И.М. Салимова
Н.Е. Почиталкина

ENVIRONMENT AND ECOLOGY
ОКРУЖАЮЩАЯ СРЕДА И ЭКОЛОГИЯ

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Учебно-практическое пособие

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В данном в пособии использованы аутентичные тексты, современные факты и статистические данные, что позволяет сформировать эффективные навыки и умения, а грамматические упражнения помогают преодолеть трудности, возникающие при изучении иностранного языка. Предлагаемый в пособии отбор и отработка лексического и грамматического материала, основывается на коммуникативно-ориентированном подходе.

Учебно-практическое пособие предназначено для студентов I и II курсов естественно-технологического факультета.

Рецензенты: Л.И. Корнеева, д-р пед. н., профессор
О.Ю. Павлова, канд. ист. н., доцент

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СОДЕРЖАНИЕ

ВВЕДЕНИЕ

Данное учебное пособие включает в себя специальные тексты по естественнонаучной тематике, сопровождаемые необходимыми дефинициями к ним, дополненные упражнениями на понимание изложенного содержания. Они служат развитию навыков чтения и перевода специальных тематических текстов, помогают овладению определенным объемом специальной лексики, способствуют развитию умения высказываться и вести беседу по представленной тематике в рамках естественнонаучной специализации. Задания также представлены и в грамматическом формате: на дополнение текста с выбором вариантов ответа, лексико-грамматические трансформации, образование производных слов с опорой на текст.

Разработка предназначена для студентов I и II курсов естественно-технологического факультета, направления: химия, биология, география, природопользование.

Состав и содержание учебного пособия выдвигают коммуникативную цель обучения, опосредованную через чтение как приоритетную в единстве всех его функций.

Как установлено, смысловое восприятие текстов на родном и иностранном языках имеет существенные различия. При восприятии текста на родном языке его материальная база, т.е. все те знаки, которыми представлен текст и его содержательный план, слиты воедино. Материал текста оказывается прозрачным для воплощенного в нем предметного содержания, у студентов создается достаточно яркий и полный образ описываемого объекта. При восприятии иноязычного текста внимание читающего концентрируется на вербальном материале, на поиске эквивалентов в родном языке; предметный план содержания оказывается представленным в сознании недостаточно и является психологически наиболее отдаленным для обучаемого.

Указанные явления распространяются и на чтение специальных текстов, поэтому возникает необходимость в процессе понимания содержания специальных текстов концентрировать внимание студентов на содержательной стороне текста, обеспечить при восприятии иноязычного тематического текста формы, близкие тем, которые характерны для чтения текста на родном языке. В данной учебной разработке этому служат составление словаря, вопросы к тексту, составление плана пересказа и пересказ текста, а также разнообразные творческие задания.

ЧАСТЬ I
ТЕМАТИЧЕСКИЕ ТЕКСТЫ
ОКРУЖАЮЩАЯ СРЕДА И ЭКОЛОГИЯ

Read and translate the text.

Vocabulary
environment – окружающая среда
due measures – должные меры
to pollute – загрязнять
pollution – загрязнение
pollutants – загрязнители
by-products – побочные продукты
man depends for his life on – в жизни человек зависит от
as early as the midforties – еще в середине сороковых годов
are falling in pieces – разрушаются
at a rough estimate – по грубым подсчетам
contamination = pollution

ТЕКСТ 1. HUMAN AND HIS ENVIRONMENT

The problem of human and his interaction with the environment has now become one of the difficult problems for many sciences not because it is fashionable but because of its great significance for the whole of the mankind. We see at present the signs of ecological imbalance, which may cause a crisis if due measures are not taken.

The air we breathe, the earth we live on and its rivers and seas are becoming polluted with ever more dangerous materials – by-products of man's activities. Human depends for his life on what the biosphere provides: water, oxygen, food, etc. However, the biosphere is strongly affected by all sorts of human activities. For example, human creates new compounds, new substances, pure chemical elements which are unknown

to biosphere. They do not belong to the natural cycle of matter. They weaken the capacity of natural processes for self-regulation. Though not changing biologically, we change the environment in which we live. The great Russian scientist Vladimir Vernadsky was the first in the world to realize the necessity for quite a new approach to the biosphere as early as the midforties.

The increasing noise level is a special problem nowadays. We need silence as much as we need fresh air and unpolluted water. Noise does not only do physical damage to the hearer but also can weaken his energy and break down his nerves.

Transport is a major source of environmental pollution. Every car consumes many tons of air. Its exhaust gases contain poisonous carbon dioxide, which makes difficult the emission of the earth's heat into space. Many cities now are too noisy to live in. Los Angeles in the USA and Osaka in Japan are known to be the air pollution champions among major industrial cities.

Pollutants are not only harmful to health but to buildings as well. Our cities are dying physically. In most city centres some of the oldest and finest buildings are falling in pieces. On one hand, the foundations are being shaken by all the heavy traffic and, on the other hand, the bricks are being eaten away by fumes from the traffic. It is a slow process but it is going on even though you can't see it.

One more aspect of the problem is water pollution. Sea- and river-going ships often pollute sea and river water with various oil products. At a rough estimate, no less than five million tons of oil are discharged into seas and oceans each year and one ton of oil can spread over about twelve square kilometers of the water surface as a fine film which prevents air-water oxygen exchange. One litre of oil makes one million litres of fresh water unfit for drinking. We must stop the contamination of our waterways which comes from so many sources: chemical waste from factories, thermal waste from power stations, domestic waste from cities and towns and so on.

Answer the questions

1. What do we all see in nature at present?
2. What does the human depend for his life on?
3. What is self-regulation?
4. Who is Vladimir Vernadsky? What is he famous for?
5. Why is transport a major source of environmental pollution?
6. Which cities are known to be the air pollution champions?
7. What happens to buildings in most cities?
8. Is it a fast process? How long does it take?
9. What pollutes the water?
10. How are the pollutants formed?

1. Unscramble the italicized words to find some clues that might tell you a stream is in trouble and show ways to clean it up

1. It is full of fallen *vlaese.*
2. Remove *raggbae* from the water.
3. Plant *stere* along the bank to prevent erosion.
4. The water is *dussy.*
5. There is no *flie* in the stream.
6. It smells bad because it contains *wesega.*
7. There is a shiny film on the water's surface because *loi* has leaked into it.
8. If you discover signs of chemicals being dumped in the stream, *trorep* it to an adult.
9. Too much *gaale* have turned the water green.
10. The water is *diddum* because there's too much dirt in it.

What statements describe clues to tell you the stream is in trouble?
What statements describe how to clean up a stream?

2. Match the words and expressions from column A with the equivalents from column B

A	B
1. to make a prediction	a. extinct
2. every day	b. to forecast
3. hotness or warmth	c. a habitat
4. very large in area	d. to cure
5. a heated glass building for growing young plants	e. to endanger
6. no longer in existence	f. to destroy
7. easily broken	g. heat
8. a place where someone or something is usually found	h. environment
9. to treat medically	i. huge
10. to ruin	j. to pollute
11. to put in danger	k. a greenhouse
12. that which surrounds	l. fragile
13. to make unclean	m. a hedge
14. to remain alive	n. daily
15. a wall of bushes, small trees growing close together	o. to survive

3. Complete the sentences below using the words from the exercise above

1. Our modern life is destroying the_____ environment.
2. Our_____ is precious. We must protect it.
3. How can we stop the _____ effect from getting worse?
4. Some illnesses are difficult _____.
5. Nowadays many scientists say that some chemicals can_____ human life.
6. Many species of animals have become _____.
7. Today people realize that the environment should be kept clean, if humanity wants_____.

4. Make up the plan of the text and retell it.
Read and translate the text.

Vocabulary
arable land – пахотная земля
cancer rate – заболеваемость раком
catalytic converter – каталитический преобразователь
fuel consumption – потребление топлива
incinerator – завод, сжигающий мусор
industrial discharges – промышленные стоки
leach – просачиваться
lead exposure – воздействие свинца на организм, отравление свинцом
per capita – на душу населения
power plant – электростанция
raw materials – сырьё
refinery – нефтеперерабатывающий завод
run – off – сток
waste – отходы

ТЕКСТ 2. BIOSPHERE AND ECOLOGY

Key words:
Emerge – появляться
Composition – состав
Fragile – хрупкий
Fauna – фауна
Biota – биота, флора и фауна
Environment – окружающая среда
Community – сообщество
Affect – воздействовать
Airborne – переносимый по воздуху
Soil – почва
Sediments – осадочные породы

Layer – слой
Cycling – круговорот
Deser – пустыня
Fora – флора
Interaction – взаимодействие
Population – популяция, население
Cause – быть причиной, вызывать
Damage – повреждать, причинять ущерб
To envelop – окутывать
Rock – скала, горная порода
Intact – нетронутый, неповрежденный

Read and translate the Words:

Biosphere ecology lithosphere
structure biology atmosphere
nature geology hydrosphere
human energy ecosystem
physics abiotic chemistry
concept biologic discipline
cycle energetics modify
component biochemical organization

Read the text and do the tasks.

The idea of biosphere appeared more than a century ago, but at first, it found a little application, until it was developed by the Russian scientist V.I. Vernadsky. It is his concept of the biosphere that we accept today. The first living cells emerged between 4 billion and 3.8 billion years ago. At present biosphere includes vast numbers of plants, animals, and other life-forms of our planet, many of them are yet to be discovered. Biosphere is a relatively thin life-supporting layer around the Earth containing living organisms, which is strongly influenced in its composition, structure and energetics by the living organisms. The part of the biosphere containing the highest concentration of living matter – the Earth's thin and fragile "film of life" – varies from a few meters in deserts and tundra

to a hundred meters in a tropical forest regions and oceans. The biosphere is a complex system of energy use and material cycling. This system functions on energy flowing from the Sun and it gives off energy (primarily as heat) to space. We can divide the biosphere into two parts, living and nonliving, or biotic and abiotic. The biotic part of the biosphere consisting of fauna and flora is known to be called biota. We can further divide the abiotic portion into three parts: the solid Earth or lithosphere, liquid water or hydrosphere, and the atmosphere.

Ecology is a branch of science which deals with the world of nature - including its human component – at certain levels of biological organization. It is the study of the living organisms interactions with each other and with their environment. Particular concern of the ecologists is with the "higher" levels of life organization: from populations to biosphere. The functional unit in ecology is the ecosystem because it comprises all of the interactions of communities with both their living (biotic) and their nonliving (abiotic) environments.

Ecology is a multidisciplinary science. Facts about ecological systems are drawn from biology, geology, chemistry, physics, and other sciences. Originally, ecology was considered to be, environmental biology. Modern ecology has to deal with environmental problems caused by human activities. People have always affected the natural environment. But the population growth along with the industrial world economy during the last two centuries has increased the magnitude, complexity and rate of these modifications. Today environment is not just modified by human action: it is radically transformed. Global satellite observations of the Earth have revealed that about 60 percent of land surface is to some extent damaged by industrial, agricultural, and other human activities, whereas no more than 40 percent of land remains intact.

Humankind is entering a new era in its evolution characterized by a new relationship with nature. Understanding of how biosphere works, and how it reacts to the global environmental change is of fundamental importance.

Answer the Following Questions:

1. How would you define the biosphere?
2. What is the biota?
3. When did the first living cells appear on our planet?
4. What are the limits of the "film of life"?
5. What levels of biological organization in nature are of particular interest for ecology?
6. What major factor has increased the intensity and scale of the biosphere transformations over the past two centuries?
7. Do you think the present day biosphere transformations caused by human activities are reversible?

1. Translate the following word groups:

Global satellite observations, industrial world economy, tropical forest regions, living organism interactions, life organization, life organization levels, atmosphere layers, nature balance, population growth.

2. Find the synonyms to the following words in the text:

To influence, to include, large, to emerge, to change, mankind, to release, field of science, to be concerned with.

3. What are the subjects of the following sciences?

Physics	... deals with ...	The molecular transformation Chemical reactions
Ecology	... treats ...	The interactions of subatomic particles
Chemistry	... is concerned with ...	The structure and functioning of the biosphere

4. There are some definitions in the text. What are they?
Complete the sentences:

1. ... is the layer around the Earth in which all living organisms exist.
2. ... is the total sum of all liquid and frozen water on or near the Earth's surface.

