

**ENGLISH
FOR STUDENTS OF
ENVIRONMENTAL ENGINEERING
Part II**



Ижевск
2024

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Кафедра профессионального иностранного языка
для естественно-научных специальностей

**ENGLISH FOR STUDENTS OF
ENVIRONMENTAL ENGINEERING**

Английский язык для студентов направления
«Природообустройство и водопользование»

Part II

Учебно-методическое пособие



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Учебно-методическое пособие содержит профессионально-ориентированные тексты и задания для отработки профессиональных языковых компетенции у студентов направления «Природообустройство и водопользование». С помощью предложенного материала студент нарабатывает навыки чтения, перевода, словообразования, говорения в профессиональной сфере.

Данное пособие предлагается использовать на занятиях со студентами-магистрантами, но оно также может быть использовано на практических занятиях со студентами-бакалаврами и для их самостоятельной работы.

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Введение

Подготовка студентов направления «Природообустройство и водопользование» на этапе магистратуры включает в себя обучение профессиональному иностранному языку. Сегодня проблемы, связанные с экологией, должны решаться не на уровне одной отдельно взятой страны, а на международном уровне. Экологические саммиты регулярно проводятся во многих странах, соответственно, владение иностранным языком, в частности английским, позволит студентам отслеживать современную ситуацию и быть в курсе текущего экологического положения, а также даст возможность принимать участие в мероприятиях данного формата.

На этапе магистратуры в процессе обучения студенты совершенствуют свои коммуникативные навыки, необходимые для профессионального взаимодействия, учатся формулировать на языке свои научные достижения.

Данное учебно-методическое пособие также направлено на закрепление грамматического материала и знакомство с новыми грамматическими структурами. Пособие состоит из 8 блоков (Unit), разделенных по тематической направленности. Каждый блок содержит один или несколько текстов, объединенных общей тематикой, разнообразные лексические упражнения и задания для приобретения навыков перевода, говорения и написания на английском языке. Предложенные в пособии упражнения помогают отработке лексических навыков. Тексты и упражнения заимствованы из различных учебных пособий и прошли апробацию на занятиях со студентами, что позволило оценить интерес студентов к данным тематическим областям.

Содержание

Unit I. Ecology	6
Unit II. Areas of Study	9
Unit III. The State of the Global Environment	11
Unit IV. Air Pollution – Smog	14
Carbon Dioxide	17
Unit V. The Importance of Water for Life	18
Unit VI. Soil	25
Protection of the Soil against Erosion.....	30
Protection of the Soil against Pollution.....	34
Unit VII. Recycling	36
Unit VIII. Practice your Ecological Vocabulary	39
Green House Effect	44

Unit I



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Ecology

Read the text and get ready to discuss its main points.

Ecology is the study of the relationships between organisms and their environment.

Ecology emerged in the late 20th century as one of the most popular and most important aspects of biology.

The word ecology was coined by a German zoologist Ernst Haeckel,

who applied the term *oekologie* to the “relation of the animal both to its organic as well as its inorganic environment”. The word comes from the Greek *oikos*, meaning “household, home, or place to live”. Thus ecology deals with the organism and its environment. The word environment includes both other organisms and physical surroundings. It involves relationships between individuals within a population and between individuals of different populations.

These interactions between individuals, between populations, and between organisms and their environment form ecological systems, or ecosystems. Modern ecology, however, is now focused on the concept of the ecosystem, a functional unit consisting of interacting organisms and all aspects of the environment in any specific area. It contains both the nonliving (abiotic) and living (biotic) components through which nutrients are cycled and energy flows. Constant interactions between living organisms and their physical environment bind these components into a stable system.

The state of balance in any ecosystem is self-sustainable so that even slight imbalances are corrected before they become severe, irreparable and fatal. Particular concern of the ecologists is with “higher” levels of life organization: from populations to biosphere.

Ecology is a multidisciplinary science. Facts about ecological systems are drawn from biology, geology, chemistry, physics, history, physiology, anthropology, including various branches of geography: hydrology, soil science, geomorphology, biogeography, etc. Originally ecology was treated as environmental biology. Modern ecology has to deal with environmental problems caused by human activities.

The science of ecology has the following areas of study. They are plant and animal ecology, population ecology, community ecology, paleoecology.

A new term “social ecology” was introduced to show interaction of man, society and nature, close interdependence of social and natural factors.

Other ecological approaches concern specialized areas.

Systems ecology, concentrating on input and output analysis, has stimulated the rapid development of applied ecology, concerned with the application of ecological principles to the management of natural resources, agricultural production, and problems of environmental pollution.

In applied ecology, basic ecological principles are applied to the management of populations of crops and animals, so that yields can be increased and the impact of pests reduced. Applied ecologists also study the effect of humans on their environment and on the survival of other species. Theoretical ecologists provide simulations of particular practical problems (e.g., the effects of fishing on fish populations) and develop models of general ecological relevance.

Nowadays it is evident that some of the most pressing problems in the affairs of men-expanding populations, food scarcities, environmental pollution, and all the attendant sociological – and political problems – are to a great degree ecological.

Ex. 1. Here are the answers to some questions on the text. What are the questions?

1. Ecology deals with the organism and its environment. (What?)
2. Ecology emerged in the late 20th century as one of the most important aspects of biology (When?)
3. The word ecology was coined by a German zoologist Ernst Haeckel. (Who?)
4. The term “ecology” comes from the Greek language. (What language?)
- 18 5. Interactions between individuals, between populations and between organisms and their environment form ecological systems. (What?)
6. The state of balance in any ecosystem is self-sustainable so that even slight imbalances are corrected before they become severe, irreparable and fatal. (Why?)
7. Modern ecology has to deal with environmental problems caused by human activities. (What?)
8. Facts about ecological systems are drawn from biology, geology, chemistry, physics, including various branches of geography. (Where?)
9. The ecosystem is a functional unit consisting of interacting organisms and all aspects of the environment in any specific area. (What?)
10. Originally ecology was treated as environmental biology (How?)

11. The most pressing problems of men-expanding populations, food scarcities, environmental pollution are to a great degree ecological. (What kind of?)

Ex. 2. Complete the sentences and define what Voice (Active or Passive) is used in each sentence:

1. Ecology is the study of
2. E. Haeckel applied the term “ecology” to
3. The word environment includes
4. Modern ecology is focused on
5. The state of balance in any ecosystem is .. .
6. Ecology is a multidisciplinary science drawing facts from
7. The science of ecology has such areas of study as
8. A term “social ecology” was introduced to
9. Applied ecologists study

Ex. 3. Match the following terms with their proper definitions.

1. Physiological ecology	a) the study of the ecology of fossil organisms
2. Behavioral ecology	b) the study of the organization and functioning of communities, which are assemblages of interacting populations of the species living within a particular
3. Population ecology	area
4. Community ecology	c) the study of the relationships between individual
5. Paleoecology	d) the study of the food-gathering techniques of individuals, the survival adaptations against predation and mating
	e) the study of the processes that affect the distribution and abundance of animal and plant populations

Unit II

Areas of study

Read the following text and subgroup the areas of study of ecology schematically.

Ecology developed along two lines: the study of plants and the study of animals. Plant ecology concerns the relationships of plants to other plants and their environment.

Animal ecology concerns the study of population dynamics, distribution, behaviour, and the interrelationships of animals and their environment. Because animals depend upon plants for food and shelter, animal ecology cannot be fully understood without a considerable background of plant ecology. This is particularly true in applied areas of ecology – wildlife and range management.

Both plant and animal ecology may be approached as the study of the interrelations of an individual organism with its environment, called autecology, or as the study of groups of organisms, called synecology.

Autecology, is usually concerned with the relationship of an organism to one or more variables such as humidity, light, salinity, or nutrient levels, it is easily quantified and lends itself to experimental design both in the field and the laboratory.

Important concepts developed by synecology are those concerned with nutrient cycling, energy budgets, and ecosystem development. Synecology may be subdivided according to environmental types, as terrestrial or aquatic. Terrestrial ecology, which may be further subdivided into forest, grassland, arctic, and desert ecology, concerns such aspects of terrestrial ecosystems as microclimate, soil chemistry, soil fauna, hydrologic cycles, ecogenetics, and productivity. Aquatic ecology, called limnology, is limited to freshwater stream ecology and lake ecology. The former concerns life in flowing waters; the latter, life in relatively still water. Marine ecology deals with life in the open sea and in estuaries.

