МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РОССИЙСКОЙ ФЕДЕРАЦИИ
ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ АВТОНОМНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ
«САМАРСКИЙ НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ ИМЕНИ АКАДЕМИКА С. П. КОРОЛЕВА»

Кафедра иностранных языков и профессиональной коммуникации

Кошарская Е.В.

СРЕДСТВА ОБУЧЕНИЯ ЧТЕНИЮ ПРОФЕССИОНАЛЬНО - НАПРАВЛЕННОЙ ЛИТЕРАТУРЫ НА АНГЛИЙСКОМ ЯЗЫКЕ

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К76 **Кошарская Е.В.** СРЕДСТВА ОБУЧЕНИЯ ЧТЕНИЮ ПРОФЕССИОНАЛЬНО-НАПРАВЛЕННОЙ ЛИТЕРАТУРЫ НА АНГЛИЙСКОМ ЯЗЫКЕ: учебное пособие / Е.В. Кошарская. – Самара: Издательство «Инсома-пресс», 2016. – 103с.

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Данное учебное пособие предназначено для обучения ESP (английскому для специальных целей) студентов (бакалавров и магистрантов) химических и биологических специальностей, может использоваться на занятиях с аспирантами указанных профилей. Работа с материалом предполагает наличие у обучающихся исходной языковой подготовки среднего уровня (Intermediate Level, Upper Intermediate).

Пособие, направленное в первую очередь на обучение чтению оригинальной литературы, формирует умение извлекать необходимую информацию и давать критическую оценку прочитанному, обосновывая свою точку. Предлагаемые тексты и упражнения способствуют развитию у студентов навыков эффективной самостоятельной работы с профессионально-направленной литературой на английском языке.

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Методические рекомендации

Современная концепция обучения иностранному языку студентов неязыковых специальностей направлена на то, чтобы иностранный язык являлся неотъемлемым компонентом профессиональной подготовки современного специалиста любого профиля. Одной из главных целей преподавания иностранного (английского) языка в высшей школе является подготовка студента к овладению чтением как способом получения и структуризации профессионально значимой информации. Согласно результатам опроса С.Г. Меньшениной, представленным в статье «Обучение чтению на английском языке как средство формирования аналитических умений будущих специалистов по компьютерной безопасности», 97% самих студентов считают чтение и понимание профессиональных текстов, чтение профессиональной документации наиболее необходимым видом речевой деятельности на иностранном языке.[1] Практически все студенты признают необходимость использования иностранной литературы при подготовке курсовых проектов, дипломных работ, при работе в Интернете, не говоря уже о работе после окончания университета, поскольку это не только позволяет им повысить уровень образования, но и своевременно получать новую информацию, что особенно важно для специалиста. Учебное пособие «Средства обучения чтению профессионально-направленной литературы на английском языке» имеет целью развитие у обучаемых навыков и умений самостоятельно читать оригинальную литературу по специальности, быстро извлекать из нее необходимую информацию, вести беседу с использованием изученной терминологии, анализируя прочитанное.

При создании пособия в задачи входило осуществлять обучение трем видам чтения: просмотровому, ознакомительному и изучающему. При просмотре текста главное внимание обращается на тему, на получение общего представления о проблеме. Для того, чтобы овладеть этой информацией, достаточно прочесть заголовок, подзаголовки, бегло просмотреть абзацы и некоторые предложения. При чтении для ознакомления с текстом студент обращает внимание на основную информацию, содержащуюся в тексте, знакомится с основным его содержанием. Поэтому такой вид чтения можно назвать «общим охватом содержания текста». Формулировка заданий для ознакомительного чтения может быть различной, однако она должна включать в себя следующие элементы: читать текст следует про себя, читать следует абзацами.

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[1] *Меньшенина С.Г. Обучение чтению на английском языке как средство формирования аналитических умений будущих специалистов по компьютерной безопасности . – Вестник СамГТУ, Серия «Психолого-педагогические науки». – Самара: Изд-во ФГБОУ ВПО «Самарский государственный технический университет», 2013. – №1 (19). – С. 102.*

Ориентация студентов на использование ознакомительного чтения исключает такой способ проверки понимания как перевод (сплошной или выборочный), так как он адекватен работе с другим видом чтения, изучающим. Приемлемыми и популярными способами проверки понимания при ознакомительном чтении являются тесты и вопросы по содержанию прочитанного. В случае теста преподавателем подбирает несколько утверждений с тремя или пятью альтернативами каждое, студент должен указать альтернативу, соответствующую содержанию прочитанного текста. Преподаватель может разрешить студентам, особенно слабым, отвечать на вопросы по-русски. При ответах на иностранном языке грамматические и прочие ошибки не должны влиять на оценку понимания прочитанного. Студент при ознакомительном чтении должен уметь видеть главное (основную мысль), заметить только существенные детали, установить связь между отдельными фактами, вывести суждение на основе выделенных фактов и связи между ними и оценить прочитанное.

При изучении текста студент стремится ознакомиться с информацией, содержащейся в тексте, наиболее подробно, старается детально понять его содержание, осознать его смысл с критической точки зрения. Эту полученную информацию он может применить в процессе дискуссии, организованной преподавателем, для проверки и закрепления материала. Поэтому здесь ставится цель запомнить содержание текста. Чтению текста уделяется больше времени, текст читают с остановками, некоторые места читают повторно. Предлагаемое пособие может быть направлено на обучение каждому из перечисленных видов чтения (в зависимости от целевой установки преподавателя и выбора послетекстовых заданий).

При этом пособие может использоваться для внеаудиторного, так называемого «домашнего» чтения, которое имеет большое значение при обучении ESP в высшей школе. Домашнее чтение является неотъемлемой частью обучения чтению студентов и находится в тесной связи с их профессиональными дисциплинами. Такую функцию в учебном процессе не в состоянии обеспечить один учебник. Немаловажное значение имеет подбор материала для домашнего чтения, виды заданий и способы проверки прочитанного. Выбранные для домашнего чтения тексты должны быть, особенно на первом этапе, легкими в языковом отношении, но не примитивными по содержанию, соответствовать читательским интересам студента. Целесообразно в связи с этим использовать для домашнего чтения сборники статей по специальности. При этом тексты должны быть подобраны по тематике и адаптированы по степени сложности в соответствии с требованиями курса. Для самостоятельного чтения дома могут подбираться подготовительные тексты к последующему чтению основного текста на уроке.

При выборе текстов особое внимание уделялось их соответствию изучаемой студентами теме. Тексты, в первую очередь, должны способствовать расширению кругозора студентов по специальности. В процессе чтения развивается наблюдательность студентов, они серьезнее относятся к формированию своего мнения через иноязычную речь. В программе по английскому языку, рекомендованной для направлений бакалавриата, часто предлагаются темы «Ecology», «Environmental Protection», «Pollution of Our Environment». Облегчение их усвоения, понимания достигается путем применения на занятиях современных инновационных педагогических технологий, аудио и мультимедийных средств обучения, но традиционный метод чтения текста, несомненно, занимает определяющее место. Данное учебное пособие подробно знакомит студентов с информацией, относящейся к указанной тематике.

Работа с текстом предполагает различные организационные формы работы: индивидуальную, парную, групповую. В качестве послетекстовых интерактивных методов преподавателем могут организовываться дискуссии, круглые столы, ролевые игры, используемые не только в целях выявления неясностей и степени понимания прочитанного, но и для осуществления обмена мнениями по поводу содержания прочитанного. Говоря о средствах обучения чтению профессионально-направленной литературы, в первую очередь, необходимо отметить важность проведения специальной работы с лексикой. Для этого весь объем лексики, включенный в словарь-минимум по данной теме, делится на две большие группы, которые можно условно назвать рецептивным словарем и потенциальным словарем. Первая является объектом непосредственного изучения, входит в тексты и упражнения, чтобы студент запомнил каждую из входящих в него лексических единиц. Вторая фактически студентами не изучается, но в курсе иностранного языка студенты получают подготовку, которая позволяет им понять ту или иную лексическую единицу данной группы, даже если она не встречалась ранее. В процессе обучения студент овладевает не самими лексическими единицами, а методикой их узнавания. К потенциальному словарю можно отнести, например, производные от известных слов, слова общего корня в родном и иностранном языках и другие.

Предлагаемое учебное пособие состоит из двух основных частей (Parts): Texts for Reading и Reading Guide. Структурно и тематически первая часть пособия Texts for Reading состоит из 7 уроков (Units), объединенных общей темой “Environmental Protection». Каждый урок включает в себя следующие материалы: тематический текст для чтения, затем даются упражнения, связанные с запоминанием лексики и терминов: сопоставить термины и их определения, найти в тексте эквиваленты русских слов, заполнить пропуски в предложениях подходящими по смыслу словами, дать определения изученным понятиям. Следующая

группа упражнений не только контролирует понимание смысла прочитанного, но и предполагает обучение творческому отношению к прорабатываемому материалу (выражение своего мнения по прочитанному, логическое обоснование своей точки зрения). Студентам предлагается найти необходимую информацию, дать подробные ответы на вопросы, выяснить наиболее существенные положения прочитанного текста, затем пересказать текст.

Во второй части Reading Guide даны определения употребляемых в уроках терминов (Glossary of Terms), излагаются эффективные методы применения знаний английской грамматики, научной терминологии по специальности для информационно-смыслового анализа профессионально-направленного текста, представлены выражения речевой стратегии, необходимые для составления грамотного пересказа текста (Text Analysis), кратко изложен грамматический материал (Grammar Material), приводятся фразы, помогающие студентам участвовать в послетекстовой дискуссии. Что касается грамматического материала, то в приложении представлена грамматика английского языка, которая достаточна для чтения предложенного материала без обращения к другим грамматическим справочникам. Кроме того, пособие имеет приложения Appendices, включающие рекомендации для дальнейшего чтения в рамках темы «Environmental Protection» и список использованной литературы.

CONTENTS

PART 1. TEXTS FOR READING

INTRODUCTION

You keep hearing in the media about how we are ruining our environment. Unfortunately, most of those reports are true. If you are like most folks, you would probably like to try to help fix things. But do you really understand the issues? Or even the terms? How can you help if you really don't understand what is going on and why it is happening?

So, before you waste a lot of time and energy spinning your wheels, let's start with the basics. Let's explain the terms and how all of this stuff is interrelated and understand why it is important to you. Then many environmental problems we face are going to be discussed here.

But before drink some fresh water, take a whiff of the fresh morning breeze, and stroll through a lush green forest filled with wildflowers, birds and animals. Then try to imagine what the world would be like without these things. It could happen! Finally, we are going to introduce you to some actions you can take to keep this from happening.

Unit 1, "The Environment and You", looks at many environmental challenges we face. We start by explaining basic environmental terms and principles so you can better understand the larger issues. Unit 2, "The Big Three Global Threats", goes into the basics of decline in biodiversity, thinning of the ozone layer and global warming. Unit 3, "The Air We Breathe", covers many problems related to the air we breathe: many causes and consequences of global warming; what is happening to the ozone layer; why acid rain is a problem. In Unit 4, "Water: Our Most Precious Resource", we focus manly on the importance of water we drink and use, great threats to our seas and oceans because of pollution and global warming again. Unit 5, "The Land We Live On", explains what hazardous waste is and why forests are

disappearing. Unit 6, "Food For Thought", shows why we need to change our eating habits, what is in our food and benefits of organic food. Unit 7, "Nature Coughs Up Her Share", discusses some of the effects that global warming might have on our wildlife and its inhabitants.

Plus, you get appendixes that includes a glossary of terms to help you with all the vocabulary, a list of books and publications for further reading on the topic and references containing resources used in the following course.

UNIT 1. THE ENVIRONMENT AND YOU

What a beautiful picture! Our lovely blue and green Earth with its swirling white cloud patterns set against the stark blackness of space. From space there are no visible political boundaries. There are just huge interconnected mountain ranges, forests, rivers, and oceans. And one big, interdependent global community.

But back down on Earth, things are not so pretty. Radioactive emissions, oil spills, toxic chemical leaks; strip-minded landscapes; clear-cut rainforests; vanishing plants, birds and animals; huge killer storms and mudslides; increasing competition for dwindling resources; famine, disease and poverty – the unhappy list goes on and on.

All of these events are connected to a variety of environmental issues, especially overconsumption of limited resources. So, in this part we'll introduce you to the basic issues we'll be seeing throughout the rest of the course and explain some environmental lingo.

Learn and revise:

oil spill, environment, ecology, interaction, biosphere, soil, ecosystem, disaster, decline, habitat, damage, society, sophistication, over-consumption, waste, pollution, resource, destruction, stuff, garbage

The Environment

Almost everything in the natural environment is interrelated. You can't really understand one part without looking at the other parts. But let's start with the basics. Just what, exactly, is an environment? Simply stated, it's all of the external factors that affect any organism. These factors can be other living organisms or nonliving variables like water, soil, light, oxygen, and climate, to name just a few. Now for a little environmental lingo. We'll be using most of these terms again, so let's get them sorted out now.

Ecology

You probably have heard the term ecology used quite a bit. It's often confused with environmental science. But that's not really correct. Ecology has two related meanings. Ecology is the branch of biology that deals with the interaction of organisms (individual life forms) with their environment. It's also the set of relationships between organisms and their physical environment. In other words, it's how you and we (and all other living organisms) interact with each other and our environment. Okay? On to the biosphere.

The Biosphere

Our planet's entire living environment is known as the biosphere. It includes a relatively thin zone of air, soil, and water that is capable of supporting life. This zone extends up about six miles into the atmosphere and down to the bottom of deepest ocean. Life in this zone depends upon the sun's energy and on the circulation of heat and nutrients.

Within the biosphere are a number of large categories of living communities that are called biomes, which are normally characterized by their main vegetation patterns such as forests, shrub lands, grasslands, deserts, tundra, and so on. Don't worry too much about the term "biome." Just remember that this is the part of the biosphere where we tend to hang out rather than six miles up in the sky or at the bottom of an ocean. Got it? Good. On to ecosystems.

Ecosystems

Biomes, in turn, are made up of ecosystems. An ecosystem includes living parts, such as plants, animals, and bacteria found in the soil, which are known as a community. The physical surroundings of an ecosystem are known as the environment or habitat. An ecosystem could be something as small as an aquarium in your living room, or as large as a tropical rain forest.

Biodiversity

The last bit of lingo for now is "biodiversity." This is actually another way of saying "biological diversity." Biodiversity is the variety of living organisms in a particular habitat or geographic area. We normally measure biodiversity as the number of species of plants, animals, and microorganisms found in a particular area. Diversity of species is usually important to the functioning of ecosystems, and that's why it's considered an indication of the health of an environment. Major declines in biodiversity usually mean environmental disaster.

Why Is This Important?

As you can see from these descriptions, our global environment is made up of systems within systems. And they all form an interconnected whole that has been described by some as the Web of Life. If you muck around with one part, it's likely that there will be a reaction in another part. And these reactions can have bizarre ripple effects that are sometimes hard to predict.

