozone and smog are created as nitrogen oxides and hydrocarbons react to sunlight.
- Light pollution includes light trespass, over-illumination and astronomical interference.
- Littering is the criminal throwing of inappropriate man-made objects, unremoved, onto public and private properties.
- Noise pollution encompasses roadway noise, aircraft noise, industrial noise as well as high-intensity sonar.
- Soil contamination occurs when chemicals are released by spill or underground leakage. Among the most significant soil contaminants are hydrocarbons, heavy metals, herbicides, pesticides and chlorinated hydrocarbons.
- Radioactive contamination, resulting from 20th century activities in atomic physics, such as nuclear power generation and nuclear weapons research, manufacture and deployment.
- Thermal pollution is a temperature change in natural water bodies caused by human influence, such as use of water as coolant in a power plant.

- Visual pollution can refer to the presence of overhead power lines, motorway billboards, open storage of trash, municipal solid waste or space debris.
- Water pollution, by the discharge of wastewater from commercial and industrial waste into surface waters; discharges of untreated domestic sewage, and chemical contaminants, such as chlorine, from treated sewage; release of waste and contaminants into surface runoff flowing to surface waters (including urban runoff and agricultural runoff, which may contain chemical fertilizers and pesticides); waste disposal and leaching into groundwater; eutrophication and littering.

Sources and causes

A pollutant is a waste material that pollutes air, water or soil. Three factors determine the severity of a pollutant: its chemical nature, the concentration and the persistence.

Air pollution produced by ships may alter clouds, affecting global temperatures.

Air pollution comes from both natural and human-made (anthropogenic) sources. However, globally human-made pollutants from combustion, construction, mining, agriculture and warfare are increasingly significant in the air pollution equation.

Motor vehicle emissions are one of the leading causes of air pollution. China, United States, Russia, India Mexico, and Japan are the world leaders in air pollution emissions. Principal stationary pollution sources include chemical plants, coal-fired power plants, oil refineries, petrochemical plants, nuclear waste disposal activity, large livestock farms (dairy cows, pigs, poultry, etc.), factories, metals production factories, plastics factories, and other heavy industry. Agricultural air pollution comes from contemporary practices which include clear felling and burning of natural vegetation as well as spraying of pesticides and herbicides.

About 400 million metric tons of hazardous wastes are generated each year.

Some of the more common soil contaminants are chlorinated hydrocarbons, heavy metals (such as chromium, cadmium–found in rechargeable batteries, and lead–found in lead paint, aviation fuel and still in some countries, gasoline), zinc, arsenic and benzene.

Pollution can also be the consequence of a natural disaster. For example, hurricanes often involve water contamination from sewage, and petrochemical spills from ruptured boats or automobiles. Larger scale and environmental damage is not uncommon when coastal oil rigs or refineries are involved. Some sources of pollution, such as nuclear power plants or oil tankers, can produce widespread and potentially hazardous releases when accidents occur.

In the case of noise pollution the dominant source class is the motor vehicle, producing about ninety percent of all unwanted noise worldwide.

Effects

Adverse air quality can kill many organisms including humans. Ozone pollution can cause respiratory disease, cardiovascular disease, throat inflammation, chest pain, and congestion. Water pollution causes approximately 14,000 deaths per day, mostly due to contamination of drinking water by untreated sewage in developing countries.

Oil spills can cause skin irritations and rashes. Noise pollution induces hearing loss, high blood pressure, stress, and sleep disturbance. Mercury has been linked to developmental deficits in children and neurologic symptoms. Older people are majorly exposed to diseases induced by air pollution. Those with heart or lung disorders are at additional risk. Lead and other heavy metals have been shown to cause neurological problems. Chemical and radioactive substances can cause cancer and as well as birth defects.

Pollution has been found to be present widely in the environment. There are a number of effects of this:

- Biomagnifications describes situations where toxins (such as heavy metals) may pass through trophic levels, becoming exponentially more concentrated in the process.
- Carbon dioxide emissions cause ocean acidification, the ongoing decrease in the pH of the Earth's oceans as CO2 becomes dissolved.
- The emission of greenhouse gases leads to global warming which affects ecosystems in many ways.
- Invasive species can out compete native species and reduce biodiversity. Invasive plants can contribute debris and biomolecules that can alter soil and chemical compositions of an environment, often reducing native species competitiveness.
- Nitrogen oxides are removed from the air by rain and fertilize land which can change the species composition of ecosystems.
- Smog and haze can reduce the amount of sunlight received by plants to carry out photosynthesis and leads to the production of tropospheric ozone which damages plants.
- Soil can become infertile and unsuitable for plants. This will affect other organisms in the food web.
- Sulfur dioxide and nitrogen oxides can cause acid rain which lowers the pH value of soil.

Pollution control

To protect the environment from the adverse effects of pollution, many nations worldwide have enacted legislation to regulate various types of pollution as well as to mitigate the adverse effects of pollution.

Pollution control is a term used in environmental management. It means the control of emissions and effluents into air, water or soil. Without pollution control, the waste products from consumption, heating, agriculture, mining,

manufacturing, transportation and other human activities, whether they accumulate or disperse, will degrade the environment. In the hierarchy of controls, pollution prevention and waste minimization are more desirable than pollution control. In the field of land development, low impact development is a similar technique for the prevention of urban runoff.

Practices

- recycling
- reusing
- waste minimization
- mitigating
- preventing
- compost

Ex. 1. Translate the Sentences into Russian.

1. The problem of urban sprawl is caused by growing cities.
2. As a result, animals are loosing their habitats.
3. Tigers are in danger because hunters kill them in order to sell their skins.
4. Governments should introduce harsher punishments for illegal hunters.
5. We are going to the country by pleasure – boat.
6. Pollution is damaging our environment.
7. Industrial waste is polluting our seas.
8. To make a long story short. I should like the consult you.
9. The present and the past are closely interrelated.
10. It`s a chain reaction.

SPEAKING

Ex. 1. Discuss what the problems are and how they can be solved.

Problems: oil slicks, noise, smog, congestion, gas emissions, acid rain, careless disposal of waste, unpleasant smells, unnecessary packaging, dumping oil/toxic waste, etc

Solutions: coastguard surveillance, radar systems, filters, fines, laws on use of horns, catalytic converters, unleaded petrol, better public transport, ban on careless disposal of rubbish, biodegradable packaging, improved waste disposal systems, etc

Model: One of the problems caused by cars is noise. This can be avoided if laws on the use of horns are enforced, and exhaust pipes are in good condition.

Ex. 2. Match the words in the list with the nouns. Use each word only once. Which of the collocations are used to describe threats to the environment? Which describe possible ways to solve environmental problems?

Acid, greenhouse, factory, nuclear, oil, breeding, conservation, environmental, forest, endangered, national, thick.

1. ….. species
2. ….. rain
3. ….. emissions
4. ….. awareness
5. ….. parks
6. ….. waste
7. ….. programmes
8. ….. areas
9. ….. smog
10. ….. spills
11. ….. fires
12. ….. gases

Ex. 3. Read the table, then in pairs discuss the problems, their effects and their solutions as in the example:

Problems	Effects	Solutions
litter/rubbish	dirty streets, spread of diseases	encourage recycling, use litter bins
air pollution	breathing problems, cancer risk	unleaded petrol, filters in factories, ban cars from city centers
water pollution	fish die, stomach illnesses	limit use of chemicals in industry, fine factories which pollute seas/rivers

Model: A: Dropping litter can result in dirty streets.

B: That's true. I think we should use litter bins instead of dropping litter carelessly. etc.

Ex. 4. Recommend measures to be to prevent environmental pollution.

GRAMMAR

Adverbial clauses

Ex. 1. In this exercise you have to explain what some words mean. Choose the right meaning and then write a sentence with who. Use a dictionary if necessary.

he/she steals from a shop

he/she designs buildings

he/she doesn't believe in God
he/she is not brave
he/she buys something from a shop
he/she pays rent to live in a house or flat
he/she breaks into a house to steal things
he/she no longer works and gets money from the state

1. (an architect) _Architect is someone who designs buildings._
2. (a burglar) _A burglar is someone ---.
3. (a customer) ---.
4. (a shoplifter) ---.
5. (a coward) ---.
6. (an atheist) ---.
7. (a pensioner) ---.
8. (a tenant) ---.

Ex. 2. Make one sentence from two. Use who/that/which.

1. A girl was injured in the accident. She is now in hospital.
   The girl who was injured in the accident is now in hospital.
2. A man answered the phone. He told me you were away.
3. A waitress served us. She was very impolite and impatient.
4. A building was destroyed in the fire. It has now been rebuilt.
5. Some people were arrested. They have now been released.
6. A bus goes to the airport. It runs every half hour.

Ex. 3. Complete each sentence using who/whom/whose/where.

1. What's the name of the man _who_ car you borrowed?
2. A cemetery is a place --- people are buried.
3. A pacifist is a person --- believes that all wars are wrong.
4. An orphan is a child --- parents are dead.
5. The place --- we spent our holidays was really beautiful.
6. This school is only for children --- first language is not English.
7. 1 don't know the name of the woman to --- I spoke on the phone.

