НАЦІОНАЛЬНИЙ ПЕДАГОГІЧНИЙ УНІВЕРСИТЕТ
ІМЕНІ М. П. ДРАГОМАНОВА

АНГЛІЙСЬКА МОВА ЗА ПРОФЕСІЙНИМ СПРЯМУВАННЯМ ДЛЯ СТУДЕНТІВ ПРИРОДНИЧИХ СПЕЦІАЛЬНОСТЕЙ

ENGLISH FOR ECOLOGY AND ENVIRONMENT

Навчальний посібник

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Вид-во НПУ імені М. П. Драгоманова
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А 64 Англійська мова за професійним спрямуванням для студентів природничих спеціальностей. "Екологія" : навч. посібник / укл. В. М. Запара ; Нац. пед. ун-т імені М. П. Драгоманова. – Київ : Вид-во НПУ імені М. П. Драгоманова. – 108 с.

Навчальний посібник "Екологія" призначений для вивчення англійської мови за професійним спрямуванням студентами І-ІІІ курсів природничих спеціальностей. Завдання розроблені з урахуванням комунікативних потреб майбутніх спеціалістів з екології. Посібник забезпечує формування мовленнєвої компетенції, допомагає засвоїти фахову термінологію, активізувати вміння практично застосовувати набуті знання.

Цілі і завдання – розвиток мовних навичок (читання, усне та писемне мовлення), орієнтованих на рівень В2 Загальноєвропейських компетенцій володіння іноземною мовою. Посібник рекомендовано до вивчення як в аудиторії, так і самостійно.

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Передмова

Даний навчальний посібник призначений для студентів-екологів 1-3 курсів.

Мета навчального посібника – навчання студентів читання та розуміння спеціальної літератури із зазначеної спеціальності англійською мовою, а також збагачення їх словникового запасу.

Всі тексти, включені в навчальний посібник, взяті із сучасних британських і американських джерел. Навчальний посібник складається з 12 розділів і 2 додатків. Розділи навчального посібника об'єднують тексти відповідної тематики, містять передтекстові вправи, лексичні, текстові та граматичні вправи. Передтекстові вправи мають на меті розвиток навичок прогнозування змісту пропонованих текстів за їх компонентами (назвою , ключовими словами , окремими реченнями і т. ін.).

Лексичні вправи призначені для зняття лексичних труднощів при ознайомчому читанні; передтекстові і лексичні вправи рекомендовано виконувати в аудиторії після введення відповідного матеріалу викладачем.

Текстові вправи призначені для розвитку навичок пошукового та вивчаючого читання, а також для вдосконалення навичок перекладу. З цією метою використовується ряд додаткових текстів, які збігаються за своєю тематикою із вмістом базового тексту.

Уроки завершуються граматичними вправами, призначеними, головним чином, для розвитку навичок перекладу, що містять найбільш характерні для англійської мови труднощі граматичного характеру. Слід зазначити, що увага акцентується на тих граматичних явищах, які присутні у досліджуваному тексті, і найбільш часто зустрічаються в англомовній літературі досліджуваної спеціальності.

UNIT 1

Students' Life and Studies. Our University

Text 1. Students' Life and Studies.

Education today is more important than at any previous time in our history. It helps young people to meet challenges of life and to see the world with greater understanding. This course is for large number of students of natural sciences to whom English will be a vital part of their scientific life. English is the language of international scientific communication all over the world.

The goal of education is to help each student to get as much knowledge as possible, to become a creative thinker, to develop a good self-image when he takes his place in the working world. Studies should help students to discover that dealing with scientific issues is fun, interesting and important to their lives.

The objective of a study programme is to provide good knowledge in science and in a special field of student's interest. Students learn to carry out and interpret investigations, and acquire teaching and technical skills in sciences.

The Institute develops a curriculum that produces a well-rounded student with good training in a chosen area of research.

At higher schools basic material is presented in the form of lectures supplemented by class discussions, seminars and laboratory exercises. Students work in laboratories to learn various experimental techniques and to become familiarised with instrumentation and other faculty facilities.

Besides studies and research work students can take part in numerous social activities offered by their department or university. They attend interesting meetings, lectures, films, exhibitions, join various sports and art clubs or societies.

The department actively helps its students to find their professional positions, placing them in jobs for which they are well prepared and in which they can prosper. Graduates of the departments of natural sciences can take industrial posts or choose academic career both in teaching and research fields.

Exercise 1. Learn by heart the following definitions.

Education – the process of developing knowledge or skills; teaching.
Knowledge – range of information or understanding; what is known.
Curriculum – a course of study in a school or college.
Student – one who studies something; one who is enrolled for study at college, etc.
Graduate – one who has completed a course of study at a school or college.
Skill – ability or proficiency.
Technique – method of procedure, scientific operation.
Facility – means by which something can be easily done.
Department – faculty; a separate part or division.

Exercise 2. Answer the following questions to check your understanding of the text.

1. What is the role of education in the life of young people?
2. What is the goal of study programmes?
3. In what form is basic material presented?
4. Where do students become familiarised with experimental techniques?
5. What subjects are included in the curriculum?
6. What careers can graduates of the faculty choose?

Exercise 3. Translate into English.

Скористатися найкращим чином, відвідувати лекції, стати членом клубу або наукового гуртка, зайняти своє місце, проводити

дослідження, мета навчання, гуманітарні дисципліни, обрати кар'єру.

Exercise 4. Write down synonyms to the following terms.

Curriculum, investigation, technique, vital, exercise.

Exercise 5. Translate the proverbs and sayings. Explain their meaning in Ukrainian.

There are many English idioms that cannot be rendered into other languages. Quickly learnt, quickly forgotten. Learn like a parrot. To learn one's lesson. A little learning is a dangerous thing. To teach somebody a lesson. Teach a pig to play on a flute. Teach the dog to bark. Teach school. Learn wisdom by the follies of others. Learn to say before you sing. Learn to creep before you leap. Learn the ropes.

Exercise 6. Translate into English.

1. Роки навчання в університеті – це найкращі роки у житті молоді. 2. Метою навчальної програми є надання глибоких знань у галузі природничих наук та психології. 3. Освіченій людині легше знайти своє місце у житті. 4. Крім теоретичних знань студенти набувають практичних навичок роботи в лабораторії. 5.Студенти вивчають іноземну мову, історію та інші гуманітарні науки. 6. Громадська активність – одна із важливих рис сучасних студентів. 7. Роки навчання найкращим чином готують молодь до кар'єри у промисловості, науці, освіті та мистецтві.

Exercise 7. Summarize the text (in written form).

Text 2. Learning and Studying at University

Studying for a degree is exciting, stimulating, and a challenge. As a mature student, you bring with you a wide range of skills and strengths from your past experience, whether this includes study at college, employment or looking after a family. Whatever your previous background and experience, you will have valuable skills to draw on as you adapt to university study and develop ways of learning that suit you.

Features of university study

A main feature of university study is independent learning. Lectures are your main introduction to a topic, and you plan your own reading and research around these, to explore a topic in more depth.

Reading lists are only a starting point – you get used to browsing and making your own decisions about the type of information you need to focus on. There is generally less contact with lecturers than you may be used to previously.

When you have assignments, you will usually have several weeks to complete them. This means planning time effectively, and fitting study tasks within a weekly schedule. Depending on your course, you are expected to study for roughly 2 hours for every 1 hour lecture. This is only a rough guide, but gives an idea of how many hours in the week you may be studying – for most courses, this adds up to 20-30 hours. Students generally have to be fairly self-reliant, both in making their own decisions about a task, finding the information they need, and locating sources of advice and support when they are needed.

Key skills

Key skills needed for independent learning are being able to organize your time, processing information and making priorities with study tasks, and also thinking for yourself – questioning and thinking critically about ideas and information. It also helps to focus on developing particular skills for particular tasks, such as planning and writing essays, reading and note-taking, and dealing effectively with lectures. You may want to think about how you take notes and deal with lectures initially. Later on, other skills become more important, such as essay writing and revision and exam techniques.

You will also develop skills in other areas of study such as group-work and giving presentations. All these skills are transferable, relevant not only to university study, but for whatever you choose to do after graduation.

How you are assessed

There are four types of assessment common across the university. These are essays, reports, presentations and exams.

Essays

Writing an essay is your opportunity to show what you know about a given subject. You will be given both a topic and a word limit. A word limit is used to make sure that you are to the point yet thorough with the information provided. You may already be familiar with writing essays and in many ways writing an essay at university is no different. One area however, that students can struggle with, is citation. Citation is the referencing of any source of research you refer to in your essay. If you fail to reference or reference incorrectly you may be accused of plagiarism (passing other peoples work off as your own).

Reports

You may be asked to write a report at the end of a practical or research project. A report differs from an essay in that it usually ends with clear recommendations as a result of your findings. A report is split in to clear sections so that the reader can gain information quickly. These sections are usually numbered and headed, any information that is not vital but in support of the report can be included in an appendix at the end.

Presentations

You may be asked to give presentations in a variety of situations. You may be asked to present your findings from a research project, a piece of design work or a group project. You will be given a time limit on the presentation and may even be cut off, by the tutor, if you start to overrun.

How you are taught

You may have between 10 and 25 hours teaching time a week, depending on the practical elements of the course. You will also be required to undertake independent study through reading and making notes to aid understanding.

Lectures

A lecture is a presentation from a tutor, or guest, on a specific topic area to a large group of students. Lectures usually take place in a lecture theatre and can accommodate as many as 300 students. You will be expected to take notes and to have undertaken some reading on the topic

beforehand. It can be tempting to miss lectures, especially those early morning sessions. Good attendance generally equates to good marks. Lectures often give direction to further reading and provide the foundation for further seminars and workshops.

Seminars

Seminars take place in much smaller groups than a lecture and will often be timetabled to enable discussion to develop. Seminars give opportunity to ask questions, clarify areas and discuss the subject matter. You will be expected to play a part in seminars and engage with the topic under discussion. Undertaking any suggested reading will make it easier to participate in seminars and feel more confident contributing to any discussion.

Tutorials

Tutorials are your opportunity to discuss on a one-to-one basis with a tutor any individual essays and projects. You may find that some tutorials involve other students from your course who are working on the same assignment.

Labs, workshop and studio time

Some courses will have timetabled practical sessions based in specialized classrooms.

Exercise 1. Make a short summary of the text (in written form).

Exercise 2. Speak about learning and studying at your University.

Exercise 3. Match the word combinations in column A with their equivalents in column B:

A		B	
1.	social sciences	a.	стати членом наукового гуртка/клубу
2.	to have an opportunity (to do smth.)	b.	вступати в аспірантуру
3.	a modern well-equipped research laboratory	c.	мати нахил до наукової роботи
4.	the problem under investigation	d.	суспільні науки
5.	to get acquainted with (the basic laws of ecology)	e.	отримувати знання

A		B	
6.	to lecture in a subject	f.	проблема, що досліджується
7.	to attend lectures on (ecology…)	g.	сучасна, гарно оснащена науково-дослідна лабораторія
8.	narrow specialization	h.	мати можливість (зробити щось)
9.	a specialized course in (ecology)	i.	випускник екологічного факультету
10.	to choose a branch of ecology as one's future speciality	j.	відвідувати лекції з (екології…)
11.	to join a scientific circle/club	k.	вузька спеціалізація
12.	to acquire knowledge	l.	спецкурс з (екології)
13.	a graduate of the ecological faculty	m.	читати лекції з предмету
14.	to have a bent for (research work)	n.	вибрати галузь екології, як свою майбутню спеціальність
15.	to apply for a post-graduate course	o.	ознайомитися з основними законами екології

Text 3. Our University.

There are many universities in our city. The biggest and oldest of them are the National Taras Shevchenko University, the National Technical University, the National Medical University and the National Drahomanov Pedagogical University. I am a student of the National Drahomanov Pedagogical University which is situated in the heart of the city. In April 2015 we celebrated the 180th anniversary of our University. At the University there are about 36,000 students. Our University has a full range of pedagogical specialities for almost all school subjects. The University consists of 106 Departments and 20 Institutes: Pedagogics and Psychology, Physics and Mathematics, Information Science and Technologies, Arts, Distance Education, Social Work and Management, Natural Sciences Education and Ecology, Sociology, Historical Education, Physical Education and Sports, Engineering and others.

1,500 lecturers, 630 Doctors of Philosophy (PhD) and Associate Professors, 250 Doctors of Science and Professors, 12 People's Artists and 7 Honoured Artists of Ukraine work at the University.

Students study at full-time and correspondence departments. The course of study lasts for four years to get Bachelor's Degree and five years – to get Master's Degree.

Our University is a four-storeyed building with many lecture rooms, different laboratories and workshops. All of them are provided with modern equipment. At these laboratories and workshops our students have got their practical training. There are many computer classes; our students get basic computer skills there.

I study at the Natural Sciences Education and Ecology Institute. I want to become a teacher of Biology and English. I am a full-time student, so I have to attend all classes. Our students do not miss classes, because they want to get good knowledge. The classes start at 8 a.m. and finish at 2 or 3.20 p.m. During the breaks we can have a snack at the students' cafe. We usually have six or eight classes every day.

We study different subjects: botany, zoology, anatomy, microbiology, genetics, physiology of man and animals, physiology of plants, chemistry, physics, natural sciences, English and others. My favourite subjects are botany, zoology, anatomy and English.

We have two English classes a week. There are also English classrooms at our University. They are provided with TV sets and video. We can watch English films at classes and listen to tape-recorded exercises and texts. At our English lessons we read texts on our speciality, translate sentences both from Ukrainian into English and vice versa, do many exercises and speak on different topics. Sometimes we have to write a composition or an essay, to prepare a project or to learn texts by heart. It is not easy to learn a foreign language, but it is a real pleasure to speak English, German or French.

There is a big scientific library at the University. It is situated on the ground floor. We can get all necessary course books there. There is a reading room in the library. The students can work there at the literature they need.

The professors, teaching staff and students of the University take part in scientific and research work. The University organizes annual scientific and research conferences both for the teaching staff and students. The results of the research are published in scientific journals and collections of articles. Advanced information and telecommunication technologies penetrate the training process deeper and deeper: the distance learning centre has been organized and all Institutes have free access to the Internet.

Olympiads in many subjects take place annually to elicit students who have the best knowledge.

There is a large sports centre where students have opportunity to go in for different kinds of sports. They take part in many competitions and often have good results.

The University cooperates with the leading higher educational establishments and scientific research institutes of the USA, Sweden, France, Poland, Slovakia, Bulgaria, Romania and others.

Exercise 1. Entitle each paragraph of the text.

Exercise 2. Write down synonyms of the following words.

Opportunity, investigation, subjects, to study, to attend, to get acquainted with, to deal with, bent, to acquire, to join, to apply for, research.

Exercise 3. Ask different types of questions to each paragraph of the text.

Exercise 4. Summarize the text (in written form).

Text 4. My Studies at the University

I am a student of the Institute of Natural Sciences and Ecology. Our Institute is one of the largest at the University. There are many departments in our Institute: of ecology, of biology, of chemistry, of botany, of zoology, of physiology of man and animals, of physiology of plants, of genetics, and of soil science. Besides there are research laboratories. Every student has an opportunity to work in modern well-equipped laboratories, where different problems of science are under investigation.

I study at the department of ecology. We study different subjects: Ecology, Geography, Chemistry, Physics, Biology, Microbiology and many others. Besides these subjects we study some Social Sciences, Humanities, History, Ukrainian and English. We study English to be able to read scientific books and discuss the problems of ecology.

During the first two years of study we attend lectures on ecology, tourism, biology and many other subjects and we attend practical classes on foreign languages. In the third year of study more narrow specialization begins. We have several specialized courses and additional

practical and research work in the subject we have chosen as our future speciality.

Besides attending lectures the students may join some scientific circles and choose a problem to work on according to their bents. All of them know that ecology is the science of great future. They do their best to acquire as much knowledge as possible.

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

Exercise 1. Entitle each paragraph of the text.

Exercise 2. Ask each other different types of questions.

Model 1. A general question.

Do you study English?

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

Model 2. An alternative question.

Do you study English or French?

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

Model 3. A special question.

Where do you study English?

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

Exercise 3. Ask different types of questions to each paragraph of the text.

Exercise 4. Work in pairs. Ask your partner:

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

Exercise 5. Act out the following situations:

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

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

Exercise 6. Summarize the text (in written form).

Exercise 7. Write a composition "University is the best time of my life".

Exercise 8. Make a report on higher education in Ukraine.

UNIT 2

First Steps into Science

Text 1. First Steps into Science

Science reflects the world in specific notions and concepts, elaborating its own language. This language is highly terminological and many scientific terms are of Greek and Latin origin, e.g. synthesis, analysis, matter, substance, etc.

Scientific languages have highly standard system of publications, among which there are monographs, articles, reviews, lectures, theses, abstracts, textbooks, etc. Not only the structure of such publications is unified, but also the style of writing, which in fact is a combination of description, narration and reasoning. Scientific journals want their authors to document their articles according to scientific style and format. Scientific writing should be concise, not wordy, clear and informative.

The term Ökologie was coined in 1866 by the German biologist Ernst Haeckel; the word is derived from the Greek (oikos, "household") and (logos, "study"); therefore "ecology" means the "study of the household (of nature)".

Ecology, also referred to as ecological science, is the scientific study of the distribution and abundance of living organisms and how the distribution and abundance are affected by interactions between the organisms and their environment. Ecology is not synonymous with environment, environmentalism, natural history, or environmental science. It is closely related to evolutionary biology, genetics, and ethology. Ecologists seek to explain: life processes, interactions and adaptations; the movement of materials and energy through living

communities; the successional development of ecosystems; the abundance and distribution of organisms and biodiversity in the environment.