3. ... is a region of gases, airborne particles, and water vapour enveloping the Earth.
4. ... is the solid Earth with the rocks, soils and sediments on its crust.

5. Suggest as many word combinations as possible and translate:

(a) Layer (thick, of water, around the Earth, of gas, outer, thin, containing, living matter);
(b) Environment (clear, physical, part of, modified, healthy, biotic, damaged, intact);
(c) Interactions (between, humankind, nature, stable, communities, global, constant, living organisms, environment).

6. Transform the sentences using emphatic construction ″It is ... that...″

Example: The activities of living organisms influence the biosphere.
It is the activities of living organisms that influence the biosphere.
1. The activities of living matter determine the structure, composition, and energetics of the biosphere.
2. Vernadsky's concept of the biosphere is accepted today.
3. The functional unit in ecology is the ecosystem.
4. The industrial world economy has caused the present-day transformations of the environment.

7. Say it in English

a) Современная концепция биосферы была разработана русским ученым В.И. Вернадским более 50 лет назад (present-day, develop). Биосфера - это слой вокруг Земли, который содержит все живое вещество на нашей планете (contain). Биосфера - слой вокруг земли, который преобразован живыми организмами (transform). Жизнь на земле возникла около 3,8 миллиарда лет назад (emerge).

b) Биосфера - это слоистая система преобразования энергии и круговорота веществ (cycling). Биосфера функционирует на энергии, поступающей в нее от Солнца (function, flow into). Толщина слоя биосферы, содержащего наивысшую концентрацию живого

вещества (пленка жизни), варьируется от нескольких метров до сотен метров (thickness, film of life, vary from ... to).

c) Экология - многодисциплинарная наука, основанная на биологии, физике, химии и многих других науках (multidisciplinary). Взаимодействие человека с природой имеет глобальный и постоянный характер (interaction). Человек воздействует на окружающую среду и изменяет ее (affect the environment). Биосфера реагирует на эти воздействия (react).

d) Сегодня окружающая среда коренным образом преобразована в результате деятельности человека (radically, as a result of). Около 60% природных экосистем суши в той или иной степени разрушено в результате сельскохозяйственной, промышленной и других видов деятельности человека (to some extent, damage). Не более 40% суши еще осталось нетронутой (intact).

8. Read the text and tell about the importance of atmosphere for

– the Earth

– the organisms living

The air surrounding the Earth is called the atmosphere. It rises upward for hundreds of miles. This air can be heavy or light, calm or stormy, hot or cold.

Without air nothing on Earth could live. There could be no colour, no weather, no fire, no sound. Without air the Earth would be burning in the daytime and freezing at night.

Air is a mixture of gases. About 78 per cent of it is nitrogen, almost 21 per cent is oxygen, and the other 1 per cent is water vapor, argon, carbon dioxide and rarer gases. We live at the bottom of an air ocean, which rests on the Earth's surface.

Air has weight. Anything that takes space has weight and exerts pressure by pushing.

The outer atmosphere begins at the top of the ionosphere, but nobody knows how many thousands of miles it extends. There is no oxygen in the outer atmosphere. Hydrogen is the main element.

Mankind has learnt much of this remote part of the atmosphere because of the many experiments with space satellites.

Read and translate the text.

Key words:

Individual – особь, индивидуум
Species – биологический вид, виды
Density – плотность
Age structure – возрастная структура
Birth-rate – рождаемость
Gene pool – генетический фонд
Competition – конкуренция, отбор
Maintain – поддерживать, сохранять
Livestock – домашний скот
Interconnect – связывать
Habitat – место обитания
Behavior – поведение
Overlap – перекрываться, накладываться друг на друга
Coincide – совпадать
Niche – (экологическая) ниша
Organic whole – единое целое
Disruption – распад, разрушение
Property – свойство
Severe – резкий, сильный
Irreparable – непоправимый, невосстановимый
Slight – незначительный, слабый
Carbon dioxide – углекислый газ, двуокись углерода
Minute – мельчайший
Lichen – лишайник
Fungi – грибы
Algae – водоросли
Generation – поколение

Read ″ch″ as [k] in the words of Greek origin:

Chrome	mechanism
Chemical	technical
Character	technology

TEKCT 3. POPULATIONS AND ECOSYSTEMS

A population is a group of individuals of the same species occupying a given area. Populations are characterized by density, age structure, birth and death rate. Each individual carries a certain combination of genes (total sum of an individual's genes is called genotype). The sum of all genetic information stored in genes of individuals of a given species is called a gene pool of the species. The population is also an evolutionary unit. Evolution suggests changes in the gene information.

Lifetime of any species is very long and can reach a million years. It exceeds the lifetime of an individual (a member of population) by many orders. Thus, the stability of a population as a system is achieved through continuous renewal of its elements… In the reproduction process, there appear many individuals whose properties differ from normal. As a rule, such weaker (noncompetitive) individuals will be forced out of reproduction by the competition process. These two processes – reproduction and competition – are vitally important for maintaining stable existence of any species in nature. Normally, the genotype of any species cor10 responds to the maximum competitiveness, which is a set of properties that provides species capability to fulfill its most important function – to sustain the ecosystem stability and, eventually, to keep matter cycles in the biosphere closed. Notice, that stability of natural ecosystem does not concern any domestic species such as agricultural plants, livestock, etc. as well as pigeons, sparrows, rats, and other "companions" of men.

A group of interconnected population of all species that occupies a habitat composes a community. Each habitat has a characteristic range of physical and chemical conditions, such as amount of light, typical temperature, pH of water, and so on. And each species is adapted to those conditions in terms of its morphology, physiology, and behavior. A full range of abiotic and biotic conditions under which a particular species can live and reproduce is called its ecological niche. Each niche may overlap with many others, which belong to neighboring species, but it coincides with none.

As a rule, the more complex the system is, the more successfully it can resist the outer stress. An ecosystem is a natural organic whole of a biologic community and its nonliving environment. Constant interactions between living organisms, say, plants, bacteria, and animals and their physical environment in any ecosystem are the ways by which matter and energy are distributed. Moreover, these interactions unite the living and nonliving components together into a stable system. Many contrast forces act within the ecosystem which may result in imbalances or disruptions but normally the ecosystem is stabilized due to its self – compensating properties. The state of a balance in any ecosystem is self-sustainable so that even slight imbalances are corrected before they become severe and irreparable.

Any stable natural ecosystem consists of a great number of various species, from minute living things like viruses or bacteria to giants like whales or sequoias, each playing a unique role in reaction in the whole system. The biological diversity is the key to the maintenance of the world as we know it and keeps the world steady.

1.

a) Give the synonyms of the following words:

to keep, to reach, inner, characteristic, owing to, various, total, to perform, opposing, to cause, continuous, certain

b) Give the antonyms for the following words:

living, minute, balance, slight, strong, simple.

2. Read, translate and mark suffixes and prefixes:

environment – environmental;
stable – stability;
compete – competition – competitiveness – competitive;
evolution – evolutionary;
act – interact – interaction;
maintain – maintenance;
balance – imbalance.

Can you find any more examples of words with the same root in the text?

3. Translate the following word groups:

Matter cycles, reproduction process, competition process, balance state, gene pool, sea level, ozone layer, stress resistance.

4. Answer the questions:

1. What are the main characteristics of any population?
2. Does the term "gene pool" refer to one individual or to a whole species?
3. What interaction between an individual in the population provides the stability of the species?
4. What is the difference between a population and a community?
5. What is an ecosystem?
6. Which systems are, as a rule, more stress resistant: complex or simple?
7. What is a characteristic property of any stable ecosystem?

5. Join the parts of the definitions:

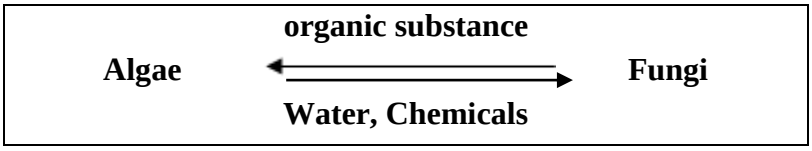
a)

1) Hydrosphere	a) all air surrounding the Earth
2) Lithosphere	b) all water on the globe
3) Atmosphere	c) all solid matter on the Earth

b)

1) abiotic	d) a disruptive force from outside
2) self – regulating means	e) nonliving
3) outer stress	f) able to control itself.

6. Look at the figure and answer the questions below:



Consider lichen as the simplest ecosystem containing only two kinds of living organisms (algae and fungi). Answer the questions:

1. Where do fungi obtain organic matter from?
2. Where do algae get water and chemical elements from?

3. Are the material cycles of this ecosystem open?
4. Is this system closed from the standpoint of energetics?

7. Translate into English:

Играть уникальную роль, постоянное обновление, соседние виды, невосстановимый дисбаланс, проблемы окружающей среды, биологическое разнообразие, смертность и рождаемость, частично совпадать с другой нишей, набор свойств, действовать внутри экосистемы, постоянные взаимодействия.

8. Are the following statements true or false? If false, say why.

1. Biologic population is a group of non – interacting individuals.
2. Simple systems are as a rule more resistant to outer stress than complex ones.
3. There exist different species whose ecological niches completely coincide.
4. Most of the energy originally fixed by an ecosystem is eventually lost to the environment as metabolically generated heat.
5. Any ecosystem consists of organisms of one and the same species.

Read and translate the text.

Key words:
Conservation – сохранение
Degradation – разрушение, деградация, гниение
Desertification – опустынивание
Destruction – разрушение, деструкция
Disposal – размещение, удаление
Environment – окружающая среда
Environmental – экологический (зд. природоохранный)
Impede – препятствовать, задерживать
Management – управление, бережное использование
Pollutant – загрязнитель
Pollution – загрязнение
Resources – ресурсы, запасы
Natural – resources природные богатства
Soil – erosion эрозия почвы

TEKCT 4. PROBLEMS OF THE CONTEMPORARY ENVIRONMENT

1. Look through the text and say:
What problems are discussed in the text?
Why are they of great importance now?
What environmental problems are mentioned here?
How can the environmental problems be solved?

The environmental question is one of the key issues of our era, and as such is directly and indirectly linked with other important international problems, namely overgrowth of population, hunger, poverty, peace and disarmament, the need for a harmonious economic and social development. It has been repeatedly stated that the protection of our environment is a matter of survival of mankind of Earth; as such, it can only be tackled as an international – global issue. Furthermore, it is clear that in order to effectively protect the environment more and better-focused research is needed, as well as better and more efficient management of the environment and all natural resources.

Environmental degradation of large areas of our globe affects wide groups of population and is clearly international. Borders cannot impede air pollution, river or marine pollution, destruction of forests, desertification or soil erosion. National borders are often unable to higher the expansion of environmental problems of a different nature, such as the case with the use of well-known dangerous substances, the transport and in some cases uncontrolled disposal of toxic or radioactive products, health problems directly connected with water use or food supply, etc. It is thus evident that environmental policy becomes more complex at national and international levels. At least on paper, nearly all governments recognize the relation between protection of the environment, conservation of natural resources and development, and have taken level and administrative measures towards this end.

The experience of the past decade has shown that environmental problems can be, and in some cases are, solved, whenever sound international cooperation is obtained. There is a need for sound supportive

structures of national police, national legislation and efficient administration, national research, training and information, together with globally oriented environmental education at all levels.

2. Arrange the following into pairs of synonyms.

Solve a problem, the key issue, protect, soil erosion, be linked with, impede be connected with, hinder, tackle a problem, the main problem, desertification, safeguard.

3. Translate the following paying attention to italicized grammar constructions.

l. The questions are linked with the results of our experiment. 2. Health problems are also connected with water use. 3. These ideas are supported by crystallographic data. 4. The environmental problems can be, and in some cases are, solved 5. Forests have also been affected by... 6. More efficient management of the environment is needed. 7. It has been repeatedly stated that... 8. The experience of the past decade has shown that... 9. The results will be discussed in more detail elsewhere. 10. An example will be considered from the field of corrosion control. 11. The transformation is followed by the appearance of new properties in the gelatin.

Read and translate the text.