The study of the geographic distribution of plants and animals is ecological plant and animal geography. The study of population growth, mortality, fatality, competition, and predator-prey relations is population ecology. The study of the genetics and ecology of local races and distinct species is ecological genetics. The study of the behavioral responses of animals to their environment, and of social interactions as they affect population dynamics, is behavioral ecology. Investigations of interactions between the physical environment and the organism fall under ecoclimatology and physiological ecology. The study of groups of organisms is community ecology (though it is difficult to separate it from studies of bioenergetics,

biogeochemical cycles, and trophic-dynamic aspects of the community or ecosystem ecology). That part of ecosystem ecology concerned with the analysis and understanding of the structure and function of ecosystems 20 by the use of applied mathematics, mathematical models, and computer programs is systems ecology.

Ex. 1. Using the information from the texts, get ready to speak on the topic “The subject of ecology and the areas of its study”.

Unit III

The state of the global environment

Read the text and say why only a very small part of the earth's surface is suitable for human beings. Explain why water and air pollution is a real menace for mankind. Give your arguments.

Man can only live in comfort on a very small part of the earth's surface, about 70 per cent of which is water, and much of the land is too hot, too cold, too barren, too swampy or too high for human beings. In that small part where he can live comfortably, man has been very careless in looking after his heritage. Our modern lifestyle is destroying the fragile environment.

At last, however, man has begun to wake up to the consequences of his actions and started to take steps to prevent things getting out of hand. There are many examples of what has happened already to make people realize that something must be done.

Water Pollution

Because of poisonous waste from industry and untreated sewage being allowed to enter rivers, many rivers in different parts of the world are now dead through lack of oxygen in the water and no longer have any fish life. A third of all British rivers are in this condition. Lakes have been similarly affected: in Switzerland Lake Zurich is dead and so are many other Swiss lakes. In northern Italy nearly all the lakes are dead and in the USA Lake Erie is dying.

A growing pollution menace is that from oil escaping from damaged oil tankers. It is alarming to think that there are about 3500 oil tankers on the world's seas.

The importance of our oceans in the life process should never be forgotten: 70 per cent of our oxygen comes from the seas through the actions of tiny one celled plants called diatoms and they cannot function in polluted water. Contaminating the oceans and seas is endangering the world's oxygen supplies.

Sewage and agricultural nitrate fertilizers are responsible for the blooms of algae, called red tides, now becoming more common. These deplete the water of oxygen, producing what are known as 'dead zones'; one such zone, of 4000km², has been found in the Gulf of Mexico, near the mouth of the Mississippi.

Many countries have joined together to improve the management of the 214 river basins that are shared by more than one country. These schemes are already improving water quality and management of the North American Great Lakes and of the European Rhine.

The UN Global Environment Monitoring System (GEMS), which is coordinated by UNEP, now includes 344 water-monitoring stations in 59 countries.

Air Pollution

Air pollution comes in many forms, but four pollutants are particularly important: the sulphur oxides, emitted mainly by power stations and industry; nitrogen oxides, emitted mainly by vehicles; and soot and dust, known technically as suspended particulate matter (SPM), found everywhere where fuels are burnt.

Some 60 per cent of the pollution is blamed on the exhausts of motor vehicles and a further 30 per cent is caused by industry. The car is an ecological disaster. It is now the world's number one polluter. From the beginning to the end of its life, one car produces an enormous quantity of pollution. The production of one car results in 1,500 kilos of waste, and 75 million metres of polluted air. Cars are partly responsible for the ever-increasing amount of poisonous lead being found in human beings.

In addition to being a health hazard (lung diseases, mentally retarded children and problems with the digestive system) air pollution causes millions of pounds worth of damage through the corrosion of metal and the decay of stone and brick-work.

Ex. 1. Put the sentences in the logical order.

1. Lakes have been similarly affected.
2. They deplete water of oxygen, producing "dead zones".
3. In Northern Italy nearly all the lakes are dead.
4. Contaminating the oceans, seas and rivers is endangering the world's oxygen supplies.
5. A third of all British rivers have no longer any fish life.
6. Because of poisonous waste from industry and untreated sewage many rivers in the world are now dead through the lack of oxygen.
7. Sewage and agricultural nitrate fertilizers are responsible for the blooms of algae.
8. One such zone has been found near the mouth of the Mississippi.

Ex. 2. Transform the following sentences, making a subordinate clause

Model: The activities of living organisms influence the biosphere.

It is the activities of living organisms that influence the biosphere.

1. Air pollution knows no boundaries.
2. Lead is among the most serious of all the pollutants.

3. The stability of a population as a system is achieved through continuous renewal of its elements.

4. The trees were the major source of food, fuel and shelter for man.

5. The activities of man literally changed the face of the earth.

6. The ancient Romans built their famous aqueducts to take the waste out of the city center.

7. Smoke from plants, houses and the exhaust fumes from cars cause the pollution of the air.

8. Powerful technology multiplies destructive impact on the environment.

9. Poor sewage disposal has always caused diseases.

10. The shortage of clean water is one of the most urgent problems in the world today.

11. German zoologist E. Haeckel applied the term “oekologie” to the relation of the animal both to its organic and inorganic environment.

Unit IV

Air pollution – Smog

Read the text and get ready to discuss its main points.

In the past, air pollution in industrialized countries caused a visible haze called smog. Smog is a mixture of different pollutants and water vapor in still, cold air. It occurs in unusual weather conditions when there is temperature inversion – that is, a layer of cold air close to the ground with a layer of warmer air above it. In normal weather conditions, air near the ground is warmer than air higher up; warm air rises and the air circulates. With temperature inversion, the air does not circulate so pollutants become trapped close to the ground.

When these pollutants combine with fog, they form a visible suspension in the air; this is known as smog. The main sources of sulphur dioxide and soot are fossil fuels, particularly coal. Oil, natural gas and hard, black coal produce much less sulphur dioxide than soft, brown coal. Sulphur dioxide is, incidentally, also emitted from volcanoes when they erupt; this “natural” sulphur dioxide can cause the same environmental problems as industrial emissions. Fortunately, volcanoes do not erupt very often!

Smog is very bad for health. Water vapor combines with sulphur dioxide to form sulphuric acid and with nitrogen monoxide to form nitric acid. These acids irritate the lungs. In the famous London smog of 1952, about 4,000 people died in two weeks from chest diseases such as bronchitis and pneumonia. In 1956, the British government introduced legislation against air pollution – the Clean Air Act.

It became illegal to burn coal or wood in residential areas. People had to use smokeless fuel such as gas or electricity. The Clean Air Act also said that industries must build tall chimneys to release their waste high into the atmosphere. This was a short-sighted policy, because the industries were not required to improve their production processes. Industrial pollution in Britain did not decrease after the Clean Air Act; it was simply released into the upper atmosphere.

Air pollution in the upper atmosphere does not cause smog, but it has other harmful effects. Sulphuric and nitric acids are carried long distances with air currents and become acid rain. Acid rain damages crops and forests, destroys aquatic life in lakes and rivers, and ruins buildings. The timber and fishing industries in Sweden have suffered badly because of acid rain originating in British factories and power stations. Trees have died, and lakes that were once full of plants and fish are now devoid of all

life. In sandstone or limestone regions, certain chemicals within the rock will reduce the acidity of the water. This is called natural buffering.

The ozone layer in the upper atmosphere protects us from solar radiation, but ozone at ground level is a major air pollutant. It causes chest disease, particularly asthma, and irritates the eyes and skin. Ozone at ground level comes from motor vehicles. Hydrocarbons and nitrogen oxides in vehicle exhausts combine with one another in sunlight to produce ozone. This photochemical smog is worst in 42 traffic-congested cities on hot, dry summer days, whereas sulphur-based smog occurs on cold, damp winter days. Photochemical smog is especially common when the vehicle engines are old and poorly maintained, as often occurs in developing countries. The toxic emissions from car exhausts can be reduced considerably by installing catalytic converters on the engines. These devices are now compulsory in new cars in many developed countries, but they are rarely found in developing countries.