Ex. 4. Make two sentences from one using a relative clause. Use the sentence in brackets to make the relative clause.

1. Mr. Carter is very interested in our plan. (I spoke to him on the phone last night.)

Mr. Carter, to whom I spoke on the phone last night, is very interested in our plan.

2. This is a photograph of our friends. (We went on holiday with these friends.)

This is a photograph

3. The wedding took place last Friday. (Only members of the family were invited to it.)

The wedding

4. Sheila finally arrived. (We had been waiting for her.)

5. We climbed to the top of the tower. (We had a beautiful view from there.)

LISTENING

Listen to a part of a TV programme about climate change. Then decide if the following statements are true or false.

1. The report suggests there are reasons for hope as well as worry
2. In the past, ice ages and droughts killed off all life
3. Temperatures are rising at five degrees every century
4. Some plants and animals move as climates become warmer
5. There are mountain animals that will die if temperatures rise

WRITING

You have received a letter from your English–speaking pen friend, Ben.

… I live in the centre of the city. But I've always dreamed about living in the country.

…Where do you live: in the city or in the country? What are the best things about living in your place? Where would you like to live, why? …

Write him a letter and answer his 3 questions.

Write 100–120 words. Remember the rules of letter writing.

APPENDIX

COMPONENTS OF A LETTER

1. Sender's address
2. Date
3. Receiver's name, title and address
4. Salutation
5. Body of letter
6. Complimentary close
7. Signature
8. Name and title of the sender
9. Enclosure

95 New Edition Road
Cambridge CB2 2 RU
United Kingdom

7 May, 2005

Dr. Boris N. Ivanov
Department of Physics
Rostov State University
5 Zoige St.
Rostov-on-Don,
344090
RUSSIA

Dear Dr. Ivanov,

The opening paragraph should arise the reader's interest in the subject of the letter. State the purpose of your letter.

Put each separate idea in a separate paragraph.

Letters have to be typed or word-processed accurately with a smart, clear layout.

Yours sincerely,
(sign here)

Should be printed or written accurately
(if you are noting that you have enclosed something else with your letter)

We can write contractions *(I've, were, I'll*) in an informal letter, but not in a formal one.

All letters begin with *Dear ...*

You can end an informal letter with *Best wishes* or *Love.*

Here are some useful phrases for informal letters:

Beginning
It was lovely to hear from you. I was pleased to hear that ...
Thank you for your letter: / was sorry to hear that ...
I'm sorry I haven't, written before, but ...
This is just a note to say ...

Giving news
We're having a lovely time in ...
I've been very busy recently. Last week I... and next week I'm going to ...

Ending
I'm looking forward to seeing you ...I to hearing from you soon.
Give my regards to Robert ...
Write to me soon ...
I hope to hear from you soon ...
Write and tell me when …

SUMMARY OF THE TEXT

Реферат, как экономное средство ознакомления с материалом, отражает его содержание с достаточной полнотой.

Составление рефератов (реферирование) представляет собой процесс аналитико-синтетической переработки первичного документа.

Объектом реферирования является преимущественно научная, техническая и производственная литература.

Реферирование - это так же сложное комплексное умение, состоящее из целого ряда отдельных элементов:

1 выделение абзацев, содержащих основную информацию;
2 выделение основных мыслей, фактов, положений;
3 озаглавливание выделенных абзацев;
4 составление плана статьи;
5 сокращение текста;
6 передача содержания текста своими словами (перифраз).

Vocabulary to be used in discussing a scientific publication

Learn the following words and word-combinations used for retelling of the text and its summarizing

I

1) данная статья - the present paper;
2) тема - the theme (subject-matter);
3) основная проблема - the main (major) problem;
4) цель - the purpose;

5) основной принцип - the basic principle;
6) проблемы, связанные с - problems relating to; problems of;
7) аналогично - similarly; likewise;
8) поэтому, следовательно - hence; therefore;
9) наоборот - on the contrary;
10) тем не менее - nevertheless; still; yet;
11) кроме того - besides; also; again; in addition; furthermore;
12) сначала - at first;
13) далее, затем - next; further; then;
14) наконец, итак – finally;
15) вкратце - in short; in brief.

II

Цели написания статьи:

1 The object (purpose) of this paper is to present (to discuss, to describe, to show, to develop, to give)…

2 The paper (article) puts forward the idea (attempts to determine) …

Вопросы, обсуждаемые в статье:

1. The paper (article) discusses some problems relating to (deals with some aspects of, considers the problem of, presents the basic theory, provides information on, reviews the basic principles of) …

2. The paper (article) is concerned with (is devoted to) …

Начало статьи:

1. The paper (article) begins with a short discussion on (deals firstly with the problem of) …

2. The first paragraph deals with …

3. First (At first, At the beginning) the author points out that (notes that, describes)…

Переход к изложению следующей части статьи:

1. Then follows a discussion on …

2. Then the author goes on to the problem of …

3. The next (following) paragraph deals with (presents, discusses, describes) …

4. After discussing … the author turns to …

5. Next (Further, Then) the author tries to (indicates that, explains that) …

6. It must be emphasized that (should be noted that, is evident that, is clear that, is interesting to note that) …

Конец изложения статьи:

1. The final paragraph states (describes, ends with) …

2. The conclusion is that the problem is …

3. The author concludes that (summarizes the) …

4. To sum up (To summarize, To conclude) the author emphasizes (points out, admits) that …

5. Finally (In the end) the author admits (emphasizes) that …

Оценка статьи:

In my opinion (To my mind, I think) …

The paper (article) is interesting (not interesting), of importance (of little importance), valuable (invaluable), up-to-date (out-of-date), useful (useless)…

Ex. 1. Make a summary of any article you are interested in using the summarizing algorithm

GRAMMAR REFERENCE

INTRODUCTORY LESSON

ТИПЫ ВОПРОСИТЕЛЬНЫХ ПРЕДЛОЖЕНИЙ

1. Общий вопрос

Do you work? - Yes, I do.
Does he live here? - No, he doesn't.
Are you a student? - Yes, I am.
Is she reading? - No, she isn't.
Has he written the letter? - Yes, he has.
Was the letter written yesterday? - Yes, it was.

2 . Специальный вопрос

Where does she live? - She lives in Moscow.
What is he writing? - He's writing a letter.
When was the letter written? - It was written yesterday.
Who is he? - He is Mr. Smith.
Which book was read? - Mine.

3. Вопросительно-отрицательный вопрос

Isn't she at home now? - No, she isn't.
Can't they write this letter? - Yes, they can.
Haven't you seen this film? - No, I haven't.
Why won't they help him? - They don't want to.

4. Разделительный вопрос

He works much, doesn't he? - Yes, he does.
She is a student, isn't she? - No, she isn't.
She can read, can't she? - Yes, she can.

He hasn't done it, has he? - No, he hasn't.
He will go there, won't he? - Yes, he will.
He didn't live here, did he? - No, he didn't.
He must stay here, mustn't he? - Yes, he must.

5. Альтернативный вопрос
Are you married or single? - I am single.
Does she speak French or English? - She speaks English.
Must he go or stay here? - He must go.
Was he a student or a teacher? - He was a

ИНТЕРНАЦИОНАЛЬНЫЕ СЛОВА

В европейских языках, в том числе в русском и английском, есть значительное количество международных слов, близких по написанию и даже звучанию, хотя произносятся они по правилам фонологической системы каждого языка.

По значению международные слова в английском и русском языках можно разделить на три основные группы. Это слова:

1) полностью совпадающие по значению в английском и русском языках;

2) частично совпадающие по значению, имеющие в русском языке несколько эквивалентов;

3) имеющие разные значения в английском и русском языках.

К первой группе относятся названия наук, слова, связанные с общественно-политической сферой жизни, научные термины, названия месяцев и некоторые другие.

Английское слово	Русский эквивалент
april	апрель
constitution	конституция
delegation	делегация
democracy	демократия
expedition	экспедиция
fact	факт
geography	география
January	январь
magnet	магнит
mathematics	математика

Ко второй группе относятся английские слова, имеющие в русском языке несколько значений. Одно из них, обычно узкое, совпадает со

значением в английском языке, другие могут существенно отличаться от основного значения, например:

champion (*of peace*) – 1) чемпион, победитель;
2) сторонник, поборник (мира);

commission – 1) комиссия, комиссионная продажа;
2) полномочие, поручение;

individual – 1) индивидуальный;
2) личный, частный;

progressive – 1) прогрессивный;
2) передовой;

public – 1) публичный;
2) общественный, народный, гласный;

social – 1) социальный;
2) общественный;

character – 1) характер;
2) репутация, характеристика;
3) роль, действующее _____лицо;

visit – 1) визит;
2) посещение.

Существуют и такие интернациональные слова, которые заметно изменили значение в русском языке по сравнению с английским:

delicate – тонкий, хрупкий, но не деликатный

data – данные, а не дата

brilliant – блестящий, яркий, а не бриллиант

novel – роман, а не новелла

fabric – материал, изделие, а не фабрика

pretend – притворяться, делать вид, а не претендовать.