But why is all of this so important? It's really quite simple. Think of the environment as your life-support system. Because that's exactly what it is. If you are a diver—say— your scuba gear is your life support system. If your scuba equipment is damaged somehow (especially if you're under water), you're in trouble. The more the damage, the deeper the trouble. If your scuba gear stops functioning, you're done for. Get the picture? It's the same general idea with our environment.

But with our increasingly technological society, people are becoming more and more detached from the natural environment and less aware of what is going on with it. And many people seem to have forgotten that, despite our technological sophistication, our modern civilization is totally dependent on its ecological foundations. Without those foundations, our civilization would collapse into chaos. And that would be a bummer.

Yet we continue to consume huge quantities of natural resources as if there is no tomorrow (and if we're not careful, there may not be a tomorrow). Unfortunately, this consumption is the most excessive right here in this country. The United States, with just 4.5 percent of the world's population, consumes about 33 percent of the world's materials today, according to the United States Geological Survey. The other 95.5 percent of the global population gets what's left over.

Not only is this unfair, it's also unsustainable. Especially if the rest of the world decides to try to copy this lifestyle. And that's what is beginning to happen in many parts of the world. You can't really blame them. Unfortunately, it would take three planets like Earth to supply the resources necessary for everyone to live a lifestyle like this. It's simply impossible.

This kind of over-consumption is very destructive for the environment. It results in excessive and unsustainable mining; logging; quarrying; coal, oil, and gas extraction; and similar activities on a colossal scale. And it results in the dumping of huge quantities of industrial and consumer wastes that have to go somewhere. Often they end up in the air, in our drinking water, on the land, or in the oceans, where they pollute our remaining precious resources and cause even more problems.

Lessons from Kindergarten

While the potential solutions to these problems can get rather complicated—and painful—there are some very simple guidelines that you might recall from your childhood that put these issues into their proper perspective. Robert Fulghum lists them in his wonderful 1993 book All I Really Need to Know I Learned in Kindergarten: Uncommon Thoughts on Common Things. These simple suggestions were: share everything, clean up your own mess, and flush. Let's look at each of them.

Share Everything

If the members of the global community could just adopt this simple strategy, we would eliminate many of the causes of international unrest and discord. This idea, of course, is fairly popular in the poorer countries where they would welcome any improvement in living standards. Not surprisingly, this strategy is not so popular in the richer countries, because it means giving up some of our privileged lifestyle. But considering how wasteful we are as a society, if we just cut back on some of our extravagant habits we could live just as comfortably on a lot less stuff.

Clean Up Your Own Mess

If everyone, including individuals, small businesses, large corporations, and governments followed this advice, the world would be a much better place to live in. Unfortunately, this has not been the practice, and we are still faced with cleaning up the terrible mess left behind by prior generations—to say nothing of the awful mess we're still making in many parts of the world.

Quite a few people in this country have begun to take this simple advice to heart and are beginning to make a difference at the local and state levels with a wide variety of programs and initiatives. But we still have a long, long way to go here. In some countries, however, especially in the Netherlands and New Zealand, "cleaning up your own mess" has taken on a whole new national dimension.

Flush

We suppose you could view this one as a variation on the previous suggestion. But if everyone would just properly dispose of his or her own waste, it would go a long way toward making for a cleaner environment. Now, we are not suggesting that you should dump all of your household waste in the toilet. Not at all. That could cause some messy problems.

And depending on what you flushed, it might lead to serious groundwater pollution. But the idea of putting our waste, whatever it is, in its proper place is important in a world that is drowning in garbage.

These are admittedly simplistic solutions to complicated issues, but they do cut right to the heart of many of the environmental problems we face today.

Word Study

Ex. 1. Match the words with their definitions:

biodiversity	harm done to things, destruction
desert	situation in which a place looks very untidy or dirty, with things spread all around
mess	people who live in the same area
damage	richness of the number of species
bummer	area of land with very little rainfall, arid soil and little or no vegetation
indication	valuable and important
guideline	sign that something is probably happening
precious	situation that is disappointing (slang)
dumping	instruction about the best way to do something
community	throwing away waste

Ex. 2. Find in the texts English equivalents to the following Russian words, word combinations and terms:

Измерять, мусор, прогнозировать, потреблять, осведомленный, сложный, круговорот питательных веществ, влиять, спутывать, снабжать, устойчивый, устранять, быстрый приток, расточительный, предшествующее поколение.

Ex. 3. Fill in the gaps using words from the box:

decline	environment	resources	sustainable	damage

1. ... is your life support system.

2. The extinction of plant and animal species has been caused by humanity's gross misuse of the earth's ... .

3. Two or every three species are estimated to be in ... .

4. The ways in which human activities affect the environment are complex and can cause ... to Nature.

5. To preserve the environment of our planet development and growth in the world must be ....

Ex. 4. Give a definition, synonym, or description of each of the words or phrases below:

overconsumption of limited resources

environmental pollution

ecology

decline in biodiversity

surroundings

Comprehension and discussion

Ex. 1. Look through the text and answer the following questions:

1. How do you understand the title of this part?
2. What other titles could you suggest?
3. What is the field of ecology?
4. What is considered an indication of the health of an environment?
5. What are three simple suggestions of Robert Fulghum?

Ex. 2. Write out a) key words out of each text; b) the sentences expressing the main idea(s) of each text. Retell the text "The Environment And You" briefly in your own words making use of the key words and the sentences you've written.

UNIT 2 . THE "BIG THREE" GLOBAL THREATS

Although the problems we have mentioned already are bad enough, it gets worse. We face three additional major threats: the decline of biodiversity, the thinning of the ozone layer, and global warming. Let's look at each of them. These aren't much fun, but they're important to understand.

Learn and revise:

threat, disappearance, massive urbanization, alarmed, ozone layer, fossil fuels, ultraviolet radiation, skin cancer, global warming, greenhouse effect, ban, fluctuation, biodiversity, extinction, species, decline, environment, damage, to protect, to cause

Decline in Biodiversity

As it was mentioned earlier, biodiversity is considered an indication of the health of an environment. And any time there is a decline in biodiversity it usually means that there is an environmental problem of some sort. Many scientists around the world have become increasingly alarmed in recent years by the massive declines in large numbers of plant and animal species.

For example, huge flocks of songbirds have traditionally migrated from Mexico to the United States every spring. But since the 1960s, their numbers have fallen by as much as 50 percent. Many other animals have been vanishing as well. The reasons for some of these disappearances are still not entirely clear. But most of these declines are directly or indirectly linked to the huge changes humans have made to the planet— especially the clearing of forests for agriculture and ranching, as well as massive urbanization, all of which have had a significant impact.

One of the leading experts on biodiversity, Harvard University's biologist Edward O. Wilson, estimates that the world could lose 20 percent of all existing species by 2020. And not just one by one, but in large groups in what he calls mass extinctions. We have some evidence that this is already happening to some species in various locations around the world. Disturbing? You bet. But that's not all.

Thinning of the Ozone Layer

There's another problem. And it's over our heads—literally. What's the ozone layer? Well, it's a section of the atmosphere about 12 to 30 miles above the Earth. It involves some complicated chemistry, but basically ozone forms from the action of sunlight on oxygen. And this process has been going on for millions of years. Recently, though, things have changed.

Back in the 1970s, scientists discovered that chemicals called chlorofluorocarbons, or CFCs (that had been used as refrigerants and as aerosol spray propellants), posed a threat to the ozone layer. Additional chemicals that damage the ozone layer were soon added to the list. Then, in the 1980s, other scientists working in Antarctica discovered a thinning or "hole" in the ozone layer above them during the Antarctic spring. A similar phenomenon was later found to be developing in the arctic region as well. Things seemed to be going from bad to worse.

But why worry about an invisible hole in the sky? The problem is that the ozone layer protects life on Earth from the full effects of the sun's cancer-causing ultraviolet radiation. And destruction of the ozone layer means more skin cancer, cataracts, and damage to some crops, as well as parts of the marine food chain (if the marine food chain collapses, goodbye fish). Ultimately, after years of controversy and debate, CFCs were banned in many countries. It's too soon to tell how successful this strategy has been. We'll look at the ozone issue again in Unit 3, "The Air We Breathe." But there's still one more big global threat.

Global Warming

The most serious problem of all is global warming, an increase in the Earth's temperature due to the use of fossil fuels (coal, oil, natural gas, etc.) and other industrial and agricultural processes. This causes a buildup of so-called "greenhouse gases" in the atmosphere. These gases—especially carbon dioxide and methane—tend to keep some of the Earth's infrared radiation from escaping into space, helping to maintain our planet's relatively warm temperatures. This is called the greenhouse effect. While it's nice to stay warm, too warm can be a problem.

Most scientists agree that the human burning of fossil fuels has finally started to have an effect on our climate. As greenhouse gases increase, so does the average global temperature. However, there is still a lot of disagreement on how much and how fast our climate will warm.

But why should you worry about the rise in global temperatures by just a few degrees? Do you have a beachfront home somewhere along the coast? If you do, you should be concerned. The increased melting of the polar ice caps caused by global warming could raise the level of the world's oceans enough to cause even more severe flooding during heavy storms than we're already experiencing.

But even if you don't live in a low-lying coastal area, global warming is going to cause greater fluctuations in weather patterns, with more severe storms and more intense droughts. These changes could in turn cause disease patterns to shift and other problems, and some of the most productive areas in the world, such as the Midwestern U.S., will probably not be able to provide the food they do presently. We've already begun to see graphic evidence of this pattern in recent years.

As bad as all this sounds, it could be worse. While not all scientists agree, some have warned that if greenhouse gases are allowed to continue to build up, there is the potential for a

"runaway" greenhouse effect sometime after 2050 that could turn areas such as the Amazon basin and southern Europe into virtual deserts.

We'll be looking at global warming repeatedly throughout this course because it's such an important issue. And we'll explain global warming in even greater detail in Unit 3. But for now, the main thing to remember is that this phenomenon is caused primarily by our reliance on fossil fuels, as well as consumption in its many forms—especially over-consumption.

Word Study

Ex. 1. Match the words with their definitions:

climate	large area of thick ice covering the North or South polar region
reliance	general weather of a certain place
fossil fuel	facts, signs that make you believe that something exists or is true
drought	measure of how hot or cold a place or thing is
evidence	organic, energy-rich substance formed from the long-buried remains of prehistoric life
temperature	state of being dependent on something
ozone layer	long period without rain at a time when normally rain falls
location	air in the atmosphere between 20 and 50 km above the surface of the earth
consumption	place, site
ice cap	using a fuel, using goods or services, taking food or liquid into the body

Ex. 2. Find in the texts English equivalents to the following Russian words, word combinations and terms:

Вызывать, кислород, солнечный свет, поддерживать, дышать, исчезающий, пустыня, сильное затопление, метан, в конечном счете, углекислый газ, сельскохозяйственные культуры, возрастать, оценивать, химический.

Ex. 3. Fill in the gaps using words from the box:

increase	droughts	climate	carbon dioxide	estimates

1. Global warming threats all of us with future ... , foods and crop losses, that have the potential for massive human miseries.

2. ... comes in large quantities from fossil fuels – oil, coal and gas.

3. ... in the greenhouse effect leads to global warming.

4. ... show that one chlorine atom can catalyze the destruction of about one million ozone molecules per second.

5. Changes in ... could dramatically decrease rain falling over enormous areas, turning more land into desert.

Ex. 4. Give a definition, synonym, or description of each of the words or phrases below:

thinning of the ozone layer

global warming

greenhouse gases

threat

significant impact

Comprehension and discussion

Ex. 1. Look through the text and answer the following questions:

1. What are the dangerous consequences of destroying the ozone layer?

2. In what way does the ozone layer protect us from the damaging effects of ultraviolet radiation?

3. What are three main threats we face today?

4. What are the main sources of CFCs?

5. What is the greenhouse effect?

Ex. 2. Write out a) key words out of each text; b) the sentences expressing the main idea(s) of each text. Retell the text "The Big Three Global Threats" briefly in your own words making use of the key words and the sentences you've written.

UNIT 3. THE AIR WE BREATH

There's nothing quite like a breath of fresh mountain air first thing in the morning. In Vermont, for example, people tend to take that sort of thing for granted. But in recent years, oven-like daytime temperatures have replaced that cool, fresh air in a series of record-breaking summer heat spells. And, of course, this isn't just taking place in New England, it's happening nationwide and around the world.

And it's not just our imagination, either. The 1990s was the hottest decade on record, breaking the previous record—held by the 1980s—according to a report by the National Climate Data Center. And the 1980s was the warmest decade of the twentieth century. So, what's going on here? What's happening is global warming?

Now, if this was just a matter of higher summer temperatures, you might be tempted to take a cold shower, jump in the pool or maybe a cold mountain stream, and forget about it. Unfortunately, it isn't that simple. Global warming has the potential to affect just about everybody and everything on the planet in one way or another—year 'round. That's why we'll focus mainly on global warming in this chapter. We'll begin by explaining what global warming is in greater detail. Then we'll look at what's causing it and why it's so important. We'll also explain the growing problem with the ozone layer and how it's related to global warming. We'll look briefly at acid rain, and then explore some of the long-term implications of all of these problems.

Learn and revise:

acid rain, long-term effect, global warming, ultraviolet radiation, ozone layer, exploitation, to absorb, energy source, refining operation, environmental damage, fossil fuel, thaw, danger, air circulation, marine food chain, algae, photosynthesis, emission, combustion, deterioration

Up in the Air

The air we breathe is such a basic ingredient of life that we tend to take it for granted. We shouldn't. For hundreds of years we've been pumping huge amounts of pollutants into the atmosphere without giving much thought to what the long-term effects might be. But now the effects of this activity are beginning to catch up with us in strange and potentially devastating ways.

You may recall that we mentioned global warming briefly in Unit 2 (along with biodiversity and the ozone layer). But global warming and its related issue of the thinning ozone layer are so important that we are going to discuss them both in even greater detail here. And the reason they're so important is that they are directly or indirectly related to just about every other issue you will read about in this book. And those issues are going to affect you.

And this is where things begin to get a little more complicated. As you will see, it's hard to decide where one issue ends and the next one begins when we talk about these things. Remember the Web of Life? It's all interconnected. And you're going to begin to see examples of that shortly.

Global Warming

For years, climatologists and other members of the scientific community have debated whether global warming was actually happening. While the debate goes on, the majority has come to accept the fact that it's actually taking place. The main disagreement now is about what the impact on us and on the planet will be, and how we should respond.

There is also general agreement that global warming presents us and the rest of the world with one of the most challenging dilemmas we have ever faced. In order to deal with this problem, we're going to have to fundamentally change our habits, as well as much of our current economic system, from one of exploitation to one of sustainability. But it begins to put this issue in its proper perspective.

What Is It?

As you may recall, global warming is an increase in the Earth's temperature due to the use of fossil fuels and other industrial and agricultural processes. This causes a buildup of so-called "greenhouse gases" such as carbon dioxide and methane in the atmosphere. There are other gases involved, too, but we'll stick with the main culprits. Like a one-way filter, carbon dioxide lets energy from the sun pass through, but it absorbs the longer wavelength radiation from the Earth and traps it. This is called the "greenhouse effect."