Key words:

Fossil fuel – ископаемое (добываемое топливо)
Despite (in spite of) – несмотря на
Forecast – прогноз
Reserves – ресурсы, запасы
Overall – всеобщий
Per capita – на душу населения
Outlay – издержки, расходы
According to – согласно, на основании
Develop – развивать, разрабатывать
Rate – скорость

Obtain – получать
Raw material – неотработанный материал, ископаемые
Recognize – признавать
Release – высвобождать, испускать
Imply – предполагать, подразумевать
Utilize – использовать
Avoid – избегать
Result in – приводить к …
To be under way – быть в процессе изучения (разработки)
To some extent – в некоторой степени
Rural area – сельская местность
On a large scale – в больших масштабах
Accompany – сопровождать
Occur – случаться, встречаться
Consumption – потребление
Increase – увеличивать
Decrease – уменьшать
Shortage – недостаток
Ultimate – в конечном счете, в конце концов
Core – сердце, сердечник
Spew – извергать
Intact – нетронутый
To be dizzy – чувствовать головокружение

Guess the meaning of the words:
Energy – battery
Pessimistic – radiation progress metallurgical
Investor – battery
To limit – radiation progress metallurgical
Hydro-resources – to concentrate
Production – thermo power station
Irrational – transmission

TEKCT 5. PROBLEMS OF ENERGY PRODUCTION

The production of energy is growing rapidly, both per capita and in total. About 90 percent of the energy we use today comes from fossil fuel-oil, coal and gas, just a few percent from nuclear fuel and about five percent from hydro-resources, all of which in the final analysis, are a transmuted kind of solar energy. Despite the intensive utilization of oil, gas and coal, and the pessimistic forecasts, their reserves are increasing both overall and per capita. The huge reserves of coal in the United States are almost untouched because this would require high outlays, according to investors of that country.

Nevertheless, the reserves of oil and other types of fossil fuel are limited. They are being developed, used at a much more rapid rate than other sources of energy. Uranium and thorium are used for obtaining nuclear energy, and are most unlimited reserves of raw materials for producing thermonuclear energy. But it should be recognized that both fossil and nuclear energy release some additional heat to the Earth, implying a fundamental "thermal pollution" limit to the use of either form.

Technological progress in exploration and utilization of outer space has stimulated the development of solar batteries and other means of using direct solar radiation. Only the use of solar energy, directly or indirectly, or tidal energy helps to avoid the above - mentioned problems.

But in this field there are some restrictions. The amount of energy reaching the Earth from the sun is great when considered as a whole, but per unit surface, the quantity is small. This results in the serious difficulty of concentrating the heat gathered from a large surface and using it as a source of energy. The research on this difficulty is under way, and progress has been made on the problem of the use of solar energy directly as heat; for example, solar radiation is being used to heat homes, to produce high temperatures for metallurgical operations (solar furnaces), and to concentrate water solutions by evaporation.

The energy of air movement has been used to some extent for the production of work, especially in rural areas (windmills). But the necessity

for large-sized equipment and variations of wind directions prevent from using this energy on a large scale.

So far, all the methods of energy production have been rather inefficient. Thus, the generation of electric power at thermo power stations is accompanied by a loss of at least 70 percent of the chemical energy contained in the fuel. Further losses occur when transmitting and utilizing electric power.

In spite of all those facts, energy consumption per unit of industrial production is going down as the result of increasing efficiency in the production and transformation of energy in various stages. The application of superconductivity has reduced the loss of energy in generation and transmission. There are some other ways of decreasing the waste and irrational use of energy.

At the same time, the energy problem may still create serious difficulties and may even set limits to the development of mankind. It's not a shortage of energy but its excessive consumption that might lead to such a situation. Besides, the electric power, used for any purposes, is ultimately converted into heat. The release of additional heat and the discharge of combustion products can result in dangerous environmental changes.

1. Find in the text the words with the similar meanings:

Application, in spite of, generation, power, to be in process, to reduce, to transform, resource, quantity, to get.

2. Form the words with the opposite meaning by adding the prefixes:

Direct, touched, limited, efficient, balance, possible.

3. Review the questions:

1. What is the most common source of energy at present?
2. Are the fossil fuel reserves increasing?
3. What are the drawbacks of fossil and nuclear energy?
4. What are the alternative sources of energy?

5. Why isn't solar energy used commonly?
6. Where is solar energy utilized?
7. What is the drawback of using wind energy?
8. Why is energy production at thermo power stations inefficient?
9. What are the ways of increasing efficiency in the production and transformation of energy?
10. What can result in dangerous environmental problems? Why?

4. Transform the sentences like in the model:

Model: The huge reserves of coal remain untouched because they require high outlays. – The huge reserves of coal remain untouched requiring high outlays.

1. Both fossil and nuclear energy release some heat to the Earth and imply a fundamental "thermal pollution" limit to the use of these forms.

2. The electric power is converted into heat and release the additional heat as well as discharge of combustion products into the atmosphere.

3. The efficiency in the production of energy increases and reduces the consumption of energy.

4. Ecology is a branch of natural science. It deals with interactions within the biosphere.

5. In case of nuclear accident huge areas should be evacuated. Because remains contaminated with radioactivity for years.

6. Radioactivity causes cancer. It affects future generations.

7. We should do research on solar energy, wind and tidal power because they are promising sources of energy and that energy lasts for ever.

5. Read the examples, join the sentences in every possible way

Example № 1: They tried hard to clean up the lake, but/yet it remain polluted.

Example № 2: They tried hard to clean up the lake; however/nevertheless, it remains polluted.

Example № 3: Although/Even though/ Though they tried hard to clean up the lake, it remains polluted.

Example № 4: In spite of/ Despite their trying hard to clean up the lake, it remains polluted.

1. Technological progress has stimulated the development of solar batteries. The use of them reveals some serious problems in gathering the heat from the sun.

2. The fossil fuel is rapidly running out. Some huge reserves remain untouched.

3. There are some difficulties in using solar energy. This energy is used directly as heat to produce high temperature for metallurgical operations.

4. The air in our region is much polluted. Toxic gases are still being damped into it.

5. The efficiency in the production and transformation of energy increases. The energy problem remains.

6. The wind power has been used in rural areas from ancient times. The necessity for large – sized equipment and variations of wind direction make it impossible to use this power on a large scale.

6. Join the sentences using the words in brackets. In what other ways can they be joined?

1. Nuclear energy is an unlimited source for producing thermonuclear energy. It presents some danger for environment (however).

2. The energy station was fined. It is still releasing toxic gases into the air (In spite of).

3. Wind power is ecologically friendly with the environment. It lasts for ever (Moreover).

4. The production of nuclear energy is connected with the danger of accidents. It introduces the problems of burning nuclear waste (not only ... but also).

5. The generation of electric power is accompanied by a great loss of energy. Some losses take place when transmitting and using it (besides).

7. Listen to the discussion about energy crisis. You will hear the following words:

To run out, to fail, inevitable, to contaminate, public outcry, to cause cancer, for disposal, to ransom, evil, nuclear waste, in the short-term.

If you don't know any of these words, find them in the dictionary.

After listening answer the questions:

1. Why do we need some energy sources besides fossil fuel?
2. What are the alternative sources of energy?
3. What are the disadvantages of nuclear power?
4. What are the advantages of nuclear power?
5. Who do you agree with? Are you an optimist?

8. Read the article and answer the questions below:

The Truth about Chernobyl

... A series of explosions shook the plant. About 700 tons of graphite and 70 tons of uranium fuel from the core of the reactor, all lethally radioactive, spewed onto the tarmac and the roof of the turbine hall. Another 50 tons of fuel evaporated, releasing 10 times as much radioactivity into the atmosphere as was released at Hiroshima.

Yet so sure of themselves were they, that for 17 hours after the blast, the power station management insisted that the reactor remained intact and that it was only an emergency water tank that had exploded. It should have been a simple matter to check, but the dosimeters for measuring radioactivity were locked in a safe and the panel in the control room was dead. The managers refused to believe the word of a physicist who inspected the plant, and who was to die of radiation sickness a few days later. Instead, they relied on machines which had a maximum reading of one five-thousandth of the dose some were actually receiving ... Some workers received lethal doses because the rest of the site was not evacuated. Night fishermen fished at the outflow to the power station until morning, by which time they were dizzy, vomiting constantly, and their skin had acquired a nut-brown nuclear tun.

There was no evacuation from the company town of Pripyat, where 50 000 people lived, for 36 hours. A man in Pripyat sunbathed on his balcony throughout the next day. Later that evening he was taken to hospital, vomiting uncontrollably.

1. Why didn't the managers stop the reactor?
2. What were the consequences of the blast at the station?
3. What were the consequences of the explosion for the company town?

Read and translate the text.

TEKCT 6. CARS: TOO MUCH OF A GOOD THING

Motor vehicles have brought enormous social and economic benefits. They have enabled flexibility in where people live and work, the rapid and timely distribution of goods and ready access to a variety of services and leisure options. Many people are very attached to their cars. They say that having a car is an essential part of their lives – it offers mobility, power, freedom and convenience. The typical car owner spends 1,600 hours (over 50 days) each year on his car: driving, parking and cleaning it.

The car industry is the largest industry in the world economy. It is dominated by huge American, Japanese and European companies like General Motors, Toyota and Volkswagen. General Motors is the largest transnational corporation. In 1986 its annual turnover of 40 billion dollars was greater than the Gross Domestic Product of all Third World nations except Brazil, China, India and Mexico.

Between 1950 and 1995 the number of cars in the world increased ninefold. In 1950 there were 70 million cars, trucks and buses on the world's roads. By 1994 there were about 630 million. Since 1970, the global fleet of vehicles has been growing at the rate of about 16 million cars per year. This expansion has been accompanied by a similar growth in fuel consumption. If this kind of growth continues, by the year of 2025 there will be over 1 billion vehicles on the world's roads.

In most parts of the world, the motor car is seen as a sign of progress and development. In the wealthy nations of North America, Europe and Japan per capita car ownership is very high, while in most developing nations it is still very low. There are about 750 vehicles per 1000 persons in the United States, more than 500 in Japan and only 8 vehicles per 1000 persons in China. But the car industry in China is developing rapidly, though traditionally up to 90% of all travel in Chinese cities is made by bicycle. China plans to invest 10 billion dollars in the car industry and wants to produce one million cars a year.

The environmental cost of cars

The widespread use of cars has real environmental and economic costs. Vehicles are major sources of urban air pollution and greenhouse emissions. They make our towns and cities dirtier, noisier and more dangerous places to live. Vehicles also represent an important threat to the economic security of many nations because of the need to import oil to fuel them.

The motor car industry requires a vast quantity of raw materials. It uses 20% of all world's steel, 10% of aluminium, 7% of copper, 50% of lead and 60% of natural rubber. Besides this, the transportation sector consumes about one half of the of the world's oil production, the bulk of it as motor fuel.

Vehicles accounted for 35% of all oil consumed in Japan, 44% in Western Europe, 49% in the Third World and 65% in the USA. Canadians and Americans together use about 125 billion gallons of fuel per year – about 800 gallons per car. Australians use about 500 gallons and Europeans about 300 gallons per car.

Car engines use only 10 to 20% of energy in the fuel – the rest is lost as noise, heat and pollution.

Road traffic is the source of one third of all harmful air pollution in the world. Car exhausts contain nitrogen oxide, which contributes to acid rain, carbon dioxide, which contributes to global warming, and lead, which damages human brain and kidney.

Worldwide, vehicles currently emit well over 900 million metric tons of carbon dioxide each year. These emissions account for more than 15 per cent of global releases of this greenhouse gas. Because of their large vehicle fleets, developed countries are responsible for a large share of emissions. These countries represent only 16% of the world's population, but they accounted for two thirds of total world carbon dioxide emissions from cars. Besides greenhouse gases, car exhausts contain lead, which is added to gasoline to improve the engine performance.

Lead is particularly toxic to the brain, kidney, reproductive system and cardiovascular system. It is very dangerous because it can accumulate in the body. Lead is a special hazard for young children. Lead exposures can significantly reduce the IQ of school -aged children; they also cause aggressive behavior, delinquency and attention disorders.

Many countries introduced catalytic converters into their cars, which require unleaded gasoline. But despite widely recognized damage to the health, most countries still use leaded fuel. By 1996 only 14 countries had completely phased out the use of leaded gasoline.