Ecology is a human science as well. There are many practical applications of ecology in conservation biology, wetland management, natural resource management (agroecology, agriculture, forestry, agroforestry, fisheries), city planning (urban ecology), community health, economics, basic and applied science, and human social interaction (human ecology). Organisms and resources compose ecosystems which, in turn, maintain biophysical feedback mechanisms that moderate processes acting on living (biotic) and nonliving (abiotic) components of the planet.

Exercise 1. Write down the answers to the following questions.

1. What is the modern definition of science?
2. Of what origin are many scientific terms?
3. What terms does a scientist use in writing?
4. What types of scientific publications are there in scientific literature?
5. What scientific journals in the field of ecology do you know and read ?
6. What is the origin of the term "ecology"?

Exercise 2. Match the synonyms.

Scientific, standard, system, publication, amidst, essay, manual, article, review, lecture, theme, analysis, lesson, thesis, abstract, summary, hand-book, structure, philosophical, criterion, organization, among, edition, arrangement.

Exercise 3. Summarize the text (in written form).

Exercise 4. Write different types of questions to the following sentences.

1. Ecology is a human science. 2. Science reflects the world in specific notions and concepts. 3. Ecology is closely related to evolutionary biology, genetics, and ethology. 4. Ecology is the scientific study of the distribution and abundance of living organisms. 5. Organisms and resources compose ecosystems. 6.Ecology is not synonymous with

environment, environmentalism, natural history, or environmental science. 7. Ecologists seek to explain: life processes, interactions and adaptations; the movement of materials and energy through living communities. 8. There are many practical applications of ecology in conservation biology, wetland management, natural resource management, city planning, community health, economics, basic and applied science, and human social interaction. 9. Scientific languages have highly standard system of publications, among which there are monographs, articles, reviews, lectures, theses, abstracts, textbooks, etc. 10. Scientific journals want their authors to document their articles according to scientific style and format.

Exercise 5. Make a report on ecological problems in Ukraine.

Text 2. Ecosystem

Never, no never, did Nature say one thing and Wisdom another. (Edmund Burke).

Topics of interest to ecologists include the diversity, distribution, amount (biomass), number (population) of organisms, as well as competition between them within and among ecosystems.

Ecosystems are composed of dynamically interacting parts including organisms, the communities they make up, and the non-living components of their environment. Ecosystem processes, such as primary production, pedogenesis, nutrient cycling, and various niche construction activities, regulate the flux of energy and matter through an environment. These processes are sustained by organisms with specific life history traits, and the variety of organisms is called biodiversity. Biodiversity, which refers to the varieties of species, genes, and ecosystems, enhances certain ecosystem services.

The environment of an organism includes both physical properties, which can be described as the sum of local abiotic factors such as solar insolation, climate and geology, as well as the other organisms that share its habitat.

An ecosystem is a community of living organisms (plants, animals and microbes) in conjunction with the nonliving components of their environment (things like air, water and mineral soil), interacting as a system. These biotic and abiotic components are regarded as linked

together through nutrient cycles and energy flows. As ecosystems are defined by the network of interactions among organisms, and between organisms and their environment, they can be of any size but usually encompass specific, limited spaces (although some scientists say that the entire planet is an ecosystem). These processes are sustained by organisms with specific life history traits, and the variety of organisms is called biodiversity. Biodiversity, which refers to the varieties of species, genes, and ecosystems, enhances certain ecosystem services.

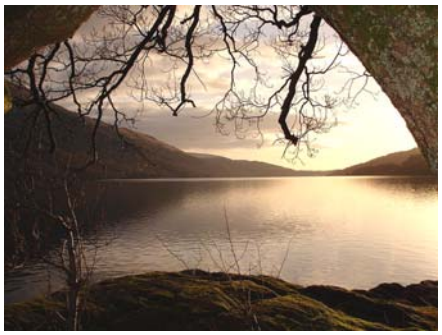
1. Coral reefs are a highly productive marine ecosystem.

2. Rainforest ecosystems are rich in biodiversity. This is the Gambia River in Senegal's Niokolo-Koba National Park.

Energy, water, nitrogen and soil minerals are other essential abiotic components of an ecosystem. The energy that flows through ecosystems is obtained primarily from the sun. It generally enters the system through photosynthesis, a process that also captures carbon from the atmosphere. By feeding on plants and on one another, animals play an important role in the movement of matter and energy through the system. They also influence the quantity of plant and microbial biomass present. By breaking down dead organic matter, decomposers release carbon back to the atmosphere and facilitate nutrient cycling by converting nutrients stored in dead biomass back to a form that can be readily used by plants and other microbes.

Ecosystems are controlled both by external and internal factors. External factors such as climate, the parent material which forms the soil and topography, control the overall structure of an ecosystem and the way things work within it, but are not themselves influenced by the ecosystem.

Other external factors include time and potential biota. Ecosystems are dynamic entities, they are subject to periodic disturbances and are in the process of recovering from some past disturbance. Ecosystems in similar environments that are located in different parts of the world can have very different characteristics simply because they contain different species.



Loch Lomond in Scotland forms a relatively isolated ecosystem.

The fish community of this lake has remained stable over a long period.

Ecosystems provide a variety of goods and services upon which people depend. Classifying ecosystems into ecologically homogeneous units is an important step towards effective ecosystem management.

Exercise 6. Answer the questions.

1. What is an ecosystem?
2. What is it composed of?
3. What processes do ecosystems regulate?
4. What is called biodiversity?
5. Which factors are ecosystems controlled by?
6. What physical properties do they include?
7. What examples of relatively isolated ecosystems can you give?
8. What essential abiotic components of an ecosystem do you know?
9. Give examples of highly productive marine ecosystems.
10. What function do external and internal factors perform?

Exercise 7. Ask different types of questions to each paragraph of the text.

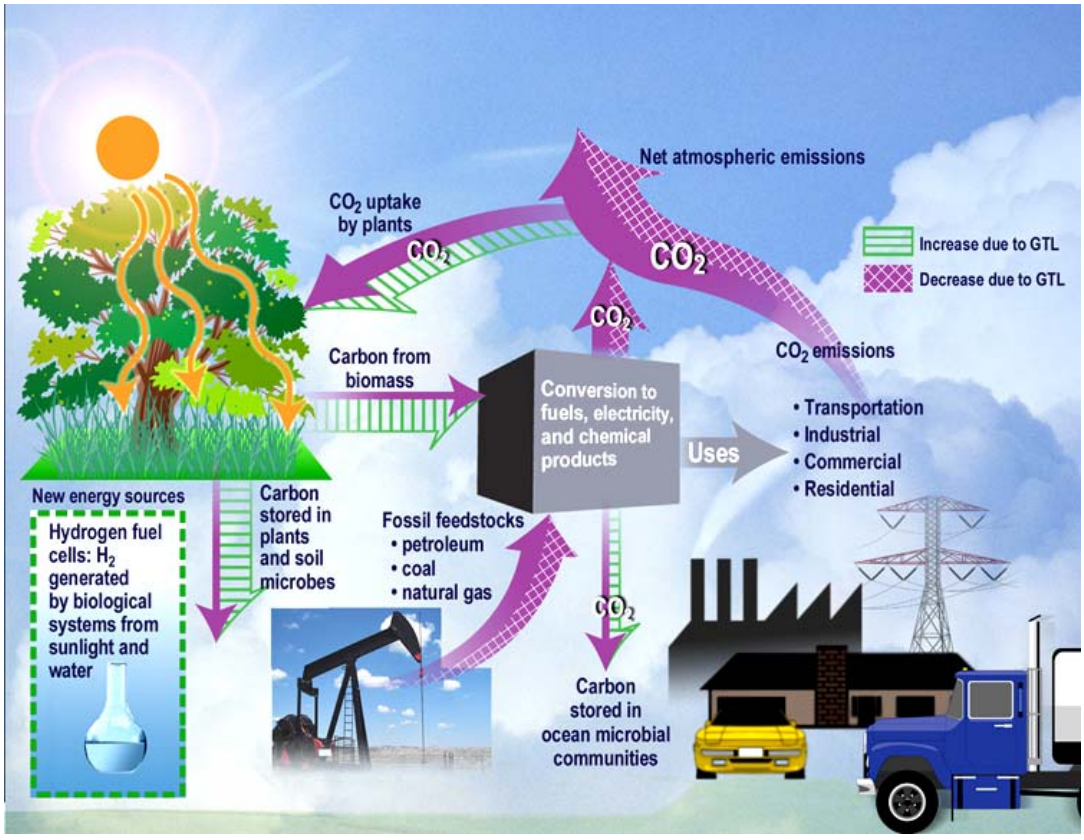
Exercise 8. Retell the text.

Text 3. Ecological analysis of CO_2 in an ecosystem.

It has been well established that rising CO_2 will stimulate plant growth. Indeed, climate change associated with rising atmospheric CO_2 has already altered ecosystem carbon balance through rising temperature, increased growing season, and increased atmospheric water content. Studies in native ecosystems have shown that while grasslands show a

relative small stimulation of shoot growth, woody plants respond vigorously to elevated CO_2. How much additional carbon will be added to terrestrial ecosystems as a result of the CO_2 fertilization effect will depend on feedbacks of environmental factors on the major resources of nutrients, water and light.

Additionally the interaction between plant physiological responses to elevated CO_2 and environmental factors in native species and in ecosystem processes is not well understood. Rising atmospheric CO_2 has the potential to stimulate carbon accumulation in ecosystems through direct effects on photosynthesis and growth of plants. But because growth of native species is often limited by the supply of water and nutrients, particularly nitrogen, it is not clear whether, in the long-term of years to decades, CO_2 stimulation of plant growth would add significant amounts of anthropogenic carbon as soil carbon to ecosystems. Moreover, the possibility that additional carbon would be sequestered in long-term, carbon pools in the soil has not been determined in native ecosystems.



Exercise 9. Define the following expressions (in written form).

Environmental factors, native ecosystems, carbon pools, woody plants, climate change, photosynthesis, anthropogenic carbon, soil carbon, terrestrial ecosystems, supply of nutrients.

Exercise 10. Find synonyms to the following words.

Stimulate, increase, growth, elevate, photosynthesis, fertilization, respond, native species, plant growth, climate change, amount, long-term, possibility, nutrients.

Exercise 11. Summarize the text (in written form).

UNIT 3

ECOLOGY as a Science

Text 1. Ecology

Ecology is the study of the relationships between living things and their environment. The term comes from two Greek words, **'oikos'** (which means "house" or "place to live") and **'logos'** (which means "study"). So ecology is the study of the "houses", or environments, of living organisms – all of their surroundings, including other animals and plants, climate, and soil. No one is sure when the word ecology was first coined, but German biologist Ernst Haeckel was the first to define it, in 1869.

Although the science of ecology is a new one, people have been studying ecology and applying their knowledge of it for many thousands of years. Prehistoric people had to know something about the ecology of wheat and com before they could successfully raise crops of these plants. Theophrastus, an early Greek botanist, is sometimes called the "first true ecologist" because he was the first to write about plants in terms of their living places, or habitats, such as forest and marsh. The Indians of the North American plains knew a great deal about the ecology of the bison, on which their lives depended. Today we often use ecological knowledge without being aware of it; for example, when we want to have a lawn in a shady place, we plant seeds of a kind of grass that grows well in shade.

For the most part, however, people do not think ecologically. When we see a bird or wildflower, our first question is: What is it?

Most people are content to know the names of some of the living things around them in nature. Perhaps you are the sort of person who

wonders further: What does it do? You may want to know the organism's role in its environment, and how it affects and is affected by other organisms. Ecologists wonder about the same things.

Exercise1. Try to guess the meaning of the following terms.

Ecology, term, organism, climate, biologist, prehistoric, botanist, Indians, bison, ecologically, nature, person, role.

Exercise 2. Explain the meaning of the words in English.

Ecology is the study of the relationships between living things and their environment.

No one is sure when the word "ecology" was first coined.

German biologist Ernst Haeckel was the first to define it.

Theophrastus was the first to write about plants in terms of their living places.

Lives of the Indians of the North America depended on the bisons.

Exercise 3. Define the parts of speech of the following words.

Their, come, Greek, which, including, first, if, in, although, people, successfully, or, about, depend, shady, shade, for, are, environment, affect.

Exercise 4. Make up your own sentences with the following words.

Between, although, before, because, such as, which, often, without, however, around, perhaps.

Exercise 5. Find out the synonyms of the words in the dictionary.

Science, thousands, marsh, the same, to study, relationship, include, soil, depend, forest.

Exercise 6. Explain in English the following Greek words.

Oikos, logos, habitat.

Exercise 7. Give the Ukrainian equivalents.

To be aware of, to come from, to be sure, to apply one's knowledge, a great deal of; for the most part, to be content, to wonder about, further, in terms of, to raise crops.

Exercise 8. Choose the best title for each paragraph of the text.

1. Ecology – the old and new science.

2. The Indians of North America – the first environmentalists.

3. Ecology – the science of the environment.

4. What ecologists study.

5. The relationship of living things and the environment – the main subject of ecology.

Exercise 9. Define the key sentence in each paragraph of the text .

Exercise 10. Tell in English about the following.

- the subject of ecology as a science;
- the history of the science of ecology;
- What is "to think environmentally."

Exercise 11. Find the subjects and predicates in the sentences below. Say what parts of speech they are expressed.

1. Ecology is the study of the relationships between living things and their environment.

2. The term comes from two Greek words.

3. The Indians knew a great deal about the ecology of the bison.

4. We plant seeds of a kind of grass that grows well in shade.

5. For the most part, however, people do not think ecologically.

6. You may want to know the organism's role in its environment.

Exercise 12. Translate the second paragraph of the text. Time limit - 15 minutes.

Exercise 13. Retell the first paragraph of the text.

UNIT 4

Ecology. Its History and Development

Exercise 1. What do you know about the history of ecology?

Read the text and find the answers to the following questions in it.

1. What was the task facing the scientists who dealt with the natural sciences?
2. What major changes have occurred in the knowledge at the turn of the 19th and 20th centuries?
3. What is the main task of modern ecology of the 21 century?

The words that will help you to understand the content of the text:

use – використовувати
century – століття
discover – відкривати, e.g. Columbus discovered America.
describe – описувати
specimens – зразки
investigate – досліджувати
humidity – вологість
distribution – розподіл
emphasis – акцент, основна увага
realize – усвідомити, зрозуміти
community – співтовариство
goal – ціль, мета
challenge – виклик, основне завдання

Ecology. Its History and Development

Although ecological knowledge has been used by people for thousands of years, ecology is one of the newest of the sciences. For many centuries, scientists concentrated on naming the plants and animals they discovered and on describing the structure of the dead specimens they collected. Gradually, as the question "What is it ?" was more easily answered, scientists began studying the effects of the environment on living organisms. During the 1800s, for example, scientists investigated the effects of day length on bird migration and the effects of humidity on the development of insects. Hundreds of books were published on the behavior of animals and on the distribution over the earth of plants and animals.

Still, the emphasis was on individual organisms. In the late 1800s and early 1900s, however, scientists began to study populations of organisms, rather than individuals. About the same time, they realized that all of the populations of plants and animals in a certain area make up a sort of community, with different kinds of organisms having different "jobs" in the community. Studies of nature became broader and more far reaching. In 1935, the word ecosystemwas coined to describe all of the living communities of an area, together with the non-living parts of their environment. The earth is one huge ecosystem.

Other ecosystems within it include forests, lakes, meadows, vacant lots, your back yard.To know more about ecosystems is the main goal of ecologists today. Even though an ecologist may still concentrate most of his studies on one kind of organism, or on one plant community, his findings help us to understand the ecosystems which include that organism or community. The challenge of ecology is to understand how ecosystems "work" and how they change with time.

Exercise 2. Determine if a particular statement is right or wrong.

1. Ecological knowledge has been used by people for thousands of years, so ecology is one of the oldest sciences.

2. For many centuries, scientists concentrated on studying the world ecosystems.

3. In 1935, the word "ecosystem" was used for the first time to describe all of the living communities of an area.

4. The main goal of ecologists today is to name the plants and animals they discover.

5. "Community" is the relationship between living organisms and their environment.

Exercise 3. Find the corresponding Ukrainian terms:

Concentrate, structure, collect, effect, migration, publish, individual, organism, populations, sort, ecosystem, ecologist.

Exercise 4. Match the definitions:

1. ecological knowledge	1. незайняті ділянки землі
2. many centuries	2. тривалість дня
3. dead specimen	3. екологічні знання
4. living organisms	4. рослинне співтовариство (фітоценози)
5. day length	5. мертві зразки
6. bird migration	6. вплив вологості
7. effect of humidity	7. багато століть
8. behavior of animals	8. величезні екосистеми
9. huge ecosystems	9. живі організми
10. vacant lots	10. поведінка тварин
11. plant community	11. міграція птахів

Exercise 5. Fill in the table with the words from the text as described in the model.

Model.

Verb	Noun	Adjective	Participle	Adverb
concentrate	migration	individual	having published	gradually

Exercise 6. Fill in the blanks with suitable words from the text.

1. The study of the relationship between plants, animals, and their environment is called ...

2. The movement of living things from one place to another is ...

3. ... is a group of plants or animals living together in the same surroundings.

4. The word ... is used to describe all of the living communities of an area, together with the non-living parts of their environment.

5. ... is everything that exists in the world independently of people, such as plants and animals, earth and rocks, and the weather.

Exercise 7. Find the basic idea, major and minor details in the first paragraph of the text.

Exercise 8. Determine the original forms of the following words.

Newest, scientific, discovered, describing, more easily, began, during, studies, broader, realized, coined, naming.

Exercise 9. Entitle each paragraph of the text.

Exercise 10. Revise the list of irregular verbs in the English language, then put the verbs in the text below in the form of the Past Indefinite/Simple Tense.

In the 1960s – 1970s, many Americans (to become) concerned that pollution (be) causing health problems. Congress (to respond) by passing laws to revive polluted lakes and rivers, improve air quality and save some animal species. In the early 1980s, new environmental problems (to emerge). Scientists (to discover) that pollution in one country (can) affect neighbouring countries. Some experts (to warn) that CO_2 (can) cause the earth's temperature to rise. Scientists also (to discover) that some chemicals (be) destroying the earth's protective ozone layer.