Without the greenhouse effect, the Earth's temperature would be about 60 degrees colder, which would result in unbearably frigid conditions. Consequently, the greenhouse effect is very important to life as we know it on Earth. However, since the nineteenth century our massive use of fossil fuels, along with extensive deforestation (trees absorb carbon dioxide), has caused greenhouse gases to flow into the atmosphere in huge quantities, turning the Earth into a giant hothouse.

The burning of fossil fuels has raised the concentrations of carbon dioxide in the atmosphere by about 30 percent since the preindustrial era. And the levels of carbon dioxide are now at their highest point in 160,000 years, according to recent studies. And if these trends continue, higher average global temperatures are almost certainly going to follow, somewhere between 2 and 6 degrees Fahrenheit by 2100. This warming will be focused in the mid-latitudes, and will be especially apparent at night and in the winter. Now, 2 to 6 degrees may not sound like much, but as you will soon see, even a few degrees' increase can cause huge problems.

Fossil Fuels

The fossil fuels that are the main contributors to global warming are coal, oil, and natural gas—the primary energy sources of our modern economy that account for around 75 percent of commercial use. In addition to causing air pollution, the burning of coal and oil also results in the production of carbon monoxide (a colorless, odorless, poisonous gas) and tiny particles that have been linked to lung cancer and other health problems. Other byproducts cause urban smog and acid rain (more about acid rain in a moment). Although natural gas is cleaner, it still gives off greenhouse gases when burned.

That's bad enough. But there's more bad news about fossil fuels—and this is where the interrelationships of these issues really start to show up. The mining or extraction of these fuels, their transport, and their processing, also causes other environmental damage from oil spills, refining operations, and water and ground pollution. And none of these fuels is renewable. Once they're gone. But the many environmental problems associated with fossil fuels will probably cause us to abandon them long before the supplies run out.

Rising Sea Levels

Another unfortunate effect of global warming is the melting of the polar ice caps. That may not sound like such a big deal, but it doesn't take much of an increase in ice melt to start to make some dramatic changes elsewhere. When this ice melts in large enough quantities, it raises the levels of the oceans around the world. And even a slight rise in ocean levels puts low-lying coastal areas at risk for flooding or for going underwater altogether.

Depending on the future pace of global warming, sea levels may rise somewhere between 2 inches and 37 inches by 2100, according to recent estimates. That's up to five times the increase of the past 100 years. And if the melting of the ice caps should accelerate, these figures could increase substantially.

In recent years huge sections of the Antarctic ice sheet have been breaking off and falling into the ocean, increasing concerns about a massive thaw. Iceberg B-18, which broke off from the Ross ice shelf in April 2000, measured 4 miles wide and 11 miles long—twice as wide and almost as long as Manhattan Island. That's a big berg.

You may have noticed that this discussion about global warming has shifted from the atmosphere to the subject of oceans. And icebergs. It's all connected, remember?

A Hole in the Sky

But there's another problem hanging over our heads related to global warming—the thinning of the ozone layer. You recall that in the 1970s scientists discovered that chlorofluorocarbons (CFCs) and other gases could damage the ozone layer that protects us and most other life forms from dangerous ultraviolet rays. Other scientists later discovered a "hole" in the ozone layer over Antarctica and a thinning over the arctic region. Eventually, CFCs were banned in

most countries, in accord with the 1987 Montreal Protocol. This international treaty calls for a global phaseout by 2006.

Nevertheless, the long, cold arctic winter of 1999-2000 resulted in one of the most massive ozone losses on record, according to scientists from NASA and the European Union. Measurements taken by researchers aboard NASA's high-flying ER-2 plane showed that ozone in the arctic region decreased by about 60 percent between January and mid-March. Other data collected by satellites confirmed their findings.

Since the production of CFCs has been dramatically reduced, the amount of human-made-chlorine-bearing pollutants in the atmosphere is not increasing. But because CFCs are so chemically stable, they may remain in the atmosphere for more than 100 years. They can also take as long as 15 years to make their way into the stratosphere. Once there, they become trapped because of the lack of air circulation. Consequently, it's going to be many decades before the ozone layer begins to recover.

What It Means for Us

The most obvious danger from the thinning of the ozone layer for us is the increased likelihood of skin cancers and cataracts caused by increased ultraviolet radiation. This is especially true for people living in Northern Europe, Canada, the arctic, as well as southern parts of South America, Australia, and other localities in extreme southern regions.

... And for Plants and Animals

The implications for many plants and animals could be more severe. Increased levels of ultraviolet radiation have been penetrating the oceans recently. This has affected photosynthesis and the growth of algae and tiny marine organisms that are part of the marine food chain.

But this problem isn't limited to simple organisms. Increased ultraviolet radiation also harms the early development of shrimp, crabs, and some fish. This is double trouble, because it harms these species when they are most vulnerable and threatens their food supply simultaneously. And that could mean big trouble for the world's fisheries.

Again, we'd like to point out that we've gone from talking about invisible problems high up in the atmosphere to potential damage to fish in the oceans.

Ouch—Acid Rain!

The burning of fossil fuels that is causing global warming is also responsible for the emissions of compounds causing another problem—acid rain. The main culprits are sulfur dioxide and nitrous oxides. These byproducts of combustion come mainly from coal and oil-fired industries, cars, and trucks.

Once they are released into the atmosphere, these compounds can be carried by the prevailing winds for long distances until they come back to the ground in the form of acid rain, snow, fog, or even dust. The resulting acid can damage fish and wildlife, lakes and forests, even crops. Acid rain also plays a large role in the deterioration of stone buildings and monuments.

Acid rain has long been a problem around the country and even in relatively remote places like Vermont, where it has caused noticeable damage to lakes and ponds, as well as portions of forests in the Green Mountains. Most of this pollution has been coming from the Midwest, especially coal-fired utilities, for many years.

Word Study

Ex. 1. Match the words with their definitions:

implication	pollution of the atmosphere in towns, caused by damp air combined with exhaust fumes from cars
dilemma	unit of measurement, especially for temperature or angles
degree	layer of the earth's atmosphere
smog	possible future effect or result of a plan, action, or event
data (datum)	situation in which it is difficult to decide what to do
harm	gap in the ozone layer
compound	information usually in form of facts or statistics that you can analyze
wildlife	damage or trouble
stratosphere	substance containing atoms from two or more elements
ozone hole	animals and plants growing in natural conditions

Ex. 2. Find in the texts English equivalents to the following Russian words, word combinations and terms:

Изучать, огромное количество, восстанавливать, сосредоточивать, рак легких, признавать факт, иметь дело с, главный виновник, поглощать, разлив нефти, возобновляемый, скорость, уязвимый, ультрафиолетовое излучение, серьезный (тяжелый).

Ex. 3. Fill in the gaps using words from the box:

fossil fuels skin cancer ultraviolet radiation holes ozone layer

1. When ... appear in the ozone layer, harmful light from the sun reaches the Earth.

2. The total amount of ... currently due to be expected is 1000 billion tones, which if burnt would result in unacceptable temperature rise.

3. ... is being damaged by chemicals, especially CFCs.

4. Increase levels of ... may cause serious consequences.

5. The ultraviolet light from the sun can have a harmful effect on animals, and causes ... in humans.

Ex. 4. Give a definition, synonym, or description of each of the words or phrases below:

photosynthesis

combustion

acid rain

air circulation

devastating way

Comprehension and discussion

Ex. 1. Look through the text and answer the following questions:

1. What are the main contributors to global warming?

2. What are the most obvious dangers from the ultraviolet radiation for our health?

3. What causes acid rain?

4. Why is acid rain considered to be a threat?

5. What are the priorities in solving the following problems?

Ex. 2. Write out a) key words out of each text; b) the sentences expressing the main idea(s) of each text. Retell the text "The Air We Breath" briefly in your own words making use of the key words and the sentences you've written.

UNIT 4. WATER: OUR MOST PRECIOUS RESOURCE

"Water, water, everywhere, nary a any drop to drink." You've probably heard these familiar lines from The Rime of the Ancient Mariner by the English poet Samuel Taylor Coleridge. First published in 1798, these words may yet prove to be prophetic.

We've already said that, for better or worse, this is going to be the Environmental Century. And one of the main reasons for this can be summed up in just one word: water. More specifically, the scarcity of fresh water. This is probably the most underestimated basic resource issue that we face this century. But it won't remain that way for long.

We'll begin this part by explaining why water is so important. Then we'll look at the shocking disappearance of our water supply and see where it's going. We'll also go through the unhappy list of things that are in our water that shouldn't be there. Then we'll explain the connection between water problems and—you guessed it—global warming. Finally, we'll take a sea cruise and explore some very troubled waters.

Learn and revise:

water supply, limited resource, water shortage, consequence, infiltration, conservation, cradle of life, garbage, scarcity, to collapse, utility, overpumping, strain, leaky pipe, theft, water-saving fixture, excessive use, measure, marine environment, source

Water

Water is our most important resource. Life would simply be impossible without it.

Our bodies are made up of about 65 percent water. And it's difficult to survive without it for more than a few days. We use it to brush our teeth, wash our clothes and dishes, take baths and showers, wash our cars, water our lawns; and, of course, we drink it. But, overall, personal use only accounts for about 10 percent of total water use worldwide. Twenty percent is utilized by industry, and the other 70 percent is consumed by agriculture.

And, at first glance, there's plenty of it. The oceans contain over 322 million cubic miles of water. That's an awful lot of water. But the oceans contain 97 percent of the water on the planet. That leaves only 3 percent of fresh (non-salty) water for us. And of that fresh water, about two thirds is locked up in glaciers and permanent snow pack at the poles and on Greenland. That means that only about a third of the fresh water on the planet is readily available for our use. And as you're about to see, a lot of that isn't fit to drink.

Going, Going, Gone?

It's important to remember that water is a limited resource. There's only so much of it to go around. And unfortunately, for many people, it's not distributed equally. Not even close. Two thirds of the global population lives in areas that receive only a quarter of the world's rainfall. China, with 20 percent of the world's people, only has 7 percent of its fresh water. The United States, on the other hand, with only 4.5 percent of the world's population, is fortunate to have 8 percent of the planet's water.

About 300 million people currently live in areas of serious to severe water shortage. Twenty-five percent of the developing world remains without clean water. And, the world's population, presently at 6 billion, is expected to exceed 10 billion sometime this century. You don't have to be a genius to figure out that these trends mean

big trouble. We've fought many wars over oil, a resource that is replaceable with alternative energy sources. Water is irreplaceable, and even more basic for survival.

Falling Aquifers

It gets worse. The challenges related to water for China and India, for example, are huge. Both depend on irrigation to produce at least half of their food supply for their enormous populations. The water table on most of China's flat agricultural lands, which produce nearly 40 percent of the country's grain, is falling at a rate of 5 feet per year. As you might expect, this is a matter of some concern to the Chinese government.

In India, the situation may be even worse. Twice as much water is being removed from India's aquifers as is being naturally recharged. As a result, the fresh water level in those aquifers is dropping between 3 and 10 feet a year. That's staggering. It's also unsustainable. Sooner or later (but probably sooner) this strategy will collapse, with terrible consequences.

The situation in India and China is not unique. And this problem is not limited to agricultural areas either. Cities worldwide face similar challenges. However, urban areas also have some distinct water issues of their own. Many cities suffer severe groundwater loss when gutters, pipes, pavement, storm sewers, and other manmade structures channel water away from the ground before it has a chance to sink in. As a result, the land may subside, causing structural damage to buildings, roads, water pipes, and other utilities. Parts of Mexico City have sunk about 30 feet in the last 100 years due primarily to overpumping of the groundwater.

A Pitch of Salt

But the overpumping of groundwater can lead to other problems. One of the most serious is the infiltration of salt water

from the oceans. This is especially true for large urban areas on or near the seacoasts of the world.

Here in this country, there are many illustrations of this phenomenon all along the Atlantic coast from Cape Cod, Massachusetts, to the southern tip of Florida. A similar scenario can be found along the Gulf and West coasts as well. But the situation in Florida is a good example of the problem.

The increasingly heavy demands that the state's growing population and industry have put on Florida's supplies of fresh water have caused the water table to fall in many areas, resulting in the infiltration of salt water into freshwater aquifers in coastal areas.

Conservation

If global warming does put additional strains on our supplies of fresh water, we're obviously going to have to figure out ways of making better use of what we have. And one of the best ways of stretching our available water resources is conservation. This is because water has not been widely subjected to the same pressures for efficiency gains as other resource-sectors. The good news is that there is lots of room for improvement.

Many cities around the world could save huge amounts of water simply by repairing their water systems. It is estimated that Manila, in the Philippines, loses a staggering 60 percent of its water due to leaky pipes and theft. In another country, Boston reduced its water demand substantially a number of years ago by fixing leaky pipes, installing water-saving fixtures, and educating the public about water conservation.

Another important way to conserve is to remove incentives for the excessive use of water. The installation of water meters, raising extremely low prices, and eliminating volume discounts, are all useful strategies to help encourage households to conserve. And because, in many countries, the residential sector uses around 50

percent of municipal water, additional conservation measures in the home can make substantial reductions in water demand, from around 10 to 40 percent. Americans tend to waste vast amounts of water, so demand-management strategies could be extremely effective.

The capture and use of rainwater is another conservation strategy that also offers food control benefits. Rooftop collection tanks in some cities are already being used to supply essentially free water for a wide variety of non-drinking water purposes.

An Ocean of Trouble

Our exploration of water issues would not be complete without a look at the oceans, which cover nearly three quarters of the Earth's surface. These vast bodies of salt water, which stretch to the horizon and beyond, have been the subject of human wonder, curiosity, and superstition for as long as we have walked the Earth. In fact, the oceans are the very cradle of life.

For thousands' of years, we have viewed the sea as a mysterious but inexhaustible source of food and other valuable resources. Many civilizations have grown up along the seacoasts around the world, taking advantage of the supply of fish and other marine life, as well as the trade routes that the oceans provided.

Unfortunately, for almost as long, we have also viewed the oceans as a limitless dumping ground for every kind of filth and garbage imaginable. This time-honored human habit hasn't gotten much better in recent years. And the accidental pollution of the oceans and beaches, in incidents like the now-infamous 1989 Exxon Valdez oil spill off the coast of Alaska, just make an already bad situation even worse.

More recently, we have begun to push the limits of the sea's ability to supply us with resources or to deal with our wastes. We do this at our peril, because, in addition to being the source of a wealth of economic activity, the marine environment also performs

essential functions such as the production of oxygen, the recycling of nutrients, and the regulation of our climate. It's easy to take these things for granted. But we shouldn't, because we depend on the oceans for life itself.