Another toxic component of car exhaust fumes is lead. Until quite recently, all gasoline contained a lead-based compound which made the gasoline burn more smoothly. Lead is a very poisonous metal. Human beings cannot excrete lead, so it accumulates in the body. Even in tiny concentrations (25 milligrams per liter), it can cause headaches, abdominal pains, miscarriages and general tiredness. Lead is particularly toxic to growing brain cells. Lead pollution from car exhaust probably reduces the intelligence of children who live in crowded cities. Today, more and more cars are made to run on unleaded gasoline.

The air we breathe is no longer clean and pure. "Developments" that have made our lifestyle more comfortable (such as industrialization, urbanization and the use of private cars) all pollute the earth's atmosphere. Reducing air pollution should be a priority in all countries. Industries should invest in environmentally friendly production methods. We should all use our cars less and buy vehicles that have catalytic converters and run on unleaded gasoline. Governments should legislate to reduce the levels of toxic emissions from cars, power stations, factories and domestic chimneys. Air pollution today is often invisible, but we should not ignore the danger it is causing to our own health, the health of our children and the health of the planet.

Ex. 1. Summary writing. The following paragraph summarizes the causes of air pollution. Put one word only in each of the blank spaces to complete the paragraph.

The main causes of air pollution

A number of factors contribute to ... pollution. In particular the burning of brown ... gives off sulphur dioxide and soot ... in certain weather conditions can cause In addition, industrial waste released high the atmosphere can produce sulphuric and ...

acid, which are carried a long ... and cause acid rain. At ground ... there is also the problem of ... exhausts producing ozone and giving off

Ex. 2. Here are the answers to some questions on the text. What are the questions?

1. Smog occurs in unusual weather conditions when there is temperature inversion. (What conditions?)

2. The main sources of sulphur dioxide and soot are fossil fuels. (What?)

3. In 1956 the British government introduced legislation against air pollution. (When?)

4. According to the Clean Air Act industries must build tall chimneys to release their waste high into the atmosphere. (Why?)

5. Acid rain damages crops and forests, destroys aquatic life in lakes and rivers, and ruins buildings. (What?)

6. In sandstone or limestone regions, certain chemicals within the rocks reduce the acidity of the water, causing what is called natural buffering. (What process?)

7. The ozone layer in the upper atmosphere protects us from solar radiation. (Disjunctive)

8. Ozone at ground level comes from motor vehicles. (Where ... from?)

9. The toxic emissions from car exhausts can be reduced considerably by installing catalytic converters on the engines. (How?)

10. Another toxic component of car exhaust fumes is lead. (What?)

11. The air we breathe is no longer clean and pure. (Why?)

12. Air pollution today is often invisible. (General)

Ex. 3. Complete the sentences.

1. When the pollutants combine with fog, they

2. Sulphur dioxide is also emitted from

3. Sulphuric and nitric acids irritate

4. The Clean Air Act said

5. Acid rain damages

6. Trees have died and lakes are

7. Ozone at ground level is

8. Photochemical smog is worst in

9. The toxic emissions from car exhausts can be reduced by

10. The air we breathe is

Additional reading:

Carbon Dioxide

Read the text, translate it and get ready to discuss it.

Carbon dioxide (CO₂) is one of the gases that make up the air we breathe. It enters the atmosphere as part of the carbon cycle. The main sources are the decomposition of organic matter by microorganisms, gas exchange in the oceans, deforestation, respiration by animals and the burning of coal and oil.

Over the last 100 years or so the amount of CO₂ in the world's atmosphere has increased due to the burning of fossil fuels from about 265 parts per million by volume (ppmv) in the early 19th century to 340 ppmv today. As well as the burning of fossil fuels, the large-scale destruction of tropical rainforests in recent times is also putting more CO₂ into the atmosphere as the cut trees decompose –and stop converting CO₂.

The effects of this increased CO₂, and other gases such as methane and nitrous oxide which are also increasing in the atmosphere, has been called the 'Greenhouse Effect'. The consequence is an overall warming of the global climate.

Already the average world temperature has risen by 1/2 °C since 1900. If the estimates for future build-up of CO₂ and other gases are realised then global temperatures could rise by up to some 4 °C sometime in the next century.

We can only guess at the possible consequences, but it seems that sea levels would rise as polar ice caps melt and climatic belts across the world would shift. The grain belt of the United States, for example, could become a desert.

Carbon dioxide is not the only atmospheric gas that is important to the heat budget and thus the global temperature. In the last few years it has been realized that the contribution of other gases to the greenhouse effect and global warming is already as important as CO₂. These other gases include methane and chlorofluorocarbons.

Methane is produced by microbes in swamps and rice paddies, and in the intestines of sheep, cattle and termites. It is also released into the atmosphere when vegetation and fossil fuels are burned. In the last 20 years atmospheric concentrations of methane have been increasing.

The amount of CO₂ being put into the world's atmosphere, mostly from the burning of fossil fuels, has more than doubled in the last 30 years. Although the increase has slowed in the 1990s, it is expected to rise again in the next decades.

Unit V

The Importance of Water for Life

Read the text, translate it and get ready to tell about the importance of water using as many Modals Verbs as possible.

There is no life without water. Although it is possible to survive for more than a month without food, it is not possible to live more than a few days without water. Without water man soon perishes. But not all water helps him to survive: if it is contaminated, then also he may die before this time. "Man and his life has in fact been described as a question of water and little else". The air surrounding him contains enormous quantities of water in the form of vapour. The surface of the earth is 70 % water.

Water is far more important to the human body than carbohydrates, proteins, vitamins, minerals and fats all combined. It transports nutrients throughout the body, gets rid of wastes helps chemicals in the body to react with one another and provides part of the lubricating fluid round the joints of the body as well as the eyes. In addition and perhaps most important in many ways, water acts as an air-conditioner and a universal solvent as well as providing lubrication along the digestive tract⁵. About 65 % of our body weight consists of water. All body tissues are at least 70 % water while our blood comprises almost all water and almost 25 % of our bones take the form of water. Expressed in terms of actual quantities, the minute cells⁶ which help to form our bodies contain about 28 liters of fluid and are surrounded by a further 14 liters of fluid. In addition, we all have about 4.5 liters of blood in our body. Thus, approximately 45 liters of all our body fluid is in the form of water.

An average adult drinks up to three liters of water a day. Ironically, this intake is often in the form of tea, coffee and soft drinks, which actually act as diuretics, reducing the body's water content. Most of the things we eat, however, comprise at least 65 % water. A lettuce, for example, contains 94 % water, a potato 80 % water, rice 75 % and meat 70 %.

There is no risk of drinking too much water as the body can easily dispose of the water which it does not need. This is done through excretion, exhalation and perspiration. There is, however, a danger caused by drinking insufficient water, and, by far the most common problem in hot weather is dehydration. Moreover, people who go on diets can also suffer from dehydration. Severe dieting reduces the amount of water the body needs in order to function efficiently.

The body then tries to regain the amount of water which it has missed. Hence the person who is dieting puts back the weight he or she has lost. If, on the other hand, someone drinks more water and eats less food, their stomach will still feel full and they will thus consume less food, resulting in a loss of weight.

Although some people have claimed that drinking water can slow down the aging process of the skin, there is no evidence of this. Certainly, drinking insufficient water will result in water being taken from the skin tissue to supply to blood circulation and other vital functions of the body. This process itself will cause the skin to wrinkle. So far, we have been concerned chiefly with the amount of water we use for drinking purposes. Each person uses about 150 liters of water a day for domestic above purposes. In addition, everyone is indirectly dependent on water in many ways – without even realizing it. For example, we use water whenever we switch on the television! Water is even used to produce electricity and drive all kinds of machinery in addition to its more obvious uses in agriculture, drainage, firefighting, etc.

perish – погибать, умирать

a question of water and little else – вопрос о воде и еще кое о чем

get rid of wastes – избавляться от отходов

lubricating fluid – смазывающая жидкость

digestive tract – желудочно-кишечный тракт

the minute cells – мелкие клетки

Ex. 1. Read the international words correctly mind the stress.

Carbohydrate, protein, vitamin, chemical, produce, dehydration, diet, function, efficiently, machinery, result, process, circulation, electricity, agriculture

Ex. 2. Complete the following pairs of derivatives.

N→Adj

importance –

– chemical

– universal

insufficiency –

– efficient

evidence –

V→N

survive –

– contamination

– provision
 – addition
 solve –
 circulate –
 produce –

Ex. 3. Match English and Russian equivalents.