UNIT 1
ИМЯ СУЩЕСТВИТЕЛЬНОЕ (THE NOUN)

Существительные – это слова, называющие предметы, живые существа, вещества, события, явления, т.е. все слова, отвечающие на вопрос *кто это*? или *что это*? (*who is this*? *what is this*?). Например:

a manager – менеджер, a storm – шторм, rain – дождь, pain – боль, time – время и т.д.

Имя существительное может быть в предложении:

а) подлежащим: *The offer is on the table. – Телеграмма на столе.*

б) именной частью сказуемого: *I am a student. – Я студент.*

в) дополнением: *I see an office. – Я вижу офис.*

г) определением: *My secretary's things. – Вещи моего секретаря.*
An iron gate. – Железные ворота.

д) обстоятельством места, времени, образа действия и т.д.:

I work at the institute. – Я работаю в институте.

He goes to the institute in the morning. – Он ходит в институт утром.

I have read this letter with pleasure. – Я прочел это письмо с удовольствием.

1. Число (Number)

Существительные в английском языке, как и в русском, имеют два числа: единственное и множественное.

1. Для образования множественного числа к существительному в единственном числе прибавляется окончание *-s*. Например: *a book – books, an offer – offers, a manager – managers.*

2. Если существительное оканчивается на буквы и буквосочетания *s, ss, ch, sh, x,* то во множественном числе прибавляется окончание *-es*: *a box – boxes, a match – matches, a telex – telexes.*

Примечание. Запомните следующие особенности образования существительных множественного числа:

1. Существительные, оканчивающиеся в единственном числе на *-o*, обычно образуют множественное число прибавлением окончания *-es*, например: *potato – potatoes, hero – heroes.*

Сравните: *metro – metros, photo – photos* и т.д.

2. Существительные, оканчивающиеся *на -f и -fe*, при прибавлении окончания *-es меняют f на v*: *a wife – wives, a shelf – shelves.*

3. Существительные, оканчивающиеся в единственном числе на букву *y* с предшествующим согласным звуком, образуют множественное число прибавлением окончания *-es*, причем *y* меняют на *i.* Например: *a company – companies, a city – cities, a duty – duties.* Но: *a day – days, a boy – boys.*

Исключения: *a man – men, a woman – women, a child – children, a tooth – teeth, a foot – feet, a mouse – mice, a goose – geese, a phenomenon – phenomena.*

2. Падеж (Case)

В современном английском языке существительное имеет два падежа – общий падеж (*the Common Case*) и притяжательный падеж (*the Possessive Case*).

Существительные в общем падеже не имеют падежных окончаний, а отношение существительного к другим членам предложения может выражаться порядком слов или предлогами, например:

The secretary asks the director. – Секретарь спрашивает директора.

The director asks the secretary. – Директор спрашивает секретаря.

Существительное в притяжательном падеже служит определением к другому существительному, выражает принадлежность и отвечает на вопрос *whose*.

Притяжательный падеж существительных в единственном числе образуется путем прибавления апострофа и буквы *s* (-*’s*) к форме существительного в общем падеже:

my brother’s name

my director’s things

Притяжательный падеж существительных во множественном числе обозначается только одним апострофом, который ставится после окончания -*s*:

the engineers’ room, the managers’ letters.

Примечание. Если существительное во множественном числе не имеет окончания -*s*, то притяжательный падеж образуется, как у существительных в единственном числе (*the women’s children*).

Имя существительное в функции определения

В английском языке не только существительные в притяжательном падеже могут выполнять в предложении функцию определения. Существительные в общем падеже также могут быть определением второго и переводятся на русский язык либо прилагательным, либо существительным в косвенных падежах (обычно в родительном падеже).

Например: *Moscow University – Московский университет*

evening school – вечерняя школа

UNIT 2
АРТИКЛИ (ARTICLES)

Артикль – это служебная часть речи, которая определяет существительное. В тех случаях, когда перед существительным имеются другие определения, артикль оказывается уже не непосредственно передсуществительным, а перед этим определением, например: *a man – человек, a young man – молодой человек.*

В английском языке два артикля: неопределенный и определенный.

1. Неопределенный артикль (The Indefinite Article)

У неопределенного артикля две формы: *a* и *an.*

Форма *a* ставится перед словами, начинающимися с согласного звука, а *an* – перед словами, начинающимися с гласного звука:

a bus;

an offer.

Неопределенный артикль употребляется перед исчисляемыми существительными в единственном числе, когда речь идет о предмете или лице, упоминаемом впервые или неизвестном слушающему.

Today I have seen a beautiful car. – Сегодня я видел красивый автомобиль.

2. Определенный артикль (The Definite Article)

Определенный артикль имеет одну форму – *the.*

Определенный артикль употребляется перед существительным как в единственном, так и во множественном числе, если речь идет об уже известных предметах или лицах.

– *Where is the cable*? – *Где телеграмма*?

– *The cable is on the table. – Телеграмма на столе.* (Та телеграмма, о которой знают говорящие).

Примечание. В некоторых случаях всегда употребляется определенный артикль, например:

1) перед прилагательным в превосходной степени, когда прилагательное является определением к последующему существительному (*the best season* – лучшее время года, *the most interesting film* – самый интересный фильм);

2) перед порядковым числительным, когда это числительное является определением к последующему существительному (*the second lesson* – второе занятие, *the fifth page* – пятая страница);

3) перед предметами или понятиями, единственными в своем роде (*the sun* – солнце, *the moon* – луна, *the earth* – земля и т.д.);

4) перед названиями рек (*the Thames* – Темза, *the Volga* – Волга), морей (*the Black Sea* – Черное море), океанов (*the Indian Ocean* – Индийский океан);

5) перед названием некоторых стран и местностей (*the United States* – Соединенные Штаты, *the United Kingdom of Great Britain and Northern Ireland, the Crimea* – Крым, *the Caucasus* – Кавказ);

6) перед названиями горных цепей (*the Alps* – Альпы, *the Ural Mountains* – Уральские горы).

UNIT 3
ИМЯ ПРИЛАГАТЕЛЬНОЕ (THE ADJECTIVE)

Прилагательное – это часть речи, обозначающая качество, признак предмета и отвечающая на вопрос: *какой*? *какая*? *какое*?

Прилагательное в английском языке не изменяется ни по родам, ни по падежам, ни по числам (*a large letter – большое письмо, a large family – большая семья, a large table – большой стол*).

В предложениях прилагательное выступает в роли определения (*a difficult problem*) и именной части сказуемого (*This problem is difficult*).

Степени сравнения (Degrees of Comparison)

Прилагательные в английском языке имеют три формы: форму положительной степени (*positive degree*), сравнительной степени (*comparative degree*) и превосходной степени (*superlative degree*).

Односложные прилагательные и часть двусложных, оканчивающихся на *-e, -y, -er, -ow,* образуют сравнительную степень прибавлением к положительной степени прилагательного суффикса *-er*, а превосходную степень – суффикса *-est*:

long – длинный *longer* – длиннее *longest* – самый длинный

large – большой *larger* – больше *largest* – самый большой

hot – жаркий *hotter* – жарче *hottest* – самый жаркий

Примечание. 1. Если положительная степень прилагательного оканчивается на немое *-e*, то оно опускается при образовании степеней сравнения: *large – larger – largest.*

2. Если положительная степень прилагательного оканчивается на согласный звук с предшествующим кратким гласным, то конечная буква удваивается перед суффиксами *-er* и *-est* для сохранения краткости гласного звука: *hot – hotter – hottest.*

3. Если положительная степень прилагательного оканчивается на букву *y* после согласного звука, то в сравнительной и превосходной степени *y* переходит в *i* перед суффиксами *-er* и *-est*: *early – earlier – earliest.* После гласного звука *y* не меняется: *gray – grayer – grayest.*

Многосложные прилагательные и двусложные прилагательные (кроме тех, которые оканчиваются на *-1e, -y, -er, -ow,* образуют сравнительную степень добавлением слова *more* (перед прилагательным) и превосходную степень – слова *most.*

interesting more interesting most interesting

beautiful more beautiful most beautiful

difficult more difficult most difficult

N.B. Небольшое число прилагательных образует степени сравнения от другого корня (по исключениям):

good – better – best

хороший – лучше – самый хороший

bad – worse – worst

плохой – хуже – самый плохой

many, much – more – most

много – больше – самый большой

little, few – less – least

мало – меньше – самый маленький

UNIT 4
МЕСТОИМЕНИЕ (THE PRONOUN)

Местоимение – это часть речи, которая употребляется вместо существительного, прилагательного иди числительного.

The story is interesting. – It is interesting.

The man is very clever. – He is very clever.

1. Личные местоимения (The Personal Pronouns)

Личные местоимения – это местоимения, заменяющие существительные, поэтому они могут употребляться в предложении в качестве подлежащего, дополнения и именной части сказуемого.

Личные местоимения имеют два падежа: именительный и объектный.