Word Study

Ex. 1. Match the words with their definitions:

aquifer	substance which is necessary to help the body grow, repair and maintain itself
glacier	examination of an area in order to find out what is there or what it is like
nutrient	ability of a process to leave natural resources undamaged and the environment in good order for future generations
incident	large area of stationary ice covering the Arctic regions
exploration	something that happens, especially something that is unusual
surface	layer of rock, gravel, or sand that contains or conducts underground water
survival	top layer of something
irrigation	state of continuing to live or exist
sustainability	act of making something better
improvement	supplying water to land to allow plants to grow, usually through a system of man-made channels

Ex. 2. Find in the texts English equivalents to the following Russian words, word combinations and terms:

Содержать, страдать, доступный для использования, незаменимый, ошеломляющий, требование, сохранять, зависеть от, грунтовая вода, преимущество, драгоценный ресурс, неисчерпаемый, торговый путь, стратегия сохранения, резервуары для воды.

Ex. 3. Fill in the gaps using words from the box:

shortage	ground water	irrigation	demand	resources

1. Lake Baikal in Siberia with a depth more than a mile, contains one-fifth of the world's fresh water ... .

2. Many regions, notably in China, Egypt, Mesopotamia, and India, have been under continuous ... from ancient times.

3. If ... increases and supply remains unchanged, a shortage occurs.

4. The UN called on governments to curb the use of ... and to ensure that countries relying on irrigation move away from water-hungry crops.

5. One of the most urgent problems in the world today is ... of the clean water.

Ex. 4. Give a definition, synonym, or description of each of the words or phrases below:

resource

infiltration

conservation

reduction

wealth

Comprehension and discussion

Ex. 1. Look through the text and answer the following questions:

1. What methods are usually used for purification of water?
2. What made many water resources unsafe?
3. What can you say about limited water supply in India and China?
4. What are the main water conservation strategies?
5. What do you know about the Exxon Valdez tragedy?

Ex. 2. Write out a) key words out of each text; b) the sentences expressing the main idea(s) of each text. Retell the text "Water: Our Most Precious Resource" briefly in your own words making use of the key words and the sentences you've written.

UNIT 5. THE LAND WE LIVE ON

So far we've looked at the many environmental problems we face in the air and in our waters. But one of the reasons why some of these issues are so hard to get a handle on is that they are more or less invisible. Now it's time to shift our focus to the land we live on.

Although many of the environmental dangers associated with the land are also out of sight, many more are dramatically obvious. And since this is where we live, rather than in the upper atmosphere or at the bottom of the ocean, many of these problems are harder to ignore. Unfortunately, we've been trashing our immediate neighborhood just as badly as the rest of the planet. And damage to the land has the same sort of negative impact on the Web of Life as elsewhere.

In this chapter, we'll take a hard look at how we treat the land we live on. We'll put on our protective clothing and explore the problems that hazardous wastes pose to the land. After that we'll take you on a walk through a magical forest.

Learn and revise:
environmental danger, impact, hazardous waste, devastation, corrosive, generator, poisonous substance, mining operation, to dump on, disastrous, nuclear power, contamination, widespread use, nuclear weapon, nuclear storage, incident, radioactive debris, chemical assault, toxic chemical, mining facility

Hazardous Waste

We'll start with hazardous waste. Just what, exactly, is hazardous waste? There are four main categories:

Ignitable — can burn or cause a fire;
Corrosive — can corrode steel or harm organisms;
Reactive — may explode or create toxic gases;
Toxic — contains poisonous substances.

There's a lot of hazardous waste on the planet. Worldwide, there are about 400 million tons of the stuff generated each year. And 250 million tons of it are produced right here in our own country. That's almost a ton for every man, woman, and child in the United States. Next year, add another ton. And so on. In fact, there are some 40,000 locations in this country that have been listed as hazardous waste Superfund sites by the EPA. And cleanup of just 1,400 of the worst ones is projected to cost $31 billion.

Mining operations tend to be big generators of all kinds of waste, but especially of hazardous waste. In 1998, mining facilities released 3.5 billion pounds of toxics into the U.S. environment, according to the EPA. Mining companies use a variety of toxic chemicals such as cyanide, mercury, and sulfuric acid to separate metal from the ore. Mine tailings, the material left over once the metal has been removed, are highly toxic, and often are just dumped on the land or into rivers and streams. The environmental consequences can be disastrous.

But even when mining wastes are contained in holding ponds, there can be serious problems. In one of Europe's worst environmental disasters in years, huge amounts of cyanide overflowed a dam at the Baia Mare gold mine in the Romanian town of Oradea in January 2000. Within a few weeks, the pollution had flowed downstream into neighboring Hungary and Yugoslavia where almost all aquatic life in the Tisa and Danube rivers was poisoned. The Tisa, for all practical purposes, was biologically dead after the incident.

Terrible Toxics

But toxics have lots of other potential problems. Somewhere around 80,000 chemicals are in common use today. Some of them are like time bombs just waiting to go off. And many of these chemicals have the potential to affect the genetics of people and animals a generation or more after they have been exposed to them.

Some of the worst are known as persistent organic pollutants, or POPs. These highly toxic substances can be carried by the winds and have even been ending up in remote Arctic locations—and in the indigenous people who live there. Dioxin is one of the most poisonous POPs known to science. Remarkably, there isn't enough information for even a partial health assessment of 95 percent of the chemicals in the environment, according to the U.S. National Academy of Sciences.

Many other toxic chemicals are known as pesticides. Unlike other chemicals, pesticides are designed specifically to alter or kill living organisms. If we're not careful, that can include us. Remarkably, most Americans were largely ignorant of these hazards until Rachel Carson published her now-classic book Silent Spring in 1962, which questioned the widespread use of chemical pesticides. Practically no one has any doubts about the dangers of pesticides anymore. The EPA has ranked pesticides as the third most important environmental problem in this country in terms of cancer risk. In fact, the National Academy of Sciences has concluded that pesticide contamination of our foods may be responsible for up to 20,000 cancer deaths each year.

Pesticides have also seriously contaminated our groundwater. And worst of all, contrary to what you may hear in the advertising that promotes their use, pesticides have simply made many pest problems even worse. In response to heavier pesticide use, many insects have become more resistant, requiring heavier use of even more potent pesticides. The same phenomenon has occurred with

plants, and a whole new crop of "super weeds" has been created by Mother Nature in response to our chemical assaults. Thousands of pesticide products are currently used in every country.

The list of hazardous and toxic substances goes on and on. The improper disposal or accidental discharge of any of these hazardous substances can cause serious environmental problems for us and for many generations yet to come.

Nuclear Nemesis

Now we're going to look briefly at some hot stuff—nuclear waste. Although radioactive materials are frequently used for beneficial medical and other purposes, trying to figure out what to do with the contaminated wastes can be a puzzle. Low-level nuclear waste, including radioactive materials from research activities, medical wastes, and so on, are normally disposed of in low-level nuclear waste dumps. Trying to find dump sites, even for these low-level materials, has become more difficult in recent years.

However, the really hot stuff—spent fuel from nuclear power plants and materials from nuclear weapons—are so toxic that they must be placed in special containers and then stored in incredibly expensive, specially designed underground sites. The lack of sufficient underground storage facilities has forced utilities and military installations all over the country to store their spent fuel rods and other radioactive materials in holding facilities that were never designed for such long-term use. The government-designed site for nuclear storage is Yucca Mountain in Nevada, yet construction of the facilities at this location are decades behind schedule, and local environmental factors may not be favorable to long-term storage.

Environmentalists and some scientists have warned of this impending dilemma for decades. Now the problems—like the

proverbial chickens—are coming home to roost. No easy or cheap solutions are likely to be developed.

But the continuing threat of a major nuclear meltdown and the release of radioactive debris is probably the most serious pollution issue of all. The now-infamous Chernobyl nuclear accident in the former Soviet Republic of Ukraine on April 26, 1986, was the worst nuclear accident in history. Large areas of several former Soviet republics were contaminated and 200,000 people had to be evacuated and resettled. Around 4.9 million people in the former Soviet Union were ultimately affected.

The enormous environmental and financial costs of nuclear power, nuclear weapons, and their wastes are simply too high to continue pursuing their development and use.

Where Have All the Forests Gone?

Okay, it's time to take a break from all of this and go for a nice, restful walk in a magical forest. All set? Let's go. The lush green canopy of leaves rustling over our heads protects us from the hot summer sun. Sweet bird songs echo through the trees.

Colorful wildflowers and green ferns carpet the forest floor. A small, clear brook gurgles around moss-covered rocks, and chipmunks and other small creatures scurry away as we approach. It's a little piece of heaven. Now close your eyes and start to count from one to three. When you reach three, open your eyes again. Ready? One, two, three!

Uh-oh, our magic forest has disappeared! And so has everything else. In its place is a wasteland of stumps, and a tangle of branches and treetops. The ground is scarred with deep, muddy ruts, the stream is clogged with silt, and the broiling sun is beating down on our heads mercilessly. It looks like hell. And it is.

Unfortunately, this isn't just a fantasy. This sort of thing is happening every day in countries all across the planet. In the past 50

years, the natural forests of the Philippines, Thailand, Haiti, and El Salvador have been virtually destroyed by excessive logging and by the spread of migrant farming. Similar devastation is taking place in many other nations as well. Logging for wood products, in fact, imperils more than 70 percent of the world's remaining virgin forests, according to the World Resources Institute. If current trends continue, half of the planet's remaining tropical forests may have vanished by 2050.

An Axe to Grind

And if you think this sort of thing is limited to poor, money-hungry nations, think again. Most of our own old growth forests were cut down early in our history. By the end of the nineteenth century they were mostly gone. But huge areas of the Pacific Northwest in Canada and in this country have been clear-cut in recent decades as well. And the destruction continues. The environmental impact of clear-cutting is severe.

Healthy forests provide a wide range of benefits. Not only do trees remove carbon dioxide from the atmosphere through the process of photosynthesis—helping to combat global warming—they also add pure oxygen to the air. In addition, forests provide habitat for a wide variety of plants and animals, store large amounts of moisture, and prevent erosion of the soil. But clear-cutting removes all the trees at once, and leaves the remaining land vulnerable to severe erosion because the moisture just runs off instead of being absorbed by the forest.

Word Study

Ex. 1. Match the words with their definitions:

mercury	act of getting rid of something
dam	water or other liquid
pesticide	substance that makes air, water, soil etc dangerously dirty
disposal	poisonous liquid metal, used in thermometers
utility	construction built to block the river
moisture	agent that is used to kill or control insects, weeds, rodents or other organism
erosion	act of sending out gas, liquid, smoke
pollutant	service provided for people to use
dump	process of being gradually destroyed by rain, wind, the sea
discharge	place where waste is thrown away

Ex. 2. Find in the texts English equivalents to the following Russian words, word combinations and terms:

Поглощать, горючий, выпускать (освобождать), неправильное устранение, бороться, чрезмерная лесозаготовка, устойчивый, руда, серная кислота, невидимый, последствие, угроза, генетика, здоровье, эвакуировать.

Ex. 3. Fill in the gaps using words from the box:

nuclear weapons	threat	consequences	pesticides	generators

1. Everyone knows ... of the accident at Chernobyl in 1986.
2. ... to Nature can only be overcome if all nations work together.
3. According to the Environmental Protection Agency more than one billion pounds of ... are used annually in the United States.
4. A chain reaction, which leads to a release of energy, is the basis of both ... and nuclear power.
5. Fission based power plants are used to heat water to produce steam that runs turbine ... .

Ex. 4. Give a definition, synonym, or description of each of the words or phrases below:

clear-cutting

cleaning up

contamination

hazardous waste

storage facility

Comprehension and discussion

Ex. 1. Look through the text and answer the following questions:

1. What are the main categories of hazardous waste?
2. What do mining companies use to separate metal from the ore?
3. What toxic chemicals do you know?
4. Are there any special sites for nuclear storage?
5. Where have the forests of the Philippines, Thailand and Haiti gone?

Ex. 2. Write out a) key words out of each text; b) the sentences expressing the main idea(s) of each text. Retell the text "The Land We Live On" briefly in your own words making use of the key words and the sentences you've written.

UNIT 6. FOOD FOR THOUGHT

"You are what you eat," the TV commercials tell us. If you believed the seductive images you see, then we'd all be slim, trim, twenty-something, and fashion-model gorgeous. Recent medical studies paint a very different picture, however. One in five adults and one in four children in this country are obese. And while we may be what we eat, what we're eating is killing us in record numbers.

What we are doing to ourselves with our overeating is bad enough, but what we are doing to our environment is even worse. Our chemical-intensive factory-farming approach to food production in this country is ruining our soils, poisoning our water supplies, breeding pesticide-resistant weeds and insects, and fouling the air with the massive fossil-fueled transport system necessary to haul agricultural products from one end of the country to the other.

In this chapter, we'll continue the strategy by taking a look at the food we eat. First, we're going to look at waste reduction and waist reduction as related issues.

We are also going to tell you about where your food comes from, and why you should care. Then we'll look at some healthy food choices, and I'll explain the many benefits of organic food.

Learn and revise:

overeating, pesticide, fertilizer, over-consumption, waist problem, crop, taste, malnutrition, suburban living pattern, mechanization, water supply, waistline, benefit, biotech industry, genetically engineered animals, nutritional value, chemical intensive, food-additive, fat-rich livestock product, mainstream market

The Overfed American

The effects of over-consumption are not just limited to our environment. Our wasteful habits are reflected in our expanding waistlines as well. We're eating too much of the wrong kinds of foods, grown in the wrong places, with the wrong chemicals, pesticides, and fertilizers for the wrong markets. These are two separate but related issues: wasteful over-consumption of food, and wasteful food-production practices.

Part of the solution, of course, is to simply cut back on the amount of food we eat to bring it in line with our actual physical needs. That would help solve the bulging waist problem. But the other part involves a shift away from the food-growing and buying patterns we have become accustomed to. As you'll soon see, this shift will benefit both the environment and us in many ways.

Fat City

Obesity is an epidemic in this country. Although this has been a problem for many years, obesity has soared in the past decade, and now affects nearly one in five adults, according to a group of studies published in the Journal of the American Medical Association in late 1999. Even worse, obesity is linked to the deaths of some 300,000 Americans annually.

The number of Americans considered obese—defined as more than 30 percent over their ideal body weight —increased from around one in eight in 1991 to nearly one in five in 1998. And the trend is pretty much across the board, with a steady increase in both sexes, all races, all educational levels, and has occurred regardless of smoking status, according to one of the studies.

But the trend toward obesity in school-age children is even more alarming. The surgeon general has said that one in four children is now obese, and describes the situation as an epidemic.

We are afraid he's right. All you have to do is look at kids these days to realize we've got a problem.

Calories to Burn

The continuing growth in the heavy marketing of fast food and junk food, coupled with a lack of exercise, are the key reasons why people are consuming more calories than they burn. Children, in particular, watch more television, sit in front of computers longer, participate in less physical education at school, and tend more often to be driven around in automobiles by their parents instead of walking or riding bicycles, than ever before. Our sprawling suburban living patterns are partially responsible for the automobile piece of this issue, but for now we want to focus on food.

Regardless of the reasons, this escalating trend toward over-consumption of food and lack of exercise is extremely unhealthy and needs to be reversed. Remarkably, we find the same general health problems associated with overfed and overweight people as we find with underfed and underweight people.

Both of these examples of malnutrition result in the same health effects—increased susceptibility to illness, and reduced life expectancy. And while we're busily eating ourselves to death, millions of other people around the world are starving to death.