Gasoline and diesel fuel are distilled at huge refineries which produce both toxic waste and toxic air emissions. The refineries are located in towns that have the highest cancer rates and are populated by workers with the highest occupational disease rates.

Road building withdraws large areas of land from agricultural use, requires tremendous amounts of resources and causes great changes in the environment. Motorways and the associated interchanges, exits and entry ramps cover thousand of acres of prime food -producing land in Europe. In the USA 60 thousand square miles (10 per cent of the country's arable land) have been paved. That is the area the size of Europe. In places where roads are built, the topsoil is pushed aside, the vegetation is stripped away and animal habitats are destroyed.

Asphalt is made from toxic tar that remains from coal and oil processing. To that is added aggregate which often comes from incinerators and power plants, and is laden with dangerous heavy metals like cadmium and mercury. These materials slowly leach their contents into the soil and water.

In cities close to one third of all land goes to accommodate the car – parking lots, expressways, roundabouts, bridges, petrol stations and garages. Parking lots devour huge stretches of land and are empty 80 per cent of time. Between parking spaces at home, at work and at the shopping centers, the average car uses three times the space of the average home. Parking lots for shopping centers are the most environmentally destructive. Car berths are marked by thick puddles of oil and transmission fluid and the water run-off from these places violates environmental standards set for industrial discharges.

People have been encouraged to use cars by the changing design of towns and the growth of large workplaces, shopping centers, hospitals and schools. People who do not have access to a car find life more and more difficult and the decline of public transport often adds to their difficulties.

Large numbers of women, all children, most young people, the elderly and the poor cannot or do not want to own or use a car. Building more cars and roads does not solve these people's transport problems.

From the 1960 onwards more and more people protested against the motor car. Some pressure groups and local councils opposed traffic in towns, the building of new roads, and the closure of railways and the loss of bus services. Some councils restricted the use of cars, improved public transport and created better facilities for pedestrians and cyclists.

Now car manufactures are trying to make more environmentally friendly cars, which use fuel more efficiently and cause less pollution. From 1992 all new cars in Europe had to be fitted with catalytic converters.

In the future cars may run on solar power, alcohol from plants or fuel cells using methanol or hydrogen. They will be much lighter with aerodynamic design and advanced electronics.

What can you do to reduce the cost of car to people and their environment?

1. Walk, cycle or take public transport wherever possible. Shop locally when you can.

2. Maintain and drive your car carefully so that it uses energy efficiently, does not cause unnecessary pollution and lasts as long as possible.

3. Buy a small, fuel – efficient car with a catalytic converter.

1. Agree or disagree. Try to prove your opinion

1. Motor cars did not bring any social or economic benefits.
2. The car industry is the largest in the world economy.
3. Global car fleet growth was accompanied by a decrease of fuel consumption.
4. The widespread use of cars does not produce any environmental problems.
5. The motor car industry requires a vast quantity of raw materials.
6. Car engines use 80% of energy in fuel.
7. Car exhausts do not contain any harmful substances.
8. Developed countries are responsible for the largest share of carbon dioxide emissions.

9. There is no use to run your car on unleaded gasoline, because lead is absolutely harmless.
10. Towns with oil refineries have the highest cancer rate.
11. Roads use up large areas of arable land.
12. People have been encouraged to use cars by the changed design of cities.
13. People do not protest against the expanded use of cars.

2. Discuss the advantages and disadvantages of cars.

3. Make these sentences passive.

Ex.: People pollute the air. The air is polluted by people.

1. They speak about environmental problems on TV, radio and in the newspapers.
2. Cars pollute the air.
3. We cut down trees.
4. People often leave glass bottles in the forest.
5. We recycle newspapers, bottles and metal cans.
6. Sometimes children break rules.

4. Complete the questions below and write your own answers

Do you think about the future of the planet?

1. _____ are some global environmental problems?
2. _____ do you like to join an environmental group?
3._____ you ever planted trees?
4. _____ things do you do to reduce pollution?
5. _____ can you save energy at home?
6. _____ is it important to remember the three R's: reduce, re-use recycle?

5. Make up the plan of the text and retell it.

Read and translate the text.

Vocabulary

diatomic oxygen – двухатомный кислород

solar – солнечный

poisonous – ядовитый
fade – тускнеть
rubber – резина
cell membranes – клеточные мембраны
split up – расщепляться
fragile – хрупкий
depletion – истощение
fertilizers – удобрения
larvae – личинки
crustaceans – ракообразные
terrestrial – наземный, земной

ТЕКСТ 7. OZONE AND THE GREENHOUSE EFFECT

There has been considerable interest in ozone and the greenhouse effect recently. They are issues, which seem to be bothering many people. But there is also a lot of confusion, particularly concerning the role, played by gases such as ozone.

Ground – level and high – level ozone

Most of the free oxygen molecules in the earth's atmosphere contain two oxygen atoms. This is known as diatomic oxygen and it makes up 20, 95% of our atmosphere. It is this type of oxygen that we need to breathe. However, the two atoms can be split up by solar radiation and when each of these then joins with diatomic oxygen, the result is a three-atom molecule of oxygen. This triatomic form of oxygen is called ozone. The earth's ozone is found mainly in two areas: either at ground level or high above our heads. The presence of ozone can be a good or a bad thing… it depends on where it is.

Ozone is poisonous and damaging – this makes ground-level ozone a problem. Although it does occur naturally, human activities are increasing the amount of ozone that we breathe. Action is needed to reduce ozone on the earth's surface.

About 90% of the ozone in the earth's atmosphere is located in the stratosphere – a band 15–20 km above our heads. This fragile layer, known as the ozone layer, is crucial to our life on the planet. It absorbs 99% of the ultraviolet (UV) radiation of the sun. Without the ozone layer, this radiation would probably kill most of us. It is the damage being caused to this layer that is worrying people. We need to take measures to protect it.

These two problems can't balance each other out. We need to find different solutions for both issues.

Some human activities indirectly produce ozone and these levels can be high enough to cause damage to our health, and to animals, trees, plants, crops and everyday materials. Increasing levels of ground-level ozone also adds to the acid raid and greenhouse effect problems.

Ozone does not come directly out of car exhausts or chimneys. It is formed when other pollutants react in sunlight. The other pollutants need to be present before ozone can be produced and, therefore, ozone is known as a secondary pollutant (the others are called primary pollutants). The main pollutants causing ozone are nitrogen oxides and unburned hydrocarbons. An important source of both pollutants is road traffic. Ozone isn't formed straight away: there is usually a delay until the other pollutants have reacted in the sunlight – this may take several hours.

High concentrations of ozone form mainly during sunny days in or near towns which have a lot of road traffic. One survey has shown that towns with a population of 100,000 or more can cause a build up of ozone in neighbouring countryside. You are not safe if you live well away from a big town. Ozone can be transported long distances – sometimes over 1000 km.

If there is a wind carrying the primary pollutants away from the town, the highest levels of ozone may not occur until they have had time to react. This may be a long way from the source of pollution. That's the trouble with this type of pollution… it has no respect for neighbours' rights.

Increased amounts of ozone at ground level are usually caused by a combination of pollutants and local weather. On days when there is a daytime temperature inversion they are stuck in a band of air close to the ground. They can't escape and their levels can build up dangerously.

Southern California in the USA was the first area to experience severe ground- level ozone pollution. People started complaining of eye and chest irritation as far back as the 1940s; the problem is still there.

Ozone is poisonous and can damage people's health. Even at a low concentration it can cause irritation of eyes, nose, throat and chest. Children and the aged are the most at risk, particularly if they already suffer from chest complaints and blood diseases. Ozone alerts have been broadcast in many countries – such as the United States, Japan and the UK – for several years. Groups that are ″at risk″ are advised to go inside and avoid exercise when there is an ozone alert.

Unfortunately, just because ozone levels don't remain high all the time it doesn't mean that we are safe. Short bursts of breathing ozone are just as damaging as prolonged exposure. Hiding indoors may not even be enough… ozone can be produced by some electrical equipment. For example, badly maintained photocopiers can produce quite high levels of ozone, particularly when they are put in small, poorly ventilated rooms.

Natural and man – made materials are also affected. Ozone can be an important link in the build up of acid air pollution – a huge problem around the world. It can also weaken textiles and cause paints and pigments to fade. Many museums and art galleries have installed air – conditioning equipment to prevent damage to paintings and valuables. Rubber is particularly prone to ozone damage which causes it to harden and crack. Many car tyres and insulating materials are now treated with chemicals to prevent attack by ozone. Worldwide, up to 30% of air pollution damage to man-made materials could be caused by ozone.

Ground-level ozone damages plants – in certain conditions it may kill them. It attacks cell membranes and internal structures of the leaf, affecting photosynthesis and respiration of the plant. The first sign of visible damage is that the plant's leaves start to go blotchy and eventually drop off. Ozone damaged plants may be more sensitive to climatic change and attack by pests and diseases.

In recent years forests throughout the world have been showing increasing signs of damage and ozone is thought to be one of the main causes in some areas – including Western Europe and North America. It is particularly damaging when combined with other air-borne pollutants – to make

the so-called pollutant cocktail. Agricultural crops which can be damaged by ozone include potatoes, tomatoes, soya bean and spinach. In the USA ozone damage may cause a 20% reduction in crop yields.

Most of the earth's ozone is found in the stratosphere – a layer in the atmosphere 15–20 km above the ground. Unlike ground-level ozone, the high-level ozone does a useful job. It protects animals and plants from the sun's harmful ultraviolet rays and it also helps stabilize the earth's climate.

We know that ozone is formed when ultraviolet radiation splits up diatomic oxygen. This reaction absorbs part of the sun's ultraviolet radiation. However, the story doesn't end there. The ozone is then split up; again by another part of the sun's ultraviolet radiation. Between them, the two sets of reactions help screen out most of the harmful UV rays before they get to the earth's surface. As long as there is enough oxygen and ozone, the cycle of reactions should ensure that we are protected.

Although the high-level ozone occupies a band which is 25 km thick, it is not very dense. If we were to bring all the stratospheric ozone down to ground level it would form a layer which is only 3 mm thick. The ozone layer is fragile and it is being threatened. In recent years it has thinned. Human activities have damaged it to the extent that it has developed periodic tears above the poles. Some gases are particularly harmful to high -level ozone: chlorofluorocarbons (CFCs) for short and nitrous oxide are under the most suspicion.

CFCs are gases used in a wide variety of processes. They were invented in 1932 and were used because they were cheap, nonflammable and stable.

CFCs are released into the air when a product containing them is destroyed. When CFCs reach the upper atmosphere, the chlorine they contain breaks down the fragile layer of ozone.

Each CFC molecule is very stable and can stay in the atmosphere for up to 130 years. During that time it may destroy up to 100,000 ozone molecules. Since their discovery in the 1930s there have been a build up of CFCs in the atmosphere; recently, there has been a mirror -image fall in the high-altitude ozone levels.

Because of their long life, even if we stopped using CFCs today they would still be eating the ozone layer well into the next century. CFCs are also important greenhouse gases.

Some everyday materials are the main contributors to CFCs in the atmosphere. CFCs are sometimes used as a propellant in aerosols. They can cause up to 31% of atmospheric CFCs. CFCs also escape during manufacture of rigid foam, which is used for insulation and packaging. It can cause up to 50% of atmospheric CFCs. In fridges CFCs are used in insulation and coolant. This can cause up to 7% of atmospheric ozone.

Nitrous oxide – otherwise known by its other name – laughing gas – mainly comes from natural vegetation, but increasing amounts are produced by cars and power stations burning fossil fuels, and from nitrogen-based artificial fertilizers. Like the CFCs, nitrous oxide is long-lived – remaining in the atmosphere for up to 150 years. It slowly moves from the ground into the stratosphere where it helps break down ozone.

The depletion of the ozone layer has become a global problem. A thinning ozone layer will allow more ultraviolet radiation to reach the earth's surface, which can have a direct effect on our health. It can damage our immune system, make us prone to infectious diseases, cause skin cancers and damage our eyes. American scientists have estimated that for every 1% decrease in the concentration of high-level ozone there would be a 5% increase in the number of skin cancers and an extra 25,000 eye cataract victims in the United States only!