1. to perish	a. потребление
2. to survive	b. избавляться
3. to contaminate	с. обезвоживание
4. to transport	d. функционировать эффективно
5. to get rid of wastes	e. выжить
6. digestive tract	f. содержать
7. to comprise	g. мелкие клетки
8. minute cells	h. погибать
9. intake	i. переносить, перемещать
10. lubricating fluid	j. приводить к
11. to reduce	k. домашний
12. the body's water content	l. сокращать
13. to dispose of	m. процесс старения кожи
14. insufficient water	n. избавляться от отходов
15. dehydration	o. смазывающая жидкость
16. to function efficiently	p. кожная ткань
17. to regain	q. желудочно-кишечный тракт
18. to result in	г. загрязнять
19. to consume	s. содержание воды в теле
20. the aging process of the skin	t. недостаточное количество воды
21. the skin tissue	u. вновь приобретать, получить обратно
22. domestic	v. потреблять

Ex. 4. Translate into Russian the following words, word combinations and sentences.

Contaminate – contaminated, contamination, the contamination of water supply

Consume – consumer, to consume less food

Comprise – our blood comprises almost all water. This dictionary comprises about 60000 words.

Content – the body’s water content, the contents of a book, form and contents.
 Digestive – digest, this food digest well, to digest the events, digester, digestibility, digestible, digestive tract. Have you digested everything that is important in the book?
 Dispose – disposal, disposable, disposition. The body can easily dispose of the water which is doesn’t need. My report is at your disposal.
 Drainage – drainage-basing, drain. The water will soon drain away (*off*). Land must be well drained for some crops.
 Nutrients-nutrimment, nutrition, nutritious, nutritive. Water transports nutrients through the body.
 Reduce – reduced, reduction, reduce the body’s water content, reduce weight, reduce prices, reduce temperature, great reductions in prices.
 Solve – solvent, the solvent action of water, a universal solvent.
 Tissue – all body tissues are at least 70 % water.
 Waste — get rid of wastes, waste land.

Ex. 5. Add nouns to the following adjectives to form noun phrases.

Adjectives: 1. vital, 2. common, 3. severe, 4. average, 5. universal, 6. digestive, 7. minute, 8. enormous, 9. human, 10. obvious.

Nouns: a. adult, b. cells, c. uses, d. functions, e. dieting, f. solvent, g. quantities, h. problem, i. body, j. tract.

Ex. 6. Pair the verbs in column A with a suitable phrase in column B.

A	B
1. to contain	a. the weight
2. to transport	b. an air-conditioner
3. to get rid of	c. less food
4. to provide	d. almost all water
5. to go on	e. enormous quantities of water
6. to reduce	f. lubrications along the digestive tract
7. to put back	g. wastes
8. to supply to	h. diets
9. to consume	i. nutrients throughout the body
10. to act as	j. blood circulation
11. to survive	k. without food
12. to comprise	l. the body’s water content

Ex. 7. Match the verbs with their appropriate explanations.

1. to reduce	a. to carry from one place to another
2. to contaminate	b. to change food in the stomach
3. to consume	c. to get back to
4. to solve	d. to make smaller in size, make less
5. to survive	e. to eat or drink
6. to waste	f. to give or provide
7. to transport	g. to have or hold
8. to regain	h. to continue to live or exist
9. to contain	i. to make dirty
10. to supply	j. to find the answer to
11. to digest	k. to get rid of
12. to dispose	l. to use without a good purpose

Ex. 8. Complete the following sentences by writing a preposition.

1. Without water, there is little chance ... of ... anyone surviving for more than a few days.
2. About 65 % of our body consists ... water.
3. Expressed in terms of quantities, our body comprises ... over 45 % water.
4. Drinking water is almost always beneficial ... one's health.
5. It also helps chemicals in our body to react ... one another.
6. Water is much better ... you than any other drink.
7. In fact, it is rarely dangerous ... anyone to drink too much water.
8. Insufficient water will result ... dehydration of the body.
9. People who suffer ... dehydration lack energy and eventually die.
10. It is therefore very important to be aware of this when you go ... a diet.

Ex. 9. Choose the correct answer for the following sentences about the text.

1. It is not possible to live more than a few days without
 - a) clothes
 - b) food
 - 62 c) water
 - d) books
2. Water helps to
 - a) send chemicals to the eyes

- b) lubricate the eyes
 - c) transport nutrients to the eyes
 - d) dispose of waste fluid in the eyes
3. Water acts as an air conditioner for our body because it
- a) keeps the body cool
 - b) cleans the body's tissues
 - c) dissolves waste, etc., in the body
 - d) provides lubrication to help us digest food
4. Water forms
- a) one half of our bodies
 - b) two-thirds of our bodies
 - c) three-quarters of our bodies
 - d) four-fifths of our bodies
5. The amount of blood contained in our bodies is
- a) 4.5 liters
 - b) 14 liters
 - c) 28 liters
 - d) 45 liters
6. Potatoes contain less water than
- a) lettuces
 - b) people
 - c) animals
 - d) rice
7. Too strict a diet can lead to
- a) perspiration
 - b) loss of weight
 - c) dehydration
 - d) improved health
8. Drinking too little water
- a) will help you to look younger
 - b) can cause your skin to age
 - c) will not alter the appearance of your skin
 - d) may increase your blood circulation
9. The smallest amount of water in the home is used for
- a) cooking and washing up
 - b) flushing toilets
 - c) drinking
 - d) washing clothes
10. About four times more water is used for baths and showers than for

- a) drinking
- b) cooking and washing up
- c) washing clothes
- d) flushing toilets

FINAL TASK: Complete the chart below.

The main sources of water pollution	The main sources of air pollution

Unit VI

Soil

Now read the text and get ready to do the exercises after it.

Soil forms over thousands of years from the weathering of rock. There are three types of weathering: physical weathering (where temperature changes cause the rock to expand and contract until it shatters into pieces), chemical weathering (where carbon dioxide and water form a weak acid that dissolves rocks such as limestone) and biological weathering (where the rock is broken down by the action of living things such as plant roots and bacteria). The top layer of the soil (topsoil) is rich in humus – a dark, fibrous material formed from decaying organic matter.

Humus contains micronutrients such as nitrogen, minerals such as iron, and microorganisms that break down the organic matter. Humus absorbs moisture and binds the inorganic particles together. The quality (or fertility) of soil depends on the amount of humus in it – the organic content.

Good quality topsoil is dark, moist and crumbly. The middle layer of the soil contains less organic material, but it is rich in minerals because these get washed down with the rain. The lower layer (subsoil) is made of inorganic material, similar to the parent rock which originally formed the soil. All living things are made of protein, which contains nitrogen. Without nitrogen, plants and animals cannot grow, because they cannot build new tissue. Traditional farming methods rotate cereal crops (which remove nitrogen from the soil) with leguminous plants (which replace the nitrogen). Intensive farming methods, where cereals are grown every year, tend to deplete the soil of nitrogen. Repeated cropping and overgrazing (that is putting too many cattle on a small area of grassland) cause erosion of the top layers of the soil. The essential nitrates are removed with the topsoil so the nitrogen cycle, which is crucial to the balance of nature, is broken.

The earth is losing 24 billion metric tons of topsoil every year through intensive farming methods and deforestation⁵. The end stage of this loss of topsoil is desertification⁶, where all the organic and mineral content of the soil has disappeared, leaving only poor quality subsoil, which cannot support plant growth. About 20 million hectares of productive land become barren every year because of soil erosion. Thirty percent of the world's land surface is threatened with desertification.

Another hazard of intensive farming is salinization, which is caused by perennial irrigation (that is, irrigation year after year without a break) in arid climates. All soil

contains some salt, which is washed away when it rains. Where rainfall is minimal, the salt content of the soil is very high.

Evaporation from reservoirs and irrigation channels increases the salinity of the water. When a new irrigation scheme raises the water table, salt from the soil dissolves in the water and rises to the surface. Unless the area is left fallow and unirrigated for a season so that the salty water can drain away, the land will become permanently salinized and unable to support plant life.

The quality of soil can be improved by adding fertilizers. Organic fertilizers are made from animal and plant material such as compost (rotting plant matter) or manure (animal excreta) which return essential micronutrients such as nitrates, phosphates and potash to the soil. Artificial (inorganic) fertilizers are manufactured compounds that contain high concentrations of these micronutrients; they are much more powerful than natural organic fertilizers.