Ironically, the healthiest people in the world are not those who consume the most food, but rather, those in the middle who consume less food in general, and less fat-rich livestock products in particular. The life expectancy of the average Italian, for example, is higher than the average American, while eating half the quantity of grain and a lot less red meat than Americans do. So, you see unhealthy eating habits are literally killing people.

Time for Action

Happily, we don't have to wait for the government or anybody else to "do something" about this problem. We can take immediate

action ourselves today. Or maybe tomorrow. Or whenever you go food shopping the next time.

Now, don't get us wrong, We are not advocating a national crash diet. Crash diets don't work for individuals in the long run and they wouldn't work for the country either. What we are suggesting is a gradual, thoughtful shift in both the amount of food we eat, the kind of food we eat, and where it is produced. This will benefit both the environment and us. In order to do this in an informed way, you need to understand where our food comes from.

The Well-Traveled Meal

When you buy your food, do you give much thought to where it comes from? You should. Because where your food was grown has an impact on the environment. Let us explain. The average mouthful of food you eat at the kitchen or dining room table has traveled 1,300 miles before it lands on your plate, according to one estimate. And almost every state buys 85 to 90 percent of its food from someplace else. This is an absurd situation from both an environmental and local economic standpoint.

The out-of-season strawberries and other fruits and vegetables that people eat in Northern New England probably have come from California, Florida, or any number of foreign countries. Although it's nice to have all these choices in the grocery store, the mass movement of all this food from one part of the globe to another represents an enormous amount of fossil-fueled transportation, which results in a good deal of global warming.

Think Global—Bay Local

We don't know about you, but we've gotten tired of buying food—produce in particular— that looks good in the bins at the supermarket, but tastes about as exciting as cardboard. This is due mainly to the fact that a lot of agribusiness produce is designed to

look good and to maintain its appearance while it's being shipped from coast to coast, and later, while it's sitting on the shelf. But how this stuff actually tastes is another matter. A few stores actually color some of their fruit to make it look ripe—even if it isn't.

There's a simple solution to this problem: buy local produce. In Vermont, there has been a statewide campaign to buy local products for many years. This strategy makes a lot of sense. Why should you send your hard-earned dollars out of state or even out of country, when you can keep them circulating in your local economy? When you buy locally, you generally support smaller, local businesses, help employ local workers, and reduce the need for shipping products over long distances.

This is a particularly sound strategy for food products—especially farm products. From an environmental standpoint it makes far more sense to produce as much food as possible for local consumption, eliminating the need to waste resources on long-distance shipping. Admittedly, some foods simply can't be grown in certain areas, but it makes no sense for people to buy an ear of sweet corn shipped all the way from the West Coast when there are local farmers nearer.

And, yes, that means that we need to eat most of these foods in season, rather than whenever the mood strikes us. But, for us at least, returning to a more natural yearly progression of fresh foods is part of what makes each season special—and delicious. And if that helps the environment and the local economy at the same time, all the better.

Do You Really Want to Eat That?

But the advantages of buying locally produced foods extend well beyond freshness and transportation issues. Increasingly, huge agribusiness companies grow much of the food produced in the United States. Like it or not, large farms dominate agricultural

production in the United States. Out of two million farms, the largest 8 percent (with sales of more than $250,000 a year) account for 72 percent of output on only 35 percent of the land.

While these corporate entities are obviously very efficient at what they do, their farming practices come at a huge cost to the environment, and raise a number of other troubling questions. Because these farming operations are so huge, they have to rely on heavy mechanization, and even heavier use of chemical fertilizers, pesticides, and herbicides for their crops. And a lot of these chemicals never reach their intended targets, but end up instead on adjacent land or in our water supply.

Virtually all of these chemicals come from nonrenewable petroleum-based resources. And, as we've mentioned previously, the extraction, transport, and refining of petroleum has its own environmental hazards. Large scale, chemical-dependent agriculture also contributes to serious soil erosion. Millions of tons of prime topsoil have been washed into the Gulf of Mexico and elsewhere as a result.

But there's another problem. The crops these corporations grow have to be able to withstand a lot of mechanical processing. Although some crops are hand picked (often by migrant workers who are sometimes exposed to dangerous herbicides), others are not. In either case, the produce goes through a lot of sorting, treating, and packaging, before being shipped to distant markets. It should come as no great surprise that fruits and vegetables that don't withstand mechanized processing never get planted in the first place, while produce that does is preferred. So what about freshness and good taste—probably the two most important things most people look for in their foods? Good question.

Then there are the troubling—and highly controversial—issues of various types of growth hormones, genetically engineered animals and crops, and other strategies that are popular with many of the huge agribusiness companies and their related chemical and

biotech industries. Entire books are written on these subjects. And the debate is just getting started. We are only going to say that, at the very least, many people view these developments as a move in the wrong direction toward even more chemical-intensive, factory-farm-produced foods.

How Do You Pronounce This?

Now we come to the question of food additives. Because a lot of the food you buy at the supermarket takes a long time to get from producer to consumer, and sometimes sits around in warehouses and distribution centers for a while, it frequently contains any number of additives designed to "maintain product consistency or palatability," "improve or maintain nutritional value," "enhance flavor or impart desired color," and so on. What most of this really means is "longer shelf life."

This longer life is assisted by a number of food additives. It's not unusual to read the ingredients listed on a food label and find such unpronounceable items as: mono-and diglycerides, methyl cellulose, sodium aluminosilicate, propionic acid, butylated hydroxyanisole (BHA), butylated hydroxytoluene (BHT), benzoates, sulfites, sodium nitrite, erythorbates, and fumaric acid. And don't forget the artificial food colors like FD&C Red No. 40, FD&C Yellow No. 6, FD&C Yellow No. 5, and so on.

For many years, there's been a good deal of speculation about what the effects of ingesting this stuff over time might be. Some of the speculation has proven to be unfounded, or at least hard to document. But the fact remains that at least some people are allergic to FD&C Yellow No. 5 (or tartrazine), which may cause hives.

Even more disturbing, however, is the fact that a small segment of the population has been found to develop shortness of breath or fatal shock shortly after exposure to sulfites. Sulfites are capable of producing severe asthma attacks in sulfite-sensitive asthmatics. For

that reason, in 1986 the FDA banned the use of sulfites on fresh fruits and vegetables intended to be sold or served raw to consumers. Sulfites, however, are still added to some prepared or packaged foods.

Frankly, we don't care whether the FDA says this stuff is safe or not. We don't want to eat it at all. You have to decide for yourself, but one of the best ways to avoid these food additives is to buy fresh, local food as much as possible.

A Gradual Shift

Because the chemical and pesticide-intensive agribusiness style of farming is such bad news for our environment and is simply not sustainable over the long haul, we need to gradually shift to a style that is. Anything that you can do to encourage this shift will help. Supporting smaller family farms in your area with your food money is one way to do this.

This is not to say that every family farm in the country is a model of environmental sensitivity. Many are not. But the small family (or community) farm offers the best potential for the development of local, more natural food production models that could help us improve the quality of our food, while improving the environment at the same time. But this is only part of the picture.

Bye Bye Burger?

Another way of improving the efficiency of our use of natural resources, while improving our health, would be to reduce our consumption of fat-rich livestock products. It takes 7 pounds of grain to add 1 pound of weight on cattle in feedlots. By comparison, it takes about 4 pounds of grain to add that same pound of gain on pork. For poultry it's just over 2 pounds, and for a fish farm operation it's less than 2 pounds, according to the World Watch Institute.

It takes 10 times as much land to provide a pound of beef as it does to provide a pound of wheat. Since it takes a lot of water to produce grain, and since beef cattle require so much of both, there are clearly better alternatives to beef. And because the heavy consumption of red meats has been shown to be unhealthy, we also need to look at ways to reduce our intake of red meats—especially beef. This strategy will also help slow the growth of our waistlines and the national trend toward obesity we mentioned earlier.

Now, don't get us wrong. We are not wild-eyed vegetarians with carrots sticking out of our ears. We like a hot hamburger or a nice juicy steak like most people. And we are not suggesting we stop eating beef completely. But we have gradually come to enjoy these things as tasty but limited parts of a much more varied and healthy diet that is less centered on red meats. You can, too.

We also hasten to add that we have nothing personally against cattle ranchers. They're hard working, honest folks who are generally following long family traditions. But the shift away from red meat is an idea whose time has clearly come in many countries. And ranchers—like everyone else these days—are going to have to learn to adapt to changing times, as painful as that may be. A shift to premium-quality, organically raised beef is one possible alternative for some smaller beef farms. Which brings us to a very exciting trend—organic foods.

Hello, Organic

One of the most obvious signs of changing times has been the phenomenal growth in demand for organic foods. In addition to a variety of personal health concerns, the growing public awareness of the damage that pesticides, fertilizers, and herbicides do to our environment has led many Americans to start buying natural, organically grown foods in recent years. As a result, organic foods, which were already the fastest-growing segment of the U.S. food industry, have now entered the mainstream market in a big way.

Sales of organic produce, in fact, grew from $1 billion per year in 1992 to $6 billion in 1999, according to the Organic Trade Association. And in response to growing consumer demand, more than 50 percent of all grocery stores nationwide now carry at least some organic produce. This is remarkable growth indeed for an industry that barely showed up on the radar screen 20 years ago.

Even the federal government finally took notice of these trends, and after a good deal of prodding, attempted to define a new set of national standards for organic foods several years ago. The first attempt, however, was embarrassingly lax, and the labeling rules went back for major revision after the department received more than 280,000 protest letters from irate consumers and organic farmers. The revised rules were finally announced in January 2000 and are expected to go into effect later in the year.

So, why are so many people opting to eat organic foods? Many believe that organics are more nutritious — a view that some scientists dispute. But most people correctly feel that organic foods are healthier in general for themselves and for the environment. In addition, many claim that organics taste better.

In our own personal experience we have found that some organics definitely do taste better. On the other hand, some organic produce definitely does not look as good as the chemically sprayed variety. But if we have to choose between taste and appearance, taste always wins.

Word Study

Ex. 1. Match the words with their definitions:

obesity	limited range and amount of food
epidemic	discussion or argument on a subject that people have different opinions about
diet	kind of a virus that enters the body and can cause AIDS

debate	plant that is grown by farmers
speculation	medical condition in which you become ill because you have eaten certain foods, touched certain things
HIV	large number of cases of a particular infectious disease occurring at the same time
crop	excessive body fat
bin	goods sold in a supermarket
grocery	container for storing things
allergy	act of guessing without knowing all the facts

Ex. 2. Find in the texts English equivalents to the following Russian words, word combinations and terms:

Тревожный, возрастающая тенденция, расползающийся во все стороны, голодать до смерти, намеченая цель, вносить вклад, приступ астмы, здоровый, зерно, качество еды, разгневанный потребитель, картон, спорный, слабый, усилить вкус.

Ex. 3. Fill in the gaps using words from the box:

fertilizers	overeating	flavor enhancer	organic food
genetically engineered crops			

1. She can't lose weight and stop ... .

2. ... provides a variety of benefits.

3. Many people think ... are no less safe than traditionally bred crops.

4. Most ... that are commonly used in agriculture contain the three basic plant nutrients: nitrogen, phosphorus and potassium.

5. Water is indeed a useful ... , exactly because it dilutes other ingredients and can change their balance for the better.

Ex. 4. Give a definition, synonym, or description of each of the words or phrases below:

overeating

food-additive

nutrient

organic food

environmental hazard

Comprehension and discussion

Ex. 1. Look through the text and answer the following questions:

1. Is obesity a real problem in our country nowadays?
2. What are the advantages of buying locally produced foods?
3. What can you say about food additives?
4. What is the best way of improving the efficiency of our use of natural resources while improving our health?
5. Is organic food healthier? What do you think of it?

Ex. 2. Write out a) key words out of each text; b) the sentences expressing the main idea(s) of each text. Retell the text "Food For Thought" briefly in your own words making use of the key words and the sentences you've written.

UNIT 7. NATURE COUGHS UP HER SHARE

If the climate did get warmer, animals could move north. They've done it in the past. When the great glaciers of the ice age advanced south and later retreated north, the wildlife followed them back and forth. In fact, Darwin in the 1850's asserted that if "they all migrated in a body together, their mutual relations will not have been much disturbed." But the transition from the ice age to the present age, the Holocene, took thousands of years, during which time the average global temperature increased 9-12.5°F (5-7°C) and the sea level rose 328 feet (100 meters). However, what we may do in the next 100 years is to increase the speed of that temperature change by about 50- to 100-fold. It's not that same gradual increase. Things won't be so smooth. Some transitions are occurring right now and they don't look choreographed.

Learn and revise:
mammal, extinction, endangered species, continued existence, reluctant, nest, to survive, to disrupt, habitat, to breed, to wipe out, devastating, insect, nature, to protect, danger, drainage, havoc, waterfowl, predator-prey relationship

Mammals

Climate changes have had enormous effects on wildlife in the past. Younger Dryas, the big dip back into the ice age that happened at the beginning of the Holocene, might have been a factor in the extinction of the great ice age mammals—the mammoth, mastodon, native camel, ground sloth, giant bison, and the saber-toothed tiger. The coming age of global warming could have as drastic an effect, causing wholesale extinctions across the globe. Some effects are already here.

California Sea Lions Take a Drive

The California sea lion is a loser in a globally warmer world. This is one of the best known seals because it is easily trained for the circus and is frequently kept in zoos. True California sea lions are found off the shores of southern California, the coast of Baja California, in the Sea of Cortez, and off the Mexican Coast. California sea lions are noisy animals. Their voices have a high pitched bark, which is very distinctive.

Our colleague accompanied biologists one summer to San Miguel Island off the coast of California, a summer rookery for the animal. There they come to mate and bear their young. Females gather into harems and big bull males challenge each other in open-mouthed fights for access to the females. Males typically wear large gashes in their coats during the summer mating season. On San Miguel there can be up to 20,000 sea lions and other seals during the California sea lion mating season, and the noise is amazing. It's like walking into a big stadium and somebody has just made a touchdown, only the cheering goes on 24 hours a day.

The diet of California sea lions consists chiefly of squid and some other species. The calves are born during the month of June. The mother returns to the water to fish soon after the pups are born to feed their hungry mouths. Sea lions prefer to hunt in shallower waters both by day and night. The waters off San Miguel are rich with food, and in good years, about 75 percent of the pups make it.

But in the El Nino year of 1997, it was a different story. When the waters grew warmer, the normal prey species began to swim deeper and move further north. The result was catastrophic. In non-El Nino years pup mortality runs about 25 percent, but that summer it went up to 70 percent. With global warming presenting the possibility of a permanent El Nino, this catastrophe could become a regular occurrence.

Grizzly Bear and White Pine

The two last remaining grizzly bear populations in the lower 48 states reside in northwestern Montana and in and around Yellowstone National Park in Wyoming. In all there are less than 1,000 grizzly bears left where 100,000 once roamed over the western portion of the United States and Mexico. The grizzly bears are in a perilous situation. They are currently protected under the Endangered Species Act. Habitat and foods are important to their continued existence in these environments.