A thinning ozone layer can damage small organisms that live in the sea – collectively known as plankton. Phytoplankton is considered to be one of the most important source of oxygen in our atmosphere. Ultraviolet radiation can also damage the eggs and larvae of fish and crustaceans. It will damage food chains in the sea and will cause the dramatic reduction of fish stock in the sea and the amount of sea animals and seabirds.

Land plants will be also badly affected and food chains in terrestrial habitats will be broken by high levels of UV. Damage to plankton and land plants may affect the carbon dioxide cycle in the atmosphere, which could worsen the greenhouse effect.

Answer the questions

1. What is the difference between the ground-level and high-level ozone?
2. What form of oxygen is called ″ozone″?
3. How many per cent of ozone in the earth's atmosphere is located in the stratosphere?
4. What would probably happen without the ozone layer (the high-level ozone)?
5. In what way does ground-level ozone damage plants?
6. Where is most of the earth's ozone found?
7. How is the ozone formed?
8. What has happened to the ozone layer in recent years?
9. What gases are particularly harmful to the high-level ozone?
10. When were CFCs discovered?
11. What materials are the main contributors to CFCs in the atmosphere?
12. Why has the depletion of the ozone layer become a global problem?

1. Agree or disagree. Prove your opinion

1. Diatomic oxygen is the type of oxygen that we need to breathe.
2. The presence of ozone can be a good or a bad thing.
3. The ozone can't damage people's health.
4. Unlike ground-level ozone, the high-level ozone does a useful job.
5. The ozone level is stable and it isn't being threatened in recent years.
6. CFCs are gases used in a limited amount of processes.
7. The depletion of the ozone layer has become a global problem.

2. Do the environmental word puzzle.

1. The word_____ means simply the world around us (11 letters).
2. Don't_____ wildlife (7 letters).
3. They are asked to_____ trees (5 letters).
4. Tropical rainforests _____ about nine million square kilometers (5 letters).
5. Don't drop_____ when you walk down the street (6 letters).
6. Don't_____ gardens by breaking trees and picking flowers (5 letters).
7. An increase in_____ effect may lead to global warming (10 letters).

8. Building motor roads can_____ countryside (6 letters).
9. *Greenpeace* helps to_____ nature (7 letters).
10. Don't_____ for rare animals (4 letters).
11. Most of the_____ in big cities comes from cars and buses (9 letters).

3. Make up the plan of the text and retell it

4. Test: ″Are you ozone friendly?″

1. Chemicals called CFCs have been destroying the ozone layer. What are they?
a) chlorofluorocarbons
b) hydrocarbons
c) monosodium glutamates

2. How big is the hole in the ozone layer?
a) the same size as the UK
b) the same size as the USA
c) the same size as Africa

3. How long do CFCs stay in the atmosphere?
a) a year
b) 100 years
c) 10 years

4. What damages the ozone layer most?
a) burning the rainforests
b) acid rains
c) pollution of the sea

5. Every year burning rainforests destroy areas the same size as…
a) London
b) Wales
c) Austria

6. Which of this is not ″ozone friendly″?
a) the washing machine
b) the computer
c) the refrigerator

7. In 1945 an atomic bomb destroyed the Japanese city of Hiroshima and killed many people. In 1986 there was a nuclear accident in Chernobyl, Russia

a) equal to the Hiroshima bomb

b) equal to 10 Hiroshima bombs

c) equal to 2,000 Hiroshima bombs

8. Which of these foods can help the world's ecology?

a) eggs

b) cheese

c) Brazil nuts

Read and translate the text.

Vocabulary

fossil fuels – ископаемое топливо

depletion – истощение

nonrenewable resources – невозобновляемые ресурсы

climate warming (global warming) – потепление климата

climate equilibrium – климатическое равновесие

natural variability of the climate – изменения климата, вызванные естественными причинами

the extent and timing of global warming – масштаб и время начала потепления климата

geographic range – ареал распространения животного или растения

species – вид (растения или животного)

habitat – место обитания

extinction – вымирание

pattern – характер, распределение

fertile lands – плодородные почвы

flood – наводнение

drought – засуха

hurricane – ураган

proliferate – размножаться

greenhouse gases emissions – выбросы газов, вызывающих парниковый эффект

renewable resources – возобновляемые ресурсы

buildup – накопление

TEKCT 8. CARBON DIOXIDE AND GLOBAL WARMING

Energy is central to our economies, lifestyle and health. It powers industrial production, transportation and agriculture. It provides services such as heating, refrigeration and lightning. All these things raise the quality of life and provide unspoiled food and relief from the stresses of heat and cold.

Global energy use has climbed steadily over the years, as industrial economics have expanded. Since 1971 global energy use has risen nearly 70 per cent and is going to increase over the next several decades. Scientists predict that by 2010 global energy consumption will rise by almost 50 per cent from 1993 levels. Nearly three quarters of all commercial energy is consumed by developed nations, but energy consumption in the Third World is rapidly increasing.

Today more than 85 per cent of the world's energy needs are supplied by fossil fuels (oil, coal and natural gas). Fossil fuels are the remains of plants and animals, laid down in the earth over millions of years. They are cheap and, as many people believe, plentiful. Humankind is using fossil fuels at an alarming rate. This source of energy took million of years to create – we will have used it up in just a few decades. At the present rate of consumption, according to some estimates, there is enough oil for the next 150 years and natural gas – for the next 50 years.

Still, many people think that fossil fuels will be powering our cars, homes and factories well into the 21st century and possibly beyond.

The rapid consumption of fossil fuels produces problems which are very difficult to solve. The depletion of these non-renewable resources is actually the robbery of our own children and grandchildren. Besides, the burning of fossil fuels causes air pollution and carbon dioxide emissions, which are responsible for the global climate warming.

Carbon dioxide is a part of the atmosphere and for millions of years its concentrations changed in a very small range. The rise of carbon dioxide concentrations was usually accompanied by the rise of global temperature and warming of the climate, and the reduction of these concentrations resulted in climate cooling and expanding of ice.

Since the beginning of the Industrial Revolution carbon dioxide concentration has risen by almost one third. In the 20th century humans discharged huge amounts of this gas, and even if they manage to keep its emissions at today's level, carbon dioxide concentration will double by the end of the 21st century.

People are not only putting huge amounts of carbon dioxide into the atmosphere, they are also interfering with the normal way it is removed from it. Trees and other plants remove this gas from the air and replace it with oxygen, transforming carbon into wood. By rapidly destroying the forests, people are damaging the earth's ability to remove excess carbon dioxide.

Global warming

The increase of concentrations of carbon dioxide and other greenhouse gases posed a threat to the earth's ability to regulate the amount of heat retained in the atmosphere. This increase of heat seriously threatens the global climate equilibrium that determines the patterns of winds, rainfalls, surface temperatures, oceans currents and sea level.

Over the past century the planet has warmed 0,3 to 0,6 degree C. Most of the scientists think that this global warming was caused by human activities, but there are some skeptics who believe it to reflect the natural variability of the global climate.

With every passing year the scientific case for greenhouse warming from human causes continues to strengthen. Still some uncertainty remains as to the extent and timing of global warming, as well as to how exactly it will affect earth's ecosystems and people.

Global warming is expected to rise much more rapidly in the Polar Regions than in the rest of the world. As the polar air warms, the ice here will thin, and since the polar cap plays a crucial role in the world's weather system, the consequences could be disastrous. And this process has already begun. The thick ice that has for ages covered the Arctic Ocean at the Pole has turned to water. In August 2000 an ice-free patch of ocean about a mile wide was opened at the very top of the world. The Russian icebreaker ″Yamal″ with tourists aboard reached the North Pole for the first time in human history.

Scientists compared data collected by submarines in the 1950s and 1960s with observations from the 1990s and came to the conclusion that the ice cover over the entire Arctic basin has thinned by 45 per cent. Besides this, the extent of ice coverage has significantly shrunk in recent years.

In many land areas north of the Arctic Circle the spring snowmelt now comes earlier every year and deeper in the tundra below, the temperature is steadily rising. If the frozen tundra thaws, enormous quantities of methane are expected to be produced and released into the atmosphere. Since each methane molecule is twenty times more effective in trapping heat than each molecule of carbon dioxide, there will be a great increase in the overall concentrations of greenhouse gases and global warming will be accelerated.

Since the 1960s warmer average temperatures have brought an earlier spring and a later winter over the higher latitude areas of the Northern Hemisphere, advancing the growing season by about 7 days in spring and extending it about 2 to 4 days in the fall. This has spurred greater plant growth over a wide swath of territory, including Alaska, Canada, Scandinavia, Northern Europe and northern sections of Russia and China. Scientific studies also show a ten per cent reduction of snow cover in higher latitudes.

Not only the plants reacted to surface warming. Field studies of a small American butterfly, known as Edith's checkerspot butterfly, have shown the first convincing evidence that the geographic range of an animal species has shifted in response to climate change. Scientists have long ago predicted that as global temperatures get warmer, the geographic ranges of plants and animals will shift toward the poles or to higher elevations to maintain their preferred temperature conditions. This is precisely what happens to the checkerspot. Over a number of decades, butterfly colonies on the southern limit of the range died, while new colonies formed on the northern limit of the range and also at higher elevations. But many other species of plants and animals will not be as lucky as checkerspot – global development and habitat loss will stand in their way, increasing the possibility of extinction for them.

Global warming will dramatically change the face of the Earth. If the polar ice caps melt, the sea level will rise and low-lying territories with very dense populations will disappear. This will cause massive migrations of people. For example, about ten million residents of Bangladesh will lose their homes. Where will they go?

Global warming is expected to change winds and oceans current patterns. As a result, vast territories of rich, fertile binds will turn into deserts.

Such disasters as tornados, floods, droughts and hurricanes may become more frequent, and occur in such places where they never (or seldom) happened before.

Computer models predict that global warming will expand the incidence and distribution of many illnesses, such as malaria, yellow fever, cholera and several kinds of encephalitis.

Mosquitoes, which transmit malaria parasites, can live only where temperatures routinely exceed 15 degrees C. Winter freezing kills their eggs and adults. However, as the air becomes warmer, mosquitoes proliferate faster and bite more people. As the whole areas heat up, mosquitoes will expand into formerly forbidden territories, bringing illnesses with them. Some models predict that by the end of the 21st century malaria will spread to the north and south of the tropics, including the eastern states of the USA, nearly all European countries, the European part of Russia, and vast territories of the Siberia.

Reducing carbon dioxide emissions

To prevent global warming mankind should significantly reduce the emissions of greenhouse gases into the atmosphere. This task will require a major change of global energy consumption – away from the use of oil and coal and toward renewable energy resources (solar and wind energy). Buildings and transportation systems, as well as industrial processes, must be redesigned to use energy much more efficiently. But undertaking these measures will entail political decisions and economic costs.

In December 1997, 167 nations signed the Kyoto Protocol – the first international attempt to reduce greenhouse gases emissions. The Protocol aims to cut these emissions by five per cent from the 1990's levels.

Nations with the highest carbon dioxide emissions – the USA, Japan and most European countries are expected to reduce them by 6-8%. This reduction seems to be very small, but it will require substantial changes in energy policies and consumer behavior in these countries.

However, even if the developed countries manage to achieve five percentage reduction of greenhouse gases emissions (which is an extremely difficult task!), that will only slow – not halt – the buildup of greenhouse gases in the atmosphere. Stabilizing carbon dioxide concentrations would require 60 per cent reduction of this gas from all nations. And there is no guarantee that this would be a safe concentration.

Efforts to reduce carbon dioxide emissions will also lead to measurable reduction of air pollution, with immediate improvements in air quality and human health. The policies that will avert greenhouse warming in the long term will save hundreds of thousands lives. Even a fifteen per cent cut of carbon dioxide emissions will prevent 700,000 deaths per year.

Answer the questions

1. Why is energy central to our economies, lifestyles and health?
2. What sort of energy took millions years to create?
3. What are the rise and the reduction of carbon dioxide concentrations usually accompanied by?
4. How do people interfere with the normal way of existence of carbon dioxide?
5. What do most of the scientists think about the warming of the planet? What do skeptics think about it?
6. Where is global warming expected to rise much more rapidly than in the rest of the world?
7. What will happen if the frozen tundra thaws?
8. Will global warming change the face of the Earth?
9. What do computer models predict?
10. What must people do to prevent global warming?
11. When was the Kyoto Protocol signed?
12. What does it (the Protocol) contain?