Примечание. Если перед существительным есть притяжательное местоимение, то артикль не может быть одновременно употреблен.

It is a textbook. – It is my textbook.

The teacher is in the room. – Our teacher is in the room.

2. Притяжательные местоимения (The Possessive Pronouns)

Притяжательные местоимения выражают принадлежность, они обычно находятся перед существительным, к которому относятся, и выполняют функцию определения. Каждому личному местоимению соответствует притяжательное местоимение.

Притяжательные местоимения бывают в общей и абсолютной форме:

my – mine.

В отличие от притяжательных местоимений общей формы, которые стоят перед существительным и выступают в функции определения, притяжательные местоимения абсолютной формы употребляются самостоятельно, вместо существительного.

Притяжательные местоимения в абсолютной форме употребляются в функции подлежащего, именной части сказуемого, дополнения.

Притяжательные местоимения *чей*? *чья*? *чье*?

ед. 1 *my* мой *mine* мой

ед. 2 *your* твой *yours* твой

ед. 3 *his* его *his* его

ед. 3 *her* ее *hers* ее

ед. 3 *its* его *its* его

мн. 1 *our* наш *ours* наш

мн. 2 *your* ваш *yours* ваш

мн. 3 *their* их *theirs* их

3. Указательные местоимения (The Demonstrative Pronouns)

Указательные местоимения *this – этот, эта, это* и *these – эти* определяют предметы и лица, находящиеся близко к говорящему.

Указательные местоимения *that – тот, та, то* и *those – те* определяют предметы и лица, более отдаленные в пространстве и времени от говорящего: *that day – тот день, those days – те дни.*

Иногда, во избежание повторения одного и того же слова, употребляются местоимения *that* и *those.*

Например: *The rivers of Russia are much longer than those of England. – Реки России намного длиннее рек Англии.*

4. Вопросительные местоимения (The Interrogative Pronouns)

К вопросительным местоимениям относятся: *who – кто, whom – кого, кому, whose – чей, what – что, which – который.* Эти местоимения используются для образования так называемых специальных вопросов, т.е. вопросов к различным членам предложения. Местоимением *what* может начинаться вопрос к подлежащему, к дополнению и к определению:

What is on the first floor of your office? *– Что находится на втором этаже Вашего офиса*? (Вопрос к подлежащему).

What do you see on the shelf? *– Что ты видишь на полке*? (Вопрос к дополнению).

Местоимением *who* начинается вопрос к подлежащему:

Who works usually on Sundays? *– Кто обычно работает по воскресеньям*?

Объектный падеж местоимения *who – whom* употребляется в вопросе к дополнению:

Whom do you want to send there? *– Кого Вы хотите туда отправить*?

Местоимение *whose* употребляется в качестве определения:

Whose laboratory is this? *– Чья это лаборатория*?

Местоимение *which* употребляется при выборе из определенного числа предметов или лиц, например:

Which shop is yours? *– Какой магазин Ваш*?

5. Неопределенные местоимения *some* и *any* (The Indefinite Pronouns).

Отрицательное местоимение *no* (The Negative Pronoun)

В английском языке местоимение *some* означает *какой-то, какой-нибудь, несколько* и употребляется обычно в утвердительных предложениях:

I want to buy some interesting novels. – Я хочу купить несколько интересных романов.

Give me some pen. – Дай мне какую-нибудь ручку.

Some перед неисчисляемыми существительными обозначает некоторое количество и в этих случаях не переводится.

Some может употребляться в вопросительных предложениях, если вопрос не относится непосредственно к местоимению *some* или к определяемому им существительному. А также в вопросах, выражающих просьбу или предложение.

Why did you not ask me to give you some more paper? – *Почему ты не попросил меня дать тебе еще немного бумаги*?

Местоимение *any* означает *какой-то, какой-нибудь, сколько-нибудь* и употребляется в вопросительных предложениях, преимущественно в общих вопросах, и в отрицательных предложениях. В утвердительных предложениях *any* имеет значение *любой, всякий.*

Did you get any news from this firm? – *Вы узнали от этой фирмы какие-нибудь новости*?

She has not any news. – У нее нет новостей.

You may take any of my copies. – Ты можешь взять любую из моих копий.

Отрицательное местоимение *no* указывает на отсутствие предмета, явления или понятия и употребляется в отрицательных предложениях, причем глагол-сказуемое стоит в утвердительной форме:

I have no information about it. – У меня нет информации об этом.

There are no computers in this room. – В этой комнате нет компьютеров.

Отрицательное местоимение *no* употребляется в предложении в функции определения.

UNIT 5
СЛОВООБРАЗОВАНИЕ

Эффективным средством расширения запаса слов в английском языке служит знание способов словообразования. Зная значение наиболее употребительных префиксов и суффиксов, можно без труда понять значение гнезда слов, образованных из одного корневого слова, которое известно.

Основные префиксы (приставки)
anti- antimonopoly антимонопольный
be- belittle умалять
co- cooperation сотрудничество
counter- counterbalance уравновешивать
de- devaluation девальвация
non- non – payment неплатеж

dis- disadvantage недостаток
in- indirect косвенный
il- illegal незаконный
im- impossible невозможный
ir- irregular неправильный
en- enclose прилагать
extra- extraordinary необычный
inter- Interaction взаимодействие
mis- misunderstand неправильно понять
out- output выпуск продукции
over- overpay переплачивать
post- postgraduate аспирант
pre- predetermine предопределять
under- underestimate недооценивать
re- rewrite переписывать
sub- subdivision подразделение
super- supermarket супермаркет
u1tra- ultramodern сверхсовременный
trans- transoceanic заокеанский

Префиксы обычно образуют новые слова внутри одной и той же части речи *(pleasant* – приятный, *unpleasant* – неприятный).

Префиксы можно классифицировать по их лексическому значению, а именно: префиксы, придающие словам отрицательное или противоположное значение, выражающее предшествование или последовательность, повторность и т.д.

Основные суффиксы глаголов
-ate to originate происходить
-en to threaten угрожать
-ise, to advertise рекламировать
-ize to organize организовывать

Производные глаголы образуются обычно от существительных и прилагательных.

UNIT 6
АКТИВНЫЙ ЗАЛОГ (THE ACTIVE VOICE)

1. Простое настоящее время (The Present Indefinite Tense)

Простое настоящее время *The Simple Present Tense* или *The Present Indefinite Tense* употребляется для выражения постоянного или повторяющегося действия.

Утвердительная форма образуется при помощи инфинитива смыслового глагола без частицы *to,* а в 3-м лице единственного числа к инфинитиву смыслового глагола прибавляется окончание *-s* (*-es*).

Примечание: 1. Если глагол оканчивается на *-o, -s, -sh, -ch, -x,* то в 3-м лице единственного числа к нему прибавляется окончание *-es*: *to go – goes, to do – does, to finish – finishes, to discuss – discusses.*

2. Если глагол оканчивается на *-y* с предшествующим согласным звуком, то в 3-м лице единственного числа к нему прибавляется окончание *-es*, а буква *y* меняется на *i*:

to study – studies.

Но: *to stay – stays.*

Отрицательная форма глаголов в *Present Indefinite* образуется при помощи вспомогательного глагола *do* (в 3-м лице единственного числа *does)* и частицы *not.* Сокращенные формы: *don't, doesn't.*

I don't like to buy clothes myself.

Вопросительная форма глагола в *Present Indefinite* образуется с помощью вспомогательного глагола *do* (*does*), который ставится перед подлежащим.

Краткий ответ состоит из подлежащего, выраженного соответствующим местоимением, и вспомогательного глагола.

Например: 1) *Do you read letters in the morning*? *– Yes, I do.*

2) *Does your manager read letters in the morning*? *– Yes, he does.*

2. Простое прошедшее время (The Past Indefinite Tense)

The Simple Past Tense или *The Past Indefinite Tense* употребляется для выражения действий, совершившихся в прошлом и не связанных с настоящим моментом, а также для выражения повторяющихся действий в прошлом.

Данное время употребляется со следующими обстоятельствами времени:

yesterday – вчера;

the day before yesterday – позавчера;

yesterday morning (*afternoon, evening*) – вчера утром (днем, ве-чером);

last – в последний (прошлый) раз;

last week (*month, year*) *ago* – неделю (месяц, год) тому назад;

the other day – на днях;

in 1969 – в 1969 году.

Время совершения действия может быть не указано, но ясно из ситуации или контекста, например:

– Did you have a nice weekend?

– No, I didn't. The weather was not good and I stayed at home.

Примечание. 1) Глаголы в утвердительной форме в *Past Indefinite* не изменяются по лицам и числам.

2) Форма прошедшего времени правильных глаголов совпадает с формой *Participle II.*

Каждый неправильный глагол имеет свою форму прошедшего времени.

Отрицательная форма глаголов в *Past Indefinite* образуется при помощи вспомогательного глагола *did* и отрицательной частицы *not.*

Например: *The manager did not look through the mail yesterday morning.*

Вопросительная форма *Past Indefinite* образуется при помощи вспомогательного глагола *did,* который ставится перед подлежащим, а смысловой глагол употребляется в 1-й форме.