The problem is, their favorite food is white-bark pine seeds. The seeds are much larger and more durable than the seeds of other cone-bearing trees, and it requires much less energy to get at them. Whitebark seeds are usually ripe around mid-August, at which time a host of birds, chipmunks, and other animals including the grizzly bear harvest the cones en masse. Bears at this time go after the whitebark pine seeds almost exclusively, especially adult females who must fatten up quickly if they are to produce cubs during the winter.

The problem is that the whitebark pine is a sub-alpine species that exists in Wyoming at elevations from 5,000 to 10,000 feet. As a warmer climate drives other species of trees higher, the whitebark pine could get squeezed out. Plus, the whitebark pine is subject to a number of diseases that could be affected by rising temperatures. Chief among them is blister rust. This fungus has already taken a toll throughout the range, as much as 90 percent in some areas.

The Sheep and the Lion

Desert bighorn sheep range over the Southwest from Texas to California and into Northern Mexico. There are about 20,000 of these animals in the United States today, a fraction of their former population. Bighorn sheep emerged from earlier evolutionary forms

during the last ice age, when the glaciers stood at their southernmost boundaries. The sheep were then confined to an area of the once-lush southwestern United States. As these ice walls retreated, vast expanses of grassland grew up in their wake. The bighorn passively followed the endless grasses and thrived.

As the Southwest became more arid, the desert bighorn adapted to an environment that sometimes reached 130 degrees. The desert bighorn can survive without water for months on end, getting most of their water by eating vegetation. They are normally secretive animals. It's hard to find one. There are tricks, though. Biologists showed me a watering hole near Lake Mead on the Colorado River above Boulder Dam and advise to come back sometime when temperatures exceeded 110°F (43 °C) three days in a row to see bighorn.

The bighorn have excellent vision, equivalent to a pair of binoculars, so I was told not to try and hide. Instead, just sit out in the open about 50 yards back of the water hole, with a beach chair, an umbrella, and a cooler full of cold drinks, and see what happened. Sure enough, a group of more than 10 bighorn sheep came to the water hole a little after noon in the heat of the day. They hesitated for a while, but deciding the clown under the umbrella was obviously harmless, came in and drank and let me take pictures.

The bighorn like the high, rocky precipices where predators cannot follow. They have a unique double-shelled hoof that spreads over sharp, broken rocks, and a soft, cushiony pad in the middle for traction on slick surfaces. The sheep are capable of nimbly bounding up and down incredibly sheer mountain cliffs, often dropping 20 feet between contact points. They can also follow two-inch-wide trails across steep cliffs.

But desert bighorn are reluctant to leave their high, rocky refuges and move to flat lands between ranges where they can't outrun predators. Biologists literally have to pick them up and take

them down the road to get them to spread into new territories. This makes them uniquely susceptible to climate change, since the animals that will survive best are the ones who can adapt and move.

However, bighorn susceptibility is more complicated than that. The bighorn are running into increasing problems with mountain lions. There are several populations in the Southwest where mountain lions have almost wiped out the desert bighorn.

In the early 1990s, when desert bighorn populations were plummeting in southern California mountains, California Fish and Game biologists radio-collared 100 animals to see if they could pinpoint the problem. When the results were tabulated, they discovered that over 70 percent of the bighorns that died in the study were killed by mountain lions. This is not the only instance where mountain lions have proved the nemesis of bighorn sheep. Mountain lion kills have reduced bighorns in the Sierra Nevada Mountains to less than 100 animals. In the San Andreas Mountains in New Mexico, hungry lions have eaten the herd down to a single female.

Eric Rominger, a professor at New Mexico State University, who works with New Mexico bighorn, admits the idea of the lions driving a herd into biological extinction goes against the classical predator-prey relationship in which the two populations are supposed to stay in equilibrium. In other words, as the prey dies back, so do the predators. But he claims that fire suppression policies have allowed forests to invade the normally bald rocky areas where bighorn are found. The trees then provide habitat for deer which are not usually found in dessert bighorn habitat. This allows resident mountain lions to prey on deer and stay healthy even though desert bighorn are declining. In an environment without the deer, the mountain lions would normally decrease as their prey decreased, so that they would never be in a position of wiping out a prey animal. But in this special situation, man has disrupted the environment and made "wipe-out" a clear and present danger.

In a globally warm world, trees will ascend the mountains and create havoc for desert bighorn sheep as well as for a number of other animals. This shows how complex some of these natural biological relationships are and how man-induced warming could throw them out of whack, with results that aren't expected.

Sea Birds

Adelie penguins are already feeling the effects of global warming in the Antarctic. Scientists studying the birds there find that only 1 out of 10 Adelie penguins survive the winter and return to nesting grounds to breed. They believe that a 5.5°F rise in sea temperature since the 1940s is the villain. The temperatures have caused the numbers of krill, an important food for the penguins, to plummet.

The 1997-1998 El Nino has not only affected California sea lions, but it also proved devastating for California's endangered brown pelican. In the spring of 1998, researchers found only 280 nests in a colony in the Channel Islands National Monument off California, which normally contained 20,000. Climate change produced by El Nino had sent the brown pelican's normal fish prey deeper and further north.

Waterfowl

More frequent and severe droughts could dry up many of the prairie potholes, small wetlands which provide breeding habitats for most of North America's waterfowl in the Great Plains and southern Canada. Models developed by scientists at Boston University suggest that within 50 years climate change could wipe out 54 percent of the prairie potholes and about 60 percent of the duck population.

Songbird Stop Singing

Climate change could cause major shifts in the range of many songbirds and some local extinctions. The forests of northern Minnesota and southern Ontario could lose up to 14 species of warblers. Warblers live off insects like spruce budworms, which ravage local forests, and their absence could lead to devastating insect infestations.

The Kirtland's warbler in northern Michigan provides an example of how global warming effects on one natural system will challenge another. The bird is confined to a narrow area of jack pines that grow in sandy soil. Models of global warming's effects on the system predict that the jack pine is likely to migrate north with the warming. The trouble is Rutland's warblers are not likely to survive the transition. That's because the birds like to nest on the ground under young pines. But the soil to the north is not sandy enough to allow proper drainage for the nests. Without that drainage, water would accumulate and kill the nestlings. Scientists who study Kirtland's warbler predict that global warming could wipe the birds out within 30 to 60 years.

Word Study

Ex. 1. Match the words with their definitions:

cub	gradual reduction
boundary	crop which is gathered
predator	state of being invaded or overrun by pests or parasites
transition	something that indicates a border or limit
fungus	number of organisms of the same species living and breeding in a certain area
wildlife	the young of certain large predatory animals

population	animal that kills and eats other animals
harvest	animals and plants growing in natural conditions
decline	act or process of changing from one form or state to another
infestation	simple fast-growing type of plant such as a mushroom

Ex. 2. Find in the texts English equivalents to the following Russian words, word combinations and terms:

Мамонт, смертность, опасная ситуация, отличительный, длительный, обрыв, неизбежная расплата, распространяться, стремительно падать, сосна, восприимчивость, певчая птица, засушливый, гладкая поверхность, засуха.

Ex. 3. Fill in the gaps using words from the box:

mammals	habitat	nest	wildlife	mammoth

1. Most species of ... were about as large as a modern Asian elephant.

2. Some ... , such as naked mole rats and whales have lost some or all of their hair.

3. ... biologists have searched dense jungles and snow-covered forests in an effort to track down and study animals that are often at risk of extinction.

4. ... is not necessarily a geographic area, for a parasitic organism it is the body of its host.

5. Plant matter is the most common construction material for ... .

Ex. 4. Give a definition, synonym, or description of each of the words or phrases below:

endangered species

extinction

ice age

vegetation

drainage

Comprehension and discussion

Ex. 1. Look through the text and answer the following questions:

1. What is the factor in the extinction of the great ice age mammals?

2. Are grizzly bears currently protected under the Endangered Species? Why?

3. What other endangered species do you know?

4. What did the scientists studying adelie penguins find out?

5. What is happening with songbirds?

Ex. 2. Write out a) key words out of each text; b) the sentences expressing the main idea(s) of each text. Retell the text "Nature Coughs Up Her Share" briefly in your own words making use of the key words and the sentences you've written.

READING GUIDE

GLOSSARY OF TERMS

Aquifer is a layer of rock, gravel, or sand that contains or conducts underground water.

Arid land is a land which has very little rain.

Biochemistry is chemistry of living tissues.

Biodiversity describes the number of species in a given environment.

Bioengineering is using of biochemical processes on the industrial scale.

Carbon dioxide is a colorless gas produced when carbon is burnt with oxygen.

Catalyst is a substance which changes the rate of a chemical reaction.

Chernobyl is the name of a large nuclear power station in the Ukraine, the scene of a disastrous accident in 1986.

Chlorofluorocarbon (CAC) is a derivative of hydrocarbons containing atoms of fluorine and chlorine.

Cleaning up is an action of removing refuse or waste substances or pollutants.

Climatologist is a scientist who studies climate conditions.

Contaminant is a substance that makes something impure by touching it or by adding something to it.

Coral reef is a ridge or part of a shallow area of sea floor near the sea's surface made up of the calcium-containing remains of millions of tiny coral animals, red algae, and mollusks.

Decay is rotting, disintegration of dead organic matter.

Deforestation is cutting down forest trees for commercial purposes or to make arable land.

Destruction is an act of killing or removing completely.

Disaster is a terrible event that kills or causes massive destruction.

Domestic waste is a waste from houses.

Downshifting is a voluntary decision to cut back on your work hours, or to take a new, lower-paying job in exchange for more time to spend with family or other parts of your life that are more important to you.

Ecological footprint is the measure of area needed to supply national populations with the resources and area needed to absorb their wastes.

Ecology is the set of relationships between organisms and their physical environment.

Ecosystem is a community of living organisms in which there is constant interchange between its various parts.

El Nino is complex weather pattern resulting from variations in ocean temperatures in the Equatorial Pacific.

Elimination is a removal of pests or waste matter.

Equilibrium is a state of balance.

Ethanol is a gasoline-fuel additive made from corn.

Flood is large amount of water covering land which is normally dry.

Fossil fuel is an organic, energy-rich substance formed from the long-buried remains of prehistoric life.

Garbage is rubbish, household waste.

Genetic engineering is a technique used to change the genetic composition of an organism so that certain characteristics can be created artificially.

Greenhouse effect is the heating of the atmosphere that results from the absorption of solar radiation by certain gases, especially carbon dioxide and methane.

Ground pollution is presence of abnormally high concentrations of harmful substances in the soil.

Hazard is a risk or danger.

Industrial ecology is the use of ecological thinking in industrial settings.

Industrial waste is a liquid or solid waste from industrial process.

Initial condition is the starting point of a weather forecast that takes into consideration temperature, wind spread and direction, air pressure, and humanity measured from points in a grid overlaying the landscape.

Kilowatt hour is 1,000 watts of electricity used for one hour.

Litter is rubbish.

Maintenance is keeping at a certain level.

Melt water is water from melting ice, especially from a glacier or from winter snow.

Methanol is known as "wood alcohol," can be used as a substitute fuel for gasoline.

Obesity is excessive body fat, occurs when the food energy you eat exceeds the food energy you use.

Oil spill is an escape of oil into the environment.

Organic foods are grown without chemicals that can harm the land and water.

Ozone is a gaseous, almost colorless form of oxygen that protects the earth against ultraviolet radiation in the upper atmosphere.

Pest is an animal or a plant which is troublesome or harmful to people, such as farmers.

Pesticide is any agent that is used to kill or control insects, weeds, rodents, fungi, or other organisms.

Pollution is presence of abnormally high concentrations of harmful substances in the environment, often put by people.

Purification is an action of making pure or removing impurities.

Recovery is getting better, getting back to previous state.

Recycling is the collection of waste materials and reprocessing them into new materials or products, which are then sold again.

Renewable resources are resources which can be replaced by natural environmental processes in a reasonable short period of time.

Reservoir is an artificial or natural area of water, used for storing water for the outside domestic or industrial use.

Storage is keeping something until it is needed.

Tanker is a large ship for carrying oil or petrol.

Toxic waste is a waste which is poisonous or harmful.

The Three Rs of the environmental movement are reduce, reuse, and recycle.

Underground water is water in porous rocks underground.

Ultraviolet rays (UV rays) are short invisible rays, beyond the violent end of the color spectrum, which form the tanning and burning element in the sunlight.

UNO (United Nations Organization) is the international organization, formed in 1945 to promote international cooperation and peace.

Unsustainable development is development which depletes or damages natural resources irreparably and which does not leave the environment in good order for future generations.

Uranium is an natural radioactive metallic element which is an essential fuel for nuclear reactor.

Urbanization is movement of people from the countryside to the city, from small settlements to larger ones; making the countryside more like a city or town, with buildings and industries.

Vulnerable species are species which are likely to become endangered unless protective measures are taken.

Waste is rubbish, material which is not needed.

Water pollution is polluting of the sea, rivers, lakes, canals.

World Conservation Union is the independent international organization that provides leadership and a common approach to conservation.

X-ray is a ray with a very short wavelength, which can go through soft tissue and register on a photographic plate.

Yield is quantity of a crop or a product produced from a plant or from an area of land.

TEXT ANALYSIS

Работа по обучению студентов чтению профессионально-направленного текста как основного источника иностранной научной информации в рамках специальности требует наличия определенных представлений о возможностях и ограничениях, присущих данному источнику распространения информации, а также определенных навыков и умений по практическому использованию английского языка для целей информационного обеспечения отраслей науки. Одной из задач данного пособия является обучение методам практического применения знаний английской грамматики, научной терминологии по специальности и навыков работы со специализированной словарно-справочной литературой для информационно-смыслового анализа профессионально-направленной литературы. Целью такого анализа является извлечение из читаемого текста ряда интересующих студента сведений, таких, как главная идея решения рассматриваемой проблемы, характер и принципы действия нового технологического процесса и так далее.

Чтение и анализ научных текстов существенно осложняются тем обстоятельством, что любой профессионально-направленный иностранный текст может быть как информационно-насыщенным, так и частично информативным или даже дезинформативным. Наряду с общеизвестными сведениями, большое количество публикуемых специализированных текстов содержит новую и полезную информацию, которую необходимо увидеть и извлечь. При работе с таким текстом студент также должен быть в состоянии увидеть и отсутствие интересующей его информации в тексте.

Выполняемая без полного перевода целевая обработка частично информативных текстов, производимая с помощью рассматриваемых методов грамматического и смыслового анализа, дает возможность

студентам существенно сократить затраты времени и сил на чтение. Эффективность такого рода анализа текста зависит от того, насколько хорошо обучающийся овладел навыками быстрого просмотрового и ознакомительного чтения, от умения увидеть в тексте нужную ему информацию, от способности выделить эту информацию из массы сопутствующих или ненужных сведений и от умения точно передать эту информацию средствами русского языка. Эффективность быстрого просмотрового, ознакомительного, а также изучающего чтения профессионально-направленной литературы зависит от знания студента основных грамматических и лексических особенностей современного специализированного текста, а также типовых структурных форм организации любого научного материала.