1. Locate the conservation words listed below and circle them

conservation	**energy**	**fossil**	**fuels**
oil	**gas**	**nuclear**	**animals**
endangered	**extinct**	**refuge**	**plants**
herbicides	**pesticides**	**fertilizer**	**carbon**
gases	**greenhouse effect**	**thermal**	**green house**
dioxide	**nitrogen**	**oxide**	
pollution	**zoo**	**coal**	

G C A R B O N D I O X I D E A R
A R T C A N S E D I C I B R E N
S F E R T I L I Z E R D O E G A
L O G E O K A T T H E I T X I N
D S R E N E R G Y U F D S T O I
E S E N E H C Y N N E V E I D M
D F E O R K O I L R O N T N A A
I O N A L I A U E D X U N C N L
X S H E A N L G S A L C S T N S
O F O D T H N T A L N L L L E I
N E U E S A T U O P I E E D D O
E U S L D R A P Y E H A U T S G
G S E N B E L C L I O R F A M I
O L E A C A T H E A S L L F I L
R K F B M I S Q U E N I I N G I
T S F R E S E D I C I T S E P N
I U E Z L O H E H T F O S L L A
N H C O N C E R V A T I O N S T
T G T O I O N M A R R E F U G E
G R E E N H O U S E G A S E S K

2. Check (*V*) the true facts from the reading

Global warming…

_____ leads to rise of the average Earth's temperature.

_____ is e expected to rise more rapidly in the polar regions.

_____ affects plants only.
_____ is expected to change winds and oceans current patterns.
_____ will turn vast territories of deserts into fertile lands.
_____ will expand the incidence and distribution of many illnesses.
_____ does a useful job to mankind.

3. Match these tenses with the sentences below: Present Simple (*Passive*), Present Continuous (*Passive*), Future Continuous; Past Simple, Past Continuous, Future Simple (*will, going to*); Present Perfect; Past Perfect

1. He is expected to make a report about mankind's destructive influence on the environment.
2. I hadn't explored town centre before.
3. Our group is going to take part in a summer international program.
4. Pollution has already caused a large hole in the ozone layer and increased global warming.
5. Loss of plant species within the rainforests will mean that many life-saving drugs will never be discovered.
6. The ancient Romans were pioneers of public health but they were very short-sighted about the health of the environment.
7. The rainforests are being cut down rapidly.
8. The volume of both industrial and domestic waste has increased dramatically over the past 50 years.
9. This time next week I'll be discussing traffic pollution.

4. Make up the plan of the text and retell it.

Read and translate the text.

Vocabulary

sulphur dioxide – двуокись серы
airborne – воздушный
lead pollution – загрязнение свинцом
car exhaust – выхлопные газы
combustion – сгорание
fossil fuel – ископаемое топливо

contaminant (pollutant) – загрязняющее вещество
nitrogen oxide – окись азота
particles – частички
mortality rate – смертность
acid rain – кислотный дождь
decline of forests – гибель лесов
long-range – крупномасштабный
vehicle – средство передвижения, автомобиль
contamination – загрязнение, заражение
emission – выброс загрязняющих веществ в атмосферу
fine suspended particular matter – мельчайшие взвешенные в воздухе частички
major pollution events – случаи сильного загрязнения воздуха
soot – сажа

ТЕКСТ 9. AIR POLLUTION AND ACID RAINS

Without air there can be no life. Without air of good quality there cannot be a healthy life. Air pollution is an old problem, which has in this century assumed wide economic and social significance. Perhaps the firs general realization of the new dangers came with the great London smog of December 1952. For five days the capital of England was enveloped in a grey shroud, and over 4 thousand people had died and incalculable numbers had suffered a worsening of bronchitis and heart disease.

An average person requires over thirty pounds of air a day or about six pints every minute. Daily the individual draws 26,000 breaths, between 18 and 22 each minute, many of which are of filthy air. The lungs of town inhabitants are usually grayish in colour, those of country people are normally pale pink.

The air is being polluted by acid gases, dust, petrol and diesel fumes and poisonous chemicals. These come from cars, factories and power plants.

Of all the pollutants that taint the air fine suspended particulate matter, sulphur dioxide and ozone pose the most wide-spread and acute risks. However, airborne lead pollution, coming from car exhausts, is a critical concern in many cities as well.

Particulate pollution

Suspended particulate matter is nearly ubiquitous urban pollutant. It is a complex mixture of small and large pictures of varying origin and chemical composition. Larger particles, ranging from 2,5 microns to 100 microns in diameter, usually comprise smoke and dust from industrial processes, agriculture, construction and road traffic, as well as plant pollen and other natural sources. Smaller particles – those less than 2,5 microns in diameter – generally come from combustion of fossil fuels. These particles include soot from vehicle exhaust, which is often coated with various chemical contaminants or metals. They also include line sulfate and nitrate aerosols that form when sulphur dioxide and nitrogen oxides condense in the atmosphere. The largest source of fine particles is coal-fired power plants, but auto arid diesel exhausts are also prime contributors, especially along busy transportation corridors.

The health effects of particles are strongly linked to their size. Small particles, such as those from fossil fuel combustion, are more dangerous, because they can be inhaled deeply into the lungs, setting in areas, where the body's natural clearance mechanisms can't remove them. The constituents in small particles are more chemically active and may be acidic as well and therefore more damaging.

Particulate pollution causes acute changes in lung function, respiratory illnesses, heart disease and aggravation of asthma and bronchitis. During major pollution events, when particulate levels in the air increase up to 200 micrograms of particulate matter per cubic meter, daily mortality rates increase as much as 20 per cent.

Acid rains

Other very dangerous pollutants are sulfur and nitrogen oxides. These gases are released by factories and power plants when fossil fuels

are burned and by cars. These oxides reach high into the atmosphere and mix with water and other chemicals to form rain that can be as acid as vinegar. Acid rains are responsible for the decline of many forests. Tiny droplets of acid attack plant leaves, disrupting the production of chlorophyll. It also weakens the tree by altering the chemistry of the soil that surrounds its roots.

Acid falls down to earth as rain and snow. Black snow, as acid as vinegar, fell in Scotland in 1984. Acid rain affects everything it falls on. Rivers, lakes and forests are at risk throughout Europe and North America. In Sweden more than 18,000 lakes have become acidic; 4,000 of them very seriously indeed. This kills fish and drives out fish-eating wildlife.

Forests are particularly badly affected by acid rain and in many places previously green, luxuriant trees show bare branches at the top, stripped of foliage. In West Germany 50 per cent of trees are affected and unless some curb is placed on pollution, the figure is certain to rise, in Austria, if nothing is done, scientists and environmentalists have predicted that there will be no trees left by the end of the century.

There is a possibility that damage to ecosystems from acid deposition may be more fundamental and long-lasting than was first believed. Scientists now report that aid rain leaches as much as 50% of the calcium and magnesium from the forest soils. These minerals neutralize acids and are essential for plant growth. If soil chemistry is changed in this way, it may take many decades for all linked ecosystems to recover. Besides this, acid rain releases heavy metals and other toxic substances, providing a persistent source of toxicity to surrounding vegetation and aquatic life.

Buildings ″die″ too. Some of the most beautiful historic buildings in the world are being eaten away by the dilute acid, rained on them. Notre Dame, Cologne Cathedral and St. Paul's Cathedral have all been damaged.

A major problem with air pollution is that it does not obey national boundaries. The planet's wind cycles and currents can carry pollution hundreds of miles away from its original source. So Britain is a large contributor to air pollution in Sweden and creates more for Norway than Norway does itself. The pollutants of the USA end up on the eastern coast of Canada.

Acid rain emerged as a concern in the 1960s with observations of dying lakes and forest damage in Northern Europe, the United States and Canada. It was one of the first environmental issues to demonstrate hoe the chief pollutants – oxides of sulfur and nitrogen – can be carried hundreds of miles by winds before being washed out of the atmosphere in rain, snow and fog.

As evidence grew of the links between air pollution and environmental damage, legislation to curb emissions was put in place. The 1979 Geneva Convention on Long-Range Transboundary Air Pollution set targets for reduction of sulfur and nitrogen emissions in Europe that have largely been achieved. The 1970 and 1990 Clean Air Acts have led to similar improvements in the USA.

Many nations have adopted air quality standards to safeguard the public against the most common pollutants. These include sulphur dioxide, carbon monoxide, suspended particulate matter, ground-level ozone, nitrogen dioxide and lead – all of which are tied directly or indirectly to the combustion of fossil fuels. Substantial investments in pollution control have lowered the levels of these pollutants in many cities of some developed countries. But poor air quality is still a major concern throughout the industrialized world.

Meanwhile, urban air pollution has worsened in most large cities in the developing world, a situation driven by population growth, industrialization and increased vehicle use. Despite pollution control effects, air quality has approached the dangerous levels, recorded in London in the 1950s, in such megacities as Delhi, Jakarta and Mexico City.

In some parts of Asia, such as Southeast China, Northeast India, Thailand and Republic of Korea, and in the Pacific region acid rain is now emerging as a major problem. In the Asia region the use of sulphur-containing coal and oil is very high. In 1990 34 million metric tons of sulphur dioxide were emitted there, which is over 40 per cent more, than in North America. The effects are already being felt in the agriculture. In India wheat growing near a power plant suffered a 49% reduction in yield. Other ecosystems are also beginning to suffer. Pines and oaks in acid rain-affected areas of the Republic of Korea showed significant declines in growth rates since 1970.

Many countries in the world are trying to solve the problem of air pollution in various ways, either by trying to burn fossil fuels more cleanly or by fitting catalytic converters to their cars, so fewer poisonous gases are produced. In some countries, like Sweden for example, new power plants use a method called fluidized bed combustion, which cuts sulphur emissions down by 80 per cent. In Germany sulphurous smoke is sprayed with lime to produce gypsum, which is then used for building roads. Developing technologies like this may raise the price of electricity a little, but will save millions of trees, plants and animals and human health.

Answer the questions

1. When did people realize a new danger for their health? What kind of danger is it?
2. Why are the lungs of town inhabitants grayish in colour?
3. What pollutants pose the most wide- spread and acute risks?
4. What does suspended particulate matter?
5. What are the sources of large particles? small particles?
6. Which particles are the most dangerous and why?
7. What are the effects of particulate pollution?
8. Which gases cause acid rains?
9. What are the sources of these gases?
10. How does acid rain form?
11. How does acid rain affect the plants, buildings, lakes and soil?
12. What is the main problem with air pollution? Prove your statement.
13. How do people try to curb air pollution?
14. In what parts of the world acid rain is emerging now as a major problem?

1. Check (*V*) the true facts from the reading

Air pollution…

_____ comes from smoke in the air.
_____ is not much of a problem.
_____ causes burning cars and buses
_____ comes from poison gases and dust.
_____ makes dirty air.

_____ helps people stay healthy.
_____ can affect the heart.
_____ hurts only people.

2. Circle the correct answer

1. Dirt in the air is called (a) disease (b) pollution (c) gases.
2. Burning fuel comes from (a) dust (b) coughs (c) cars.
3. Smoke carries (a) poison colds (b) poison gases (c) poison plants.
4. Dirty air is bad for the (a) hands and feet (b) arms and legs (c) heart and lungs.

3. Read the text below. Use the word at the end of each line to form a word that fits in the space in the same line

The use of animals for (1) _____ purposes is a	science
difficult (2) _____ issue. Many people owe their lives	ethics
to modern drugs or (3)_____ techniques that were	surgery
first (4) _____ on animals. Some of these	test
(5)_____ would not have been possible without animal experiments. People who	develop
campaign for animal rights are usually young and (6)_____ and	health
have not yet needed the benefits of (7) _____ progress.	medicine
Perhaps it is ethically (8)_____ to sacrifice animals for the sake of medical research, as long as the	accept
animals do not suffer. But that (9)_____ standpoint raises two	theory
difficult questions: the first is what (10)_____ as medical	count
research and the second, what counts as (11)_____?	suffer

4. Make up the plan of the text and retell it.

Read and translate the text.

