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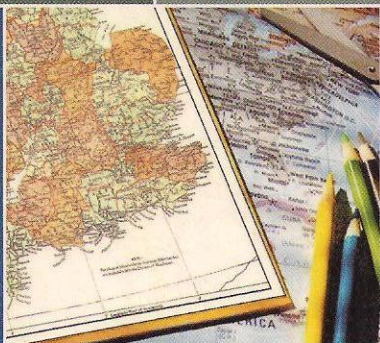
Высшее профессиональное образование

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# АНГЛИЙСКИЙ ЯЗЫК ДЛЯ ГЕОГРАФИЧЕСКИХ СПЕЦИАЛЬНОСТЕЙ

## ENGLISH FOR GEOGRAPHERS

Учебник



Естественные  
науки

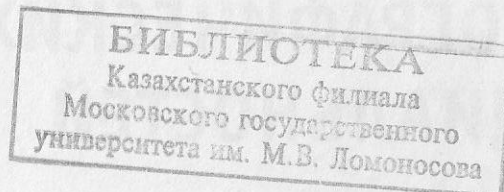
  
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Учебник содержит профессионально ориентированные тексты, заимствованные из учебников по географии, страноведению и экологии на английском языке и других оригинальных источников. Цель книги — научить студентов быстро извлекать информацию при чтении аутентичных текстов и обсуждать научные темы, используя самые употребительные языковые средства и основные термины специальности.

Для студентов географических и экологических факультетов высших учебных заведений.

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## ПРЕДИСЛОВИЕ

Предлагаемый учебник предназначен для обучения английскому языку студентов географических и экологических факультетов университетов, педагогических институтов и колледжей, специальностью которых является география и другие смежные эколого-географические и экономико-географические дисциплины: природопользование, геоэкология, картография, метеорология, океанология, гидрология, ландшафтоведение, география мирового хозяйства, социально-экономическая география, страноведение, регионоведение, туризм и др. Он также может быть использован для более широкого круга изучающих английский язык на основе познавательных материалов о природе Земли, хозяйственной деятельности людей и их воздействии на окружающую природную среду. Учебник рассчитан на общую трудоемкость 340 академических часов (не менее 175 из них должны быть аудиторными). В соответствии с требованиями Государственного образовательного стандарта Российской Федерации по профессиональной подготовке студентов высших учебных заведений по дисциплине «Иностранный язык» данный учебник нацелен на развитие и совершенствование у студентов практических умений и навыков во всех видах речевой деятельности: чтении, говорении, аудировании, письме в сфере профессионального общения. Основная цель учебника — научить быстро извлекать информацию при чтении, излагать содержание по-английски просто и понятно, делать сообщения и обсуждать научные темы, используя самые употребительные языковые средства и основной словарный фонд английского языка, т. е. освоить стиль нейтрального научного изложения. Учебные тексты содержат и позволяют студентам усвоить основную географическую терминологию, а также термины по экологии и охране природы.

В понятийном плане учебник имеет четкую структуру, обусловленную логикой данной предметной области как целостной дисциплины с широким охватом современных интересов и направлений. Он состоит из 22 разделов (Units), сгруппированных в 3 части: часть I — *Физическая география*; часть II — *Социально-экономическая география*; часть III — *Экология и окружающая среда*. Учебный текстовый материал дается так, что английские тексты, взятые вместе, представляют географию как систему естественных и обще-

ственных наук, изучающих природные и антропогенные процессы и явления, происходящие на поверхности Земли и в окружающих ее сферах, а также территориальные особенности их проявления. Каждый раздел (Unit) посвящен базовой теме общей физической географии (часть I), социально-экономической географии (часть II) и актуальным экологическим проблемам взаимодействия человека и окружающей среды (часть III). Разделы повторяют последовательность изложения материала в систематических курсах по общей географии и вместе представляют, по существу, географию «в миниатюре», охватывая основы геоморфологии, метеорологии, гидрологии, биогеографии, ландшафтоведения, почвоведения, геоэкологии, рационального природопользования, океанологии и др. Разнообразный и интересный текстовый материал, связанный общей тематикой и представленный в логической последовательности, способствует закреплению у студентов знаний по основам специальности и расширяет их кругозор. При отборе текстов учитывалась их информативность, познавательная ценность и актуальность тематики.