Способность извлекать смысл из иностранного текста является главным умением, лежащим в основе программных требований к курсу изучения иностранного языка в техническом вузе. Имеющее важное значение в теории и практике перевода понятие смысла в данном случае определяется как содержащаяся в тексте некоторая идея, которую переводчик, в данном случае студент, должен полностью понять и адекватно передать. Мы полностью согласны с В.Б. Григоровым, который предлагает для решения этой задачи использовать следующие средства:

1) Опознавание знакомых слов и терминов в тексте, необходимое для этого знание специальной терминологии и умение пользоваться словарно-справочной литературой при переводе неизвестных или новых терминов.

2) Умение увидеть структуру предложения или абзаца текста, умение пользоваться аппаратом грамматического чтения текста для выявления структуры предложения, абзаца.

3) Понимание научной сути самого рассматриваемого вопроса, умение пользоваться справочной литературой по профилю текста.[2]

Необходимой частью работы студента с профессионально-направленным текстом, имеющей целью извлечение информации, помимо правильного использования словарно-справочной литературы, является анализ общего смысла предложения, осуществляемый с помощью грамматического чтения. Под грамматическим чтением понимается деление предложения на отдельные смысловые группы с целью раскрытия связей как между отдельными группами, так и между отдельными словами в пределах одной группы. Входящие в состав предложения смысловые группы, такие, как группа подлежащего, группа сказуемого, группа обстоятельства, и т.д., дают возможность установить смысловые связи в пределах предложения, в то время как выполняющие роль смысловых групп структурно-смысловые подразделения более высоких порядков дают возможность установить смысловые связи в пределах абзаца или всего текста в целом. Таким образом, грамматическое чтение на уровне абзаца является более высоким уровнем структурно-смыслового анализа, дающим возможность полностью понять мысль автора.

Под абзацем в данном случае понимается законченная единица мысли, которая может быть полностью понята на основании заключенной в нем информации. Самым высоким уровнем грамматического чтения является структурно-смысловой анализ законченной текстовой единицы, например, всей научной статьи. Теоретически объем информации, заключенный в законченной текстовой единице, должен быть достаточным для того, чтобы полностью понять идею, замысел автора.

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[2] *Григоров В.Б. Как работать с научной статьей. — М.:Высшая школа. 1991. — С. 71.*

Умение увидеть структуру английского предложения, а также возможные отклонения от этой структуры, имеет основополагающее значение для выявления содержания предложения. Для современного английского поясняющего повествовательного предложения, являющегося основной формой языка научной прозы, наиболее характерна следующая структура:

0	1	2	3	4
Обстоятельство	Группа подлежащего	Группа сказуемого	Группа прямого дополнения	Обстоятельство с предлогом, предложное дополнение

В данной структуре левое и правое определение (5), не вынесенные в таблицу, не имеют постоянного места и обычно входят в состав смысловой группы определяемого слова.

Грамматическое чтение повествовательного предложения, характерного для английской научной прозы, начинается с поиска сказуемого, поскольку понимание смысла сказуемого сразу создает у читающего верное представление о том, что происходит в предложении. Сказуемое является обязательным членом любого английского предложения, отвечает на вопросы что делает подлежащее?, что делается с подлежащим?, каково оно?, что (кто) оно такое? и т.д. Сказуемое является наиболее важным для понимания смысла членом предложения и занимает в структуре предложения центральное место (2). Места остальных членов предложения определяются относительно сказуемого. Основными признаками-идентификаторами сказуемого по В.Б. Григорову являются:

1) Появление вспомогательного или модального глагола в личной форме. Идентификаторами сказуемого также являются вспомогательные

глаголы shall, will, should, would и модальные глаголы can, could, may, might, ought…

2) Окончания "s" и "ed" глагола.

3) Роль сигнализатора о том, что дальше последует группа сказуемого, могут играть наречия already, often, always, seldom...

4) Роль сигнализатора также могут играть так называемыt бесспорные подлежащие: I, he, she, we, they.

5) В ряде случаев сигнализатором группы сказуемого может оказаться группа прямого дополнения, которая в английском языке стоит после сказуемого.[3]

Наибольшие трудности при идентификации сказуемого обычно возникают в тех случаях, когда глагол находится в Present или Past Indefinite (Active Voice) (кроме 3-го лица ед. числа). В этих случаях важнейшими структурными ориентирами могут оказаться порядок слов в предложении и наличие признаков-идентификаторов 3,4 и 5. В современной научной прозе наиболее распространенной формой сказуемого является сочетание вспомогательного или модального глагола со смысловым глаголом в соответствующей форме.

От сказуемого зависят и некоторые другие члены предложения, например, дополнения и обстоятельства, без которых смысл сказуемого может оказаться недостаточно точно выраженным и которые по этой причине должны включаться в его группу. Правильная идентификация и точный перевод группы сказуемого позволяют определить остальные группы и выявить структуру предложения в целом, понять и точно передать содержание предложения.

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[3] *Григоров В.Б. Как работать с научной статьей. — М.:Высшая школа. 1991. — С. 73.*

Подлежащее (1) также является обязательным членом любого английского предложения, отвечает на вопрос кто? что? Общеизвестными формальными признаками-идентификаторами подлежащего являются:

1) Отсутствие предлога и, в некоторых случаях, наличие артикля a или the.

2) Место в структурной схеме предложения — обычно перед сказуемым.

3) Лексическое значение — обозначает процесс, действие, лицо, предмет.

Ввиду того, что группа подлежащего всегда определяется после и относительно группы сказуемого, ее идентификация и анализ обычно не представляет особых сложностей. В современном языке научного общения подлежащее чаще всего выражается следующими частями речи: именем существительным, герундием, инфинитивом или инфинитивной группой.

Значительно реже в профессионально-направленных текстах встречается выражение подлежащего местоимением в именительном падеже, числительным или герундиальным оборотом. Эти формы более характерны для газетных и литературных текстов. Статистически более чем в 50% случаев подлежащими в научных текстах оказываются имена существительные — термины или терминологические группы с несколькими левыми определениями.

Дополнение (3) обозначает предмет или лицо, на которое распространяется действие сказуемого, выраженного переходным глаголом в личной форме. Такого рода прямое дополнение обычно образует вместе со сказуемым единую смысловую группу. Помимо прямого дополнения в смысловую группу сказуемого могут входить предложное и беспредложное косвенные дополнения.

Обстоятельство (0), (4) обычно характеризует действие, обозначаемое сказуемым, и указывает где, когда, почему и каким образом это действие имеет место. Обстоятельство выделяется в отдельную смысловую группу только в том случае, когда оно относится к сказуемому. Группа обстоятельства имеет в начале в качестве служебного слова предлог, наречие или союз и занимает в предложении нулевое и четвертое место. Обстоятельство может быть также выражено наречием, придаточным обстоятельственным предложением, причастным инфинитивным и герундиальным оборотами.

Определение (5) обозначает признак предмета, отвечает на вопросы какой?, который?, чей?, сколько? и может располагаться до или после определяемого слова. В отличие от дополнения и обстоятельства определение не занимает в структуре предложения определенного места и не образует отдельной смысловой группы, поскольку входит в состав группы того члена предложения, который оно определяет.

Таким образом, первый этап грамматического чтения предложения сводится к синтаксическому анализу, выявлению структурных подразделений предложения. В ходе второго этапа должен быть выполнен правильный перевод входящего в подразделение смыслового глагола (2) и входящего главного существительного (1), что создает у студента правильное представление об основном содержании предложения. Выполняемая на третьем этапе работа с подразделениями (3), (4), (0) и (5), где (5) – левые и правые определения, позволяет уточнить уже выявленный смысл и добавить некоторые второстепенные детали. Рекомендуемый порядок обращения к словарю должен соответствовать установленной последовательности грамматического чтения, т.е.

(2) -> (1) -> (3) ->(4) -> (0) -> (5).

Нарушение этого порядка обычно ведет к потере синтаксической ориентировке и к искаженному пониманию, а иногда и полному непониманию смысла предложения и всего текста.

Vocabulary to be used in discussing a scientific publication

The reporter (commentator, author) mentions .../ reports on/ comments on .../ touches upon/ dwells upon .../ explains.../ analyses the developments in .../ gives an account of.../ gives a detailed analysis of/ describes in detail.../ gives no details as to .../ gives full coverage of.../ reminds the reader of.../ focuses the reader's attention on .../ emphasizes the feet that/ lays the emphasis on .../ stresses that../ draws the reader's attention to .../ takes a critical view of.../ is in favour of.../ is opposite to.../ calls on smb for smth .../ expresses a deep concern for ...

In commentator's opinion/ view ...

In this connection it worth while mentioning ...

The key-note of the article ...

The article speaks in terms of facts and figures ...

The article to be discussed is ...

The discussed article is ...

The title of the article is ...

The article consists of... (3) parts.

The article contains /includes/ falls into ... (3) parts.

The article contains a summary/ a treatment of.../ a list of references/ a large amount of useful information.

The article is addressed to scientific workers/ professional scientists/ interested laymen/ undergraduates/ post-graduates/ those working in the field of .../ those studying the problems of .../ those familiar with the field of .../ those approaching the problems of...

The article is written for researchers.

The subject of the article is ... (includes .../ is reviewed/ is covered).

The topic (theme) of the article is ...

The topic of the research /investigation / thesis is ...

The subject matter of the article relates to/ includes/ is devoted to ...

The subject matter of the article falls into two parts.

The article (the author) discusses.../ deals with.../ is concerned with.../ covers.../ considers.../ gives consideration to.../ describes.../ gives an accurate description of.../ outlines.../ emphasizes.../ places emphasis on the problem of...

The article provides the reader with some data on ... /some material on .../ some information on .../ an introduction to .../ a discussion of.../ a treatment of.../ a study of.../ a summary of .../ some details on .../ a useful bibliography/ a list (set) of references/ key references...

It is an urgent/ vital/ burning/ bread-and-butter problem.

It is a problem of paramount importance.

Then, further (on) / the article goes on to say that...

The text is purely informative.

The text contains the definition of such a phenomenon as (this phenomenon is defined as follows: ...)/ theory and practice/ experimental data/ established facts to illustrate several phenomena in the field of (Psychology, Physics, Maths, Mechanics, Computing)...

I arrive at a conclusion that...

I'm confident that...

There's plenty evidence that...

I give full approval/ disapproval of...

I am absolutely convinced that...

My impression is that...

If I rightly remember the opinion is widely held that...

It's surely true that...

It's common knowledge that...

It is an open secret that...

There's a general feeling that...

There is some evidence that...

It's very likely/ unlikely that...

There is every likelihood that...

There's every reason to believe that...

In conclusion the article says that...

The article ends in (an appeal)...

At the end of the article the reporter ...

To sum up ...

In conclusion the reporter suggests that.../ the commentator concludes by saying that.../ the commentator draws to the conclusion that...

GRAMMAR MATERIAL

Word Building

Noun-forming prefixes

Prefix	*Meaning*	*Examples*
anti-	against	antidote, antithesis
auto-	self	autobiography, automobile
bi-	two	bilingualism, biculturalism,
co-	joint	co-founder, co-owner, co-descendant
counter-	against	counter-argument
dis-	the converse of	discomfort, dislike
ex-	former	ex-chairman, ex-hunter
hyper-	extreme	hyperinflation, hypersurface
inter-	between	interaction, interchange, interference
kilo-	thousand	kilobyte
mal-	bad	malfunction, maltreatment
mega-	million	megabyte
mis-	wrong	misconduct, mismanagement
mini-	small	mini-publication, mini-theory
mono-	one	monosyllable, monograph
neo-	new	neo-colonialism, neo-impressionism
out-	separate	outbuilding
poly-	many	polysyllable
pseudo-	false	pseudo-expert
re-	again	reorganization, reexamination
semi-	half	semicircle, semi-darkness
sub-	below	subset, subdivision
super-	more than, above	superset, superimposition
in-	the converse of	incoherence, incompatibility

Noun-forming suffixes

Suffix	*Meaning*	*Examples*
-tion/-sion	action/instance of V-ing	alteration, demonstration expansion
-er	person who V-s something used for V-ing	advertiser, driver computer, silencer
-ment	action/instance of V-ing	development, punishment, unemployment
-ant/ -ent	person who V-s	assistant, consultant student
-age	action/result of V ollection of N	breakage, wastage, baggage
-al	action/result of V	denial, proposal, refusal, dismissal
-ence/ -ance	action/result of V	preference, dependence, interference attendance, acceptance, endurance
-ery/-ry	action/instance of V-ing place of V-ing	bribery, robbery, misery refinery, bakery
-ship	state of being N	friendship, citizenship
-ism	doctrine of N	Maoism, Thatcherism
-ity	state or quality of being A	ability, similarity
-ness	state or quality of being A	darkness, preparedness
-cy	state or quality of being A	urgency, efficiency
-dom	collectivity	kingdom
-ess, -ine	feminine gender	actress, heroine
-hood	abstract notion	childhood

Adjective-forming prefixes with negative meaning

Prefix	*Examples*
un-	unfortunate, uncomfortable, unjust
in-	Indirect, inexperienced
il-	illogical illegal, inconvenient
ir-	irregular irreplaceable
im-	impossible immature, impatient, improbable
non-	non-fiction, non-political, non-neutral
dis-	dishonest disloyal, dissimilar, dishonest

Adjective-forming suffixes

Suffix	Examples
-al	central, political, national, optional, professional
-ent	different, dependent, excellent
-ive	attractive, effective, imaginative, repetitive
-ous	continuous, dangerous, famous
-ful	beautiful, peaceful, careful
-less	endless, homeless, careless, thoughtless
-able	drinkable, countable, avoidable

Verb-forming prefixes

Prefix	*Meaning*	*Examples*
re-	again or back	restructure, revisit, reappear, rebuild, refinance
dis-	reverses the meaning of the verb	disappear, disallow, disarm, disconnect
over-	too much	overbook, oversleep, overwork
un-	reverses the meaning of the verb	unbend, uncouple, unfasten
mis-	badly or wrongly	mislead, misinform, misidentify
out-	more or better than others	outperform, outbid
be-	make or cause	befriend, belittle
co-	together	co-exist, co-operate, co-own
de-	do the opposite of	devalue, deselect
fore-	earlier, before	foreclose, foresee
inter-	between	interact, intermix, interface
pre-	before	pre-expose, prejudge, pretest
sub-	under/below	subcontract, subdivide
trans-	across, over	transform, transcribe, transplant
under-	not enough	underfund, undersell, undervalue

Verb-forming suffixes

Suffix	*Examples*
-en	awaken, fasten, shorten, moisten
-ise	stabilise, characterise, symbolise, visualise
-ate	differentiate, liquidate, pollinate, duplicate, fabricate
-fy	classify, exemplify, simplify, justify

English Tenses (Active)