Exercise 11. Analyze the verbs in the text and determine which of them are Past Indefinite or Past Participle forms.

Exercise 12. Retell the first and second paragraphs of the text.

UNIT 5

The World Ecosystem

Exercise 1. Read the text (time limit – 5 minutes) and determine which of these questions you can answer.

1. Why has ecology as a science a growing interest? 2. How do environmental issues affect economic development? 3. How does population growth affect its ecosystem? 4. What according to scientists can be a life expectancy by the end of this century? 5. How does human activity affect the environment?

Text 1. The World Ecosystem

The study of ecology reveals that nature, or any ecosystem in it, is like a complex web. One ecologist

has said of the world's ecosystem: "It is not only more complex than we think. It is more complex

than we can think". People are part of the world ecosystem, and have a great and growing effect on many other ecosystems. The increasing numbers of people are changing ecosystems all over the world. Some of the changes are small and local: a house is built on a vacant lot; a highway slices through a forest. Some changes are major: long-lasting insect poisons such as DDT were spread all over the earth before scientists became aware of the deadly effects of these chemicals on eagles, ospreys, and pelicans.

Lake Erie, one of the largest lakes in the world, is badly polluted and "dying" as a result of wastes produced by people. The burning of coal, oil, and other fuels has affected the entire atmosphere of the earth; and dust particles in the air have helped reduce the amount of sunlight reaching the

earth's surface. Changes like these, along with thousands of smaller ones, have alerted us to the dangers of altering ecosystems before we understand the effects of the alterations. We fancy ourselves to be rulers of the earth. But we don't know the rules. The study of ecology may help us to learn the "rules of nature" on which our survival depends.

More and more, people are turning to ecology and ecologists for advice on how to live with nature without destroying our life-giving environment. But often there are no answers, or only partial answers.

Ecology is a new science and ecologists know little about most of the world, especially about the tropics and the oceans. Some of the ideas of ecology, accepted for many years, are now being challenged and changed.

Exercise 2. Read the following words and explain their meaning in English.

Complex, effect, local, vacant, insect, chemicals, pelican, result, produce, atmosphere, ecologist, tropics, ocean, idea.

Exercise 3. Determine the meaning of the underlined words and phrases from the context.

1. The study of ecology **reveals** that nature is like a complex web.
2. The increasing numbers of people are changing ecosystems **all over the world.**
3. Lake Erie is **badly** polluted and "dying" as a result of **wastes** produced by people.
4. The burning of coal, oil, and other **fuels** has affected the atmosphere of the earth.
5. More and more people are **turning** to ecology for advice.
6. Some of the ideas of ecology, **accepted** for many years, are now being challenged and changed.

Exercise 4. Get ready for the dictation-translation.

Great effect, deadly effect, burning of coal, more complex, entire atmosphere, study of ecology, growing numbers, part of the ecosystem, local changes, partial answers.

Exercise 5. Find equivalents of the following phrases in the English language.

Сказати про що-небудь; впливати на що-небудь; усвідомити (зрозуміти) що-небудь; залежати від чого-небудь; звертатися до кого-небудь.

Exercise 6. Write down 3-4 keywords from each paragraph of the text.

Exercise 7. In each paragraph of the text find: - The basic idea; - The major details; - Minor details.

Exercise 8. Give the titles for each of the three paragraphs of the text.

Exercise 9. Which of these statements, in your opinion, most accurately reflect the main ideas of the text?

1. The world's ecosystem is more complex than we can think.
2. Population of the Earth is increasing.
3. Houses are built on a vacant lot and highways slice through a forest.
4. People have a great effect on the world's ecosystem.
5. Lake Erie is badly polluted.
6. Big and small changes of the world's ecosystem have become dangerous for people.
7. The study of ecology may help us to learn the laws of nature on which our survival depends.
8. Ecology is a new science.
9. More and more people are turning to ecology for advice on how to live with nature without destroying our environment.
10. Insects are part of the world's ecosystem.

Exercise 10. Place the statements from exercise 9 in the right order. Retell the text in English, using these statements as a plan.

Exercise 11. Translate the following sentences. Determine what parts of speech the underlined words are and what function they perform in the sentences.

1. People have a great and growing effect on many other ecosystems.

2. The increasing numbers of people are changing ecosystems all over the world.

3. Lake Erie is dying as a result of wastes produced by people.

4. The burning of coal and other fuels has affected the entire atmosphere of the earth.

5. Dust particles in the air have helped to reduce the amount of sunlight reaching the earth's surface.

6. More and more, people are turning to ecology for advice on how to live with nature without destroying our environment.

7. Lake Erie is badly polluted as a result of wastes produced by people.

8. Some of the ideas of ecology, accepted for many years, are now being challenged and changed.

Exercise 12. Translate the last paragraph of the text. Time limit – 7 minutes.

Exercise 13. Retell the first paragraph of the text.

Text 2. Components of Ecosystem

Exercise 1. Write definitions of the following terms:

Biological community, soil, anemometer, lack of rain, weather centre, bachelor, tree branches, living trees, website, decay, profit, meteorology, animal life.

Exercise 2. Read and translate the text.

Any ecosystem is made up of two parts: nonliving (the physical environment) and living (the biological community). The nonliving environment usually includes energy from the sun, temperature, water, gases in the air, wind, soils, and the rocks beneath them, and the topography, or shape of the land. These nonliving parts of the ecosystem determine the kinds of life that can exist in an ecosystem, and they also affect each other.

The world's deserts, for example, occur where the annual rainfall is ten inches or less. This lack of rain is sometimes caused by topography. Along the west coast of North America, winds carry water vapor inland from the Pacific Ocean. The air is forced to rise as it hits the coastal mountain ranges. As it rises it cools and the water vapor in the air falls as

rain or snow on the seaward side of the mountains. As a result, there is little rainfall on the other side. This is called the rain shadow effect.

The living parts of an ecosystem often affect the nonliving parts. When rain falls on a forest, the tree branches and leaves help break the force of the drops. Layers of dead leaves on the forest floor soak up water and prevent the drops from washing soil away. Little water runs off the land. So the living trees help maintain the soil on which they depend. In fact, the trees add to the soil, since the leaves that fall to the forest floor eventually decay and become part of the soil itself.

As ecologists study ecosystems, they often turn to the science of meteorology for information. Does the annual rainfall come mostly in one season, or is it spread evenly over the year ? How much does the temperature vary between day and night, and through the year ? Finding answers to such questions is important because the climate of an area has a tremendous effect on its plant and animal life.

Exercise 3. Write 5 questions to the text.

Exercise 4. Make a short summary of the text.

Text 3. Producers, consumers, decomposers

Exercise 1. Read and translate the text.

To learn more about the living parts of an ecosystem, you might visit a small pond. A pond ecosystem usually contains all of the nonliving factors mentioned above. The sun provides the energy of life. The climate determines how much rain falls in the area, the length of the growing season for plants, and whether the pond is covered with ice in winter. Theses factors can have a great effect on the life that the pond supports. The underlying rocks and soils affect the chemistry of the water, which in turn helps determine what kinds of plants and animals live in the water. And the life of the pond affects the nonliving environment: when plants and animals die, their remains settle to the bottom and decay there, adding to the bottom muck and making the pond more shallow.

The living parts of the pond ecosystem (and of any ecosystem) can be divided into three groups.

Producers are green plants which capture radiant energy from the sun and convert it into food energy. They also take substances such as carbon dioxide, water, oxygen, nitrogen, and sulfur from the environment and convert it into plant material that is used as food by other organisms. In

fact, green plants might better be called converters than producers. Regardless, all other life in the pond ecosystem depends on green plants. The same is true of forests, prairies, tundra, and oceans.

Consumers are animals that depend on green plants for food. Some feed directly on the plants while others eat animals that haveeaten plants. The plantfeeders include tiny animals called zooplankton, which eat phytoplankton, and larger organisms, such as pollywogs, insects, and snails, which eat larger plants. The planteaters, or herbivores, get their energy directly from the green plants. The other consumers are either carnivores (which usually eat herbivores) or omnivores (which eat both plants and animals). The carnivores in a pond ecosystem include fish, herons, and insects such as giant water beetles. Raccoons and people are omnivores.

Decomposers are the third major group of organisms. They use dead plant and animal material as food. The decomposers break down this material, getting the energy they need to live and releasing minerals and other nutrients back into the environment. Most decomposers are simple plants such as bacteria and fungi. These microscopic organisms can be found everywhere in a pond, but are especially abundant at the bottom, where the dead parts of plants and animals settle. On land, decomposers are most abundant at or near the surface of the soil.

Exercise 2. Translate into English.

Скелі, грунт, отримувати енергію, основні групи, повертати в навколишнє середовище, променистa енергія, період росту (вегетаційний період), сірка, дрібні тварини, двоокис вуглецю, всеїдні, азот.

Exercise 3. Write 5 questions to each sentence.

1. A pond ecosystem usually contains all of the nonliving factors mentioned above.
2. Producers are green plants which capture radiant energy from the sun and convert it into food energy.
3. Consumers are animals that depend on green plants for food.
4. Decomposers are the third major group of organisms. They use dead plant and animal material as food.
5. Based on feeding habits, researchers broadly classify ray-finned fishes as herbivores, carnivores, omnivores, zooplanktivores and detrivores.

UNIT 6

The USA

Exercise 1. Match the following expressions on the left with their definitions on the right

1. Natural disaster	a fierce fire that spreads rapidly, especially in an area of wilderness
2. Global warming	the collapse of part of a mountainside or cliff so that it descends in a disintegrating mass of rocks and earth
3. Wildfire	a downhill displacement of rock, mud, or earth, often caused by rainfall or erosion
4. Landslide	a shock wave travelling through the Earth from the epicentre of an earthquake
5. Seismic wave	a downhill displacement of rock, mud, or earth, often caused by rainfall or erosion
6. Sewage plant	liable to being affected by something
7. To slide	an artificial embankment alongside a river, built to prevent flooding of the surrounding land
8. To wipe out	to destroy large numbers of things or kill large numbers of people, especially suddenly
9. Levee	a place where sewage is treated to make it nontoxic

10. To spill	to flow from a container, or allow something to flow from a container, especially accidentally and usually with resulting loss or waste
11. Inlet	the number of deaths that occur at a specific time, in a specific group, or from a specific cause
12. Susceptible	an increase in the world's temperatures, believed to be caused in part by the greenhouse effect
13. Mortality	a disaster caused by natural forces rather than by human action, e.g. an earthquake
14. Volcano	a naturally occurring opening in the surface of the Earth through which molten, gaseous, and solid material is ejected

Exercise 2

Work in pairs and answer the following questions. Report your findings to your colleagues:

1. What natural disasters do you consider the most threatening?
2. Think of the recent natural disasters in the world, choose one and try to explain their cause.
3. What areas on Earth are most prone to natural disasters?
4. Have there been any natural disasters in your country?
5. What places in the USA are most susceptible to natural disasters?

Exercise 3

Read the following article. While reading, try to fill the correct forms of passive.

Ten risky places by Mark Monmonier

1. Hazards of different types affecting areas of varying size are not easily…… (compare). Even so, the research experience makes it easy to identify ten typical risky places–areas to which I would be reluctant to move. Almost any place in **California**, for various reasons, in addition to earthquakes, wildfire, landslides, the state has volcanically active areas in the north, around Mt. Shasta and other major volcanoes, as well as in the east, where the Long Valley Caldera shows signs of renewed activity. Even beyond its infamous seismic zones, California's shoreline is vulnerable to tsunamis (seismic sea waves) from submarine earthquakes throughout the Pacific. More recent additions to this smorgasbord of hazards are smog, freeway snipers, urban riots, oil spills, and …… (looking ahead a few decades) severe water shortages.

2. …(locate) only 70 miles from Mt. Rainier and Glacier Peak, which the U.S. Geological Survey considers active volcanoes, **Seattle**, **Washington** is also vulnerable to severe earthquakes. Unlike Californians, long aware of the risk, Washingtonians have only recently begun to plan for a seismic disaster.

3. **Coastal Alaska** and **Hawaii** are especially susceptible to tsunamis, huge waves …… ….(whip up) by submarine earthquakes in the Ring of Fire encircling the Pacific Ocean. Alaska's Pacific coast is seismically active, and the Hawaiian Islands can generate their own tsunamis: deposits on Lanai suggest past run-ups as high as three thousand feet, and geophysicists fear a similar disaster were thesoutheast side of the Big Island (the island named Hawaii) to slide suddenly into the sea.

4. Tropical hurricanes pose a less catastrophic but more frequent danger to the Atlantic Coast, particularly to **North Carolina's Outer Banks**, a long, thin barrier island, from which evacuation is difficult. Since the seventeenth century, infrequent but fierce storms have carved new inlets, filled old channels, and move the shoreline westward at a rate of 3 to 5 feet per year. Moreover, if forecasts of a 250-foot rise in sea level because of global warming prove correct, current settlements on the Outer Banks could……. (wipe out) in the next century or so.

5. Inadequate building codes, shoddy construction, low elevation, and level terrain make areas south of **Miami** especially vulnerable to high winds and flooding from storms like Hurricane Andrew, which caused over 20 billion dollars damage there in August 1992. Adding

to the region's misery is metropolitan Miami's crime rate, one of the highest in the nation.

6. The **Louisiana coast** is also vulnerable to multiple hazards: winds and storm surge from tropical hurricanes, unnaturally high levees along the lower Mississippi River, and air and groundwater pollution from poorly regulated chemical industries concentrated along the state's Gulf Coast. Cancer mortality is extraordinarily high here as well.

7. The floodplains of **the Mississippi** and other main **stem rivers**, which drain vast areas, are vulnerable to prolonged high water…….(cause) by persistent weather systems. The costly floods of summer 1993 demonstrated the shortsightedness of flood

forecast models based on limited hydrologic data. Humans play a dangerous game of hydrologic roulette by building homes, factories, and sewage-treatment plants in low-lying

areas along rivers.

8. Any **floodplain**, large or small, anywhere in the country. What does the word "floodplain" mean, and how did the floodplain get there? Although most victims evacuate in time, a picturesque parcel where "a river runs through it" carries the threat of sodden heirlooms and undermined foundations. In arid areas, where thunderstorms are infrequent, flash floods kill around two hundred unsuspecting campers and hikers in a typical year. Along rivers large and small, the Federal Flood Insurance program uses maps to set rates, spread the risk, and encourage local governments to plan evacuations and control land use.

9. Because warm weather is attractive to affluent retirees and house-breakers, property crime is especially high in the south, where a warm climate favors year-round burglary. And urban areas with many young males, newly arrived or unemployed are notorious for violent crime. Growing **southern cities** such as San Diego, Los Angeles, Phoenix, El Paso, and Miami, are thus especially hazardous, although risk varies greatly with neighborhood and time of day.

10. The neighborhoods of **nuclear plants** are risky areas of a different sort. Although catastrophic radiological accidents are rare and highly unlikely, the 1986 Chernobyl event had frightening consequences. More worrisome than the poor design and mismanagement underlying the 1979 Three Mile Island incident, near Harrisburg, Pennsylvania, is the specter of terrorism: a nuclear facility is an enormously attractive target for organized terrorists able to breach security with a vehicle bomb. Over four million people live within the ten-mile emergency planning zones (EPZs) around America's atomic power plants, and Chernobyl indicated clearly that radiological accidents can have a lethal reach much longer than ten miles. Equally daunting is the variation in emergency preparedness among EPZs.

Exercise 4. Discuss the following questions:

1. Which of the 10 risky places do you consider the riskiest?
2. Name all types of natural disasters mentioned in the article, choose one and try to explain its origin and cause.
3. Is there anything that can be done in order to prevent natural disasters?
4. How are natural disasters related to climate change?
5. Place the 10 risky places on the map of the USA.
6. Try to label as many states on the map as you can.

Exercise 5.

Look at the expressions in bold and find their right definition below:

Tsunami, Volcano, Wildfire, Blizzard, Core, Crust, Drought, Earthquake, Flood, Fujita scale, Hurricane, Magnitude, Mercalli scale, Saffir-Simpson scale, Tornado

1. … a series of waves created when a body of water, such as an ocean, is rapidly displaced

on a massive scale.

2. … is a phenomenon that results from the sudden release of stored energy in the Earth's crust that creates seismic waves.
3. … is a severe winter storm condition characterized by low temperatures, strong winds, and heavy blowing snow.
4. … is a 1-5 rating based on the hurricane's present intensity.

5. … is used to rate the intensity of a tornado by examining the damage caused by the tornado after it has passed over a man-made structure.

6. … is a scale used for measuring the intensity of earthquake.

The passive is formed with the verb to be (is/was/have been etc.) and the past participle (done/cleaned/seen etc.):

- The sculpture is made of glass and plastic.
- That toy was made in China.
- All staff has been informed of the changes.

When we say what a person or a thing does, we use an active verb:

- My parents built their own house.
- We all speak English.
- The man is repairing the fridge at the moment.

When we say what happens to a person or thing – what is done to them – we use a passive verb:

- All of those houses were built by my parents.
- Spanish is spoken in most Latin American countries.
- I came by bus because my car is being repaired.

Exercise 6. Fill in the correct form of passive.

Present Simple

Active:	Ann	writes	a letter.
Passive:	A letter	…	by Ann.

Past Simple

Active:	Ann	wrote	a letter.
Passive:	A letter	…	by Ann.

Present Perfect

Active: Ann has written a letter.

Passive: A letter ….. by Ann.

Future Simple

Active: Ann will write a letter.

Passive: A letter …. by Ann.

Modal Verbs

Active: Ann can write a letter.

Passive: A letter … by Ann .

Present Progressive

Active: Ann is writing a letter.

Passive: A letter … by Ann .

Past Progressive

Active: Ann was writing a letter.