Конечно, учебник по иностранному языку не может претендовать на исчерпывающее изложение предмета во всей его полноте, да этого от него и не требуется. Но предлагаемый систематический отбор текстового материала обеспечивает знакомство студентов с основами географии и ее базовой терминологией, так как каждая отрасль географии представлена в одном из тематически ориентированных разделов тем ограниченным, но достаточным количеством ключевых слов, которые отражают ее существо и главные понятия на английском языке.

В плане языковой организации тексты выдержаны в стиле достаточно простого, стилистически нейтрального изложения, оптимального для активного овладения и практического использования студентами в их собственной речи на английском языке. Запоминание и усвоение таких образцов речи учит студентов выражать свои мысли на английском языке максимально просто и четко и тем самым достигать понимания, что и является в конечном счете целью обучения иностранным языкам для профессионального общения. С языковой точки зрения учебник представляет собой пособие по практической стилистике английской научной речи в области географии и экологии.

Весь текстовый материал пособия аутентичный. Тексты отобраны главным образом из учебников по географии и экологии на английском языке, а также из других оригинальных источников. Отбор текстов проводился в соответствии со строгими принципами современной лингвистики, теории функциональных стилей и практики преподавания «языка для специальных целей». Наличие нескольких текстов в разделе позволяет обучать навыкам разноцелевого чтения в сочетании с другими видами речевой деятельно-



сти: говорением, аудированием, письмом. Каждый раздел включает в себя грамматические, лексические, переводческие и коммуникативные упражнения и задания, обеспечивающие вместе активную деятельность в области речевой практики. Учебник можно использовать на занятиях со студентами с различным уровнем знаний английского языка и в комплексе с другими учебниками и учебными пособиями.

Учебник написан на основании опыта работы по преподаванию иностранных языков на естественных факультетах Московского Государственного университета им. М. В. Ломоносова, а также на основании лингвистических исследований в области функциональной стилистики, текстологии английской научной речи и методики преподавания иностранных языков.

В текстовых материалах сохранена орфография первоисточника (британская или американская), чтобы студенты знакомились с основными вариантами написания самых распространенных слов, относящихся к их профессиональной сфере.

Каждый раздел (Unit) учебника включает следующие рубрики, направленные на развитие основных навыков речевой деятельности и контроль усвоения языкового материала:

1. **Reading and Learning (Чтение и запоминание)** направлена на развитие навыков понимания при чтении (извлечения информации) и включает в себя три базовых текста. Содержание текстов раскрывает основные аспекты темы, заявленной в заголовке раздела. Предлагаемые тексты — это связные произведения речи, законченные в смысловом отношении и хорошо структурированные по содержанию. В языковом плане — это простые, написанные на хорошем английском языке фактологические тексты (clearly written texts in easy-to-follow language), в которых соотношение информации и языкового выражения оптимально для целей обучения. Они легки для запоминания и воспроизведения. Данные тексты можно использовать для тренировки разноцелевого чтения. Каждый из трех текстов (в первой и второй частях) сопровождается вопросами, которые следует воспринимать как материал для тренировки говорения, умения реагировать на вопрос и отвечать на него по возможности распространено и полно. В третьей части учебника вопросы к текстам предлагается сформулировать самим учащимся.

2. **Lexical and Grammatical Exercises (Лексические и грамматические упражнения)** содержит несколько упражнений, направленных на закрепление лексики общего языка, общенаучной лексики и основных терминов по географии, правил словообразования и словоизменения и т.п. Особое внимание уделяется использованию слов в составе наиболее употребительных, стандартных словосочетаний и умению употреблять их в своей собственной речи. Упражнения обращают внимание на языковые элементы, часто

встречающиеся в речи, направленной на передачу информации и четкое изложение фактов. Они не дают обзора всех грамматических явлений английского языка, а высвечивают только самые главные, наиболее употребительные в нейтральном научном стиле явления, а значит, первоочередные для обучения.