But they cause environmental damage by a process called eutrophication. Excess nitrogen is washed out of the soil with the run-off after it rains. It passes into rivers and lakes, and encourages the growth of algae (seaweed) in the water and of wild plants on nearby land. Overgrowth of algae upsets the balance of nature in lakes and seas. Overcrowding on the banks causes the plants to rot and die. The air becomes contaminated with nitrous oxide which contributes to the greenhouse effect. Like nitrates, phosphates and potash are taken up by growing plants and returned to the soil in animal excreta. The phosphates and potash in artificial fertilizers must be extracted from rocks by mining, but these mineral resources will not last forever. If we continue to dump animal and human waste into the sea instead of using it to fertilize the soil, our entire reserves of these precious minerals will be lost at the bottom of the oceans. Artificial fertilizers add a few selected micronutrients, but because they cause rapid plant growth they deplete the soil of other nutrients. Plants grown in artificial fertilizers are often tasteless and have a low nutritional value. They may be contaminated with chemical residues from the fertilizer manufacturing process. For both environmental and health reasons, many consumers today prefer to buy organic vegetables – that is, vegetables grown without any artificial fertilizers.

weathering – выветривание, эрозия

nitrogen – азот

leguminous plant – растение из семейства бобовых

overgrazing – выбивание пастбища (скотом), чрезмерное стравливание пастбища

deforestation – обезлесение, вырубка леса

desertification – опустынивание

to become barren – стать неплодородной (о земле)

salinization – засоление (почв)

manure – навоз, удобрение

eutrophication – эвтрофикация (обогащение естественных водоемов неорганическими веществами, способствующими росту растений и водорослей)

alga (pl. algae) – водоросль

Ex. 1. Read the international words correctly. Mind the stress.

Type, physical, temperature, chemical, fibrous, humus, mineral, protein, method, cycle, balance, ton, scheme, reservoir, phosphate, biological, bacteria, organic, microorganism, originally, intensive, erosion, productive, irrigation, reserve

Ex. 2. Complete the following pairs of derivatives.

N → Adj	V → N
– saline	– irrigation
minimum –	– evaporation
salt –	– fertilizer
environment –	grow –
product –	deplete –
– biological	
– original	
– fibrous	

Ex. 3. Match English phrases and their Russian equivalents.

1. weathering of rock	a. чередовать культуры
2. to shatters into pieces	b. истощать почву
3. to dissolve rocks	c. нарушать цикл
4. plant roots	d. интенсивное земледелие
5. to absorb moisture	e. наносить ущерб окружающей среде
6. fertility of soil	f. выветривание породы
7. to get washed down with the rain	g. корни растений
8. to rotate crops	h. вымываться дождем
9. to deplete the soil	i. разрушать породы
10. to break the cycle	j. впитывать влагу
11. intensive farming	k. плодородие почвы
12. to cause environmental damage	l. расколоться на кусочки

Ex. 4. Translate into Russian the following words, word combinations and sentences.

Form – The rain formed large pools on the lawn. The clouds formed a veil over the mountain-top. Clouds are forming on the hills.

Rock– Rock decay, rock excavation, rock exposure.

Dissolve– Dissolve in water. Snow dissolves in the sun.

Soil– Poor soil, rich soil, unbroken (virgin) soil, Sandy (clayey, alluvial) soil, alkali soils, permanently frozen soil, poorquality subsoil.

Moisture– Moisture of plants, moisture equivalent, moisture recorder.

Land– Rich land, good land, fat land, boggy land, clayey land, cultivated land, stony land, good wheat land.

Arid– Arid zone, arid climate, arid desert.

Irrigation– Irrigation engineering, irrigation canal, irrigation farming, irrigation plant, irrigation station, irrigation water.

Fallow– To lie fallow, to lay land fallow, virgin and fallow lands.

Waste– Waste disposal, waste utilization.

Reason– The reason of eclipses. What is the reason of the tides? What is the reason of the dew?

Eutrophication – anthropogenous eutrophication, cultural eutrophication, managed eutrophication, eutrophication of waters.

Ex. 5. Pair the verbs in column A with a suitable phrase in column B.

A	B
to encourage	the organic matter
to contribute	the inorganic particles together
to break down	the rock to expand and contract rocks
to buy	new tissue
to deplete	nitrogen from soil
to bind	plant growth
to cause	to the greenhouse effect
to dump	animal and human waste into the sea
to dissolve	the soil of other nutrients
to support	organic vegetables
to build	the growth of algal
to remove	

Ex. 6. Match the words with their appropriate explanations.

1. rock	a. not able to produce crops
2. expand	b. varying the crops grown each year on the same
3. contract	land to avoid exhausting the soil
4. decay	c. having not enough rainfall to support plants
5. bind	d. continuing throughout the whole year
6. fertile	e. solid stony part of the earth's crust
7. similar	f. make or become larger
8. remove	g. lose power; go bad
9. rotation (of crops)	h. tie or fasten
10. barren	i. producing much
11. perennial	j. like; of the same sort
12. arid (of climate)	k. make or become smaller or shorter
	l. take off or away (from the place occupied)

Ex. 7. Fill in the missing words in the sentences below. Choose from the following putting the verbs in the right tense and voice.

Try, introduce, increase (3), secrete, unit, fall, accelerate, deplete, accumulate, cost, grow, absorb (2), use, wash, cause, associate, fail, kill, have, reduce, make

1. Organic vegetables ... also ... without pesticides.
2. Pesticides ... by the crops and ... into the rivers and the sea.
3. Some pesticides ... in the human body and ... in breast milk.
4. Some pesticides may ... cancer, miscarriage or even birth defects.
5. Intensive farming of high-yield strains ... usually ... with heavy use of both fertilizers and pesticides.
6. Organic farming methods ... usually ... these high-yield strains.
7. Intensive farming methods which successfully ... crop yields in temperate zones often ... in tropical climates.
8. Tropical heat ... microorganisms, so tropical soil ... a lower organic content.
9. This ... its capacity to ... water and ... it particularly vulnerable to erosion.
10. In general, tropical regions ... more ... to subsistence farming than to the large-scale, intensive production of cash crops.

11. If the people ... to introduce intensive farming methods, yield may ... temporarily, but they eventually ... still further and soil erosion

12. Intensive farming techniques ... crop yield in the short term but ... the quality of the soil in the long term, particularly in tropical regions.

13. Intensive farming is yet another example of the “live now, pay later” philosophy that may ultimately ... us the earth.

Ex. 8. Which preposition has been blacked out in the following article?

Protection of the Soil against Erosion

<p>Soil erosion is the destruction and wearing ... the soil ... water or wind. A layer ... soil formed ... the course ... 100 or 200 years may be destroyed ... a few days ... heavy rain or dust storms. The soil is rapidly destroyed but forms only ... a very lengthy period. That is why it is so vitally important to protect the soil.</p>	<p>of (2), in (2), by (2), over, away of</p>
<p>Soil erosion ... water is widespread and most destructive. It occurs ... slopes and is due ... improper working ... the land. Soil erosion ... water is bad ... agriculture ... all respects. Grain harvests ... strongly eroded soils are half those ... uneroded soils.</p>	<p>for, in, by (2), on (3), to, of</p>
<p>Fighting any kind ... soil erosion always requires a set ... anti-erosion measures. No one measure alone is effective. Soil erosion ... wind is characteristic mostly ... open, dry, diffused soils. It may arise ... any field ... sparse vegetation.</p>	<p>of (3), by, on, with</p>
<p>... wind erosion, the wind usually blows small bits ... soil ... the surface. When the wind grows stronger, these bits not only roll ... the surface ... the field but are even thrown ... the air ... distances ... 3 to 4 metres.</p>	<p>for, into, in, of (3), over (2)</p>
<p>A cloud ... dust raised and driven ... a field where the soil is destroyed ... the wind is called a dust storm. Sometimes, the wind may erode 1 to 5 cm ... soil ... a field. ... natural conditions, it takes 250 ... 300 years to restore one cm ... soil. Soil loss is thus irretrievable.</p>	<p>from, to, of (3), over, by, in</p>
<p>Measures ... wind erosion include: firstly, protection ... fields ... the wind; and secondly, retention ... moisture ... soil, because moist soil is firmer, plants grow quicker and more thickly</p>	

<p>... it, preventing the wind ... destroying the soil. Mud and stone streams (avalanches) ... the mountains are a form ... soil erosion which occurs ... great speed due ... to steep slopes and narrow gorges.</p>	<p>on, against (2), of (3), in (2), from, at, to</p>
<p>Beginning unexpectedly ... small mountain streams, the streams ... foaming water, mud and stones move down ... the speed ... a train bringing death and destruction. They bury sections ... railways and motor roads, houses, entire towns, and fertile lands, turning the latter ... heaps ... dried mud.</p>	<p>In, of (4), with, into</p>

Continue: **Protection of the Soil against Erosion**

Mud and stone streams caused by human activities occur when the latter are incorrectly conducted in the mountains, such as mining enterprises dumping waste on steep slopes. Strong rain erodes these waste piles and disrupts the unstable balance of the loose waste masses. Dozens or even hundreds of thousands of cubic metres of soil and stones are driven by the water down mountain rivers. It is not surprising that avalanches due to human activities occur much more often than natural ones.