Passive: A letter … by Ann .

Past Perfect

Active: Ann had written a letter.

Passive: A letter …. by Ann.

Future Perfect

Active: Ann will have written a letter.

Passive: A letter …. by Ann.

Conditional I

Active:	Ann	would write	a letter.
Passive:	A letter	….	by Ann.

Conditional II

Active:	Ann	would have	written a letter.
Passive:	A letter	….	by Ann.

Exercise 7

Change active sentences into passive and vice versa.

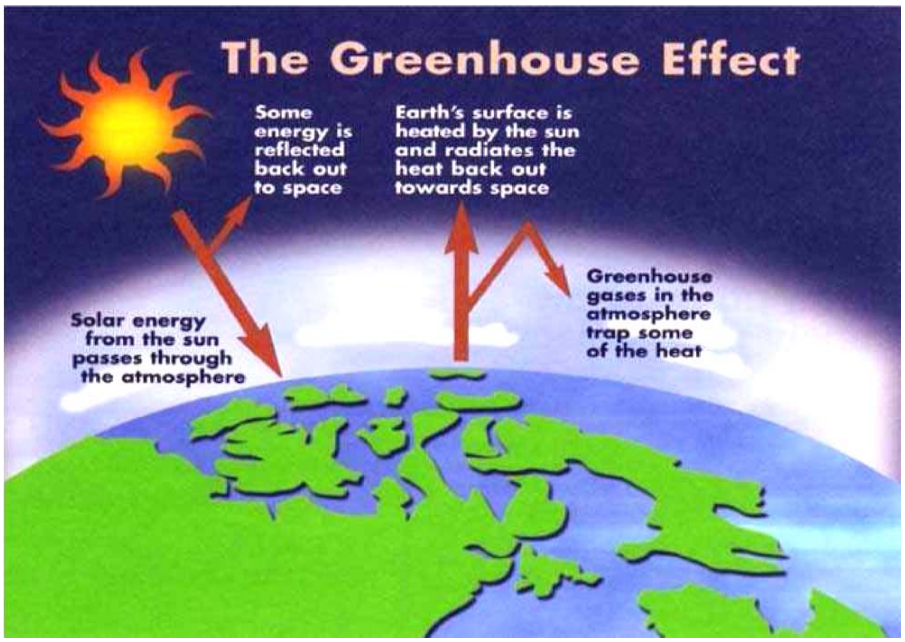
1. A client delayed Ann when she was leaving the office.
2. The tennis club was holding a meeting at 6.30.
3. The doorway was blocked by Sheba, the dog.
4. Joanne had to take Sheba to the vet.
5. Her condition worried the vet.
6. The dog was treated by the vet while Joanne went home.
7. The telephone call confused Joanne.
8. The vet told Joanne to get out of the house.
9. The police captured the burglar.
10. The dog had bitten off his fingers.

Presentation

1. Think about risky places in the USA.
2. What are they and what is the threat?
3. Are there any ways how to prevent such risks?
4. Do some research on this subject and prepare a presentation.

UNIT 7

The Environment



Exercise 1. Look at the picture above and try to explain the Greenhouse Effect, its causes and process.

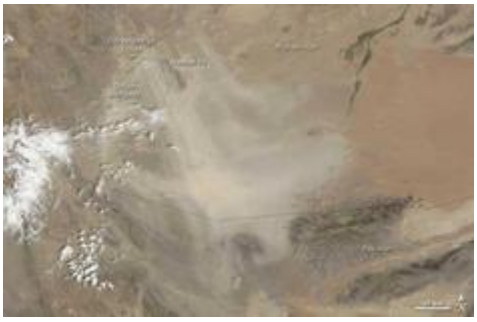
Key expressions: battery farming, greenhouse effect, destruction of the ozone layer, polluted, pollution, waste disposal, over-polluted, destruction of the rainforests, over fishing, coast, shore, beach, cliff, cape, peninsula, cove, bay, gulf, source, tributary, waterfall, mouth, valley, gorge, delta, brook, stream, estuary.

Exercise 2. Read and discuss the text.

The 7 Harshest Environments on Earth

Summer heat waves have you clinging to your air conditioner and guzzling ice water? Here are some of the hottest, coldest and all-around harshest places on Earth.

Greenland. All but the rocky coastline of this island nation is covered in an ice sheet up to 1.8 miles (3 kilometers) thick. If that's not enough of a tip-off that Greenland's name doesn't represent truth in advertising, consider that the northernmost edge of the country is a mere 460 miles (740 km) from the North Pole. The ice sheet keeps Greenland's population of 57,000 confined to the coastline, where ice gives way to fjords and barren mountains. The northeast quarter of the island, known simply as The National Park, is populated only by polar bears, walruses and other Arctic wildlife. Other than whalers, seal-hunters and the occasional scientist, few humans travel into the Park. The nearest village, Ittoqqortoormiit, sees three months without a sunset every summer, which may help make up for mid-November to mid-January, when the sun never rises over the horizon.



Sistan Basin, Afghanistan. This region along the southern border of Afghanistan is one of the driest in the world, and recent events have made it worse. Despite its arid climate, the Sistan Basin used to be home to the Hamoun wetlands, an 800-square-mile (2,000-square-km) oasis fed by the Helmand River. The wetlands supported wildlife and human agriculture until the 1990s, when they began to disappear. The reason was decades of damming and irrigation combined with an unprecedented drought. In 2001, according to NASA's Earth Observatory, precipitation in the Sistan Basin dropped 78 percent. The wetlands dried up and became a dustbowl. The United Nations is part of

an effort to reverse the damage, but war and instability are complicating efforts to return water to the desert.

The Changtang region of the Tibetan Plateau. If the Tibetan Plateau is the Roof of the World, the northern Changtang region is its apex. With an average elevation of 16,400 feet (5,000 meters), this high, dry steppe is punctuated by brackish wetlands. Despite short summers, arctic winters and precipitation that falls mostly as hail, birds, Tibetan gazelle and wild sheep survive in the Changtang. So do a few hundred thousand people called the Changpa. These nomads move from camp to camp, herding goats and other livestock. But in Changtang and throughout the Tibetan Plateau, grasslands are dying as a result of overgrazing and climate change. The result, according to an April 2010 National Geographic article, is that nomads are forced to move to government resettlement camps, where they face unemployment and water shortages.

Siberia. This vast swath of northern Asia extends from the Ural Mountains in the west to the Arctic Ocean in the north and to the Pacific Ocean in the east. It's perhaps best known for being a place of exile, where Soviet gulags dotted the landscape in the 20th century and political prisoners and religious outcasts were banished in the centuries before. Today, parts of Siberia boom thanks to oil, gas and mineral discoveries, but the area is as harsh as ever. Temperatures can soar above 100 degrees Fahrenheit (38 degrees Celsius) in the summer and plummet into double-digit negatives in the winter. The town of Oymyakon in Siberia is the coldest permanently inhabited village in the world, with a record low temperature of minus 90 F (minus 67.7 C) in 1933.

The Australian Outback. Spiders and snakes and crocodiles, oh my! The Australian Outback is home to lots of hostile-sounding wildlife and little else. Arid weather, fierce sun and infertile soil keep the population low in this desert, which spans most of the continent of Australia. Although the Outback is home to the Inland Taipan, the most venomous land snake in the world (which has never been known to kill humans), and the saltwater crocodile (which has), the greatest danger in the desert is heat. In Alice Springs, a town almost perfectly centered on the continent, summer temperatures reach 113 degrees Fahrenheit (45 degrees Celsius). In this climate, engine trouble or a bogged-down vehicle can turn deadly, which is why travelers are advised to carry spare parts, an emergency radio beacon and lots and lots of water.

The Sahara Desert. With less than 3 inches (7.6 cm) of precipitation each year, the Sahara Desert is one of the driest places on earth. And the temperature is beyond sweltering: The mercury regularly tops out around 122 degrees Fahrenheit (50 degrees Celsius) in summer. The hottest temperature on record, 136 F (58 C), was recorded in the desert town of El Azizia, Libya. Few humans make the Sahara desert their home. Nomads such as the Tuareg people survive on the Sahara's margins, trading, hunting and raising livestock on sparse vegetation. The central, drier parts of the desert are almost entirely unpopulated.

Antarctica. When it comes to harsh spots, Antarctica sweeps the superlatives: According to the CIA World Factbook, this southern land mass is the coldest, driest, highest and windiest continent. The coldest temperature on Earth was recorded in Antarctica in 1983, when the outside air hit minus 129 degrees Fahrenheit (minus 89 degrees Celsius) at Vostok Research Station, which sits at the center of the East Antarctic Ice Sheet,

about 800 miles (1,300 km) from the Geographic South Pole. Antarctica's terrain is 98 percent ice, with the rest made up by barren rock. And while the seas around Antarctica teem with krill, squid, fish and seals, the land is less hospitable. According to the British Antarctic Survey, there are no native reptiles, amphibians or mammals on the continent. Antarctica isn't completely deserted, though. By the CIA's count, the human population of the fifth-largest continent swells to over 4,000 in the summer as researchers and support crews launch missions from Antarctic research stations. In the winter, about 1,000 people remain to brave temperatures as low as minus 94 F (minus 70 C).

Exercise 3. Speak on the following.

1. What are the most threatening environmental issues today?
2. Is there anything you can personally do about the environment and its protection?
3. Discuss the following proverbs about the environment:
   a) When spider webs unite, they can tie up a lion.
   b) There are no passengers on Spaceship Earth. We are all crew.
   c) Earth is not a gift from our parents it is a loan for our children.

Exercise 4. Some of the following sentences need the definite article. Try to correct some mistakes.

Danube flows into the Caspian Sea – The Danube doesn’t flow into Caspian Sea. It flows into the Black Sea.

1. Europe is much larger than Africa.
2. The highest mountain in Slovakia is Slavkovsky Peak
3. South of Iceland is warmer than north.
4. United Kingdom consists of Scotland and Wales.
5. We are going skiing to Rockies.
6. I have visited United States and Canada.
7. Hungary is in northern Europe.
8. Crimea is in north of Italy.
9. Toronto is on Lake Superior.
10. Canary Islands are a group of islands in Pacific Ocean.

Exercise 5.

Here are several questions. Choose the right answer from one of the boxes and write "the" where necessary.

Continents	Countries	Oceans and Seas	Mountains	Rivers and Canals
Africa	Canada	Atlantic	Alps	Amazon
Asia	Denmark	Indian ocean	Andes	Danube
Australia	Indonesia	Pacific	Himalayas	Nile
Europe	Sweden	Black sea	Rockies	Suez canal
North America	Thailand	Mediterranean	Urals	Panama canal
South America	United States	Red sea		Volga
				Thames
				Rhine

1. What do you have to cross to travel from Europe to America?
2. Where is Argentina?
3. Which is the longest river in Africa?
4. Which country is Stockholm the capital?
5. Which country is Washington the capital?
6. What is the name of the mountain range in the west of North America?
7. What is the name of the sea between Africa and Europe?
8. Which is the smallest continent in the world?
9. What is the name of the ocean between America and Asia?
10. What is the name of the ocean between Africa and Australia?
11. Which river flows through London?
12. Which river flows through Vienna, Budapest and Belgrade?
13. Of which country is Bangkok the capital?
14. What joins the Atlantic and Pacific Oceans?
15. Which is the longest river in South America?

Exercise 6.

Read this short article about Iceland. Try to fill in the definite article if necessary.

Iceland. An island republic in North Atlantic. Landscape consists largely of barren plains and mountains, with large ice field particularly in

south west. Island has active volcanoes and is known for its thermal springs and geysers. With less than 1% of land suitable for growing crops, nation's economy is based on fishing, and fish products account for 80% of the exports. Area: 103, 000 square km. Population: 227, 000. Capital: Reykjavik.

Referring to geographical names or areas, we tend to use the definite article with:

- seas (the Atlantic, the Pacific, the North Sea)
- mountain ranges (the Alps, the Andes)
- island groups (the British Isles, the West Indies)
- areas (the Midlands, the Lake District, the Middle East)
- rivers (the Danube, the Blue Nile, the Thames)
- deserts (the Gobi, the Sahara)
- hotels and pubs (the Red Lion, the Grand Palace)
- cinemas and theatres (the Playhouse, the Majestic)

We generally use no articles with:

- continents (Africa, South America, South East Asia)
- counties and countries (Oklahoma, Bulgaria, Nigeria)
- towns and principal buildings (Ely Cathedral, Oxford University)
- lakes (Lake Como, Lake Windermere, Derwent Water)
- mountains and volcanoes (Everest, Etna, Vesuvius)

Of course, there are always exceptions: The UK, The USA, The UAE, The Netherlands, The Hague.

Some useful vocabulary about the environment.

When the land meets sea: **coast, shore, beach, cliff, cape, peninsula, cove, bay, gulf**.

Words connected with rivers: **source, tributary, waterfall, mouth, valley, gorge, delta, brook, stream, estuary**.

Words connected with mountains: **foot, ridge, peak, summit, glacier**.

Exercise 7.

There are 6 adjectives below. Try to match them with nouns from above :

1. sandy 2.steep 3.shallow 4.rocky 5.turbulent 6.dangerous

Exercise 8.

Fill in the following expressions in the text: battery farming, greenhouse effect, destruction of the ozone layer, polluted, pollution, waste disposal, over-polluted, destruction of the rainforests, overfishing. The air, rivers and seas are all……..(1), especially in ……(2) and heavily industrialized regions. Poor……(3) is the cause of much of this …….(4). …….(5) has depleted the numbers of fish in the oceans. The……..(6) is leading to climatic changes and what is known as the……..(7). The……..(8) is causing widespread ecological problems. …….(9) provides large amounts of food but it involves keeping animals in crowded and unnatural conditions.

Exercise 9.

1. Why do environmentalists say we should avoid spray cans?
2. Why are environmentalists in favor of practicing organic farming and

using unleaded petrol?

3. Why do environmentalists encourage us to use recycled paper and bottle banks?
4. What else are environmentalists in favor of?

Presentation

Write a short essay on the most threatening environmental issue. Try to think of the causes, solutions and consequences.

UNIT 8

Continents

Exercise 1. Read the text and answer the questions.

1. What is a continent and how many are there?
2. What are the five countries with the highest population?
3. How many languages are there in the world?
4. Where do people speak Inuit?
5. What are the five most widely spoken languages?
6. On which continent will you find the Caribbean Islands, Greenland, the South Pole, the North Pole, the Prime Meridian, the International Date Line, the equator, the deepest point of land?
7. Which is the largest continent?
8. What continent is the island continent?
9. What is the difference between an island and a continent?
10. Which continent is the largest island but the smallest continent?

The Continents of the World

A continent is defined as a large expanse of land on Earth. In geology, tectonic plates are used to describe continents. Although there is no set criteria for qualifying continents, the modern world has relied on existing conventions in order to identify the seven continents of the world. Of these seven, the smallest continent is Australia. Ironically, this is also the world's largest island and sixth largest country. Both Australia and Antarctica are regarded as island continents. They are, first and foremost, *continents*, but because they are both surrounded by water, they are known as *island continents*.

Asia. Asia is the largest continent in the world, as well as the largest in population. Asia is the largest of the seven continents. It takes up nearly 9% of the total space on Earth, which is almost 30% of the world's land, and it is home to a little over 4 billion people. This is 60% of the world's total population, all located on one continent. The population saw its greatest increase over the 20th century; wherein Asia's total population has been estimated to nearly quadruple in numbers. Asia is the largest continent of them all, which allows it to have an abundance of riches in everything from varying climates to spoken languages. It has seen an awe-inspiring number of Nobel Prize winners, but it has also seen a great deal of poverty, due to its higher population counts. Some areas are warm and moist, while others are freezing cold and arid. Such variances allow the people of Asia to form and foster enriching and absorbing cultures.

Africa. The African continent comprises around 20 percent of the world's total landmass. At almost 12 million square miles and with a little over 1 billion people, Africa is the second largest continent and has the second largest population. It is separated from Europe by the Mediterranean Sea in the north and from Asia by the Suez Canal and the Red Sea in the northeast. To the southeast lies the Indian Ocean and the Atlantic Ocean to the west.Africa is believed to be where humans originated, specifically in Ethiopia. As such, it is the oldest inhabited among the continents of the world and has played an important role in human history. It hosts a diverse culture, numerous languages, and several natural resources.

North America. North America is the third largest continent and is one part of an area known as the New World. There are 23 countries in the continent, but it is dominated by Canada, Mexico, and the U.S. The three countries take advantage of natural resources in the region, bolstering their economic positions. U.S. has the largest economy in the world, giving it a superpower status.Most geographers consider the continent to start at Canada in the north and end with the Isthmus of Panama in the south. Atlantic and Pacific Oceans surround it in the east and west, respectively. Apart from the main landmass, the island of Greenland and Caribbean islands are considered part of North America as well.

South America. South America is sometimes considered just part of North America. It is home to almost 400 million people living in 12 independent countries and a few non-sovereign areas administered by different European states. Populations are mostly found on the coasts with the inner and southern parts of the continent sparsely populated. Due to a long history of European colonization, South American culture and society is largely influenced by Western traditions. Most people speak either Portuguese or Spanish and practice Christianity. Though experiencing economic growth, investment remains low for the region. The largest economies are Peru, Columbia, Brazil, and Venezuela.

Europe. Also known as the Old World, Europe is the birthplace of Western civilization, which started with the Greeks. The region and its people have continued to play a dominant role in politics and economics through colonization and trade. It is the central arena of both world wars, which saw much of its influence decline in the modern age. Today, much of the region has integrated into the European Union to once again take its place in the world stage.Europe is bordered by the Arctic Ocean in the north and the Mediterranean Sea in the south. To the east, it is separated from Asia by the Ural Mountains. It is separated from North America by the Atlantic Ocean. This almost 4 million square-mile area is home to prosperous and culturally-diverse countries. Among the biggest economies are France, Germany, and Sweden.