Vocabulary

life-sustaining – поддерживающий жизнь
irreversible – необратимый
lush – буйный (о растительности)
rainfall – количество выпадения осадков
deforestation – вырубка леса
interconnect – связывать
overpopulation – перенаселенность
inequitable – несправедливый
implement – осуществлять
controversy – полемика, дискуссия

ТЕКСТ 10. DEFORESTATION: THE UNKINDEST CUT

The earth is made up of many different ecosystems, but none more spectacular and life-sustaining than the forests. We depend upon the world's forests to regulate climate, clean air and water, conserve precious soil and provide habitat to much of the planet's wildlife.

Forests of all types are giving way to population pressures, causing irreversible damage to an integral part of our biosphere. Of the approximately 6,750,000 square miles of lush forest canopy that once covered the planet, only 40 per cent remains.

Trouble in the tropics

Of primary global concern is the loss of the Earth's tropical rainforests. Tropical rainforests are defined primarily by two factors: location (in the tropics) and level of rainfall. Rainforests receive four to eight meters of rain each year. The five meters of rain that falls on Borneo each year represents five times the rain that annually falls on New York City. Due to a constant climate, rainforests grow all year long.

The effects of rainforest destruction are felt by every community in the world. Although tropical forests cover less than seven per cent of the global land surface, they are home to more than half the species of all living things. Rainforests are a treasure house of foods, medicines, and other resources we have only begun to discover. Less than one per cent of rainforest species have even been studied for their potential usefulness.

Tragically, 100 acres of tropical forests are destroyed every minute. The World Resources Institute estimates that the planet loses 51 million acres of rainforest (about the size of Pennsylvania) every year to agriculture, ranching and timbering in Southeast Asia, Africa, and Central and South America. In fact, all the primary rainforests in India, Bangladesh, Sri Lanka and Haiti have been destroyed; the Ivory Coast rainforests have been completely logged out; and the Philippines and Thailand have depleted half of their rainforests since 1960. Of the 8 million square miles of tropical forests that once circled the globe, fewer than 3 million square miles remain, and these are being destroyed at an ever-increasing rate.

A deep-rooted problem

What drives humans to destroy this precious ecosystem? The causes of rapid tropical deforestation are many and often interconnected. The initial and probably most devastating cause has been the lack of knowledge concerning the rainforest. A case study in Brazil illustrates this point. In 1969, Brazil enacted a National Integration Program with the goal of populating Amazonia with thousands of landless and unemployed people. This was in response to overpopulation and inequitable distribution of land and wealth. Another goal of the program was to get wealthy investors to clear the forest lands and raise cattle for export to the industrialized world. The program proved a disaster because the people implementing the project failed to realize that the richness of the once-vast Amazon forest is in trees, not its soil. Land cleared by slash-and-burn techniques will support a farmer for a year or two before the soil erodes and the farmer is forced to relocate elsewhere to continue this destructive process. With some prior research, such a program would not have been implemented, and vast amounts of Amazonian forests would

have been saved. Because of this oversight, the Brazilian government's goals to create additional habitation and grazing land were not realized. This scenario has been repeated in different regions of the world.

Another leading cause of deforestation, particularly in parts of Africa and Asia, is the need for firewood. Nearly one half of the world's population depends on wood for fuel to cook and to heat their homes. It is estimated that nearly 100 million people are unable to meet their minimum fuel needs. The endless search for wood dominates the lives of millions of women and children who spend anywhere from 100 to 300 days each year looking for firewood.

Timber harvesting is yet another major contributor to tropical deforestation. Tropical forests provide about one-fifth of all the wood used worldwide in industry, and that share is expected to grow as the world's population continues to increase. In the process of harvesting timber, industries build roads to facilitate retrieval of the wood deeper in the rainforest. These roads open once-impenetrable forests to exploitation by miners, hunters, ranchers and farmers.

Deforestation, American-style

While rainforest destruction is a globally significant issue, the cutting down of old-growth forests in the United States has developed into a national controversy. Since the turn of the century, the U.S. Forest Service has been overseeing the management and protection of national forests. In total, there are 156 national forests, covering 191 million acres. In September of 1986, the agency released its plans to nearly double the timber harvest from the national forests by the year 2030.

Much of the bitter controversy between environmental groups, the timber industry, and the federal government has been directed toward the fate of the old-growth forests. At one time, old growth covered some 15 million acres in the Pacific Northwest. Some areas included trees ten feet wide, 275 feet tall and 1,120 years old. But because of their size and bulk, old-growth trees represent valuable lumber to loggers. During the past century, some 12 million acres have been cleared. Less than five per cent of the nation's original, virgin forests remain today, compared with Japan's

26 per cent. Less than one per cent of the nation's native forests are protected from logging. According to the Native Forest Council, US forests are cut at the rate of two football fields every minute.

Both tropical and old-growth forests are rapidly disappearing because they are being logged and burned far faster than they are being replenished. Many of the effects of deforestation are the same for both tropical rainforests and old-growth forests. One of the catastrophic consequences of continued deforestation is mass species extinction, especially in the rainforests, home to more than 80 million species.

Additionally, deforestation causes forests to lose their meditating effects on rainfall, resulting locally in erosion, drought and flooding. Globally, deforestation affects the world's climate. A broad uprising of air follows the rainforest around the equator, driven, in part, by heat absorbed by tropical forests. This massive uprising helps drive the circulation patterns of the entire global atmosphere. Tropical deforestation can disrupt this process, resulting in reduced rainfall and altered weather conditions over a large portion of the globe.

All deforestation adds to the atmospheric pool of rising carbon dioxide emissions, hastening the onset of global warming. An intact forest naturally removes carbon dioxide from the air and stores it through the process of photosynthesis. When trees are cut down, this carbon dioxide is released into the atmosphere.

Answer the questions

1. What is ″deforestation″?
2. Why do we depend on the world's forests?
3. What are ″rainforests″? What factors are they defined by?
4. How many acres of rainforests does our planet lose every year? Where do they go?
5. What drives human to destroy this precious ecosystem?
6. Why do rainforests grow all year long?
7. Are the effects of rainforest destruction felt by every community in the world?
8. How many square miles of tropical forests remain?
9. What can you offer to prevent deforestation?

1. Agree or disagree. Prove your opinion

1. The world is made up of many different ecosystems.
2. Of primary global concern is the increase of the Earth's tropical rainforests.
3. The effects of rainforests destruction are not felt by every community at all.
4. Rainforests are a treasure house of foods, medicines and other resources.
5. The World Resources Institute estimates that the planet loses 51 million acres of rainforest every year.

2. Complete the biome story with the words below so it will make sense. Use each word once.

wildlife	**save**	**furniture**
temperatures	**oceans**	**burn**
animals	**boycott**	**replanted**
disappearing	**biomes**	**disasters**
tropical	**rainforest**	**deserts**
cattle	**laws**	**trees**
carbon	**dioxide**	

The _____ is one of the most important land biomes. The trees and other plants live there take_____ out of the air. When too much carbon dioxide builds up in the air, _____rise all over the Earth. These rising temperatures could result in many new _____ forming, the polar ice caps melting, and rising water levels in the _____. These _____ could make the Earth a much less desirable place to live.

The tropical rainforest is being destroyed faster than the other_____. Farmers_____ thousand of square kilometers of the rainforests each year to clear the land to grow crops. Other people cut down the trees to make_____. Ranchers clear the land to raise_____ so they can sell the meat. The_____ that live in the

rainforests are losing their homes. Many of the rainforest plants are in danger of_____ forever.

Things can be done to_____ the rainforests. People can pass_____ to limit the destruction of the rainforests. Areas where trees are cut down can be_____.

Animals' homes can be saved by setting aside protected _____ areas. People can_____, or refuse to buy beef that was raised on land that was once a rainforest. They can also avoid buying furniture made from_____ that were removed from the rainforests.

3. Match the phrasal verbs and idioms in list A with their meanings in list B

A	**B**
1. to make up one's mind	a. to find information
2. to set up	b. to decide
3. to take up	c. to increase
4. to give up	d. to go in for smth.
5. to go up	e. to organize
6. to look up	f. to stop doing smth.
7. to catch up with smb.	g. to allow smb. a short stay in your house
8. to put up	h. to come from behind and reach the same position as smb. else

4. Make up the plan of the text and retell it.

Read and translate the text.

Vocabulary

contaminant = pollutant – загрязнитель

expose to – подвергаться воздействию

exposure to – воздействие чего-либо на кого-либо

cancer – рак

volatile organic compound – летучее органическое соединение

benzene – бензол
dry-clean – чистить при помощи химических веществ
treat – обрабатывать запасы воды
carbon monoxide – угарный газ
incomplete combustion – неполное сгорание
fine particles – мельчайшие частицы
repellent – репеллент (вещество, отпугивающее насекомых)

ТЕКСТ 11. INDOOR POLLUTION

Most citizens have the greatest contact with toxic pollutants not outside but inside their homes, offices and cars. These places are usually considered to be unpolluted, but the levels of many contaminants proved much higher indoors than out.

Daily routine exposes people to many harmful substances – chemicals known to cause cancer. Among them are toxic volatile organic compounds, including benzene (which comes from cigarette smoke); tetrachloroethylene (which is used to dry-clean clothes); chloroform (which comes from the chlorine used to treat water supplies). The chief sources of other toxic volatile compounds are ordinary consumer products, such as air fresheners, cleaning compounds and various building materials.

Other indoor contaminants are: carbon monoxide, a product of incomplete combustion, that robs the blood of oxygen; fine particles – particles smaller than 2,5 microns in size – the product of combustion, such as smoking, cooking, burning candles or firewood; pesticides and heavy metals; dust mites, mold and animal dander, which are asthma-including allergens.

The main sources of indoor pollution are right under people's noses – most repellents, pesticides, solvents, deodorizers, cleaners, dry-cleaned clothes, dusty carpets, paint, adhesives, fumes from cooking and heating and cigarette smoke, to name a few.

Scientists in America came to the conclusion that everyday items, with which people happily share their homes, could be more dangerous to their help than industrial pollution. For example, benzene is known

to cause leukemia in workers continually exposed to its high concentrations. It is present in gasoline, some household products and in tobacco smoke. The average concentration of benzene people inhale in their houses is three times higher than typical outdoor levels. Some 45 per cent of the total exposure to benzene comes from smoking (or breathing smoke exhaled by others), 36 per cent from inhaling gasoline fumes or from using glues, 16 per cent from paints and gasoline, stored in basements or attached garages. And only 3 per cent comes from the industrial pollution. So living with a smoker is dangerous for one's health.

Cutting all industrial releases of benzene would reduce health risks only to a tiny fraction. Yet even a modest reduction in cigarette smoking would significantly reduce the rate of benzene causing diseases.

Other volatile organic compounds that are quite toxic at high concentrations are also more prevalent indoors than out. The greatest exposure to tetrachloroethylene occurs when people live in buildings with dry-cleaning facilities, wear recently dry-cleaned clothes or store chemically laden garments in their closets. Moth-repellent cakes or crystals, toilet disinfectant and deodorizers are the major source of another cancer-causing compound, paradichlorobenzene.

It is clear that less contact with volatile organic compounds is better than more. People can reduce their harmful effect to the people's health by avoiding products containing such pollutants.

But there are other worrisome vapours that are difficult to avoid. When people take hot shower, boil water or use clothes washers, they inhale chloroform – a gas, forming the chlorine, used to treat water supplies. The only way to minimize household exposure to chloroform is to drink bottled water or to run it through a good-quality filter and to improve ventilation in the bathroom and laundry.

Better airflow can also help to reduce the level of carbon monoxide, which can be very high indoors. This gas is particularly harmful to people with heart ailments. Poorly operated gas stoves, grills and furnaces can cause extremely unhealthful conditions – even death.

Another environmental concern that appears more severe indoors than out is the danger from fine particles. Exposures to these particles

during the day are very high. Partly it can be explained by the fact that people do not simply float through the air. They usually stir up "personal clouds" of particle-laden dust from their surrounding as they move about.