3. **Translation into Russian (Перевод на русский)** содержит отдельные предложения, представляющие собой тезисы основных положений данного раздела, или небольшой текст. Они предназначены для письменного или устного перевода на русский язык.

4. **Complementary Text (Дополнительный текст)** включает в себя текст, связанный с тематикой раздела и содержащий дополнительную информацию по теме. Текст предназначен для понимания, запоминания и пересказа или, возможно, прочтения преподавателем вслух для аудирования. В третьей части книги эта рубрика носит название **Complementary Activities** и содержит задания и рекомендации, направленные на развитие навыков работы с текстом: понимания содержания, выделения главной мысли, перефразирования, написания эссе, реферата и т.д.

5. **Writing (Письмо)** направлена на развитие навыков письма и перевода, содержит текст на русском языке, соответствующий основной теме раздела. Текст предназначен для письменного перевода на английский язык, причем в зависимости от задач обучения и уровня знаний студентов они могут делать либо подробный перевод, либо вольный перевод, передавая содержание русского текста на английском языке более свободно.

6. **Speaking (Говорение)** направлена на развитие навыков устной речи. Содержит текст, который следует прочитать, понять, уметь пересказать, а потом высказать свое мнение или комментарий по данной проблеме. Преподаватель может организовать дискуссию студентов по предложенной проблематике, воспользовавшись сформулированными после текста темами.

7. **Summarizing the Unit (Конспектирование)** предлагает в завершение работы составить план всего раздела с учетом дополнительной информации, полученной как на занятиях, так и в процессе самостоятельной работы, а затем суммировать ее в виде конспекта и краткого 4—5-минутного доклада, который излагается на уроке и обсуждается в виде ролевой игры, имитирующей выступление на конференции и участие в дискуссии.

После основного курса в приложении 1 даны названия частей света и стран.

В приложении 2 помещен **Словарь основной лексики (Vocabulary)**. Он составлен с помощью созданной нами компьютерной программы анализа слов, которая позволила подсчитать, сколько раз каждое слово встретилось в текстах учебника. Полученный достаточно длинный алфавитный список слов был сокращен: исключены служебные слова и слова, встретившиеся менее 5 раз



(при этом слова, встретившиеся хотя и менее 5 раз, но понятийно относящиеся к географии и экологии и важные для научного изложения, сохранены в списке). Таким образом, удалось надежно, на основании сплошного компьютерного анализа, показать базовый словарь, необходимый студентам для активного усвоения. Он включает самые употребительные и необходимые слова, функционирующие в научном регистре речи по географии. Студенты и преподаватели могут любое слово из текста сравнить со словарным списком и выяснить, насколько оно распространено и входит ли в базовый словарный состав учебника, что помогает понять, в какой степени то или иное слово следует усваивать: должно ли оно войти в активный словарный запас студента, или же оно рекомендовано для рецептивного (пассивного) восприятия.

В приложении 3 дан **Частотный список слов (Frequency Wordlist)**, наиболее часто встречающихся в текстах учебника. Слова представлены в порядке убывания частотности. Некоторые из них указаны в разных формах, каждая из которых весьма употребительна (так, как они встречались в текстах).

*Авторы*

## PART I

# PHYSICAL GEOGRAPHY

---

### UNIT 1

## THE NATURE AND PURPOSE OF GEOGRAPHY

### 1. Reading and learning

Scan each text and formulate the main ideas. Read the text again carefully and memorize it, then retell the text close to the original.

#### 1.1. THE SCIENCE OF GEOGRAPHY

Geography, which comes from the Greek words *geo*, meaning "earth", and *graphein*, meaning "description", is literally a study of the planet Earth. As trained scientists, geographers describe and analyze the physical characteristics of our planet and the ways in which people interact with these physical characteristics and with each other.

Throughout history people who went even short distances from where they lived became keenly aware of differences that distinguish one place from another and one group of people from another. Many of these travelers formed mental images of the places that they had visited and told others what they had seen. They sometimes scratched crude maps on rocks or on pieces of cloth or leather to improve the accuracy of their descriptions.

Geography, the study of the relationship between people and their physical surroundings, or environments, grew directly out of these attempts by early explorers to describe what they had seen on their travels. Today those who study geography describe and analyze the earth to explain what is where, why it is there, and what significance it has.