Australia and Oceania. The smallest among the continents of the world, Australia is one large landmass in the midd?e of the ocean. The Indian and Pacific Oceans border it in the west and east, respectively. It is

the only continent without an active volcano. The area experiences extremes in weather from snow-capped mountains to arid desert. The continent includes mainland Australia, nearby Tasmania, New Guinea, and Timor.In some texts, Oceania is recognized as one of the continents of the world. The area is composed of Australia and various South Pacific islands. It includes the subregions of Polynesia and Micronesia. Under the strictest definition of a continent, Oceania is not regarded as such by some. Instead of one continuous landmass, it consists of several small islands spread out over the Pacific. This leads to disputes among experts.

Antarctica. Antarctica is the world's southernmost continent entirely within the Antarctic Circle. It contains the geographic South Pole and is surrounded by the Southern Ocean. Although it is the fifth largest continent, Antarctica is only populated by a few thousand people, mostly researchers. The cold climate means only cold-adopted species are able to survive here.

Exercise 2. Read the following article and fill in the missing geographical names: (Mediterranean, Caucasus, Oceania, the British Isles, Asia, Greenland, Eurasian, Syria).

A continent is defined as a large unbroken land mass completely surrounded by water, although in some cases continents are (or were in part) connected by land bridges. The seven continents are North America, South America, Europe, Asia, Africa, Australia, and Antarctica. The island groups in the Pacific are often called.....(1) but this name does not imply that scientists consider them the remains of a continent. Political considerations have often overridden geographical facts when it came to naming continents. Geographically, Europe, including the.....(2), is a large western peninsula of the continent of Asia; and many geographers, when referring to Europe and Asia, speak of the.....(3) continent. But traditionally, Europe is counted as a separate continent, with the Ural and the .....(4) mountains forming the line of demarcation between Europe and Asia. To the south of Europe, Asia has an odd-shaped peninsula jutting westward, which has a large number of political subdivisions. The northern section is taken up by Turkey; to the south of Turkey there are.....(5), Iraq, Israel, Jordan, Saudi Arabia, and a number of smaller Arab countries. All these

are part of.....(6). Traditionally, the island of Cyprus in the.....(7) is also considered to be part of Asia. The Caribbean islands, Central America, and.....(8) are considered part of North America.

Exercise 3. Do the quiz.

1. Name four countries where English is the major official language.
2. For each of the six inhabited continents, name one country where English is a major language.
3. Name four countries where Islam is a major religion.
4. Name four countries that have large deserts.
5. Name four countries on four different continents.
6. Assume that it is now 3:00 P.M. in Washington, D.C. (New York, Miami, Boston, Atlanta, etc.). Name five cities where it is not 3:00 P.M., and give the time in each. Only one of the cities you name may be in the U.S.
7. Name four countries where there are rain forests.
8. Name four countries with high birth rates, high death rates, and low life expectancy.
9. Name four countries with low birth rates, low death rates, and high life expectancy.
10. Name four countries which are major manufacturers of automobiles.
11. Name four countries which are major producers of petroleum.
12. Name four countries on four different continents.

Exercise 4. Ask 5 questions to each sentence.

1. James Cook was a British explorer who achieved the first European contact with the Hawaiian Islands and the eastern coastline of Australia. 2. He also holds the record for being the first person to circumnavigate New Zealand. 3. James Cook explored the islands of New Zealand; the east coast of Australia; within the Antarctic Circle (but not Antarctica itself) and Hawaii, as well as up the west coast of North America. 4. A geographer – someone who studies Earth's surface, climate, countries, peoples, and so on – says that continents are big and islands are small. 5. For example, Greenland, the largest island, is only about a third as big as Australia. 6. A geologist – someone who studies

the physics of Earth as a planet – says that density accounts for the difference between continents and islands. 7. Continents are made up of low-density rock, so they float high on Earth's molten mantle like big rafts. 8. Ocean crust is denser, so it floats low on the mantle. 9. Most islands are really extensions of the ocean floor – undersea volcanoes pump out dense lava that cools into ocean floor crust and sometimes piles up to poke above sea level. 10. Greenland is ancient continental crust, but it isn't big enough to fit the geographer's definition of a continent. So, geologists compromise by calling it a microcontinent. Comparative and superlative form of adjectives

Two-syllable adjectives ending in **-y** have **-ier** and **-iest** as their comparative and superlative. Thus:

pretty	prettier	prettiest
happy	happier	happiest
dirty	dirtier	dirtiest
messy	messier	messiest

• Yours is the messiest room I have ever seen.

• She was the prettiest and happiest girl at the party.

Other common two-syllable adjectives ending in an unstressed vowel normally take the **-er/-est** patterns:

simple	simpler	simplest
clever	cleverer	cleverest

• The clever**est** solution to any problem is usually the simpl**est** one.

Others, particularly participial adjectives formed with **-ing** and **-ed** and those ending in **-ious** and **-ful** form their comparatives and superlatives with **more** and **most**:

boring	more boring	most boring
worried	more worried	most worried
anxious	more anxious	most anxious
careful	more careful	most careful

• Watching cricket is even **more** boring than playing it.

• My wife was certainly **more** anxious than I was when Penny failed to return.

• I bought the wrong type of hair shampoo for Joan. Next time I was more careful.

Note that **most** sometimes means **very** :

• I was most careful to leave the room as tidy as I had found it.

• I became most anxious when I heard that there had been a fire at the hospital.

• I was most impressed by Deborah's performance as Lady Macbeth.

With some two-syllable adjectives, **er/est** and **more/most** are both possible:

• The commonest /most common alcoholic drink in Poland is vodka.

• He is more pleasant /pleasanter to talk to when he has not been drinking.

Three or more syllable adjectives take **more** or **most** in the comparative and superlative except for two-syllable adjectives ending in **-y** and prefixed with **un-**:

reasonable	more reasonable	most reasonable
beautiful	more beautiful	most beautiful
untidy	untidier	untidiest
unhealthy	unhealthier	unhealthiest

• John is the unhealthiest person I know, but one of the most successful.

Hyphenated adjectives, which are also known as compound adjectives, normally use **more** and **most** for the comparative and superlative forms. This is the general rule. Sometimes we have to use **more/most** if, for example, the adjectival part of the compound ends in **-ed**. So, **sun-tanned** would have to be **more sun-tanned**, just as **tanned** would have

to be **more tanned**:

• You're more sun-tanned than I am.

Sometimes it is not so clear-cut, so we would say that one form is more likely than the other.

Exercise 5. Choose the correct answer.

1) Which mountains are higher?
a) The Andes b) the Rockies

2) Which country has a longer coastline?
a) Russia b) Denmark

3) What is further?
a) London to New York b) London to Moscow

4) Which city has bigger population?
a) Seoul b) San Paulo

5) Which elephant weighs more?
a) the Indian elephant b) the African elephant

6) Where are there more countries?
a) in Africa b) in South America

7) What city has more polluted atmosphere?
a) New York b) Beijing

8) Which country has a smaller population?
a) Australia b) Japan?

9) Which pyramids are older?
a) the Egyptian Pyramids b) the Maya Pyramids

10) Where is colder?
a) in the Antarctic b) in the Arctic

Presentation:

Choose the most endangered continent.
Write an essay introducing the problem and the ways to solve it.

UNIT 9

AUSTRALIA

Keywords

Area, land boundaries, coastline, maritime claims, contiguous zone, arable land, meadows and pastures, irrigated land, overgrazing, desertification, drought.

Exercise 1. Write 10 things you know about Australia. Exchange your information with your partner. Before you read more about Australia try to answer the following questions:

1. Who are Aussies and Kiwis?
2. What oceans is it surrounded by?
3. What do the abbreviations in the map stand for?
4. Is there any environmental threat to the Australian continent?
5. Try to talk about the terrain, population, capital, places of interest, anything you know about Australia.

Location: Oceania, continent between the Indian Ocean and the South Pacific Ocean

Map references: Oceania

Area: total area: 7,686,850 sq km; land area: 7,617,930 sq km;

comparative area: slightly smaller than the US; includes Macquarie Island

Climate: generally arid to semiarid; temperate in south and east; tropical in north

Terrain: mostly low plateau with deserts; fertile plain in southeast

Natural resources: bauxite, coal, iron ore, copper, tin, silver, uranium, nickel, tungsten, mineral sands, lead, zinc, diamonds, natural gas, petroleum

Land use: arable land: 6%; permanent crops: 0% ; meadows and pastures: 58%; forest and woodland: 14%; other: 22%.

Environment: soil erosion from overgrazing, industrial development, urbanization, and poor farming practices; soil salinity rising due to the use of poor quality water; desertification; clearing for agricultural purposes threatens the natural habitat of many unique animal and plant species; the Great Barrier Reef off the northeast coast, the largest coral reef in the world, is threatened by increased shipping and its popularity as a tourist site; limited natural fresh water resources

Natural hazards: cyclones along the coast; severe droughts

Note: world's smallest continent but sixth-largest country; population concentrated along the eastern and southeastern coasts; regular, tropical, invigorating, sea breeze known as "the Doctor" occurs along the west coast in summer.

Basic Facts About Australia

Although Australia is both the name of the smallest continent and a large country, there is a difference between the two. The country of Australia is just part of the bigger Australian continent, which also includes New Guinea, Tasmania, and other smaller, neighboring islands. The continental shelf where Australia lies has shallow seas in between, thus dividing it into several smaller landmasses. These seas are the Torres Strait and Arafura Sea between New Guinea and mainland Australia, and the Bass Strait between Tasmania and mainland Australia.The continent Australia is also known as Meganesia, Sahul, or Australinea. These names make it easier for the continent and the country to be set apart. It is the world's smallest continent but sixth largest country; with population concentrated along the eastern and southeastern coasts; regular, tropical, invigorating, sea breeze known as "the Doctor" occurs along the west coast in summer.

Australia's Geography Australia's total land area is 8,560,000 square kilometers. Since it is low-lying and surrounded by water, it is informally referred to as an island continent. During the Pleistocene Ice

Age, the islands in the Australian continent were connected by dry land. However, the past 10,000 years saw the rising sea levels overflowing and submerging the lowlands, hence separating the continent into mainland Australia, New Guinea, Timor, and Tasmania.

Australia's Geology Since Australia is situated on the Indo-Australian Plate, it was once connected to Antarctica as part of the supercontinent Gondwana 500 to 800 million years ago. Currently, Australia is composed of a thick subcontinental lithosphere or landmass, which has an average thickness of 38 kilometers, excluding the thinned margins. Most of the continental crust is formed by granites that appeared as far back as the Archaean, Proterozoic, and Paleozoic times. The continent also has a thin veneer of sedimentary basins that are about 7 kilometers thick. Through erosion, the continental crust and lithosphere formed sand dune systems, playa lakes, and salt lakes.

Australia's Flora and Fauna Australia has a very diverse animal, plant, and fungal life. In fact, marsupials and monotremes have even dominated the placental mammals found in the continent. This is due to the fact that the continent is the most isolated among all the continents. Moreover, it has tectonic stability and a unique pattern of climate change that enabled other species to thrive for a long time. As for Australian flora, it has over 34,000 species of plants. The arrival of the Aborigines 50,000 years ago and their use of fire-stick farming led to the extinction of around 60 plant species and the endangering of about a 1,000 plant species. Even though Australia is the smallest continent in the world, it has much history in terms of geology. It was once part of a bigger southern supercontinent, but because of the shifting of the tectonic plates, it became as isolated as it is now. Nowadays, it is home not just to humans, but also to diverse species of flora and fauna.

Exercise 2. Decide whether the following statemenst are true or false. If they are false try to correct them.

1. Australia has a semiarid climate.
2. It is threatened by natural hazards such as blizzards and tsunamis.
3. It is the largest country in the world.
4. The Great Barrier Reef is threatened by limited water resources.
5. Desertification causes overgrazing.
6. Australia’s natural resources include crude oil, gold and tin.

7. South east part of Australia covers 20 % of arable land.
8. Australia is as large as Asia.
9. The capital is Sydney.
10. Original inhabitants are Red Indians.

Relative Clauses

Defining Relative Clauses

As the name suggests, these clauses give essential information to define or identify the person or thing we are talking about. Obviously, this is only necessary if there is more than one person or thing involved.

Example: Elephants **who** marry mice are very unusual.

In this sentence we understand that there are many elephants, but it is clear that we are only talking the ones who marry mice.

Punctuation

Commas are not used in defining relative clauses.

Relative pronouns

The following relative pronouns are used in defining relative clauses:

Subject	who/that	which/that				
Object	who/whom/that	which/that	where	when	why	
Possessive	whose	whose				

Notes:

1. The relative pronoun stands in place of a noun. This noun usually appears earlier in the sentence: The woman **who/that** spoke at the meeting was very excited.

2. **Who, whom** and **which** can be replaced by **that**. This is very common in spoken English.

3. The relative pronoun can be omitted when it is the object of the clause:

The mouse **that** the elephant loved was very beautiful. **/or** The mouse the elephant loved was very beautiful.

Both of these sentences are correct, though the second one is more common in spoken English.

The mouse that the elephant loved was very beautiful.

You can usually decide whether a relative pronoun is an object because it is normally followed by another subject + verb.

4. **Whose** is used for things as well as for people.

Examples:

The man whose car was stolen. A tree whose leaves have fallen.

5. **Whom** is very formal and is only used in written English. You can use **who/that**, or omit the pronoun completely:

The doctor whom/who/that I was hoping to see wasn't on duty.

6. That normally follows words like something, anything, everything, nothing, all, and superlatives.

Examples:

- There's something that you should know.
- It was the best film that I've ever seen.

Examples:

- A clown is someone who makes you laugh.
- An elephant is an animal that lives in hot countries.
- The plums that were in the fridge were delicious. I have eaten them.
- Where are the plums (that) I put in the fridge?
- Has anyone seen the book I was reading?
- Nothing that anyone does can replace my lost bag.
- Let's go to a country where the sun always shines.
- They live in the house whose roof is full of holes.

Exercise 3. Write relative clauses with or without the relative pronoun.

1. I gave you a book. It had many pictures.
2. I am reading a book at the moment. It is very interesting.
3. You live in a town. The town is very old.
4. The sweets are delicious. I bought them yesterday.
5. The football match was very exciting. My friend played in it.
6. The letter hasn't arrived yet. I posted it three days ago.
7. He lives in a house. The house is not very big.
8. They are playing a song on the radio. Do you like it?
9. Jane wore a beautiful shirt yesterday. Did you see it
10. Sue is going out with a boy. I don't like him.

Presentation

Prepare a presentation about Australia as a continent. Focus on its original inhabitants.

UNIT 10

EUROPE

Exercise 1. Find the following places and show them on the map:

Ural Mountains, Caspian Sea, Black Sea, Azores, Danish Strait, White Sea, Gulf of Bothnia, English Channel, Mediterranean Sea, Volga, Carpathian Basin, Iron Gate.

Exercise 2. Read and interpret the text.

Europe, the world's second-smallest continent by surface area, comprises of the westernmost peninsula of Eurasia, and shares 2% of the Earth's surface and about 6.8% of its land area. It is the third-most populous continent after Asia and Africa, having about 11% of the world's population.Where is Europe located?

Europe is not an island nor a country but a continent which is located Eastward from the U.S. is divided by the North Atlantic ocean. Asia is to it's East. Europe comprises the westernmost peninsula of Eurasia. Countries such as Germany, France, Poland, Switzerland and Luxembourg are some of the countries that make up Europe.

Europe is a large peninsula on the western end of the Eurasian continent, and is located directly north of the African continent, separated from Africa by the Mediterranean Sea. Its eastern limit is the Caucuses mountains. Britain and Ireland are considered part of Europe, as are other adjacent small islands such as parts of Fenno-scandia. It is also located right next to Asia it is one of the biggest continents in the world. Where in Europe is 47 degrees? It depends on what you mean by 47˚.

Do you mean 47˚ Celsius? If so, then this temperature is achieved in multiple countries throughout Europe, mostly the Mediterranean region, during summer.

Do you mean 47˚ Fahrenheit? If so, then this temperature is achieved throughout the European continent during winter or fall months. Sometimes year round in the far north.

Do you mean 47˚ Latitude? If so, then this degree of latitude (north) passes through the heart of Europe, from France to Russia.

Do you mean 47˚ Longitude? If so, then this degree of longitude (east) passes through the westernmost of Russia.

Exercise 2. Read the text and put the words in brackets in the right form.

Although long called a continent, in many physical ways Europe is but a great western peninsula of the Eurasian landmass. Its eastern limits are……. (arbitration) and are ……(convention) drawn along the water divide of the Ural Mountains, the Ural River, the Caspian Sea, and the Caucasus watershed to the Black Sea. On all other sides Europe is surrounded by salt water. Of the……..(ocean) islands of Franz Josef Land, Spitsbergen (Svalbard), Iceland, and the Azores, only Iceland is regarded as an……..(integrity) part of Europe; thus the northwestern boundary is drawn along the Danish Strait.