The second cause of mud and stone streams of human origin is incorrect exploitation of plant resources and excessive cattle, grazing in the mountains. If forests are cut down in the mountains or cattle graze for too long on denuded slopes, the soil becomes unstable.

The best way of fighting mud and stone streams is to plant forests in river valleys where they occur, prohibit the random felling of trees on mountain slopes, the disorderly dumping of refuse ore by mining enterprises, and the destruction of rock by explosions. Cattle grazing should be strictly regulated in the mountains, and banned completely in places where the danger of mud and stone streams is particularly great. At the same time, permanent hydraulic works – drainage canals, check dams and so on should be set up in river valleys.

The process of bank erosion is of particular interest in terms of soil conservation as is the washing away of soil during floods in the flood land and depositing of sand and silt in the flood land and river bed.

It is most important to preserve the rich floodland soils. Floodland meadows are the most fertile soil.

Protective forestation. There are two main types of protective forest belts: water regulating and wind breaking. The first type is intended to protect the soil from water erosion. These belts are planted across slopes.

Wind breaking forest belts are quite different. Their purpose is to reduce wind speed on the fields between the belts.

None of the anti-erosion measures and hydraulic works can be effective without protective forest belts. In the places where the forest belt system has been created with due account for the direction of the most harmful winds, crops and soil are not harmed by the wind and harvests are higher as a rule.

These belts should also be considered as the habitat of wild animals, recreation sites and in terms of their aesthetic value.

Ex. 9. Which phrase on the right completes each sentence beginning on the left? Do you strongly agree or disagree with any of the statement?

1. There are three types of weathering: ...	a) ... support plant growth
2. The quality of soil depends ...	b) ... perennial irrigation
3. All living things are made ...	c) ... adding fertilizers
4. Plants and animals cannot grow without...	d) ... erosion of the top layers of the soil
5. Traditional farming methods rotate ...	e) ... deplete the soil of nitrogen
6. Intensive farming methods tend to ...	f) ... cereal crops with leguminous plants
7. Repeated cropping and overgrazing cause ...	g) ... nitrogen
8. Poor quality subsoil cannot ...	h) ... of protein
9. Salinization is caused by ...	i) ... on the amount of humus unit
10. The quality of soil can be improved by ...	j) ... physical, chemical, biological weathering

Ex. 10. Here are the answers. What are the questions?

1. The soil forms only over a lengthy period. (How long?)
2. Soil erosion occurs on slopes and is due to improper working of the land. (Due to what?)
3. Soil erosion by wind may arise on any field with sparse vegetation. (Where?)
4. Because moist soil is firmer, plants grow quicker and more thickly on it, preventing the wind from destroying the soil. (Why?)
5. The soil becomes unstable, if forests are cut down in the mountains or cattle graze for too long on denuded slopes. (Under what conditions?)
6. The best way of fighting mud and stone streams is to plant forests in river valleys, prohibit the random felling of trees on mountain slopes, the destruction of rock by explosions. (What?)

7. Floodland meadows are the most fertile soil? (What?)
8. There are two main types of protective forest belts: water regulating and wind breaking. (What?)
9. The purpose of wind breaking forest belts is to reduce wind speed on the fields between the belts. (What?)
10. In the places where the forest belt system has been created with due account for the direction of the most harmful winds, crops and soil are not harmed by the wind. (Where?)

Ex. 11. Expand on the following in your presentation:

1. Soil erosion is the destruction and wearing away of the soil by water or wind.
2. Soil erosion by water is bad for agriculture.
3. Soil erosion by wind is characteristic mostly of open, dry, diffused soils.
4. Mud and stone streams are often caused by human activities.

Additional reading:

Protection of the Soil against Pollution

Read the text and say by what the soil may be polluted. Explain according to what soils are classified.

The most widespread substances polluting the soil from the atmosphere are nitric and sulfur oxides. They enter the soil together with precipitation, raise soil acidity and significantly lower fertility.

Higher concentrations of heavy metals in the soil around industrial enterprises deplete the local flora, with the more sensitive species disappearing. It is a difficult problem to restore the fertility of soil polluted by heavy metals.

The main measure, and a cardinal solution to the problem is to improve technology so that waste is not released into the environment. Sometimes various chemical substances are introduced into the soil to neutralize the effect of soil pollutants, and so on.

The soil may be polluted when fertilizer and pesticides are incorrectly used, and also by the waste of livestock breeding complexes. Until recent times, animal wastes were utilized as a valuable economic source of nutrients for crop production. Since World War II, commercial fertilizers have become the preferred source for supplementing nutrients in the soil because of their relatively low cost, ease of handling, ease of storing and ready availability.

It is imperative that ways are found to utilize agricultural wastes to improve soils and provide added / fertility for plant growth. Soils vary greatly in their physical and chemical properties and are classified according to these properties.

An understanding of these properties provides information needed to determine the suitability of soils for land disposal of wastes. The engineer 'may find the advice of a soil scientist valuable when attempting to locate soils for waste disposal.

The chemical conditions existing in soils determine the reaction of soil, which may be acid, neutral or alkaline. This reaction in turn determines the availability or solubility of certain elements as well as the response of microorganisms and higher plants.

There is a natural tendency for soils to become acid in humid climates where sufficient rainfall occurs to leach bases from the surface layers. Hydrogen and aluminium become dominant in the exchange complex and the soil is acid in reaction. When soil colloids are dominated by calcium and magnesium on their adsorptive

surfaces, the soil is neutral or alkaline in reaction. This condition occurs in limed soils or low rainfall areas.

The soil chemical properties determine the capacity of the soil to break down the complex waste materials added in varying amounts. These properties are also influenced by the application of wastes.

In the past several years, interest in land disposal of domestic wastewaters has increased. This increase arises from a widespread desire to conserve water by recycling. Also, it is thought that land disposal of wastewater would minimize water pollution problems attributed to the presence of large amounts of chemical constituents that can cause significant water quality deterioration in water-based disposal systems. Additional interest in land disposal has been created by the possibility that nutrients present in domestic wastewaters, such as nitrogen and phosphorus, can be recycled to the land where they could then serve as fertilizer for terrestrial plants. Land application of domestic wastewaters is potentially an ecologically sound practice; however, a number of potential problems associated with such a practice could result in environmental degradation.

Ex. 1. What problems can be discussed with the help of the following groups of words?

1. widespread substances, to raise soil acidity, to lower fertility, to deplete the local flora, to release waste into the environment, to neutralize the effect of soil pollutants;

2. properties of soils, to determine the suitability of soils for land disposal of wastes, to locate soils for wastes, to locate soils for waste disposal;

3. to become acid, to occur, to become dominant, limed soils, low rainfall areas;

4. to conserve water, land disposal, to minimize water pollution problems, to cause water quality deterioration, to recycle, to serve as fertilizer, to result in environmental degradation

FINAL TASK: Complete the chart below.

The ways of polluting the soil	Classification of soils	Conservation of soil

Unit VII

Recycling

Ex. 1. Read, translate and discuss the main problem raised in this article practicing If-sentences:

We are running out of space in which to discard our garbage, and our current methods of disposing of it are endangering the environment. One solution to this problem is recycling.

Recycling is the process of collecting used materials and remanufacturing them into new products instead of throwing them away. This process is important because it reduces the trash in overcrowded landfills, salvages materials that we can use to make new products, and saves our natural resources.

Used products may be converted or reutilized in a number of ways. Paper is reprocessed into new sheets, glass is cleaned and remolded, and plastic is melted and formed into new products such as carpet backing, fence posts, and drainage pipes.