Например: *Did he stay at home last morning*?

Примечание. Глагол *to be* в *Past Indefinite* имеет форму *was* для 1-го и 3-го лица единственного числа и *were* для 2-го лица единственного числа и всех лиц множественного числа. Отрицательная и вопросительная форма образуются без вспомогательного глагола.

Например: – *Was the General Director in his office yesterday*?

– No, he wasn't. He was in the conference room.

3. Простое будущее время (The Future Indefinite Tense)

The Future Indefinite Tense употребляется для выражения действий, которые произойдут в будущем.

Утвердительная форма *Future Indefinite Tense* образуется при помощи вспомогательного глагола *will* и инфинитива смыслового глагола без частицы *to.*

Например: *We will go there by train tomorrow.*

Отрицательная форма *Future Indefinite* образуется при помощи вспомогательного глагола *will* и частицы *not,* которая ставится после вспомогательного глагола (*will not = won't*).

Например: *We will not go there by bus tomorrow.*

Вопросительная форма *Future Indefinite* образуется путем перестановки: вспомогательный глагол *will* ставится перед подлежащим.

Например: *When willvwe see you*?

4. Настоящее продолженное время

(The Present Continuous Tense)

Present Continuous употребляется для выражения действия, совершающегося в момент речи или в настоящий период времени. Глаголы, выражающие чувства и восприятия, умственную деятельность и некоторые другие *to see – видеть, to know – знать, to like – нравиться, to want – хотеть* и др. в *Present Continuous* не употребляются.

Утвердительная форма *Present Continuous* образуется с помощью вспомогательного глагола *to be* в соответствующей форме *Present Indefinite* и *Participle I* (причастие настоящего времени) смыслового глагола.

Например: *Mr. Bell is reading a letter.*

Примечание. Participle I образуется путем прибавления окончания *-ing* к основной форме глагола:

speak + -ing = speaking. Если глагол оканчивается на букву *-e,* то при прибавлении *-ing e* опускается:

come + -ing = coming. Если глагол оканчивается на согласный звук, перед которым стоит один гласный, то конечная буква удваивается:

sit + -ing = sitting.

Отрицательная форма *Present Continuous* образуется с помощью отрицательной частицы *not,* которая ставится после вспомогательного глагола *to be.*

Например: *I am not reading a book now.*

В вопросительной форме *Present Continuous* вспомогательный глагол *to be* ставится перед подлежащим, а смысловой глагол в *Participle 1* ставится после подлежащего.

Например: *Is Mr. Bell reading a telex*?

5. Прошедшее продолженное время (The Past Continuous Tense)

Past Continuous употребляется для выражения действия, происходящего в определенный момент в прошлом. Этот момент может быть выражен:

1) точным указанием времени.

2) другим действием, выраженным глаголом в простом прошедшем времени.

Утвердительная форма глаголов в *Past Continuous* образуется при помощи глагола *to be* в прошедшем времени (*was, were*) и *Present Participle* смыслового глагола.

Например: *Igor was waiting for the British businessmen at 7 o'clock.*

В вопросительной форме *Past Continuous* вспомогательный глагол *to be* в прошедшем времени (*was, were*) ставится перед подлежащим, а смысловой глагол в *Participle I* ставится после подлежащего.

Например: *Were you looking through the latest letters yesterday at nine*?

Отрицательная форма образуется при помощи отрицательной частицы *not,* которая ставится после вспомогательного глагола *to be* в прошедшем времени.

Например: *The director was not looking through the catalogues at two yesterday.*

7. Будущее продолженное время (The Future Continuous Tense)

Употребляется для выражения незаконченного действия, которое будет совершаться в определенный момент в будущем. Этот момент может быть выражен:

1) точным указанием времени:

I will be working at the laboratory at 8 o'clock tomorrow morning. – Я буду работать в лаборатории завтра утром в 8 часов.

2) другим действием в будущем, выраженным глаголом в *Present Indefinite.*

When you come to see me, I will be working at the laboratory. – Когда Вы придете ко мне, я буду работать в лаборатории.

Глагол в форме *The Future Continuous Tense* переводится на русский язык глаголом в будущем времени несовершенного вида.

Утвердительная форма *The Future Continuous Tense* образуется при помощи вспомогательного глагола *will,* а также вспомогательного глагола *be* и смыслового глагола в *Participle I*: *will be + -ing.*

Например: *I will be passing my examination at 3 o'clock tomorrow.*

Вопросительная форма образуется при помощи вспомогательного глагола *will,* который ставится перед подлежащим, а вспомогательный глагол *be* и смысловой глагол в *Participle I* ставятся после подлежащего.

Например: *Who will be passing his examination at 3 o'clock tomorrow*?

Отрицательная форма образуется при помощи отрицательной частицы *not,* которая употребляется вспомогательного глагола *will.*

Например: *He will not be passing his examination at 2 o'clock tomorrow.*

8. Настоящее совершенное время (The Present Perfect Tense)

Это время употребляется для выражения действия, завершившегося к моменту речи и связанного с настоящим временем. На русский язык глаголы в *Present Perfect* в большинстве случаев переводятся прошедшим временем. *Present Perfect* в основном употребляется в устной речи.

Утвердительная форма *Present Perfect* образуется при помощи вспомогательного глагола *to have* в *Present Indefinite и Participle II* (причастия прошедшего времени) смыслового глагола:

to have + Participle II.

Например: *I have just read the offer from Sam and Co.*

Примечания.

1) *Participle II* стандартных глаголов образуется путем прибавления окончания *-ed, -d* к инфинитиву глагола без частицы *to.*

Если инфинитив глагола оканчивается на букву *-e,* то прибавляется только *-d*: *to translate – translated.*

Буква *y* после согласного звука меняется на *i,* а после гласных *y* сохраняется: *to study – studied,* но *to stay – stayed*

После краткого гласного звука конечная согласная удваивается: *to stop – stopped.*

2) *Participle II* нестандартных глаголов образуется не по правилам. Каждый нестандартный глагол имеет свою форму:

to begin – begun, to drink – drunk.

3) Вспомогательный глагол *to have* меняется на *has* при употреблении с 3-м лицом единственного числа: *He has just read the telegram from this company.*

4) *Present Perfect* часто употребляется: а) с наречиями неопределенного времени – *already, yet, lately, just, ever, never*; б) со словами, выражающими незаконченный период – *today, this week, this month, this year.*

Вопросительная форма образуется при помощи вспомогательного глагола *have (has),* который ставится перед подлежащим, и *Participle II* смыслового глагола, который ставится после подлежащего.

Например: *Has he known her for many years*? – *Он знает ее много лет*?

Have you ever been to London? – *Были ли Вы когда-нибудь в Лондоне*?

Отрицательная форма образуется при помощи отрицательной частицы *not,* которая ставится после вспомогательного глагола *have* (*has*). Например: *I have not seen you since spring.*

9. Прошедшее совершенное время (The Past Perfect Tense)

Past Perfect употребляется для обозначения действия, совершившегося до определенного момента в прошлом. Этот момент может быть выражен точным указанием времени с предлогом *by* или другим прошедшим действием:

Richard and his wife were late for the performance. When they got to the theatre, the play had already started. – Ричард и его жена опоздали на спектакль. Когда они добрались до театра, спектакль уже начался.

Утвердительная форма *Past Perfect* образуется с помощью глагола *to have* в форме *Past Indefinite* и *Participle II* смыслового глагола: *had + + Participle II:*

– When did you finish your work yesterday?

– I had finished it by 5 o'clock.

Вопросительная форма образуется при помощи глагола *to have* в *Past Indefinite,* который ставится перед подлежащим, и *Participle II* смыслового глагола, который ставится после подлежащего:

What business matters had you discussed before you signed the contract?

Отрицательная форма образуется при помощи отрицательной частицы *not,* которая ставится после глагола *to have* в *Past Indefinite.*

Например: *I couldn't watch the nine o'clock news on television because I hadn't finished my article by that time.*

10. Будущее совершенное время (The Future Perfect Tense)

Употребляется для того, чтобы выразить действие, которое будет совершено к определенному моменту в будущем. Этот момент может быть выражен:

1) обозначениями времени с предлогом *by* (*by 6 o'clock – к 6 часам, by that time – к тому времени* и т.д.)

We will have finished this article by 6 o'clock tomorrow. – Завтра к 6 часам мы закончим эту статью.

2) другим будущим действием, выраженным придаточным предложением условия и времени с глаголом в настоящем времени, который переводится на русский язык глаголом в будущем времени.

You will have finished your work before the bell rings. – Вы закончите свою работу, прежде чем прозвенит звонок.

Утвердительная форма *Future Perfect* образуется при помощи вспомогательного глагола *will* и *have*, а также *Participle II* смыслового глагола: *shall/will have + Participle II.*

Например: *I shall have written the letter by seven o'clock.*

Вопросительная форма образуется при помощи вспомогательного глагола *will,* который ставится перед подлежащим, а также вспомогательного глагола *have,* который ставится после подлежащего и *Participle II смыслового* глагола.