Europe is not only…….. (peninsula) but has a large ratio of shoreline to land area reflecting a notable interfingering of land and sea. Excluding Iceland, the maximum north-south distance is (3529 mi) (5680 km); and the greatest east-west extent is 2398 mi (3860 km). Of Europe's area of 3,881,000 mi^2 (10,050,000 km^2) 73% is mainland, 19% peninsulas, and 8% islands. Also, 51% of the land is less than 155 mi (250 km) from shores and another 23% lies closer than 310 mi (500 km). This situation is caused by the inland seas that enter, like arms of the ocean, deep into the northern and southern regions of Europe, which thus becomes a peninsula of peninsulas. The most notable of these branching arms of salt water are the White Sea, the North Sea, the Baltic Sea with the Gulf of Bothnia, the English Channel (La Manche), the Mediterranean Sea with its secondary branches, and…… (final), the Black Sea. Even the Caspian Sea,…… (present) the largest

saltwater lake of the world, formed part of the southern seas before the folding of the Caucasus. The…… (penetrate) of the landmass by these seas brings marine influences deep into the continent and provides Europe with a balanced climate……. (favour) for human……. (evolve) and…… (settle). Europe has a unique…… (diverse)of land forms and…….. (nature) resources. The relief, as varied as that of other continents, has an average…… (elevate) of 980 ft (300 m) as compared with North America's 1440 ft (440 m). The shape and the overall physiographic aspect of the great peninsula are controlled by……. (geology) structure which delimits the major regional units. Climate is determined by a number of factors. Probably the most important are a favorable location between 35° and 71°N latitudes on the western or more maritime side of the world's largest…….. (continent) mass; the west-to-east trend (rather than north-south) of the lofty southern ranges and the Central Lowlands, as well as of the inland seas, which permit the prevailing westerly winds of these latitudes to carry marine influences deep into the continent; the ……(benefit) influence of the North Atlantic Drift, which makes possible ice-free coasts far within the Arctic Circle; and the low elevation of the northwestern mountain ranges and the Urals, which allows the free shifting of air masses over their crests. The intricate relief and the climates of Europe are well reflected in the drainage system. …….(extension) drainage basins with large slow- flowing rivers are developed only in the Central Lowlands, especially in the eastern part. Streams with the greatest discharge empty into the Black Sea and the North Sea, although Europe's longest river, the Volga, feeds the Caspian Sea. Second in dimension is the Danube, which crosses the Carpathian Basin and cuts its way twice through mountain ranges at the Gate of Bratislava and at the Iron Gate. The Rhine and Rhone are the two major Alpine rivers with headwater sources close to each other but feeding the North Sea and the Western Mediterranean Basin, respectively. … (abundancy) precipitation throughout the year, as well as the permeable soils and the dense vegetation which…… (temporary) store the water, provides the streams of Europe north of the Southern Highlands with ample water throughout the seasons. The combined effects of poor vegetation, rocky and desolate limestone karstlands, and slight annual……. (precipitate) result in intermittent

flow of the rivers along the Mediterranean coast, especially on the eastern side of peninsulas. Only the Alpine rivers carry enough water, and if it were not for the Danube and Rhone, both originating in regions north of the Alps, the only major river of the Mediterranean basin would be the Po. (of sedimentary rocks) to change laterally from one type to another in a zone where the two types form interpenetrating wedges.

Exercise 3. Say if the statements are true or false.

1. Eastern borders of Europe are surrounded by sea.
2. The northwestern boundary of Europe is in Franz Jozef Land.
3. Mainland covers 19% of Europe.
4. The Caspian sea is the largest freshwater lake in the world.
5. The Rhine and Danube are two major Alpine rivers.
6. Lack of precipitation is the cause of dense vegetation.
7. Danube is Europe's largest river which flows from Gate of Bratislava.

Word-formation: nouns and adjectives

We can make adjectives from nouns with the suffixes **-ous, -ic and -al**.

fame > famous, ambition > ambitious
photography > photographic, drama > dramatic
music > musical, maths > mathematical

Sometimes the spelling changes when you add a suffix. If necessary, use a dictionary to help you find the correct
spelling.

Exercise 4. Write the related adjectives.

1. logic ……
2 . fury ……
3. person ……
4. apology ……
5. rebel ……
6 . technology ……
7 . optimism ……
8. caution ……
9. nation ……

10. advantage ……
11. theory ……
12. pessimism ……

Exercise 5. Complete the sentences with the correct form of the words.

1. Jackie is very ambitious. She wants to be a actress. (ambition)
2. The holiday was …… . There was nothing to do and it rained all the time. (disaster)
3. Brenda was very …… when she heard that I'd split up with Pete. (sympathy)
4. You have to be fit and extremely …… to take part in this sport. (energy)
5. The …… party promised to cut taxation when it was elected. (politics)

Exercise 6. Complete the following sentences by adapting the word given in brackets.

1) We need to find a _____ to the problem as soon as possible. (solve)
2) Juan speaks English fluently and makes very few _____ mistakes. (grammar)
3) The teacher keeps a record of every student's _____ . (attend)
4) Air-conditioning is a _____ if you live somewhere like the south of Spain. (necessary)
5) Don't be afraid of the dog. He's absolutely _____ . (harm)
6) The company is trying hard to improve customer _____ . (satisfy)
7) Measures were taken around the world to _____ airport security after the 11 September attacks. (tight)
8) We're going to change our suppliers as they have become very _____ in the last year. (rely)
9) Patricia's very _____ . She writes short stories, paints and makes mosaics. (create)
10) We need your _____ at the bottom of the page. (sign)

11) The index at the back of the book is in _____ order. (alphabet)

12) The fans waved _____ as the film star stepped out of the limousine. (excite)

13) Chickenpox is a highly _____ disease which many people catch as a child. (infect)

14) Matt is very _____ . He wants to be number one at everything. (compete)

15) Harry loves cars and he's so _____ about them. (knowledge)

16) There is little _____ of the president being re-elected. (likely)

17) The prime minister thinks there may be a _____ to overthrow him. (conspire)

18) In _____ with Tokyo, London and Paris are relatively cheap. (compare)

19) The police were unable to _____ that she had committed the crime. (proof)

20) The president's speech went on for so long that I almost died of _____ ! (bore)

Exercise 7. Read the following expressions and make up sentences using these expressions (border, flow, separate, occupy, form, locate, stem, divide, interrupt, run, situate).

Danubian Flat, Danubian Lowland, Demographics of Slovakia, Devín Gate, Caves of Slovakia, Cities and towns in Slovakia, Mountain ranges of Slovakia, Mountains of Slovakia, Traditional regions of Slovakia, Dukla Pass, Pannonian Plain, Viennese Basin, Regions of Slovakia, Rivers of Slovakia, Eastern Slovak , Flat Eastern Slovak Lowland, Gaderská Valley, Great Hungarian Plain, Little Hungarian Plain, Tokaj (region in Slovakia).

Exercise 8. Do the following quiz.

1. Which city is sometimes referred to as the 'Queen of the Adriatic'?
2. Which country is called the 'Land of the Midnight Sun'?
3. In which city in Italy is the Leaning Tower located?
4. Which is the highest mountain peak in Europe?

5. How high is the Eiffel Tower in Paris?

6. In which city can you take a ride in a gondola?

7. The Caucasus Mountains lie between the _____ Sea and the _____ Sea.

8. Which is the water body that separates the British Isles from the mainland?

9. Which is the water body that separates Europe from Asia?

Presentation

Prepare a presentation on any European country. Give the list of places to visit.

UNIT 11

AFRICA

Exercise 1. Answer all questions about Africa. Rank the continents according to size.

1. Is Africa bordered by two oceans and a sea?
2. Which ocean borders Africa to the west?
3. Which ocean borders Africa to the east?
4. Which sea borders Africa to the north?
5. What is the primary language in Africa?

AFRICA

Africa is the world's second largest continent (next to Asia) in both area and population.

Its area of 11,699,000 square miles is more than three times the size of the United States, and

its 1990 population of 642 million made up 12 percent of the world's total. Africa encompasses over fifty nations, ranging in size from Nigeria (with a population of more than 120 million) to small island countries such as Cape Verde (population 424,000). Africa is commonly divided into two regions delineated by the Sahara Desert, which runs through northern Africa. The countries north of the Sahara are generally considered more developed than those in sub-Saharan Africa, where most of the continent's population resides. With an estimated one thousand different languages spoken and at least as many distinct ethnic groups, Africa is perhaps the most linguistically and ethnically diverse of all the world's continents.Two hundred ethnic groups have at least half a

million people; no single group accounts for more than five percent of Africa's total population.

For much of history, non-Africans have referred to Africa– especially sub-Saharan Africa–as the "Dark Continent." This was a reflection of European and American ignorance of Africa's interior geography and rich cultural and political history. Europeans established trading posts on Africa's coasts beginning in the late 1400s and over the next centuries developed an extensive trade with the peoples they encountered–a trade that included the exportation of African slaves to New World colonies. However, due to disease, topography, and African resistance, little European exploration or penetration of Africa's large interior was done until the nineteenth century. "Kept on the fringes of Africa, and ignorant of it," writes historian Robert Garfield, "Europeans turned the situation around and assumed it was Africans who were isolated. They thus created the myth of the 'Dark Continent,' though the darkness was only in European minds." Europe's rush to colonize Africa in the nineteenth century was motivated in part by a quest to "enlighten" African peoples with European religion and civilization.

In contemporary times Africa has remained a "Dark Continent" for many not because of geographic isolation or foreign ignorance, but because of the frequent humanitarian disasters and political misfortunes that have brought global attention to the region. "The next time you read about Africa in the news," writes Liberian journalist C.William Allen, "it will most likely be in a story about a military coup d'etat, political corruption, [or] a catastrophe of major proportions." Sub-Saharan Africa, which contains a tenth of the world's people, is the location of half the planet's wars and refugees and most of its famines. In the 1990s alone Africans have suffered through continuing war in Angola, a collapse of government, ethnic conflict, and starvation in Somalia, slavery and war in Sudan,genocide and massive refugee flows in Rwanda, a brutal civil war in Liberia, and political repression and corruption in many other countries. Even in nations that have escaped major wars or famines, Africans have been faced with a steady decline in their quality of life as measured by poverty rates, school enrollments, per capita incomes, and life expectancies.

Exercise 2. Are the following statements true or false?

1. Africa is the world's largest continent (next to Asia) in both area and population.

2. Africa encompasses over one hundred nations.

3. Africa is perhaps the most linguistically and ethnically diverse of all the world's continents.

4. For much of history, non-Africans have referred to Africa – especially sub-Saharan Africa – as the "Dark Continent.

5. Sub-Saharan Africa, which contains a third of the world's people, is the location of half the planet's wars and refugees and most of its famines.

Connecting words, or conjuncts.

They join sentences or parts of sentences in a logical, chronological, or other way.

We can think about conjuncts by the grammatical roles that they play:

A. **Listing**

1) Enumerative. In the first place, the economy is recovering, and secondly

unemployment is beginning to decline.

(for one thing, for another thing, next, then, finally)

2) Additive. She has the ability, the experience, and above all the courage to tackle

the problem.

(furthermore, moreover, what is more, similarly, in addition)

B. **Summative**

He was late for work, he quarrelled with a colleague, and he lost his wallet; all in all,

it was a bad day.

(altogether, overall, therefore, in sum, in summary, in conclusion)

C. **Appositive**

There was one snag; namely, the weather.

(that is, that is to say, i.e., for example, e.g., in other words, specifically)

D. **Resultive**

I got there very late, so I missed most of the fun.

(therefore, as a result, accordingly, in consequence of, of course)

Exercise 3. Fill in the gaps. More than one word may be correct.

1. I think she's just the right person for the job. She has the degree, _____ the experience. (moreover, what is more, in addition, furthermore, above all)

2. The sample will soon melt. _____ it will flow out of the sample holder. (of course, therefore, as a result, accordingly, in consequence of)

3. There is just one small problem. _____ I want to use the instrument tomorrow. (namely, that is, that is to say, for example, in other words, specifically)

4. _____, we have shown that these methods have much in common. (in summary, in conclusion, overall, altogether)

5. I don't want to work on the paper today. _____, I have a class and _____ I'm very tired. (firstly, first of all, for one thing, secondly, for another thing, also)

E. **Inferential**

You haven't answered my question; in other words, you disapprove of the proposal. (in that case, so, then, otherwise, else)

F. **Contrastive**

1) Replacive. She's asked some of her friends–some of her husband's friends, rather. (better, more accurately, in other words)

2) Antithetic--They had expected to enjoy being in Manila but instead they both fell ill. (on the contrary, by contrast, on the other hand, then)

3) Concessive. My age is against me; still, it's worth a try. (however, nonetheless, yet, all the same, of course, that said, only, though)

G. **Transitional**

1) Discoursal.

Let me introduce you to my sister, and by the way, did I tell you that I'm moving? (incidentally, now)

2) Temporal. The ambulance got stuck in rush-hour traffic and in the meantime the child became delirious. (meanwhile, originally, subsequently, eventually)

Exercise 4. Fill in the gaps. More than one word is possible.

1. Last month I _____ thought he was wrong. _____ I agree with him. (originally, meanwhile, subsequently)

2. He asked no questions. ____ was he asleep, or _____ not interested? (so, then, in that case, otherwise, else, just)

3. He heated the sample above its glass transition. _____, to 100 degrees Centigrade. (more accurately, better, in other words, rather)

4. I'm giving a talk in Germany next month. _____, I'll be there during a special festival. (incidentally, by the way, now)

5. I expected to have a lot of interest in my talk. _____, no one came. (on the contrary, but, instead)

6. We disagree with the other group's interpretation. _____, their experimental results are impressive. (still, however, nonetheless, yet, all the same, of course, that said, only, though)

Presentation

Give a presentation on Africa – the continent of variety.

UNIT 12

ANTARCTICA

Exercise 1. Match the expressions in bold with their definitions below.

Antarctic Convergence (Polar Front), continental slope, cyanobacteria, evaporation, glaciation, land-based ice sheet, marine biology , ultraviolet radiation (UV).

1. The study of plants and animals living in the seas and oceans.

2. A large body of ice with a base mostly above sea level. The East Antarctic Ice Sheet is a land-based ice sheet. Freshwater.

3. A part of the electromagnetic spectrum that has shorter wavelengths than visible light. Ultraviolet radiation has more energy than visible light and can damage tissue (like human skin). Much of the ultraviolet radiation from the sun is absorbed within the ozone layer before it reaches the Earth's surface.

4. The formation, activity, and retreat of glaciers through time. The glaciation of a region refers to the growth of ice over that region. Large parts of the Northern Hemisphere experienced glaciation in the past - ice ages.

5. Change in state from a liquid or a solid to a gas. Evaporation takes place most quickly in an arid or dry environment when there is little or no water vapour in the air. Antarctica is arid and solid ice can "evaporate" or turn into a gas, particularly if a (relatively) warm wind blows across a snow or ice field. The change from a solid directly to a gas is properly called sublimation - like the "smoke" you get when you open the freezer door.

6. Very specialized acellular organisms classified as blue-green algae. Cyanobacteria can photosynthesize, making their own food from sunlight. They are exceptionally tough organisms, able to colonize and survive in harsh environments.

7. Narrow, steep (3° to 6° slope) transition zone between the shallow shelf and the deep ocean floor.

8. A surface boundary where which the colder, north flowing Antarctic Surface Waters sink beneath warmer circulating waters. This marks a change in the oceans surface temperature and also chemical composition. North of the convergence, the area is known as the sub-Antarctic.

Exercise 2. Translate into English using the following word-combinations:

"Electromagnetic environment" of the Earth, long-term weather forecast, tracking climate change, the Antarctic Peninsula, anthropogenic impact on, biomedical research, recycling of solid food wastes, medical standards, the establishment of an international health care system, to implement the technology on, to consider in, the Academy of Sciences, named after, Galindez Island, Argentine archipelago, hazardous organic wastes, molecular hydrogen, neutralization, experimentally, theoretically, the possibility of obtaining.

1. Академік Вернадський – українська антарктична станція. Розташована на острові Галіндез Аргентинського архіпелагу, поблизу Антарктичного півострова. Заснована в лютому 1996 року.

2. Вперше в Антарктиці на антарктичній станції “Академік Вернадський” впроваджена технологія з переробки твердих харчових відходів.

3. Результати медико-біологічних досліджень українських вчених враховані при розробці медичних стандартів та створення міжнародної системи охорони здоров'я в Антарктиці.

4. Вперше в світі сформульована концепція дослідження техногенного впливу на “електромагнітний клімат” Землі, розроблений метод довгострокового прогнозу погоди для Антарктичного півострова.

5. Антарктична станція “Академік Вернадський” включена в глобальну систему відстеження кліматичних змін.

6. Станція названа на честь відомого вченого, академіка Володимира Івановича Вернадського (1863-1945), який у 1918 році став першим президентом Академії наук України.

7. Київський вчений-біолог Олександр Таширєв сподівається звільнити білий континент від харчових відходів, він теоретично розробив й експериментально підтвердив можливість отримання молекулярного водню при знешкодженні екологічно небезпечних органічних відходів.

Exercise 3. Render the text.

Fascinating facts about Antarctica

1. If Antarctica's ice sheets melted, the worlds oceans would rise by 60 to 65 metres (200 – 210ft) – everywhere.

2. Antarctica is pushed into the earth by the weight of its ice sheets. If they melted, it would "spring back" about 500m (1 625 ft). It would do this very slowly taking about 10,000 years to do so. Scotland and Scandinavia are still rebounding today after the last ice age – at the rate of half a meter a century in the Northern Baltic – the fastest place.

3. Antarctica is the best place in the world to find meteorites. Dark meteorites show up against the white expanse of ice and snow and don't get covered by vegetation. In some places, the way the ice flows concentrates meteorites there. The ice makes them gather in one place.

4. One of the biggest icebergs ever (possibly the biggest iceberg ever) broke free from the Ross ice shelf in Antarctica in 2000. It was 295km (183 miles) long and 37km (23 miles) wide, with a surface area of 11,000 sq km (4,250 square miles) above water – and 10 times bigger below. It's similar in size to The Gambia, Qatar, The Bahamas, or Connecticut.

5. It has been estimated that during the feeding season in Antarctica, a full grown blue whale eats about 4 million krill per day (krill are small shrimp-like creatures), that's 3600 kg or 4 tons – every day for 6 months. The daily intake would feed a human for about 4 years! Krill may be nutritious but they're not very nice as people food – which is lucky for the whales!

6. Since the Antarctic convergence arose about 20 million years ago, there has been very little exchange of fish or other marine life in either direction. This means that fish have lived in their side of the ocean and have not crossed over to their neighbours side.Antarctic fish have lived at between +2° C and -2° C for 5 million years (-2° C is the freezing point of sea water, below zero because of the salt). They are therefore the best cold adapted animals that there are on the planet – now or ever.