**The study of the earth.** Earth is only one of nine planets in our solar system that revolves around the sun — a minor star in the universe. A planet is an object or body that is made of various solids and gases and



that circles a star. A star and the planets and other related bodies such as asteroids that revolve around it are known as a solar system.

Earth is the third planet in distance from the sun, which is 150 million kilometers away. Even though the sun ranks as one of the smaller stars in the universe, it is huge when compared to Earth. The sun's heat and light provide most of the energy that makes life on Earth possible. It is this life and the physical features of the earth that geographers attempt to describe and analyze.

Most geographers focus on one of the two major branches of geography, physical geography and cultural geography, or on one of its more specialized fields. The earth offers many different natural, or physical, features. Low-lying jungles mark some places on the earth. Ice-covered mountain peaks dominate other places. Each location derives its physical character from combinations of the shapes of the land, climate, soils, plants, animals, and other naturally occurring phenomena. These combinations of physical features and their variations from place to place are the subject of physical geography, the study of the physical features and changes of the earth's surface.

**Cultural geography.** In contrast to physical geography, cultural geography focuses on the impact of human ideas and actions on the earth. The sum of what a human group acquires through living together, such as language, knowledge, skills, art, literature, laws, customs, and life styles, is known as that group's culture. Cultural features are evident in a group's tools, foods, government, religions, and other characteristics.

Each group of people leaves a distinct imprint (has a strong effect) on its human habitat, or the place where that group lives. This imprint, or effect, is known as the cultural landscape. Examples of cultural landscapes include the fields people clear and farm, the crops and livestock they raise, and the style and distribution of the villages and cities they build.

The skyscrapers of New York City's cultural landscape, for example, show how humans there have changed the environment. People constructed multistorey buildings to make better use of a very limited amount of space. Even remote villages in the Himalayas or in the Amazon Basin show how a society, or group of people who share traditions, institutions, activities, and interests, changes its habitat.

Along with the cultural landscape, geographers also study the process of cultural diffusion, or the spread of parts of a culture from one area to another. The spread of Christianity from Palestine to other parts of the Middle East and to Europe between the years A.D. 100 and 600 is one example of cultural diffusion. The spread of the alphabet is another example. The alphabet originated in the Middle East about 2000 B.C. and gradually spread to most parts of the world. Today many different cultures use various forms of the alphabet to write their languages. The process of cultural diffusion continues. The spread of rock music from

Great Britain and the United States to other parts of the world illustrates modern cultural diffusion.

1. How did the study of geography develop?
2. What do modern geographers study?
3. What are the two main branches (subdivisions) of geography?
4. Give examples of cultural diffusion today.

## 1.2. THE ROUND EARTH ON FLAT PAPER

Geographers use a variety of tools to carry out their work. The tools that most people identify with geography are those that are still most important to geographers today — globes and maps. Modern geographers, however, also use tools such as aerial photographs, satellite images, and computer programs to help them analyze the interactions between people and their environments. The best tool to use often depends on the geographic theme that is the focus of the research. Globes and maps are useful models of the earth. However, globes and maps do not provide perfect representations of the earth. Each has specific advantages as well as disadvantages.

**Globes.** The most important advantages of globes relate to their shape. A globe is the only model of the earth in the shape of a sphere, just like the earth. A globe, then, provides the most accurate representation of the shape of the earth. Because it is true to scale, the landmasses and bodies of water the globe illustrates have the same shapes as they do on the earth's surface. When you look at Greenland on a globe, for example, its true shape is what you see. You can also compare its size to any other land body. In addition, a globe accurately represents the earth's grid of parallels and meridians, as well as direction and distance from one place to another.

Among the disadvantages of globes is that they often are not practical to use. Globes are expensive and most are too big and bulky to carry around. In addition, people can view only one-half of a globe at a time. This makes it impossible, for example, to look at Canada and India at the same time because they lie on opposite sides of the globe, just as they lie on opposite sides of the earth. Another disadvantage of globes concerns the problem of detail. Because globes represent the entire earth, the individual areas that they illustrate are relatively small. As a result, globes cannot show the detailed features of an area, such as roads, streams, forests, and parks.