SIMPLE	*CONTINUOUS*	*PERFECT*	*PERFECT CONTINUOUS*
verb	be + verb -ing	have + verb (III form)	have been + verb -ing
ask (I form) **asks**	**am** **is** **asking** **are**	**have** **asked** **has**	**have** **been asking** **has**
permanent situations or states	temporary situations	recently completed actions (evidence in the present)	actions started in the past and continuing up to the present
She works as a teacher.	*They are living in London at present.*	*She has finished tidying her room.*	*I have been reading this book for 3 hours.*
repeated/habitual actions (especially with frequency adverbs)	actions happening at or around the moment of speaking	actions which happened at an unstated past time and are connected with the present	past actions of certain duration having visible results or effects in the present
I usually get up at 9 o'clock.	*She is playing tennis at the moment.*	*He has lost his keys.*	*She has been crying. (Her eyes are red.)*
permanent truths or laws of nature	repeated actions with "always" expressing annoyance or criticism	personal experiences/ changes which have happened	actions expressing anger, irritation or criticism
Water boils at 100 degrees.	*She is always interrupting me!*	*I have lost 5 kilos.*	*Who has been using my comb? (annoyance)*
timetables/ programmes (future meaning) / reviews / sports commentaries	fixed arrangements in the near future	emphasis on number	emphasis on duration (usually with for, since or how long)
The plane arrives at 4 o'clock.	*My son is arriving tonight.*	*She has bought three new dresses since morning.*	*She has been reading since morning.*
every day/ week/ month/ year, always, often, usually, sometimes, rarely, seldom, never, in the morning/ afternoon/ evening, at night, on Mondays etc	now, at the moment, at present, nowadays, today, tonight, always, still etc	just, already, ever, never, yet (negations and questions), so far, lately, recently, since, for, this week/ month/ year, today, by now, how long, how many etc	for, since how long
asked **took** **(II form)**	**was** **were** **asking**	**had asked**	**had been asking**
past actions which happened one after the other	action in the middle of happening at a stated past time	past action which occurred before another action or before a stated past time	action continuing over a period up to a specific time in the past
I got up, took a shower and had my breakfast.	*He was playing football at 3 o'clock yesterday.*	*She had left by the time I got there*	*She had been working as a teacher for 13 years before she resigned*
past habit or state *He used to go / went to school by bus.* complete action or event which happened at a stated past time *She came an hour ago.*	past action in progress interrupted by another past action, the longer action is in the Past Continuous, the shorter is in the Past Simple *While I was reading the bell rang.*	complete past action which had visible results in the past *She was upset because she had failed her exam.*	past action of certain duration which had visible results in the past *They were wet because it had been raining.*

	action which happened at a definite past time although the time is not mentioned, the action is not connected with the present *Shakespeare wrote many plays (He is dead -- period of time now finished)*	two or more simultaneous past actions or background description to events in a story *While I was cooking, my mother was laying the table* *She was flying to London. The sun was shining...*	the Past Perfect is the equivalent of the Present Perfect *He couldn't find his keys. He had lost them.*	the Past Perfect Continuous is the past equivalent of the Present Perfect Continuous *She went to the doctor. Her back had been aching for 4 days*
	yesterday, then, when, last week / month / year, (how long) ago, in 1978, just now etc	at 5 yesterday, from 5 to 6 yesterday, for 3 days last week, all day long/the whole day, when, while, as etc	already, after, before, just, never, yet, by the time, by 5 o'clock yesterday, by the end of last year, for, since etc	for, since
	will ask (I form)	**will be asking**	**will have asked**	**will have been asking**
	decision taken at the moment of speaking (on-the-spot decisions) *It's dark, I'll turn on the light*	actions in progress at a stated future time *She'll be swimming in the sea this time next week.*	actions which will be finished before a stated future time *She will have come by the end of May.*	duration of an action up to a certain time in the future *By the end of this year he will have been writing this play for 3 years.*
F U T U R E	hopes, fears, threats, offers, warnings, predictions, requests, comments etc, esp with: expect, hope, believe, I'm sure, I'm afraid, probably etc *I hope you'll not be late*	actions which are the result of a routine (instead of Present Continuous) *I'll be seeing Mary tomorrow. (We are classmates so we'll definitely meet.)*		
	actions or predictions which may (not) happen in the future or actions which we cannot control and will inevitably happen *She'll probably buy this coat* *She will be 20 next year.*	when we ask politely about people's arrangements to see if they can do smth for us or because we want to offer to do smth for them *Will you be going to the supermarket? Can you buy me some sugar?*		
	things we are not sure about or haven't decided to do yet *She'll probably be promoted (not sure yet)*			
	tomorrow, tonight, in 2019, in two/ three days, next week/month/ year, the day after tomorrow, in a week/ month/ year, soon etc	at 5 tomorrow, tomorrow, tonight, in 2019, in two/ three days, next week/month/ year, the day after tomorrow, in a week/ month/ year, soon etc	by, by 5 o'clock tomorrow, by next summer, before, by then, by the time, until/till (are used only in negative sentences), when etc	by...for

The formation of the Passive Voice

	TENSE	*ACTIVE*	*PASSIVE*	*EXAMPLE*
SIMPLE	Present	ask(s)	am is asked are	He asks/ He is asked *Он* спрашивает/ *Его* спрашивают
	Past	asked	was asked were	
	Future	will ask	will be asked	
CONTINUOUS	Present	am is asking are	am is being asked are	He is asking/ He is being asked *Он* сейчас спрашивает/ *Его* сейчас спрашивают
	Past	was asking were	was being asked were	
	Future	will be asking	—	
PERFECT	Present	have asked has	have been asked has	He has asked/ He has been asked *Он* уже спросил/ *Его* уже спросили
	Past	had asked	had been asked	
	Future	will have asked	will have been asked	

The Sequence of Tenses

If the verb in the principal clause is in one of the past tenses, a past tense (or future-in-the past) must be used in the subordinate clause. The action expressed in the subordinate clause can be simultaneous with the action expressed in the principal clause, prior or posterior to that of the principal clause.

	SIMULTANEOUS ACTION	***PRIOR ACTION***	***FUTURE ACTION***
I knew (that)	- he *lived* in Kiev он *живет* в Киеве	- he *had already left* Moscow он *уже уехал из* Москвы	- they *would arrive* on Sunday они *приедут* в воскресенье
	- they *were waiting* for us они *ждут* нас		
He said (that)	- he *had been living* in Kiev since 1946 он *живет* в Киеве с 1946 года	- it *had been raining* as it was wet *шел дождь*, так как на улице мокро	- they *would be working* at 6 в 6 они *будут* работать
	- he *had known* her for two years он *знает* ее 2 года	- she *had been ill* for two weeks она *болела* две недели	- he *would have translated* the article by Monday он *уже переведет* эту статью к понедельнику

So a useful general rule is: we move the reported clauses "one tense back" - *present* becomes *past, past* becomes *past perfect, will* becomes *would.*

Present Simple *I do...*	->	Past Simple *I did...*
Present Continuous *He is doing...*	->	Past Continuous *He was doing...*
Present Perfect *I've done...*	->	Past Perfect *I had done...*
Past Simple *I did...*	->	Past Perfect (or stays the same) *I did / had done...*
Past Continuous *I was doing...*	->	Past Perfect Continuous *I had been doing*
Past Perfect *I had done...*	->	does not change
will/ can/ may/ must	->	would/ could/ might/ must or had to
could have done/ might have done/ should have done/ needn't have done	->	do not change

Direct and Indirect Speech

Indirect Statements

Indirect Speech is formed according to Rule of the Sequence of Tenses. The verbs most commonly used to introduce the reported speech are: *to tell, to say, to add, to notice, to remark, to explain, to inform, remind etc.*

to say smth (to smb) *to tell smb smth*

DIRECT SPEECH	***INDIRECT SPEECH***
Jimmy said, "My sister *is learning* to drive". (The Present Continuous Tense)	Jimmy said that his sister *was learning* to drive. (The Past Continuous Tense)
Mary said, "Sometimes I *go* home by tram". (The Present Simple Tense)	Mary said that sometimes he *went* home by tram. (The Past Simple Tense)
The teacher told Leon, "You *didn't write* exercise two". (The Past Simple Tense)	The teacher told Leon that he *hadn't written* exercise two. (The Past Perfect Tense)
Mike said, "Bill *fell down*, but he *didn't hurt* himself". (The Past Simple Tense)	Mike said that Bill *had fallen* down, but he *hadn't hurt* himself. (The Past Perfect Tense)
Bob said, "My aunt *has just arrived* from Paris". (The Present Perfect Tense)	Bob said that his aunt *had just arrived* from Paris. (The Past Perfect Tense)

Indirect Command and Request

An order or request in indirect speech is expressed by the infinitive. The verbs most commonly used to introduce indirect orders are: *to tell, to order, to command.* Requests are usually introduced by the verb *to ask.* More emotional forms are: *to beg, to implore, to urge.*

DIRECT SPEECH	***INDIRECT SPEECH***
The mother said to the lazy son, "*Wake up*!"	The mother *told* the lazy son *to wake up.*
My brother said to me, "*Remember to post* these letters".	My brother *reminded* me *to post* those letters.
I said to Bill, "*Shut* the door, please".	I *asked* Bill *to shut* the door.
Mother said to the children, "*Don't* ever *enter* this room".	Mother *warned* the children *not to enter* the room.

Indirect General Questions

The inversion in the direct question changes to statement word order. If necessary, the tense is changed at the same time. We use *if/whether (ли)* after *ask, want to know, wonder, not know, didn't say/tell me.*

DIRECT SPEECH	***INDIRECT SPEECH***
Kate's mother asked her, "*Are* you *tired*?"	Kate's mother asked her *if* she *was tired.*
He asked his friend, "*Do* you *like* the wine?"	He asked his friend *if* he *liked* the wine.
I asked my friend, "*Did* you *buy* a new car?"	I asked my friend *if* he *had bought* a new car.
Ann's father asked her, "*Have* you *finished* the work?"	Ann's father asked her *whether* she *had finished* the work.
I asked my aunt, "*Will* you *go* to Italy in summer?"	I asked my aunt *whether* she *would go* to Italy in summer.

Indirect Special Questions

An indirect special question is introduced by the same adverb or pronoun that introduces the direct question.

DIRECT SPEECH	*INDIRECT SPEECH*
Fred asked, "Who *has taken* my book?"	Fred asked who *had taken* his book.
I asked the gardener, "What *are* you *planting* here this year?"	I asked the gardener what he *was planting* there that year.
Nina's sister asked her, "Who *did* you *meet* at the theatre?"	Nina's sister asked her who she *had met* at the theatre.
I asked my mother, "What *did* the teacher *say*?"	I asked my mother what the teacher *had said*.
He asked Roger, "When *will* he *come* back?"	He asked Roger when he *would come* back.
Ted asked Ben, "Where *do* your parents *live*?"	Ted asked Ben where his parents *lived*.
The professor asked his student, "Why *haven't* you *done* the home assignment?"	The professor asked his student why he *hadn't done* his home assignment.

Conditional Sentences

CONDITION	*SUBORDINATE CLAUSE*	*PRINCIPAL CLAUSE*	*USE*
Type 1 real present	If + any present form (Present S., Present Cont. or Present Perf.)	Future/Imperative can/may/might/must/should + bare inf. Present Simple (for general truths)	real - likely to happen in the present or future
	If he leaves early, he'll be on time for the meeting. If you're tired, go to bed! If you have finished your work, we can go for a walk. If you heat water, it boils.		
Type 2 unreal present	If + Past Simple or Past Continuous	would/could/might + bare Infinitive	unreal-unlikely to happen in the present or future; also used to give advice
	If I saw a ghost, I would run away. (not likely to happen) If I were you, I wouldn't go out with him. (advice)		
Type 3 unreal past	If + Past Perfect or Past Continuous	would/could/might + have + past participle	unreal situation in the past; also used to express regrets and criticism
	If I had locked the car, it wouldn't have been stolen. (regret; It's a pity I didn't lock it.) If he had behaved well, the teacher wouldn't have punished him. (criticism)		

Irregular Verbs

INFINITIVE	*PAST*	*PAST PARTICIPLE*
be	was	been
bear	bore	born(e)
beat	beat	beaten
become	became	become
begin	began	begun
bite	bit	bitten
blow	blew	blown
break	broke	broken
bring	brought	brought
build	built	built
burn	burnt	burnt
burst	burst	burst
buy	bought	bought
can	could	(been able to)
catch	caught	caught
choose	chose	chosen
come	came	come
cost	cost	cost
cut	cut	cut
deal	dealt	dealt
dig	dug	dug
do	did	done
draw	drew	drawn
dream	dreamt (dreamed)	dreamt (dreamed)
drink	drank	drunk
drive	drove	driven
eat	ate	eaten
fall	fell	fallen
feed	fed	fed
feel	felt	felt
fight	fought	fought
find	found	found
fly	flew	flown
forbid	forbad(e)	forbidden
forget	forgot	forgotten
forgive	forgave	forgiven
freeze	froze	frozen
get	got	got
give	gave	given
go	went	gone

grow	grew	grown
hang	hung	hung
have	had	had
hear	heard	heard
hide	hid	hidden
hit	hit	hit
hold	held	held
hurt	hurt	hurt
keep	kept	kept
know	knew	known
lay	laid	laid
lead	led	led
learn	learnt (learned)	learnt (learned)
leave	left	left
lend	lent	lent
let	let	let
lie	lay	lain
light	lit	lit
lose	lost	lost
make	made	made
meet	met	met
pay	paid	paid
put	put	put
read	read	read
ride	rode	ridden
ring	rang	rung
rise	rose	risen
run	ran	run
say	said	said
see	saw	seen
seek	sought	sought
sell	sold	sold
send	sent	sent
set	set	set
sew	sewed	sewn
shake	shook	shaken
shine	shone	shone
shoot	shot	shot
show	showed	shown
shut	shut	shut
sing	sang	sung
sit	sat	sat
sleep	slept	slept

smell	smelt (smelled)	smelt (smelled)
speak	spoke	spoken
spell	spelt (spelled)	spelt (spelled)
spend	spent	spent
spill	spilt (spilled)	spilt (spilled)
split	split	split
spoil	spoilt (spoiled)	spoilt (spoiled)
spread	spread	spread
spring	sprang	sprung
stand	stood	stood
steal	stole	stolen
stick	stuck	stuck
sting	stung	stung
strike	struck	struck
swear	swore	sworn
sweep	swept	swept
swim	swam	swum
take	took	taken
teach	taught	taught
tear	tore	torn
tell	told	told
think	thought	thought
throw	threw	thrown
understand	understood	understood
wake	woke	woken
wear	wore	worn
win	won	won
write	wrote	written

POPULAR PHRASES TO BE USED IN DISCUSSION

Could you explain what you mean by...
I'm not quite sure I follow you.
Well, the point is...
It is obvious that...
In my opinion...
As I see it...
Won't (Would) you agree that...?
There is no doubt about that.
I couldn't agree more.
I completely agree with you.
That's just what I was thinking.
You haven't convinced me that...
I agree with you on the whole but...
Perhaps, but...
Possibly, but...
Oh, but don't you think that...
Look at it in another way...
On the contrary.
On the one hand...
On the other hand...
It seems to me that...
I am not sure about that.
As far as I know
Could you be a little more specific?
I am afraid, I don't agree with you.

APPENDICES

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