7. When the Antarctic sea-ice begins to expand at the beginning of winter, it advances by around 40,000 square miles (100,000 square kilometres) per day, and eventually doubles the size of Antarctica, adding up to an extra 20 million square kilometres of ice around the land mass. That's one and a half USA's, two Australia's or 50 UK's worth of ice area that forms, then breaks up and melts each year.

8. Snow falling at the South Pole takes about 100 000 years to "flow" to the coast of Antarctica before it drops off the end as part of an iceberg.

9. The largest land animal in Antarctica is an insect, a wingless midge, Belgica antarctica, less than 1.3cm (0.5 in) long. There are no flying insects (they'd get blown away), just shiny black springtails that hop like fleas and tend to live among penguin colonies.

10. Samples of ice known as ice cores are regularly drilled through the ice in Antarctica by scientists. They are removed as a long cylinder of ice that gives an indication of the past going back tens of thousands of years. The properties of the ice, of dust trapped in the ice, and even of air bubbles trapped in the ice give valuable information about the earth's climate at various times in the past.

11. The Antarctic ice cap has 29 million cubic kilometres of ice. This is 90% of all the ice on the planet and between 60 and 70 % of all of the world's fresh water. Only about 0.4 percent of Antarctica is not covered by ice. A glaciologist could easily give you a drink of water that was frozen during the life of Christ.

Exercise 4. Write different types of questions to cover the contents of the text.

Exercise 5. Speak on the topic "The coldest, windiest, and driest continent".

Exercise 6. Interpret the following text. Time limit – 10 minutes.

Global Warming Slows Down Antarctica's Coldest Currents

The coldest, windiest, and driest continent, Antarctica contains 90 percent of all of the ice on the planet in an area just under one and a half times the size of the United States. Let's take a look at one of the world's most desolate regions. A shift from briny to fresh in Antarctica's ocean waters in recent decades could explain the shutdown of the Southern Ocean's coldest, deepest currents, a new study finds.

The cold currents, called the Antarctic Bottom Water, are chilly, salty rivers that flow from the underwater edge of the Antarctic continent north toward the equator, keeping to the bottom of the seafloor. The currents carry oxygen, carbon and nutrients down to the deepest parts of the ocean. Previous studies have found this deep, dense water is disappearing, though researchers aren't sure if the shrinkage is part of a long-term trend linked to global warming, or a natural cycle.

The new study suggests that Antarctica's changing climate is to blame for the shrinking Antarctica Bottom Water. In the past 60 years, the ocean surface offshore Antarctica became less salty as a result of melting glaciers and more precipitation (both rain and snow), researchers reported Sunday (March 2) in the journal Nature Climate Change. This growing freshwater layer is the key link in a chain that prevents the cold-water currents from forming, the study finds.

"Deep ocean waters only mix directly to the surface in a few small regions of the global ocean, so this has effectively shut one of the main conduits for deep-ocean heat to escape," said Casimir de Lavergne, an oceanographer at McGill University in Montreal.

Exercise 5. Translate into Ukrainian.

Holey ice

The linchpins linking freshwater and cold currents are polynyas, or natural holes within sea ice. These persistent regions of open water form

when upwellings of warm ocean water keep water temperatures above freezing, or when winds drive sea ice away from the coast.

Polynyas are one of the main sources of Antarctica Bottom Water. Polynyas act like natural refrigerators, letting frigid temperatures and cold winds chill seawater and send it sinking down to the ocean bottom. As the cold water sinks, warmer ocean water comes up to take its place, maintaining the polynya's open water.

But as Antarctica's ocean surface water has freshened, fewer polynyas have appeared, the researchers found. That's because the fresher water is less dense. Even if the water is very cold, it doesn't sink as readily as saltier water, de Lavergne explained. The freshwater acts like a lid, shutting down the ocean circulation that sends cold water to the seafloor, and brings up warm water into the polynyas.

"What we suggest is, the change in salinity of the surface water makes them so light that even very strong cooling is not sufficient to make them dense enough to sink," de Lavergne told Live Science. "Mixing them gets harder and harder".

Exercise 6. Write 5 questions on the text.

In addition to warming and shrinking the Antarctic Bottom Water currents, the reduction in polynyas could be trapping extra heat in the Southern Ocean, de Lavergne said.

"If the warm waters aren't able to release their heat to the atmosphere, then the heat is waiting in the deep ocean instead," he said. "This could have slowed the rate of warming in the Southern Hemisphere." De Lavergne cautioned that the heat-storage effect is localized and not related to the so-called global warming "hiatus" – the recent slowdown in the rise of global surface temperatures. "Our study is still a hypothesis," he added.

"We say that climate change is preventing convection from happening, but we do not know how frequent it was in the past, so that's a big avenue for future research."

Exercise 7. Make a report on the topic "Global warming".

Past Perfect

[had + past participle]

Examples:

• You had studied English before you moved to New York.

• Had you studied English before you moved to New York?

• You had not studied English before you moved to New York.

USE 1. Completed Action Before Something in the Past

The Past Perfect expresses the idea that something occurred before another action in the past. It can also show that something happened before a specific time in the past.

Examples:

• I had never seen such a beautiful beach before I went to Kauai.

• I did not have any money because I had lost my wallet.

• Tony knew Istanbul so well because he had visited the city several times.

• Had Susan ever studied Thai before she moved to Thailand?

• She only understood the movie because she had read the book.

• Kristine had never been to an opera before last night.

• We were not able to get a hotel room because we had not booked in advance.

• A: Had you ever visited the U.S. before your trip in 2006?
B: Yes, I had been to the U.S. once before.

USE 2. Duration Before Something in the Past.

With non-continuous verbs and some non-continuous uses of mixed verbs, we use the Past Perfect to show that something started in the past and continued up until another action in the past.

Examples:

• We had had that car for ten years before it broke down.

• By the time Alex finished his studies, he had been in London for over eight years.

• They felt bad about selling the house because they had owned it for more than forty years.

Although the above use of Past Perfect is normally limited to non-continuous verbs and non-continuous uses of mixed verbs, the words

"live," "work," "teach," and "study" are sometimes used in this way even though they are not non-continuous verbs.

Specific Times with the Past Perfect

Unlike with the Present Perfect, it is possible to use specific time words or phrases with the Past Perfect. Although this is possible, it is usually not necessary.

Example:

• She had visited her Japanese relatives once in 1993 before she moved in with them in 1996.

If the Past Perfect action did occur at a specific time, the Simple Past can be used instead of the Past Perfect when "before" or "after" is used in the sentence. The words "before" and "after" actually tell you what happens first, so the Past Perfect is optional. For this reason, both sentences below are correct.

Examples:

• She had visited her Japanese relatives once in 1993 before she moved in with them in 1996.

• She visited her Japanese relatives once in 1993 before she moved in with them in 1996.

If the Past Perfect is not referring to an action at a specific time, Past Perfect is not optional. Compare the examples below. Here Past Perfect is referring to a lack of experience rather than an action at a specific time. For this reason, Simple Past cannot be used.

Examples:

- She never saw a bear before she moved to Alaska. (Not Correct)
- She had never seen a bear before she moved to Alaska. (Correct)

Exercise 8. Try to fill in the following story with the correct form of tense (Past Perfect or Past Simple).

Cooking the books?

Old Mr Williams was very concerned. He and his wife were pensioners and he (spend)..... the whole morning looking for thier pension books. He (look).....everywhere but he (not be able).....to find them. Meanwhile, his wife (be).....busy. She (cook).....all orning. She (prepare).....a delicious meal. She (make).....soup, followed by a lovely pie, which she (bake).....in the oven. Mr Williams (always

enjoy).....his food, but he clearly wasn't enjoying the lunch. „What's the mater, Tom?", his wife asked. Mr Williams (have to) confess that he (lost).....their pension books. „I know, Mrs Williams (say).....with a twinkle in her eye. „I've got them". „You've got them?" „ Yes – and guess where I (find).....them!" Mr Williams suddenly remembered. „In the oven! I (put).....them there for safe- keeping." He (smile).....with relief as she (fish).....them out of her apron pocket.

Exercise 9. Do the quiz "How well do you know Geography?" Correct the sentences.

1. Andes is an after dinner mint.
2. The Balkans are an alien people on Star Trek.
3. The English Channel is a TV sitcom about Charles and Di.
4. The United Kingdom is a cultural theme park.
5. The Tropic of Cancer is a sunscreen lotion.
6. The $10,000 Pyramid is in Egypt.
7. The Gaza Strip is a Middle Eastern folk dance.
8. The Ring of Fire is the center ring of Barnum and Bailey's Circus.
9. The Bermuda Triangle is a percussion instrument in a reggae band.
10. The Cumberland Gap gives out a pair of clogs with every set of jeans sold.
11. The International Dateline is a new cable TV network.
12. The Equator is a cartoon action figure.
13. The Continental Shelf is a specialty section of the supermarket.
14. An archipelago is a food stabilizer.
15. The Dust Bowl is Granny's old favorite dish.
16. A fault is what you find in other people.
17. A fjord is a Norwegian car.
18. A mantle is what goes over your fireplace.
19. Tide is a laundry detergent.
20. You can do a research paper to find out who killed the Dead Sea.

Some Useful Latin Expressions

ad hoc	–	for the special purpose or end
anno Domini (A.D.)	–	in the year of our Lord; a date after Christ (A.D.)
ante meridiem (a.m.)	–	before noon
post meridiem (p.m.)	–	after noon
circa (ca.)	–	about; used especially in approximate dates
et alia (et al.)	–	and others; and elsewhere
et cetera (etc.)	–	and others; and so forth; and so on
exempli gratia (e.g.)	–	for example; such as
ibidem (ibid.)	–	in the aformentioned place
idem	–	the same as previously given
id est (i.e.)	–	that is
in situ	–	a. in place or position; undisturbed
		b. in a localized state or condition
ex situ	–	the opposite of " in situ"
opere citato (op. cit.)	–	in the work cited (in other words, "op. cit." means
	–	that you don't know the page number)
sic	–	thus; so. Used to indicate that a surprising word in the text is not a mistake or is quoted verbatim
vice versa	–	conversely; in reverse order from that stated
vide	–	see
vide ante	–	see before
vide infra	–	see below
vide post	–	see after
vide supra	–	see above
videlicet (viz.)	–	that is to say; namely

GLOSSARY

Abiotic: non-living.

Abundance: the number of organisms in a given population.

Acclimatization: adaptation to a different climate.

Acid Rain: precipitation heavy with nitric and sulfuric acid. Most of it is generated by sulfur dioxide and nitrogen dioxide (air pollution). Its pH is less than 5.6.

Acre: 1 acre = 43,560 sqare feet, 208.7 feet on a side, and .405 hectares.

Acre-Foot: the amount of water it would take to cover an acre of land to a depth of one foot: 325,851 gallons of water. The standard measure of agricultural irrigation.

Adaptation: how living things change what they do or what they are to survive in a particular environment. In this the organism is not a passive recipient of external circumstances; the relationship is interactive.

Aeroplankton: tiny organisms living in the atmosphere. Certain small seeds, bacteria, and spores are examples.

Agriculture: large-scale cultivation of the land, with resulting specialization of labor, domestication of plants and animals, identification with one's sedentery social group, and a radical separation from the natural world.

Agroforestry: planting crops among trees.

Air Pollution: sulfur oxides and particulates from industrial plants burning fossil fuels are the current worst forms of air pollution.

Algae: primarily marine organisms, single-celled or multicellular, that use chlorophyll to feed, like plants, but lack the roots, leaves, flowers, etc. of true plants.

Alpine: above the timberline. Roughly synonymous with "mountainous."

Alternative Fuels: fuels from sources cleaner than coal or petroleum products: ethanol, methanol, natural gas, solar, wind, geothermal, biodiesel from vegetable oil, etc.

Ambient: prevailing natural conditions studied and recorded outside rather than indoors under microscopes or other controlled conditions.

Amphibians: newts, frogs, salamanders: backboned animals that can live in water and on land.

Anabolic: metabolic processes that build tissues and organs.

Angiosperms: flowering plants that place their seeds in fruits. Monocots include grasses, orchids, palms, and cattails, and dicots include oaks, sycamores, and maples.

Animals: the animal kingdom branches into the deuterostomes (mouth and anus develop separately) and the protostomes. 75% of all the animal species are insects.

Annuals: pioneer plants which grow, flourish, and die in one season.

Artesian: water pushed upward by the hydrostatic pressure of a confined aquifer.

Bacteria: single-celled prokaryotic organisms (prokaryotic means: DNA not enclosed in a cell nucleus), many microscopic.

Bacteriophage: a virus that infects and eventually kills its bacterial host.

Basic: alkaline.

Biocenose (Biocenosis): the interacting organisms living together in a habitat. A biotic community.

Biocentric: putting the natural world, rather than the human world, into the perceived center of the cosmos. The land is not made for us: we are a part of it.

Biodiversity: biological variety of the kind that preserves species and their DNA.

Biomass: the total quantity of living matter in a given area or ecosystem.

Biome: the largest ecological regions distinguishable by characteristic plants and animals. There are six: tundra, conifer, deciduous forest, grassland, tropical, and desert.

Biophilia: love of nature. Coined by biologist E. O. Wilson. The opposite of necrophilia, the love of dead things.

Bioregion: a naturally bounded, ecologically distinct geography: a watershed is one example. The largest bioregion is an ecoregion (example: the Ozark Plateau).

Biosphere: taken together, the troposphere, oceans, and land surfaces where things live. Also called the Ecosphere.

Biotic: living.

Biotic Community: a self-sustaining community of living things. An ecosystem.

Biotic Factor: the environmental influence exerted naturally by living organisms: worms that aerate soil, animals that enrich it with manure, trees that throw shade, etc.

Biotic Potential: a population's maximum production rate given ideal surroundings and resources.

Biotope: an environmentally uniform area. The physical aspect of an ecosystem.

Boreal Forest (Taiga): the high to mid-latitude biome characterized by coniferous forests inhabited by fir, pine, spruce, larch, and cedar standing on previously glaciated land.

Carbon: an element whose atoms have six protons and six electrons.

Carcinogen: a substance that fosters cancer, an illness characterized by cells that cannot quit dividing in a kind of biological nation-statism.

Catabolic: metabolic processes that break down tissues and organs-turning protein into energy during a fast, for example.

Cell: makers and maintainers of protoplasm; the basic living unit of all organisms except viruses.

Celsius Scale: temperature scale in which water freezes at 0° and boils at 100°.

Cereals: grasses cultivated for their edible seeds (grains). They include wheat, rice, maize, barley, oats, and rye.

Chernozem Soils: soils rich in humus and calcium, like the soils often seen in meadows and prairies.

Chromosome: a long, threadlike structure that carries the bearer's genetic code (DNA), among other things. Humans have 23 pairs of chromosomes, 46 in all: 44 autosomes and two sex chromosomes, the X (female) and less complex Y (male).

Cities: urban systems whose dominant members occupy various niches, some of which compete.

Climate: average atmospheric conditions over a long time interval. Energy from the sun drives climate, which sets limits on a biome's plant life and therefore on the animals that live there.

Climax: the culminating stage of plant succession in a given ecosystem.

Community Coefficient: a measure of similarity between the plants and animals of two different ecological communities.

Competition: for food and resources. Types: interference (by direct attack), exploitation (forced to share a resource), scramble (everyone gets something), contest (one competitor gets it all), and restrictive (preventing someone else from getting it); also, inter- and intraspecific modes (between or within species).

Compound: a substance composed of various elements.

Consumer: an organism that consumes other organisms, whether living or dead.

Coral: marine invertebrates that secret a calcium carbonate exoskeleton and live symbiotically with algae.

Core: the Earth's iron-nickel interior; about 7,000 kilometers in diameter. Its currents generate the planet's magnetic field.

Counter-Radiation: greenhouse deflection of incoming longwave radiation back to the planet surface.

Crash: a sudden population dropoff caused by resource depletion.

Creep: slow downslope soil movement.

Cryosphere: the part of the Earth that remains below the freezing point (e.g., the poles).

Cultivar: an organism with desirable breeding qualities.

Cultivate: to break up soil in preparation for planting.

Cyanobacteria: bacteria that photosynthesize. They were among the first living things on Earth. Cyclone: a low-pressure center wrapped in rotating movements of air.

Cytokinesis: cell division.

Cytoplasm: the portion of a cell's protoplasm (living matter) outside the nucleus.

Decomposer: an organism that eats dead organic matter. Most are bacteria, algae, and fungi. They fuel the nitrogen and oxygen cycles that support all life on Earth.

Deep Ecology: a term coined by Arne Naess in his 1973 article “The Shallow and the Deep, Long-Range Ecology Movements”

Deflation: the removal of soil by wind erosion in hollows and depressions.

Defoliant: an herbicide that kills leaves.

Demographic Transition: the hypothesis that industrializing nations exhibit death rate declines followed by birth rate declines.

Density Dependence: the tendency of a population's growth rate to depend on its size, with an increase in population density corresponding to a decrease in growth.

Dieback: the deep population crash when an environment can no longer support a population's demands. Usually leads to dieoff (extinction).

Dioxin: a highly toxic chlorinated hydrocarbon used in herbicides and produced by industrial pollution.

Divergent Evolution: when two populations become more and more dissimilar, usually as a result of different environmental pressures.

Dunes: along with estuaries they prevent coastal flooding and erosion.

Dystrophic: toxic habitats deficient in nutrients.

Earth, Age: 4.55 billion years. Formed by particles of gas and denser materials once ejected from exploding supernovae and gradually pulled together by gravity.

Ecological Efficiency: the percentage (usually around 10%) of useful energy that passes from one trophic level in a food chain to another. Shorter food chains tend to lose less energy.

Ecological Equivalents: species that live far apart but in similar niches and ecosystems.