Recycling is being done worldwide. Japan recycles 95 % of its bottles and 50 % of its aluminum; the United States recycles only 20 % of its bottles and 38 % of its aluminum. In Germany a new law requires product manufacturers to create ways of reusing their packaging material.

Helping to solve the garbage crisis is something everyone can do if they just remember the three Rs: “*reduce, reuse, and recycle.*”

Ex. 2. Read the text and say which passage A, B, C, D or E describes:

1. safe dumping of waste
2. unsafe dumping of waste
3. burning waste
4. recycling waste
5. the amount of toxic waste produced in a country every year

A. Some waste is not dangerous. Often somebody will recycle it and do something useful with it. You can break up old cars to get the metal, or make new glass from old bottles. But some waste is toxic – it is very poisonous. In the USA, for example, factories dump – throw away – 265 million tons of toxic waste every year.

B. How do you dump toxic waste safely? Well, you can put it in metal containers and leave it somewhere safe. But this can be a very bad idea. You can bury toxic waste. You put it in a deep hole and cover it with soil. That is what happened at Love Canal

in the USA. In the 1930s a chemical producer buried many tones of toxic waste in metal containers. In the 1950s, a builder bought the land and built a little town there. Nobody remembered the containers of toxic waste under the ground. Then, in the 1970s, the waste started to come through the metal of the containers and pollute the ground. Trees and grass blackened and died. There was a

bad smell everywhere. People had to leave their homes. The people who cleaned up Love Canal found eighty-two different toxic chemicals in the soil.

C. You can burn toxic waste, but it is more expensive than burying it, and the burning can produce dangerous gases. So some countries burn their toxic waste at sea in special ships. The chemicals get into the air and the wind carries them a long way.

D. You can send your toxic waste to a poorer country and pay somebody to burn or bury it there. The USA sends toxic waste to Panama. Germany and Holland send toxic waste to the Czech Republic. Is this a good idea?

E. Toxic waste can be useful if you know how to recycle it. Some petrol producers bury their toxic waste in the soil. There, special bacteria in the soil eat the waste and change it into clean, safe carbon dioxide and water. In Britain, some companies are growing special waste-eating bacteria. These bacteria eat toxic waste in the world: are these bacteria hungry enough?

Ex. 3. Choose the most appropriate word in the following sentences:

1. In the USA factories *burn/ bury/ dump* 265 million tones of toxic waste every year.
2. Burning waste can produce dangerous *gases/ bacteria/ smog*.
3. The USA sends toxic waste to *Czech Republic/ Panama/ Holland*.
4. Special bacteria eat the waste and change it into *oxygen/ carbon dioxide/ cellulose* and water.
5. To dump toxic waste safely, you can put it into *plastic / glass / metal* containers.

Ex. 4. Put these sentences into the right order.

1. People had to leave their homes.
2. Nobody remembered the containers of toxic waste under the ground.
3. In the 1950s a builder bought the land and built a little town there.
4. In the 1930s a chemical producer buried many tones of toxic waste in metal containers.
5. There was a bad smell everywhere.
6. Then, in the 1970s, the waste started to come through the metal of the containers and pollute the ground.

7. The people who cleaned up the town found eighty-two different toxic chemicals in the ground.

Ex. 5. Can you think of three examples of pollution near your home? Write a blog about them.

Ex. 6. Read what people say about waste disposal in their countries.

A. Cincia Cellone, Italy: ‘In each town we have different days for disposal of different types of wastes. For example, in Rimini we can throw away paper on Mondays, glass – on Tuesdays, plastic – on Wednesdays, metal – on Thursdays and so on. So each family has to put different types of wastes in different bags.’

B. Kurosava Siomoto, Japan: ‘The Japanese usually don’t buy much furniture. We value open space. It’s very expensive to get rid of old things. For example, if you want to throw away an old sofa, you must pay a tax (about 1800 yens). That is why we prefer to swap old things with people who need them or repair and reuse them.’

C. Pierre Leroy, France: ‘In my country eco-tourism is becoming more and more popular. Many people work as volunteers during their holidays. They clean beaches and do a lot of other jobs to help the environment. Last summer I worked at a national park. We removed litter and did conservation work.’

D. Helen Ivanova, Russia: ‘In 2018 Russia hosted a World Football Cup. Thousands of football fans came to our country. I worked as a volunteer in S.Petersburg. We were deeply impressed by tourists from Japan who cleaned their zone at the stadium after all the matches. They had special bags to put litter in. They told us it was normal and there was nothing unusual in their behavior.’

E. Bert Vahnulle, Holland: ‘In my country we classify our household garbage into different categories and put wastes made of different materials in different garbage bins. Before throwing away a plastic bottle we usually remove its label and top.’

FINAL TASK: Surf the Internet and find more information on methods of waste disposal in different countries of the world. Make a presentation and share your data with your group mates.

Unit VIII

PRACTICE YOUR “ECOLOGICAL VOCABULARY”

Ex. 1. Ask each other for an explanation of the following terms.

- a) biosphere
- b) biotic
- c) ecology
- d) environment
- e) pollution

Ex. 2. Match the verbs with their appropriate explanations.

1. to emit	a. to separate into parts, decay
2. to absorb	b. to cover with a great quantity of water in a place that is usually dry
3. to release	c. to give off a gas
4. to occur	d. throw back light, f. e. that of the sun
5. to reflect	e. to take smth. in, f. e. heat, light
6. to flood	f. to exist, be found
7. to reduce	g. to make less, make smaller in size, number, degree, etc.
8. to decompose	h. to allow to go, set free, unfasten
9. to respire	i. to come to pieces, disintegrate
10. to break up	j. to keep safe from danger, guard
11. to protect	k. to breathe in and out
12. to accelerate	l. to increase the speed of

Ex. 3. Complete the collocates below by adding an appropriate noun. Some can combine with more than one noun.

Example: environmental effect (changes, disaster, pollution, resources).

warming, changes, rays, effect, disaster, consequences, energy, pollution, famine, fumes, fuels, layer, gases

1. global ...
2. ozone ...
3. nuclear ...
4. natural ...
5. air ...
6. exhaust ...
7. solar ...
8. greenhouse ...
9. fossil ...
10. recycled ...
11. harmful ...
12. damaging ...
13. disastrous ...
14. dramatic ...
15. severe ...

Ex. 4. Pair the verbs in column A with a suitable phrase in column B. You must find a match for every word but there is not necessarily only one correct solution!

A	B
absorb	global warming
accelerate	in the absence of oxygen
break up	shortwave ultraviolet radiation
cause	waves
compromise	an irreversible environmental crisis
contain	disastrous consequences
contribute	burns, skin cancer
decompose	us from damaging effects

prevent	ozone molecules
protect	the greenhouse effect
reduce	the earth
reflect	severe drought and famine
risk	emissions of greenhouse gases
lead to	our life
surround	electrically charged particles

Ex. 5. Study the table below and write the plural of the following nouns.

crisis – crises

phenomenon – phenomena

bacterium – bacteria

formula – formulae

nucleus – nuclei

datum, antenna, analysis, medium, genius, basis, millennium, hypothesis, alga, criterion

Ex. 6. Write out the equivalents in pairs.

prevent	catastrophe
toxic	damaging
harmful	give off
artificial	stop
vehicle	means of transport
absorb	cut
emit	man-made
decompose	take in
reduce	bring about
cause	poisonous
crisis	break down

Ex. 7. Choose the best alternative to complete the following sentences.

1. Man-made contributions to the greenhouse effect can (rise / raise) average temperatures between 2 ° F and 8 ° F by the year 2050.

2. A direct release air pollutant is one that is emitted directly from a given source, such as the carbon monoxide or sulphur dioxide, all of which are (byproducts / emissions) of combustion.

3. Experience shows that environmental pollution also (leads / contributes) to immense economic losses.

4. The most promising way to solve the problem of clean air is to improve technology: (release / reduce) emissions into the atmosphere and make maximum use of waste.

5. The problem of radioactive pollution of the atmosphere (raised / arose) in 1945 after the atomic bombs were dropped on Hiroshima and Nagasaki.

6. There are more than 300 million motor (means / vehicles) in the world today. The automobile is a convenient (means / vehicle) of transport, but it has a negative (influence / affect) on the environment.