Например: *Will you have written this article by 6 o'clock*?

Отрицательная форма образуется при помощи отрицательной частицы *not*, которая ставится после вспомогательного глагола *will.*

They will not have finished this work by 4 o'clock tomorrow.

UNIT 7
ПАССИВНЫЙ ЗАЛОГ (THE PASSIVE VOICE)

Пассивный (страдательный) залог показывает, что подлежащее не является производителем действия, оно испытывает действие, направленное на него со стороны другого лица или предмета. Поэтому глагол-сказуемое употребляется в форме страдательного залога. Лицо, совершающее действие, выражается в страдательном обороте существительным или местоимением с предлогом *by.*

The radio was invented by Popov in 1895. – Радио было изобретено Поповым в 1895 году.

Примечания.

1) Глаголы, требующие после себя предложного дополнения (*to look at, to listen to, to speak about, to talk about, to send for*), в страдательном залоге сохраняют предлог.

Например: *The doctor was sent for a few minutes ago.*

2) Непереходные глаголы, такие как *to grow, to take place, to take part, to appear* в страдательном залоге не употребляются.

Утвердительная форма глаголов страдательного залога в *Indefinite* образуется при помощи вспомогательного глагола *to be* в нужном времени и *Participle II* смыслового глагола.

Например: – *You often go to the theatre, Lena. Who gets tickets for you*?

– *They are usually booked by my father.*

При образовании вопросительной формы вспомогательный глагол ставится перед подлежащим.

– *Is TV equipment exported to many countries*?

– *Yes, it is.*

При образовании отрицательной формы частица *not* ставится после вспомогательного глагола. Например:

The goods were not delivered on time because the plant was heavy with orders.

The machines will not be tested next week because they are not ready for tests.

UNIT 8
СОГЛАСОВАНИЕ ВРЕМЕН (SEQUENCE OF TENSES) КОСВЕННАЯ РЕЧЬ (INDIRECT SPEECH)

Правило согласования времен, которое действует в основном в придаточных предложениях, состоит в следующем: время глагола придаточного предложения строго зависит от времени глагола главного предложения.

1. Если глагол главного предложения стоит в одной из форм настоящего или будущего времени, то глагол придаточного предложения может стоять в любом времени, которое требуется по смыслу.

а) Для выражения одновременного действия - в настоящем (Present Indefinite или Present Continuous и др.)

He says (that) he works (is working).

Он говорит, что он работает.

б) Для выражения предшествующего действия - в прошедшем (Past Indefinite или Past Continuous).

He says (that) he worked (was working).

Он говорит, что он работал.

в) Для выражения предстоящего действия - в будущем (Future Indefinite или Future Continuous).

He says (that) he will work (will be working).

Он говорит, что будет работать.

2. Если глагол главного предложения стоит в одной из форм прошедшего времени, глагол придаточного предложения также стоит в форме прошедшего времени.

а) Для выражения одновременного действия - в прошедшем (Past Indefinite или Past Continuous), но переводится настоящим временем.

He said (that) he worked (was working).

Он сказал, что он работает.

б) Для выражения предшествующего действия - в предпрошедшем (Past Perfect or Past Perfect Continuous) и переводится глаголом прошедшего времени.

He said (that) he had worked (had been working).

Он сказал, что он работал.

в) Для выражения предстоящего действия употребляется Future Indefinite in the Past (would + Indefinite Infinitive) или Future Continuous in the Past (would + Continuous Infinitive), которое переводится глаголом будущего времени.

He said (that) he would work (would be working).

Он сказал, что он будет работать.

Правила обращения прямой речи (Direct Speech) в косвенную (Indirect Speech)

При обращении прямой речи в косвенную, если прямая речь представляет собой повествовательное предложение, производятся следующие изменения:

1. Запятая и кавычки опускаются. Прямая речь становится дополнительным придаточным предложением, вводимым союзом that (что), который может опускаться.

2. Если глагол главного предложения стоит в одной из форм прошедшего времени, то глагол придаточного предложения приобретает одну из форм прошедшего времени в соответствии с правилом согласования времен.

3. Как и в русском языке, личные и притяжательные местоимения заменяются соответственно смыслу.

4. Происходит замена местоимений и наречий:

указательные местоимения

this (these) ==> that (those)

наречия времени

now ==> then

today ==> that day

yesterday ==> the day before

tomorrow => the next day

ago ==> before

наречия места

here ==> there

She said, "We are leaving today."
She said that they were leaving that day.
He said, "I will read it tomorrow."
He said that he would read it the next day.
He said, "I came for the lesson in time."
He said that he had come for the lesson in time.
He said, "They didn't know the rule."
He said that they hadn't known the rule.
He said, "She has to translate this text."
He said that she had to translate that text.
He said, "They'll be able to read it."
He said that they would be able to read it.

Если прямая речь представляет собой вопросительное предложение, то при обращении в косвенную она становится дополнительным придаточным предложением (косвенным вопросом).

1. Общие вопросы (вопросы, начинающиеся с вспомогательного или модального глагола) присоединяются к главному предложению при помощи союзов if или whether (при переводе в придаточном предложении употребляется частица «ли»).

2. В специальных вопросах (вопросах, начинающихся с вопросительного слова или вопросительной группы слов who, where, how much, how long и т.д.)

3. Вопросительный знак опускается, и вопросительный порядок слов в прямом вопросе заменяется порядком слов повествовательного предложения, т.е. сказуемое ставится после подлежащего.

Далее производятся те же изменения, как и при обращении в косвенную речь повествовательных предложений.

He asked me, "Where do you live?"
He asked me where I lived.
He asked me, "Have you written the paper?"
He asked me if (whether) I had written the paper.
John asked, "Are you ready?"
John asked if (whether) I was ready.
"How long will it take you to write this essay?" asked Mary.
Mary asked how long it would take me to write that essay.
The tourist asked, "Where could I buy some postcards?"
The tourist wanted to know where he could buy some postcards.
He asked, "Who is the writer?"
He asked who the writer was.

Когда прямая речь представляет собой повелительное предложение, то при обращении ее в косвенную речь производятся следующие изменения:

1. Повелительное наклонение заменяется в косвенной речи инфинитивом.

Отрицательная форма повелительного наклонения заменяется инфинитивом с частицей not.

2. Личные, притяжательные и указательные местоимения, а также наречия времени и места заменяются по смыслу.

She said to him, "Come at 5 o'clock."

She told him to come at 5 o'clock.

He said to me, "Don't go there."

He told me mot to go there.

John said, "Can you help me?"

John asked me to help.

UNIT 9
МОДАЛЬНЫЕ ГЛАГОЛЫ (MODAL VERBS)

Модальные глаголы – это такие глаголы, которые обозначают не само действие, а указывают на отношение говорящего к действию, т.е. указывают на возможность, вероятность или необходимость совершения действия.

Модальные глаголы не употребляются самостоятельно, а только в сочетании с инфинитивом смыслового глагола, образуя глагольное составное сказуемое.

1. Глагол *can* – "*могу*", "*умею*" выражает физическую возможность совершения действия:

– *Can you speak English*?

– *Yes. I can speak English.*

2. Глагол *must* – "*должен*" выражает долженствование или необходимость совершения действия:

– *I cannot speak to you now. I must go home.*

– *Must you go now?*

– *Yes, I must.*

3. Глагол *may* – "*можно*" выражает разрешение выполнить действие. В разговорной речи вместо *may* часто употребляется *can*:

– *May I go to the cinema*?

– *No, you must not. The film is not for children.*

– *You can watch TV at home.*

У модальных глаголов *can, may, must* есть ряд грамматических особенностей:

1. В *Present Simple* не имеют окончания *-s* в 3-м лице единственного числа.

2. Вопросительную и отрицательную формы образуют без вспомогательного глагола *to do.* Отрицательная частица *not с* глаголом *can* пишется слитно – *cannot.*

3. Не имеют формы инфинитива.

4. Следующий за модальным глаголом смысловой глагол употребляется без частицы *to.*

5. Не имеют форм будущего времени (*Future Simple*), а глагол *must* не имеет и формы прошедшего времени (*Past Simple*).

Present Past Future

can could –

must –

may might –

6. Взамен недостающих форм модальных глаголов *can, may, must* употребляются заменители модальных глаголов.

Заменители модальных глаголов

Can May Must

to be able (*to*) – быть в состоянии (мочь)

to be allowed (*to*) – иметь разрешение

to have (*to*) – быть вынужденным (в силу обстоятельств)

to be (*to*) – быть обязанным (в силу договоренности, плана, расписания и т.д.)

Заменители модальных глаголов употребляются не только в тех случаях, когда модальные глаголы не имеют соответствующих форм *Future* или *Past,* но и вместо них.

Инфинитив, следующий за заменителем модального глагола, употребляется с частицей *to.*

They were to be at the conference. – Они должны были быть (*присутствовать*) *на конференции.*

She was not allowed to stay there. – Ей не разрешили оставаться там.

7. В вопросительных предложениях модальный глагол ставится перед подлежащим.