Indoor air contains ten or more times higher concentrations of pesticides than outside air. Such poisons can be trackled in on people's shoes. Pesticides that break down within days outdoors may last for years in carpets, where they are protected from the degradation caused by sunlight and bacteria. For example, the pesticide DDT, banned from using in 1972, was found in the carpets of the Americans twenty years later!

House dust is the major source of exposure to cadmium, lead and other heavy metals, as well as to many pollutants. Carpets are most troublesome, because they act as deep reservoirs for these toxic compounds (as well as for dangerous bacteria and asthma-including allergens) even if the rugs are vacuumed regularly. Plush and shag carpets are more of a problem than flat ones; floors covered with wood, tile or linoleum are better for health, because they can be easily cleaned. Wiping one's feet on a doormat reduces the amount of lead in a carpet by a factor of six. Removing one's shoes before entering is even more effective than just wiping the shoes. These preventive acts are very simple but they help to reduce the levels of contaminants considerably.

Sadly most people and officials as well are rather complacent about indoor pollution. The Environmental Laws are focused mainly on outdoor pollution ignoring the fact that people spend 95% of their time inside.

Few people know that the pesticides and volatile organic compounds found indoors cause 3,000 cases of cancer a year. So these substances are just threatening to people's health as radon and tobacco smoke for non-smokers. Toxic house dust can be a particular menace to small children, who play on floors, crawl on carpets and regularly place their hands in their mouths. Infants are particularly susceptible: their rapidly developing organs are more prone to damage, they have a small fraction of the body weight of an adult and may ingest five times more dust – 100 milligrams a day on average. Each day an average urban child ingest 110 nanograms of benzoprene – it is equivalent to smoking three cigarettes.

People do not have to wait for their government to make changes in the environmental regulations. Reducing exposure normally demands only modest alterations in one's daily routine. Giving up smoking, taking out carpets, improving ventilation, using water and air filters, avoiding household products, containing toxic compounds, will make our houses and offices healthier places to live and work.

Answer the questions

1. Why is indoor pollution more dangerous than outdoor pollution?
2. What volatile organic compounds do you know? Name them.
3. What do these chemicals cause?
4. What are the main sources of indoor pollutants?
5. Why should we drink bottled water?
6. Where can we find pesticides indoors?
7. What does house dust consist of?
8. What are the main indoor contaminants? Name them.
9. How much time do people spend indoors?
10. What should we do to prevent ourselves from indoor pollution?
11. What are the ways to minimize the level of contaminant?

1. Agree or disagree. Prove your opinion

1. The levels of many contaminants proved much higher indoors than outdoors.
2. Such contaminants are not known to cause cancer.
3. Carbon monoxide is a very useful chemical for our health.
4. One of the main sources of indoor pollution is pesticides.
5. Volatile organic compounds are very toxic at high concentrations.
6. More contact with volatile organic compounds is better than less.
7. When people take hot shower they inhale chloroform.
8. Shag carpets are never a problem for pollutants as compared with flat ones.
9. The Environmental Laws are focused mainly on outdoor pollution.
10. House dust can never be a menace to small children.

2. Use the correct tense in these sentences

1. During the past two hundred years, humankind (to invent) powerful technology.
2. If we (not to take) action to protect the earth's atmosphere; it soon (to become) unable to protect us.
3. Nowadays very many people in Russia (to protest) against water being polluted with industrial waste.
4. The earth probably (to contain) between 10 and 100 million different species.
5. By the end of the 19th century, the British people (to learn) that they should plan the growth of their towns and cities.
6. Man (to grow) crops for 10,000 years.

3. Read the words below read the sentences. Use the words to complete the sentences

sun energy fuels beneath fossil oil
wind used pollute natural corn

1. _____ is moving air.
2. _____ is a fossil fuel.
3. Solar energy is made by using the rays of the_____.
4. In the future, some fossil fuels will be _____ up.
5. Solar energy does not_____ the air.
6. Today, we are using fossil_____ too.
7. _____ gas is a fossil fuel.
8. Fossil fuels were formed_____ the earth.
9. Coal is a_____ fuel.
10. Windmills have been used to grind_____.
11. _____ is needed to make things move or work.

4. Make up the plan of the text and retell it

Read and translate the text.

Vocabulary

odour – аромат, запах, привкус

shade – тень
grit – гравий, песок
fuel – топливо
pollution – загрязнение
measure – мера, степень
deposit – класть откладывать
loose into – высвобождать(ся)
combat – бороться
persistent – устойчивый, постоянный
unburnt – несгоревший
comprehensive – всеобъемлющий, исчерпывающий
extent – размер, круг, диапазон
on the average – в среднем
phenomena – явления
hygiene – гигиена

ТЕКСТ 12. SMOG IN THE TROPICS

For most people, who have only dreamed of going there, Mexico is a country of colour, of light and shade, of brilliant sunshine. However, the traveler arriving for the first time in Mexico City can often be disappointed. The sky is free of clouds, but it is not so blue as he imagined. The air has a slight but persistent odour. The fact is that Mexico City has smog. It is not so depressing as that of London, but still it is there, becoming thicker each year as the city grows.

Mexico is becoming industrialized, but still not to the extent of cities in North America and Europe. Nevertheless the experiments show that on average, about five tons of dust and greet were deposited per square kilometer per week during the weather, and that in the centre of the city the figure rose to over fifteen tons, which is almost as high as that observed in English industrial towns, such as Birmingham. How could this be true in a city which is not so heavily industrialized?

The reason is that Mexico City lies in a valley surrounded on all sides by high mountains. Winds are light and smoke, instead of being carried away, just hangs around the valley. Two hundred tons of smoke are loosed into the air every day and probably half of this is unburnt fuel. It becomes clear that all possible steps must be taken to control these phenomena and prevent the danger to public health.

A beginning has now been made in Mexico. On the one hand the Institute of Applied Science is continuing its work and is making a special study of the phenomena. On the other hand, the Mexican Ministry of Health has set up a special air pollution section in its Department of Industrial Hygiene, which has started a comprehensive study not only of the smoke but also of the gases which are found in the air.

We know that the smog exists, because we can see it every day. We know it may easily become a danger. But there are also many questions which must be answered before affective steps can be taken to combat it.

What does the smog consist of? What kind of smoke grit and gases does it contain? Where does it come from? When the answers to these questions are known, but not before, it will be possible to plan effective measures.

Answer the questions

1. Why can a traveler to Mexico City be disappointed at first?
2. What kind of air is there?
3. What is there in Mexico City?
4. Is Mexico an industrialized country?
5. How many tons of grit and dust are deposited there per square kilometer?
6. Where does Mexico City lie geographically?
7. What happens to smoke in the valley?
8. Is smoke the danger to public health?
9. What organization has set up a special air pollution section and why?
10. What does the smog consist of?
11. Where does it come from?
12. What effective steps must be taken to combat this problem?

1. Give the three forms of the following verbs

to become, to grow, to rise, to observe, to be, to burn, to begin, to set up, to find, to know, to take, to study

2. Form questions to the italicized words

1. The air has a *slight but persistent* odour.
2. Mexico City lies *in a valley* surrounded on all sides by high mountains.
3. *Two hundred tons* of smoke are loosed into the air every day.
4. A beginning *has* now *been made* in Mexico.
5. We can see *the smog* every day.
6. The smog is becoming thicker each year *as the city grows*.

3. Translate the following word-combinations

sharp pencil	fresh air	hard work	deep river
sharp voice	fresh water	hard rock	deep voice
sharp wind	fresh place	hard time	deep-blue sky
sharp frost			

4. Make up the plan of the text and retell it.

ЧАСТЬ II
СЛОВАРЬ ЭКОЛОГИЧЕСКИХ ТЕРМИНОВ

greening: the act of making something green or fresh: a restoration. *The program to plant trees along the downtown boulevards is one aspect of the mayor's plan for the greening of the city.*

ecology: a division of biology concerned with the relationship between living things and their environment. *Because there are so many people today using the natural resources of the world, ecology has become an important concern.*

extinct: no longer existing or found on earth. *Dinosaurs and the giant mammoths are now extinct.*

endangered species: animals that are threatened with extinction. *The orangutan, rhinoceros, and falcon are endangered species.*

rainforest: a moist, densely wooded area with an annual rainfall of 200 cm. *The largest rainforests in the world are found in South America.*

environmentalist: a person who works toward protecting the environment from destruction or pollution. *Environmentalists may be in opposition to commercial interests of big corporations.*

ozone layer: a region in the upper atmosphere containing a high amount of ozone gas that absorbs the sun's ultraviolet radiation. *Some chemicals used in refrigerators and in the production of foam plastics reduce the ozone layer, allowing harmful ultraviolet radiation to enter, thereby contributing to skin cancer.*

acid rain: precipitation containing high levels of nitric and sulfuric acids resulting from car exhaust and factories. *The smoke from the steel mills in Indiana mixes with the moisture in the air and falls as acid rain in the Adirondack Mountains of New York, killing trees and polluting rivers.*

greenhouse effect: the phenomenon by which the earth's atmosphere traps some of the sun's heat as it radiates from the earth's surface. *The greenhouse effect is noticeable in the warmer temperatures that we have experienced over the last two decades.*

landfill: method of solid waste disposal in which refuse is buried between layers of dirt to fill in low-lying areas. *People were becoming*

seriously ill because their neighborhood had been built upon landfill that contained poisonous waste products.

global warming: the increase in world temperatures due to the greenhouse effect. *Global warming is causing some melting of the polar ice caps, resulting in increased coastal flooding.*

solar energy: electrical power generated by the heat of the sun. *The desert home was powered entirely by solar energy.*

biodegradable: capable of quick decomposition into products that are not harmful of the environment. *The fast-food chain stopped using foam plastic containers because they are not biodegradable.*

fuel-efficient: using little fuel. *Small cars are generally more fuel-efficient than larger ones.*

recycling: the process of collecting used products and remanufacturing them into new products instead of throwing them away as garbage. *Recycling newspapers helps to preserve forests, since fewer trees have to be cut down to make pulp.*

organic fertilizers: a natural product such as manure to make the soil more productive for agriculture. *Unlike chemical fertilizers, organic fertilizers are not harmful to living creatures.*

deforestation: the destruction of forests resulting from excessive clearing. *Deforestation leads to climatic and environmental changes that sometimes cause rich agricultural regions to become desert wastelands.*

composting: making a mixture of decaying organic matter to improve soil structure and provide nutrients for crop production. *A composting attachment for a lawn mower will cut the grass small enough so that it will fertilize the soil when it decays.*

hazardous waste: nuclear waste or an industrial by-product that is potentially damaging to the environment and harmful to the health and well-being of living organisms. *An old car battery is hazardous waste and must be disposed properly.*

energy efficient: using little energy. *Aerodynamic design and lighter materials make automobiles more energy efficient.*

non-toxic: not poisonous. Food preservatives are thought to be non-toxic when they are used in small amounts.

БИБЛИОГРАФИЧЕСКИЙ СПИСОК

1. Азаренкова, М.И. Английский язык: сборник текстов и упражнений / М.И. Азаренкова. – СПб.: Изд-во СЗТУ, 2008. – 49 с.
2. Барановская, Н.В. Some aspects of ecological problems: учебное пособие / Н.В. Барановская, И.А. Матвеенко, Р.М. Даниленко, А.В. Таловская. – Томск: Изд-во Томского политехнического университета, 2009. – 110 с.
3. Man and his environment = Человек и окружающая среда [Текст]: учебное пособие для студентов всех специальностей и форм обучения / авт.-сост. М.А. Иванова, В.Н. Тарабукина; Сыкт, лесн. ин-т. – Сыктывкар: СЛИ, 2005. – 120 с. – (ESP: English for specific purpose).
4. Английский язык. 2000. № 39 [Электронный ресурс]. Режим доступа: URL: http://eng.1september.ru/article.php?ID=200003902. (Дата обращения 15.06.2010).
5. Английский язык. 2000. № 31 [Электронный ресурс]. Режим доступа: URL: http://eng.1september.ru/article.php?ID=200003101. (Дата обращения 25.12.2009).
6. Earth Matters: An Encyclopedia of Ecology [Электронный ресурс]. Режим доступа: URL: http://teachers.sduhsd.net/bbodas/Deforestation%20the%20Unkindest%20Cut.pdf. (Дата обращения 06.03.2012).

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