7. Temperature records show that, over the past 100 years, global mean temperature (has raised / risen) by 0.3–0.6 ° C.

8. The main sources of these pollutants include (artificial / natural) air pollution from forest and grassland fires as well as (man-made / natural) emission from fossil-fuel burning.

9. Greenhouse gases in the atmosphere (trap / release) some of the solar radiation, maintaining the planet at temperatures that allow life to flourish.

Ex. 8. Fill in the gaps with any appropriate preposition.

1. Natural sources contribute ... the depletion of the ozone layer, but not as much as human activity. Natural sources account ... approximately 15–20 % of ozone damage.

2. The most important gas which leads ... acidification is sulphur dioxide.

3. There is no direct observational evidence linking ozone depletion ... higher incidence of skin cancer ... human beings.

4. Ozone concentrations ... the lower stratosphere over Antarctica will increase ... 5–10 % by 2020.

5. Air pollution is a major environmental health problem affecting ... the developing and the developed countries alike.

6. The ionosphere protects the biosphere ... the harmful effect of cosmic radiation and influences ... the reflection and absorption of radio waves.

7. Twelve European countries have agreed to reduce nitrogen oxide emissions ... 30 % ... 2010.

Ex. 9. Give the meaning of the word in bold in each of the following sentences.

1. Something is wrong with your **circulation** if your feet feel cold.
2. Fortunately, the huge field had several **drainage** channels which prevented it from flooding.
3. Put a little oil or other **lubrication** here in the engine to prevent it squeaking.
4. There are a lot of valuable **nutrients** in the soil and so it is possible to grow many different kinds of plants.
5. Oil is our most important **resource** as the country has no mineral deposits at all.
6. Water won't get rid of the grease mark. Use petrol or a similar solvent to dissolve it.
7. An effective strategy for distributing and using water is now vital for the world.
8. His digestive **tract** seems to be blocked, and his body is not taking in food properly.

Now match the meanings of the eight words to the following definitions.

- a. a substance or fluid which helps something to work smoothly without rubbing, etc.
- b. a liquid which can turn a solid substance into another liquid (i.e., by dissolving it).
- c. a tube, etc., along which something passes from one part of the body to another
- d. a useful supply of something, possession(s) (especially of a country).
- e. a substance or food, etc., which provides what is needed for life and growth
- f. the movement of something from one place to another, the flow of blood round the body
- g. pipe, ditches, etc., for allowing water to flow away
- h. a plan for dealing with something successfully

Additional reading:

The Greenhouse Effect

The following paragraph describes the greenhouse effect but the verbs have been omitted. You may have to use a verb more than once. The verbs you can use are:

to know, to reflect, to absorb, to arrive, to conserve, to occur, to be, to freeze, to transmit.

Another environmental problem is the greenhouse effect. Some gases ... shortwave radiation but not longwave radiation. The sun's energy ... as shortwave radiation; some of this ... away in the clouds and upper atmosphere and some ... into the ground. About 5 percent of the energy ... off the earth's surface as longwave radiation. Certain gases in the upper troposphere—especially carbon dioxide, methane and CFCs – ... this longwave radiation back to the earth. The glass in a greenhouse ... heat by the same principle, so these gases ... as “greenhouse gases”. The greenhouse effect ... very important; if it did not ... at all, the temperature of the planet ... 40 degrees lower and the oceans

Dialogue

Read the dialogue and say who the people talking might be to each other.

1 – Why don't you begin by telling me something about yourself?

2 – What do you want to know?

1 – The usual – you know – something about your background and experience and anything personal.

2 – Well, I was born in Iowa and went to school there. My father is a chemist, and my mother is a biologist.

1 – Sounds as if you come from a professional family.

2 – That's right. One of my sisters is an ecologist and the other one teaches geography at a university.

1 – And what made you decide to get into geology?

2 – Oh, nothing in particular, I guess, I always liked collecting different stones and minerals and things like that.

1 – Now what about your experience? How long have you been working in this field?

2 – More than five years now.

1 – You’ve got a degree in mineralogy, haven’t you?

2 – Just a Master’s degree. After I did my degree, I began to specialize in ecology, dealing with a whole series of environmental issues.

1 – Sounds like an interesting field. By the way, could you explain me one thing? What’s the difference between an environmentalist, an ecologist and a conservationist?

2 – Well, a conservationist is really someone who, in my mind, wants to keep things exactly as they are, and, as long as they can keep the world around them in the same familiar shape that they’ve always known it, then they’re happy. An environmentalist is someone who accepts that there’s going to have to be change, but they want that change to be of such a kind that it doesn’t destroy the earth’s resources, or cause too much pollution, or anything else. An ecologist is likely to look a lot deeper than that, into the economic and political systems that govern our lives, and to understand that there are going to have to be profound political and economic changes if we’re going to preserve the environment.

So it’s a sequence, if you like, or a hierarchy of depth, in terms of the extent to which one looks at the root causes of what’s going wrong. And think that the ecological movement, or the green movement, as I call it, is more radical, because it goes right to the root of what’s going wrong. You can actually be an environmentalist, and get away with thinking that the systems aren’t going to change much. It’s an illusion, but a lot of people do it.

1 – Oh, thank you very much.

Polylogue

Read the following polylogue and guess where this conversation might take place.

DJ: Great to have you on the show today, Gordon.

Gordon: Nice to be here.

DJ: You’re going to answer some questions about water...

Gordon: Yes, that’s right.

DJ: Well, here’s your first question on line 2 – Shirley: what’s your question?

Shirley: Hello. Is it true that we have less water today than 1000 years ago?

Gordon: Well, no. We’ve got the same amount of water that we’ve always had. You see, it’s constantly recycled.

DJ: Does that answer your question, Shirley?

Shirley: Yes, thank you?

DJ: Hmm. OK, another caller on line 1. Yes, Marianne.

Marianne: How many countries don't get enough rain?

Gordon: Well, about 80 countries in the world – that's about 40 % of the world's population – have water shortages at some time in the year.

Marianne: But is there enough rain in the world?

Gordon: Oh yes, but the problem is that different countries get different amounts of rain. Iceland and parts of Canada for example get a lot of rain but countries like Australia get very little.

DJ: A caller now on line 3. Yes, Oliver.

Oliver: What about the countries that have very little rain? Where do they get their water from?

Gordon: Well, usually they use underground water supplies. The problem is that these supplies are getting smaller, and the populations are getting bigger. For example, so much water has been pumped out from underground in Mexico City and Beijing that the cities are slowly sinking.

DJ: Thank you, Oliver. Yes, another caller: Anton.

Anton: Can't we take the salt out of the sea and use the sea water?

Gordon: Yes, we can. Desalination plants have been used in Middle East countries and in California for some time now. The problem is that they're very expensive and they also use a lot of energy.

Anton: Mm, thank you.

DJ: I think we've got time for one more quick question. Yes, line 2 again: Jeff.

Jeff: Can we build more dams to stop water flowing into the sea?

Gordon: Well, yes. About 36,000 large dams have been built around the world now. One big problem with dams, however, is that mosquitoes can breed in them. For example, since the Aswan Dam was constructed on the Nile, many people have become ill.

Jeff: Oh, right.

Gordon: Yes, and dams also destroy the local ecosystem of plants and animals, and people often have to move from their villages when the dam is built.

DJ: Thanks, Gordon. Let's have some more music. Here's a song all about water!

Ex. 1. Say if these statements are true or false. Check your answers according to the polylogue.

1. We have less water today than 1000 years ago.
2. The world doesn't get enough rain for its needs.
3. Some large cities are sinking because there is too much water.
4. It is very expensive to take salt out of sea water.
5. Dams can cause many health problems.

Ex. 2. What does Gordon say about the problems with each type of water supply? Make some notes about each problem.

Underground water supplies.

Desalination plants.

Dams.

Ex. 3. Try to sum up the information from the polylogue, which you have read in the form of a monologue.

Список рекомендованной литературы

1. Murphy, R. Basic grammar in use: student's book with answers. 3rd ed., 7th print. / R. Murphy. – Cambridge : Cambridge University Press, 2012. – XI, 312 p.
2. Foley, M. MyGrammarLab intermediate B1/B2: with key / M. Foley, D. Hall. – Harlow : Pearson, 2012. – XI, 395 p.
3. Foley, M. MyGrammarLab advanced C1/C2: with key / M. Foley, D. Hall. – Harlow : Pearson, 2012. – 410 p.

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