8. В отрицательных ответах на вопросы с глаголом *must* употребляется модальный глагол *need* (в отрицательной форме *needn't*) для выражения отсутствия необходимости.

9. Глагол *should* может употребляться в качестве модального глагола, выражая моральную обязанность или необходимость совершения действия. Обычно глагол *should* переводится на русский язык "следует", "следовало бы", "должен". *You should help him. – Вам следовало бы помочь ему.*

10. Глагол *would* может употребляться в качестве модального глагола для выражения упорного нежелания, отказа выполнить действие, для выражения просьбы.

UNIT 10
ПРИДАТОЧНЫЕ ПРЕДЛОЖЕНИЯ (ADVERBIAL CLAUSES)

Сложноподчиненное предложение состоит из главного и одного или нескольких придаточных предложений. Придаточные предложения соединяются с главным предложением при помощи подчиненных союзов и союзных слов, а также бессоюзным способом.

1. Дополнительные придаточные предложения (Object Clauses)

Дополнительные придаточные предложения выполняют в сложном предложении функцию прямого

дополнения или предложного косвенного дополнения. Они отвечают на вопросы *whom – кого*? или *what – что*? без предлогов или с предлогами и вводятся союзами *that, if, whether*, союзными словами *who, what, which, when, where, how* или бессоюзно.

I am sure that he is not at home now. – Я уверен, что его нет дома сейчас.

I am glad you have come. – Я рад, что Вы пришли (*бессоюзное подчинение*).

2. Определительные придаточные предложения (Attributive Clauses)

Определительные придаточные предложения выполняют функцию определения в сложноподчиненном предложении, отвечают на вопросы *what, which – какой*? и присоединяются к главному предложению бессоюзным способом или при помощи следующих союзных слов-местоимений: *who – который*

(*whom – которого*), *whose – чей, которого*, *which, that – который*, а также наречиями *when – когда,*

where – где, куда, why – почему. Местоимения *who, whom, whose* относятся к существительным, обозначающим одушевленные предметы, *which* относится к неодушевленным предметам, а местоимение *that* относится как к одушевленным, так и неодушевленным предметам.

Here are the letters that I received yesterday. – Вот письма, которые я получил вчера.

The man whom you saw yesterday is our director. – Человек, которого ты видел вчера, мой директор.

При бессоюзной связи предлог стоит в конце придаточного предложения, а при переводе на русский язык – в начале.

This is the office we work in. – Вот офис, в котором мы работаем.

3. Обстоятельственные придаточные предложения

(The Adverbial Clauses)

Обстоятельственные придаточные предложения выполняют в сложном предложении функцию различных обстоятельств. Они делятся по своему значению на обстоятельственные предложения времени,

места, образа действия, причины, цели, следствия, уступительные, степени и сравнения, условия.

4. Придаточные предложения времени (Adverbial Clauses of Time)

Придаточные предложения времени отвечают на вопросы *when – когда*? *since when – с каких пор*? *how long – как долго*?

Придаточные предложения времени соединяются с главным предложением союзами: *when – когда*; *while – в то время как*; *before – перед тем как, до того как, перед*; *after – после того как*; *as soon as – как только*; *as – когда, в то время как, по мере того как*; *till, until – пока, до тех пор, пока не*; *as long as – пока, до тех пор пока*; *since – с тех пор как* и др.

I saw many places of interest when I was in Moscow. – Я осмотрела много достопримечательностей, когда была в Москве.

As soon as I receive his cable, I shall give it to you. – Как только я получу его телеграмму, я дам ее тебе.

She came after I had left. – Она пришла после того, как я ушла.

Примечание: В придаточных предложениях времени будущее время не употребляется.

While you are working I shall be reading this article. – Пока Вы будете работать, я прочитаю эту статью.

5. Придаточные предложения условия (Adverbial Clauses of Condition)

Придаточные предложения условия обычно соединяются с главным предложением союзами *if – если*, *unless – если не*. В английском языке условные предложения подразделяются на три типа:

1 тип условных предложений выражает осуществимое условие, относящееся к настоящему, прошедшему или будущему времени.

If it gels dark, we switch the light on. – Если становится темно, мы включаем свет.

2 тип составляют предложения, выражающие маловероятные условия, относящиеся к настоящему или будущему времени. Эти предложения употребляются в сослагательном наклонении. В главном предложении употребляются вспомогательные глаголы *should/would* + + инфинитив смыслового глагола, в придаточном предложении употребляется форма сослагательного наклонения, совпадающая с *Past Simple*.

If I had time (*now, tomorrow*), *I should go there. – Если бы у меня было время* (*сейчас, завтра*), *я бы пошла туда*.

3 тип составляют предложения, выражающие неосуществимые предположения, относящиеся к прошедшему времени. В условных предложениях 3 типа глагол главного предложения стоит в форме

should (*would*) + *Infinitive Perfect*, а глагол условного придаточного предложения стоит в форме сослагательного наклонения, совпадающего с *Past Perfect.*

If you had listened to me carefully, you would not have asked me such questions. – Если бы Вы слушали меня внимательно, Вы бы не задавали мне таких вопросов.

TAPESCRIPT

INTRODUCTORY LESSON

Marie: Hi, everyone. Welcome to *Thrillseekers.* I'm Marie Gregg and this is Jack Roberts. We're going to be your guides on our expedition from London to South Africa.

Jack: Hi! As you heard, my name's Jack and, as - you can probably tell from my accent, I'm from South Africa. And this is Bessie, our trusty vehicle. She's going to take us all the way down through Europe and Africa to Cape Town. Now we're going to be together on the road for the next five weeks, so we need to get to know each other. Can I ask you all to introduce yourselves briefly to the group? Now, who would like to start? Yes?

Lulu: Hello, everybody. My name's Lulu McNulty and I'm from Sydney, Australia. I'm a fashion designer. My father was born in South Africa. I've always wanted to go there, because he's told me so much about the place. So I'm really looking forward to the trip.

Jack: Thanks, Lulu. And now the person next to Lulu.

Paola: Hi. I'm Paola, Paola Rossi. I'm an accountant. I work for a big chemical company. Oh, and I'm from Argentina - from Buenos Aires. At the moment I'm working in London. I've been here for about a year now. I like travelling but I like a bit of adventure, too. So that's why I wanted to go on this trip.

Jack: Thank you, Paola and ... ?

Istvan: Hi. I'm Istvan Tisza. I'm from Hungary and I'm a student.

Marie: What are you studying, Istvan?

Istvan: I'm studying psychology at the University of Budapest. I wanted to come on this trip because I'd like to do something unusual. And also I'll have a chance to practise my English.

Jack: Thanks a lot, Istvan, and ...

UNIT 1. HISTORY OF BIOLOGY

Teacher: OK, listen up class. Today were going to learn what germs actually are. So let's begin by clearing up one mistaken belief many people have. Germs are not all bad. No, indeed, germs are basically microbes and they can live in many places, such as in or on humans, animals or plants. While you might think that sounds disgusting, let me explain something: some germs actually help the human.

UNIT 2. BIOLOGY TODAY

Teacher: Well, today we're going to talk about the micro-organisms known as protozoa. Now me word protozoa comes from the Greek and it literal means first animal. Of all the life forms in the world they have the largest population. Yes, Harry W hat do you want to say?

Harry: Erm, Miss, isn't it true that protozoa are very important for maintaining the earth so it is suitable for other life forms to live on?

Teacher: Yes, indeed. Probably one of the most important ecological functions these tiny animals have is that they consume bacteria, which keeps them under control and enables us to have an environment in which we can survive. Right, what I'd like now is for somebody to give me a basic definition of this form of life. Yes, Emily, you tell us. Emily: I looked it up on the Internet, Miss, and I found out that they are one-celled forms. They're the smallest of all animals and can only be seen under a microscope. The reason they can be considered animal life is because they share features we connect with animals: they breathe, they reproduce and they move. And...

Keith: Can I butt in there? I found out more about what they look like. Well, they don't have an inner or outer skeleton but apart from that their appearance varies. For example, an amoeba doesn't have a fixed shape and it is very simple in its internal organisation. On the other hand, a paramecium has a fixed shape and a more complicated internal organisation.

Teacher: Good! Well done both of you! Let me add a bit more to that information. Firstly, although we said protozoa are helpful, there are also some which aren't. What I mean is that some can be parasites and others can be the cause of certain diseases. When I -ay parasite, that means they feed off their host - the animal or human in which they are living A- far as what they eat is concerned, they can take in organisms such as bacteria and algae (a kind of water plant) or organic particles such as waste from animals or plants. Some types take in nutrient- through the cell mouth, others absorb nutrient- through their cell walls.

Let's go on to look more closely at the different types of protozoa...

UNIT 3. LIFE ORIGIN

Historically, being immunised against diseases is a relatively new thing but that doesn't mean the idea hadn't been thought of before. If we go as far back as 429 BC, the historian Thucydides noted that after a smallpox plague in Athens survivors did not become infected again. This was at a time before there was even recognition of such things as bacteria and viruses.