Ecology: from the Greek *oikos* (household) and *logos* (study): the study of interrelationships between organisms and their environment. The term was coined in 1866 by German biologist and philosopher Ernest Haeckel.

Ecopsychology: a relatively new discipline operating on an ancient assumption: the deepest levels of the psyche are tied to the Earth. "Ecopsychology is the effort to understand, heal, and develop the psychological dimensions of the human-nature relationship through connecting and reconnecting with natural processes in the web of life.

Ecosynthesis: Haikai Tane's term for a hypothesized evolution of ecosystems, some changing in response to human-caused planetary changes.

Ecosystem: a biotic community and its surroundings, part inorganic (abiotic) and part organic (biotic), the latter including producers, consumers, and decomposers.

Ecotherapy: Earth-based healing practices. "Ecotherapy involves understanding and healing the human-nature relationship through connecting and reconnecting with natural processes"(Robert Greenway).

Ecotope (Biotope): the smallest ecologically distinctive area within a landscape classification system.

Ecotopia: a vision of an ecologically friendly society.

Ecotourism: tourism that makes use of the ecological attributes of a place (e.g., bird-watching).

Ecotype: a genetically differentiated subpopulation evolved to remain within its habitat.

Element: a molecule composed of one type of atom (e.g., Carbon, Hydrogen, Helium).

Embryo: a zygote (fertilized egg) whose cells have divided prior to its developing into a foetus.

Entropy: disorder or unproductive energy in a given system. It tends to increase over time.

Enzyme: proteins that augment (catalyze) and manage chemical reactions in cells by lowering the activation energy.

Eukaryote: an organism with a membraned cell nucleus. Eustacy: sea level changes due to seawater volume changes in the oceans.

Euphotic Zone: the zone of water penetrable by sunlight.

Evaporation: liquid water's transformation into vapor. Requires a lot of energy.

Exotic Species: those not native to an ecosystem.

Facultative: able to live in more than one kind of environment, like a plant that flourishes with or without air. Frequent in species that dwell in wetland uplands.

Fermentation: the enzyme-controlled conversion of carbohydrates like grape sugar into hydrocarbons like alcohol.

Field Capacity: the water remaining in a soil after it has drained naturally.

Fixed: a genetic mutation that infiltrates 100% of a population.

Food Web: the interconnection of all food chains in an ecosystem.

Forests: = rain. Cut down a forest and make a localized drought. Deforestation is a direct cause of spreading desertification worldwide.

Forest Outlier: a patch of forest separated from the main body.

Fossil Fuel: coal, oil and natural gas geologically transformed from ancient beds of plant matter into burnable hydrocarbons.

Fragmentation: breaking up of a forest into islands of trees.

Free-Living: a mobile organism that does not depend on other organisms for food or other resources.

Frost: ice formation on exposed surfaces due to atmospheric cooling and a relative humidity of 100%.

Fungi (Mycota): saprophytic (decay-fed), spore-making plants without chlorophyll: rusts, molds, smuts, mildews, mushrooms, and yeasts.

Gametes: eggs and sperm; reproductive cells that combine to form a zygote (fertilized egg).

Gamma Diversity: regional diversity.

GEM: genetically engineered microorganism.

Germ-Line Cells: those that specialize in reproduction.

Germ Plasm: the hereditary material in germ cells (e.g., genes).

Gene(s): a chunk of DNA that allows organisms to pass on adaptations and acquired features by making a protein through codon sequences. DNA duplication errors often create new genes. Gregor Mendel discovered genes and wrote about them – he called them "factors" – in 1865, but his work was ignored for 45 years.

Generalist: an organism able to survive under a wide range of environmental conditions.

Genetic Diversity: genetic variability found in a population due to the genetic combinations of its individuals.

Genome: the genes of a species. Their chromosomal order controls physical characteristics.

Genotype: an individual organism's genetic constitution.

Geothermal Energy: heat energy from the Earth's interior. Geysers and volcanos are naturally occuring examples.

Gibbons: small apes that use their arms to swing from branch to branch.

Glaze: an ice coating left by rain on a cold surface.

Global Warming: the rising of the Earth's average global temperature because of greenhouse gases accumulating in the atmosphere.

Gradation: the growth and decline of a population.

Green Algae: a common (more than 7,000 species) algae, especially in estuaries, with nucleated cells and chloroplasts that make food from sunlight.

Greenhouse Effect: the gradual warming of a planet by an atmosphere's conversion of incoming solar radiation into heat (discovered in 1824 by Jean Baptiste Fourier).

Greensand: an organic source of potassium: 7% potash plus trace elements.

Growing Season: traditionally, the period between the last freeze in the spring and the first frost in the fall. Varies by location.

Habitat: the abode of a species. (*Microhabitat*: of an individual organism.)

Hard Technology: costly, highly centralized, mechanical technology that uses a lot of energy, wastes resources, and pollutes the environment. Mining and agricultural machinery, for example.

Heavy Metals: elements between lead and copper in terms of the Periodic Table. Too much lead, zinc, nickel, mercury, arsenic, copper, or cadmium in soil can damage plants.

Hectare: 2.47 acres.

Hemoglobin: the iron-bearing protein/pigment in red blood cells that tranports oxygen to the cells.

Herb: a nonwoody angiosperm whose flowers back seasonally. Herbs are grown for seasonings, for medicinal use, and for attracting beneficial insects like bees into gardens.

Homology: a similarity shared by descendants of a common ancestor. We walk upright; so did early hominids.

Horticulture: gardening; growing fruits, vegetables, and ornamental plans.

Hotbed: a bed of soil enclosed by a structure with a top of glass, and heated, often by manure, for raising seedlings.

Hox genes: those that determine what proteins go where in a developing body.

Humus: rich, black organic material; the living component of soils where plant and animal matter has been allowed to decompose.

Hybrid: a cross between two genetically diverse parent plants. Agribusiness companies produce and sell hybrids that do not reproduce in order to retain a monopoly on seeds.

Hydration: the chemical weathering of a mineral when water is added to it.

Hydrocarbon: organic compound composed primarily of hydrogen and carbon atoms. Petroleum, natural gas, coal, and methane are examples.

Hydrolysis: chemical weathering in which hydrogen ions from water alter a mineral's composition.

Hydrosphere: the water mass of the earth, including water vapor. Oceans occupy 71% of the planet surface: roughly the same percent occupied by water in the human body. Of the fresh water in rivers, streams, reservoirs, etc., 90% is believed to show some level of pollution.

Hypoxia: depletion of oxygen in water to less than 2 miligrams/liter.

Infauna: animals that live in sedimentary deposits on the sea floor.

Influent: a plant or animal that has an important effect on the biotic balance in a community. Sometimes used to mean a species that moves into an ecosystem from outside.

Insolation: solar energy received by the Earth.

Interaction: the primary ones are competition, mutualism, predation, parasitism, amensalism, and commensialism.

Invertebrate: an animal without a backbone.

Ionization: producing ions. Example: solar radiation striking the upper atmosphere.

Isogamy: where two individuals combine half their genes to make an individual offspring.

Isothermal Layer: a vertical atmospheric layer where temperature remains uniform. Such layers form the bottom of the stratosphere, mesosphere, and thermosphere.

Kangaroo Rat: an organism notable for its ability to make its own water.

Katabatic Wind: wind blowing down a mountain slope.

Keystone Species: a species that increases or decreases the diversity of a system.

Life Pyramids: niche diagrams of the organisms living there.

Life Zones: created by C. Hart Merriam in 1894 to classify environments by temperature and rainfall. There are eight major life zones: Arctic-Alpine, Boreal (Hudsonian), Boreal (Canadian), Transition, Carolinian, Loouisianian, Upper Sonoran, and Lower Sonoran.

Limestone: sedimentary rock composed of calcium carbonate (calcium carbonate) formed by deposits of seashells and marine animal skeletons.

Lipids: fats, waxes, oils: greasy organic hydrocarbons insoluble in water.

Macroecology: the study of statistical distributions of large groups of organisms or species to see why the distribution patterns vary.

Macrophyte: a plant too large to be considered microscopic.

Magma: molten rock beneath the planet surface. (Lava is exposed magma.)

Magnetosphere: the Earth's magnetic field, generated by the planet's nickel-iron core and extending thousands of kilometers into space.

Mammal: hairy, warm-blooded vertebrates that nourish their young with milk (hence the name).

Mangrove: trees that grow in coastal wetlands in tropical climates. Their trunks block wind, and their roots provide habitats and a barrier to erosion.

Marsh: a damp wetland less acidic and waterlogged than a bog.

Mesic: semi-wet.

Mesophytes: organisms living in habitats of moderate moisture.

Mesotrophic: moderately nutrient-rich habitats.

Metabolism: an organism's total biochemical activity.

Metapopulation: local but geographically separated populations of a species that are linked only by organisms that migrate between them.

Metazoic: many-celled.

Microclimate: the climate of small locales: under plant leaves, in a garden, on a hillside. Microhabitat: a small, specific habitat, like under a log or in a bush.

Mineral: the inorganic, crystalline solid that makes up rocks.

Mineralization: decomposition of organic matter into its inorganic (mineral) components (e.g., petrified wood).

Molecule: a group of atoms bonded together. Chemistry is the scientific study of molecular reactions.

Monoculture: the cultivation of a single crop on a piece of land to the exclusion of other crops.

Monophagus: predators that favor a single prey species.

Monsoon: a reversing seasonal wind often bearing heavy rainfall. Common near the Indian Ocean.

Morphology: the form and structure of plants and animals.

Mosses: small, leafy, spore-producing plants without true roots or water-conducting plumbing. Moulin: a tunnel of water that forms when a lake on a sheet of ice begins to melt.

Mutation: change in the structure of a gene or chromosome due to a biochemical replication error.

Mycoplasma: parasitic bacteria that cause diseases (pneumonia). Similar to a virus.

Natural Gas: hydrocarbon gasses that accumulate in rocks of marine sediment. Roughly 80% methane.

Natural Selection: nature's selection of viable strengths through environmental pressures that force an organism to adapt.

Niche: an organism’s role, function, or position in an ecosystem.

Niche Differences: those that keep organisms from competing for resources (like plants that draw nutrients from different depths).

Nivation: erosion by frost or snow.

Ocean Floor (Abyssal Plain): the surface of the oceanic crust 5,000 to 7,000 meters below the ocean surface. Ocean basins take up 30% of the Earth's surface.

Oceanic Crust: primarily basaltic and roughly 5 to 10 kilometers thick.

Oceanic Plate: a mobile chunk of primarily basaltic lithosphere floating on the asthenosphere below it.

Old Growth Forest: a relatively undisturbed forest containing many old trees and luxuriant levels of vegetation from the forest floor to its canopy. Logging old growth forests triggers ecological consequences.

Omnivore: an animal or person that eats food of both plant and animal origin.

Organic: containing carbon; also, made of living things or the products of their decomposition, like humus.

Osmoregulation: the ability to control mineral and salt concentration in the blood.

Ovary: in flowering plants, the enclosure around the seed-making ovules. The ovary becomes the fruit.

Oxidation: changing a substance chemically by adding oxygen to it.

Ozone layer: the protective ozone layer hangs 10 to 50 kilometers above the Earth's surface.

Ozone Hole: a once-natural springtime thinning in stratospheric ozone over Antarctica, but now enlarged by pollutants into a hole the size of the Moon.

Palustrine: freshwater.

Parent Material: the minerals from which a soil originates.

Pathogen: a microorganism that makes its host sick.

Persistence: how long a population lasts.

Pests: anything that eats or damages what we eat.

Photochemical Smog: air pollution produced by the reaction of hydrocarbons, nitrogen oxides, and sunlight.

Photoperiodism: an organism's responsiveness to changes of daylight or season.

Photosphere: the light-giving surface of the sun.

Phytoplankton: green microscopic plants, typically algae but including diatoms, desmids, and dinoflagellates.

Plankton: microscopic algae and protozoa drifting in water. Larger organisms graze them like grass.

Playa: a temporary, shallow body of water with a clay bottom. Also, a dry desert lake bed.

Prairie: an extensive, uncultivated tract of level or rolling grassland with no or few trees. Its soils are usually fertile.

Primary Consumer: an organism that eats green plants.

Primary Producer: an organism that makes its own food through photosynthesis (plants) or chemosynthesis (certain microorganisms).

Primary Air Pollutant: a pollutant dumped directly into the air. (Photochemical smog is a secondary air pollutant: it is chemically derived from primary pollution.)

Productivity: the rate at which a group of organisms produces biomass.

Progress: an ideological justification for nonsustainable exploitation of natural resources.

Prokaryote: an organism whose cells lack a nucleus.

Protoplasm: a generic for living matter.

Protozoa: tiny, single-celled animals without a backbone. Usually classed with the protists.

Quadrat: a small area set aside for ecological study.

Rainforest: an evergreen forest growing in a wet, humid climate.

Resilience: the ability of a biotic community to return to its former state after a disturbance.

Respiration: the conveyance of oxygen to cells and tissues as carbon dioxide and water are given off.

Rift: a zone between two diverging tectonic plates. Often volcanic, and a site of new sea floor.

Riplines: channels cut in gullies to reduce erosion.

Rock Cycle: the cycle of transformations between igneous, metamorphic, and sedimentary rock over time.

Rotation: using the same soil to grow different crops.

Salt: sodium chloride.

Savanna: flat tropical or subtropical grassland with occasional shrubs, herbs, and trees.

Scrub: small or low bushes or trees. Common in dry and alpine regions.

Sea Breeze: the daytime movement of air from water to land down a pressure gradient.

Secondary Consumer: a predator that eats plant-eating prey (primary consumers).

Section: 640 acres (1 square mile).

Sedentary: unmoving.

Sediment Sink: a place where beach sediment leaves a coastal area.

Sexual Reproduction: creating offspring by fusing gametes (sex cells).

Silvicultural: forestry.

Slip Erosion: a landslide.

Slip-Face: the lee side of a dune.

Social Ecology: a discipline that links ecological problems with social problems.

Society: a local climax community.

Soil: a mixture of humus and particles weathered from rock. A cubic yard of soil will cover 300 square feet of ground to a depth of 1 inch.

Soft Technology (Appropriate Technology): the non-intrusive kind that does not harm the Earth: small, decentralized, inexpensive.

Softwood: wood from gymnosperm trees (redwood, pine, fir, spruce-conifers).

Specialist: an organism that uses a narrow range of resources with high efficiency. The panda is a specialist who harvests the bamboo that makes up most of its diet.

Species: a group of organisms that can breed with each other.

Spermatophyte: a seed plant.

Spore: a seedless embryo.

Steppe: a sweep of unforested grasslands.

Succulent: juicy, moisture-retaining plants like aloe, iceplant, cactus, agave, and yucca.

Sucker: a plant shoot emerging from the root or lower stem. There's one born every minute.

Supercell: a severe thunderstorm with a steep, rotating updraft. Supercells are likely candidates for producing tornados.

Surface Microlayer: the surface of water, where pollutants float and atmospheric gasses meet the sea.

Sustainable: using resources without using them up.

Sustainable Society: a society that manages its politics, economies, industries, and population size without overwhelming ecosystems or depleting resources beyond their ability to recharge themselves.

Symbiosis: a mutually beneficial relationship between two species, like the Hawaiian squid and the luminous bacteria it carries in its stomach. The bacteria gets a home, and the squid is camouflaged by the light.

Tarn: a small mountain lake in a cirque.

Taxonomy: the classification of life, starting with Aristotle's attempts. Botanist Carl Linneaus worked out a system in 1735 whose primary categories are still in use. From largest to smallest, here is how we fit them:

- KINGDOM: Animalia (animals)
- PHYLUM: Chordata (with nerve chords)
- SUBPHYLUM: Vertebrata (and backbones)
- SUPERCLASS: Gnathostomata (and jaws for biting)

- CLASS: Mammalia (the young feed on mother's milk)
- ORDER: Primata (primates: five-fingered omnivores)
- SUBORDER: Haplorrhini (dry-nosed)
- FAMILY: Hominidae (erect, walking mammals)
- GENUS: Homo (humans and their close relatives, all now extinct but us)
- SPECIES: Homo sapiens (this two-name genus/species form is called *binomial nomenclature*)

Thermal Pollution: a temperature rise that threatens an ecosystem, particularly one in which organisms breed or give birth.

Tide: the periodic rise and fall of the ocean surface pulled on by gravity from moon and sun.

Tolerance, Ecological: examined close up, the term seems to mean "ability to put up with things that are harsh." The range of an organism's ability to do this is referred to as its *ecological amplitude*.

Transpiration: evaporation of water from plant leaves.

Tundra: an arctic or subarctic treeless plain with frozen subsoil and small growth: some grasses, dwarf shrubs, lichens, mosses, sedges, and herbs.

Urban Heat Island: a bubble of heat hung over a metropolis not only by cars, industrial plants, business parks, and other such structures, but by paved areas devoid of vegetation.

Vascular: networks of channels that transport nutrients, fluids, and wastes. The circulatory system is an example.

Vector: a disease-carrying organism.

Vertebrate: an animal with a backbone. Most large animals are vertebrates.

Virus: a protein-coated fragment of DNA or RNA that infects a host cell in order to reproduce.

Water Budget: the balance of all water moving into and out of a specified area in a specified period of time.

Watershed: the region drained by a stream or river.

Weed: a plant growing where it is not wanted.

Wetland: a wet land; a bog, fen, marsh, estuary.

Xeric: dry.

Xerophytes: organisms that live in dry areas.

Xylem: woody tissue that transports water and nutrients upward from the roots.

Zero Population Growth (ZPG): when birth rate (plus immigration) equals the death rate (plus emigration), resulting in an ecologically stable number of organisms.

Zoonotic Diseases: diseases transmissible from animals to humans. Ebola, tuberculosis, and rabies are examples.

Zooplankton: plankton that do not produce their own food, as phytoplankton do. In size they fall between phytoplankton and larger organisms like fish.

Zygote: a fertilized egg.

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