Nowadays, we take it for granted that we will be vaccinated and avoid diseases like polio, but how many of us actually stop to ask ourselves what is behind the injection we have? How does vaccination work?

Basically, it is the process by which a person is exposed to an agent so that his or her immune system develops against that agent. The immune system makes antibodies which fight against infection. Once the human immune system is exposed, that is, made open to a disease, it is able to act against any future infection. Vaccination exposes a person to an immunogen - something which helps develop immunity - in a controlled way by using a weak dose so he or she doesn't become ill while being immunised.

The good thing about a vaccination programme is that it can limit the spread of a disease among a population, reducing the risk for people who have not been vaccinated so we have something which is known as herd immunity. That means when the number of non-immune people has dropped to a certain level, the disease will disappear from the whole population. This is how nowadays we have achieved the elimination of many diseases.

UNIT 4. THE CELL

When we say something is written in our DNA what do we actually mean? What kind of alphabet are we suggesting? Well actually, it's a very good description as the strands or lengths of DNA contain 3.2 billion letters of coding. That's a lot of information. The nature of the information depends on the order of the base pairs along its length. Of course, we inherit this information from our parents. Not just hair colour or skin tone, sometimes the chances of getting certain diseases. That's why DNA is so important for the future of health care. From our mothers we get mitochondrial DNA. and the male Y chromosome only comes from our fathers. Now this is interesting since DNA isn't destroyed by time and because there is so much of it. we can often find it in animals that have been dead for thousands of years. Archaeologists for example, might find it in the teeth of ancient man, and since DNA is handed down from generation to generation it would be possible to find a living relative of someone who had been dead for four thousand years. Bringing things up to date, don't forget that the police can use samples of DNA left it a crime scene to find criminals!

UNIT 5. THE VARIETY OF LIFE

Teacher: One of the most interesting animals was the Tasmanian tiger. First of all, it wasn't a tiger, or any sort of cat.

Student 1: What was it?

Teacher: It was actually a dog. In fact, its scientific name means 'dog with a wolf's head'.

Student 2: So, why was it called a tiger?

Teacher: It was called a tiger because it had stripes on its body. That's probably why the first Europeans who set foot in Tasmania killed it - they thought it was dangerous.

Student 1: Was it really dangerous?

Teacher: Not really no. It was a very shy animal, and it stayed away from humans.

Student 2: Is it extinct now?

Teacher: Well, we' re not sure about that. The last Tasmanian tiger died in captivity - that is, in a zoo - in l930 and the species was officially declared extinct in 1986 but people still claim they have seen them in the wilder parts of Tasmania.

UNIT 6. EVOLUTION

Charles Darwin was an English scientist who put forward a theory of evolution. He outlined this theory in his book The Origin of Species. He also wrote another book called The Descent of Man. In the second book he used his theory to suggest that human beings evolved from apes and monkeys. Many people disagreed with what he said. However, despite the fact that some of Darwin's ideas have been disproved, his basic ideas are still accepted.

After travelling and collecting many specimens of animal and plant life, he returned to England in 1836. There he began to classify his findings, and the similarities between the fossil mammals Darwin collected and modern mammals led him to believe species change over time. However, he had to answer the question, 'if evolution occurred, by what means did it do it?' So began his studies, spread over twenty odd years which finally led Darwin to the conclusion that those who possessed advantageous variations, that is helpful differences, were more likely to survive and reproduce than those without these advantageous variations. In other words, the fittest would survive. He coined the term 'natural selection to describe this process by which organisms with favourable variations survived and reproduced more offspring. He called an inherited variation which increased an organism's chance of survival in a particular environment an 'adaptation'. Over many generations, an adaptation would spread throughout an entire species and thus, according to Darwin, evolution by natural selection would happen.

UNIT 7. GENETICS

Student 1: What are you going to write about in your Biology report? I haven't decided yet, but I might write about Gregor Mendel's experiments, you know, the ones with the pea plants.

Student 2: Actually. I'm thinking of writing about modern genetics and how we can change genetic information. I'll probably write about genetic

engineering. I think it’s fascinating. It’s incredible how scientists can change information in genes. It’s like something from a science fiction film.

Student 1: Yes it is. But just like in films, scientists sometimes create strange things in their laboratories.

Student 2: Oh? Like what?

Student 1: Well, I read that they have used genetic engineering to produce square watermelons. Isn’t that crazy?

Student 2: Square watermelons? Why would anyone want a square watermelon?

Student 1: Apparently, normal watermelons are difficult to store and transport because of their shape. These square ones can be easily put one on top of the other, so more can be transported at the same time. In this way, it costs less to transport them.

Student 2: That’s amazing. But it makes sense, doesn’t it? I mean, that’s what genetic engineering is all about - making life easier for us. I had no idea about those watermelons though. I was going to write about food crops, like wheat, and how' scientists can change them so that the wheat can survive in different weather conditions.

Student 1: Yes, that’s important. That means there’ll be more wheat for food. I think they also use genetic engineering to create plants that are used to make certain medicines. That’s a good idea.

Student 2: I agree. It’s a great idea, although of course there is quite a lot of public concern about genetic engineering that is carried out on food crops...

UNIT 8. CLONNING

At the beginning of the 1950s one of the players in the race to identify the structure of DNA was a woman - Rosalind Franklin. However, due to her early death - she died at the age of 37 and because she was a woman working at a time when women were not treated equally in the workplace, it is often argued that the history of science didn't give her the credit she deserved.

So what is it that she contributed? Well, she was talented and committed researcher and she developed particular skill in taking photos of crystals. Added to that, she was able to interpret ne photos better than anybody else. Using the technique known as X-ray crystallography she could map the atoms in a crystal. When she showed her photo of the DNA molecule to James Watson, he was very excited because it was the first time that the structure of DNA - its double-helix shape - could be seen. Moreover, identifying the structure of DNA would also help explain how it reproduced itself.

Even nowadays there is disagreement about how important Franklin’s contribution to learning the structure of DNA was but her genius cannot be denied. After the problems she had working on DNA she decided to move to

Birkbeck College, perhaps to a friendlier climate, where she did work on the tobacco mosaic virus and the polio virus. Unfortunately, she died in 1958, thus ending a brilliant career.

UNIT 9. THE THEORY OF NOOSPHERE

Teacher: Many years ago - in fact, billions of years ago - uranium began to enter the Earth's crust.

Student 1: Where did it come from?

Teacher: It had been released from an exploding star, and floated around the universe. Uranium is the heaviest of all the naturally occurring elements. It has an atomic number of 92.

Student 2: Does that mean there are 92 protons in the atom's nucleus?

Teacher: Yes, it does. That is a huge amount. Just to compare it to lighter elements, can anyone tell me how many protons there are in, for example, hydrogen or oxygen?

Student 1: There's just one in hydrogen, and there are eight in oxygen.

Teacher: That's right. Uranium is also radioactive. What does that mean?

Student 3: It means that it is an atom that can release huge amounts of energy

Teacher: Correct. We can use uranium - that is, nuclear power - to produce energy, such as electricity. But before this happens, the uranium must be mined and refined into very small pieces about the size of a piece of chewing gum. These pieces are then put into small tubes, and are used in nuclear reactors as fuel. Student 2: How much energy can it produce? Teacher: Well, because it contains more energy than any other element, a small amount - about a handful, in fact - can provide as much energy as 390 barrels of oil.

Student 3: It's dangerous though, isn't it?

Teacher: Yes, it can be extremely dangerous, and accidents have occurred in the past.

Student 3: Why is it used then?

Teacher: Because it is cleaner than other forms of energy that we use to produce the huge amounts of electricity that we need. At the moment, if we didn't have any nuclear power, an extra two billion tons of carbon dioxide would be poured into the atmosphere by other forms of energy such as coal. There are alternative forms being developed through…

UNIT 10. ECOLOGY

Presenter: Good afternoon. Today we're considering how worried we really need to be about climate change. In particular, how worried we should be about plant life and the future of animals on this earth. Sarah's report gives us some reasons to be optimistic and some reasons to really worry. Sarah.

Sarah: Hello there. Yes, it's true that climatic change does affect animal and plant life but not always to the point of disaster. Many animals and plants are actually very adaptable - you know, able to change according to conditions. Of course, historically ice ages and droughts - a severe lack of water - have completely destroyed certain types of animal and plant life, but many managed to survive extreme, long-term climate change by adapting.

Now, many biologists and ecologists believe the Earth today may again be in the middle of climate change because over the last century many studies have shown rising global temperatures, on average about half a degree centigrade, and although this may seem very little, it is actually happening much faster than before and it can affect life enormously.

Climate change leads some plants and animals to find new homes, while others that are not so lucky[7] become extinct. Mountains give a good example of this. A hotter climate means trees and plants can grow higher up mountains. In the Alps, it's been observed that every decade sees plants moving up about four metres. And how does this influence animal life? Well, unfortunately[7], some animals, which have become highly specialised in order to live on mountain tops, have no escape if conditions change. They simply cannot survive in warm weather.

So let's go over to Dr Bernard in Switzerland who will fill us in with more details...

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