The oldest preserved globe is kept and displayed to the public in a museum in Germany. This wooden globe was made in 1492. It is 15 cm in diameter. The globemaker drew on it the land and water bodies that he thought existed. What is interesting about this globe is that it shows the world as Columbus thought of it.



**Maps.** Maps are flat representations of the earth. Maps vary in size from small maps that appear in pocket size to huge wall maps. Maps also vary in purpose.

One of the most obvious advantages of maps over globes is that they are more convenient to use. Maps can be rolled and folded and are easy to carry around. Maps and related material can also be collected in an atlas to provide an easy-to-use reference. Another advantage of maps is that they can show the earth's entire surface at one time, or can show specific details. Maps can also present information about a wide range of topics related to both physical and cultural features of the earth. Using different colors and symbols, maps can illustrate many kinds of topics, including rainfall, mineral resources, and religions. Presenting such a variety of information about an area often helps geographers to see regions and relationships otherwise difficult to visualize.

On the other hand it is impossible to accurately show a three-dimensional object like the earth on a flat, two-dimensional map. For this reason all maps have one or more inaccuracies, called distortions. The problem of distortion remains the major disadvantage of maps.

1. What tools do geographers use?
2. What are the major advantages and disadvantages of a) globes and b) maps?
3. Why is cartography related to all the fields of geography?
4. Why do maps have distortions?

### 1.3. CONVENTIONAL AND MODERN TOOLS OF GEOGRAPHY

#### Mapping

Despite their variety, all maps have similar components, or parts. These include a title; a legend or key; a direction indicator; and a scale.

**The title of a map.** It identifies what the map is about and what parts of the earth it shows. The title of some maps includes a date. Dates are useful on maps showing features that change over time. A map with the title "Distribution of Population in France: 1920", for example, should not be used when looking for figures on the present population of France.

**A legend.** A legend or key explains the meaning of colors and symbols used on a map. A map with areas shown in green, red, and blue might be misunderstood unless the user knows what the green, red, and blue represent. The legend also explains the meaning of symbols used on a map, such as stars for capital cities.

**A direction indicator.** Every map should have a direction indicator. One such indicator is an arrow that points north. A different way to find directions on a map is to study the parallels and meridians. East and west directions follow parallels, or lines of latitude. North and south directions

follow meridians, or lines of longitude. Parallels and meridians cross each other to form an imaginary grid over the earth. Because each degree can be broken into 60 minutes (') and each minute can be broken into 60 seconds ("), this grid can be used to fix the precise location of any point on the earth's surface.

The most important longitude is called the Greenwich Meridian, because it passes through a place called Greenwich in London where there is a famous observatory. The longitude of the Greenwich Meridian is 0 degrees. At Greenwich local time is called Greenwich Mean Time (GMT). All places on the same meridian have the same local time. When it is noon at a given meridian, it is after noon or *post meridiem* (p.m.) at places which lie to the east of it. This is because the earth rotates from west to east. At the same time the sun will be before noon or *ante meridiem* (a.m.) at places lying to the west.

**Map scales and projections.** A map scale provides statistical information used to measure distances on a map. While maps have similar components, they do not always show areas of the world in exactly the same way. The size and shape of North America, for example, may look somewhat different on two different maps. The differences occur because the two maps use different map projections, or methods by which the features of the earth's curved surface are transferred onto a flat map.

No matter which projection is used, every map has some distortions that are inevitable in the process of illustrating the earth's spherical surface on a flat map. Certain distortions, however, are worse on some projections than on others. Mapmakers choose which projection to use depending on what undistorted features, or map properties, are most important to be illustrated. The four most useful map properties are correct shape, correct size, correct distance, and correct direction. No world map can have all four map properties. Maps of smaller areas, however, may have less distortion than maps of larger areas.

#### Remote sensing

Rapid developments in technology have made several new tools available. These tools already have provided a wide range of valuable information about the earth's surface. Remote sensing, the gathering and recording of information through aerial photographs and satellite images, ranks among the most important of the new methods.

**Aerial photographs.** Geographers use aerial photographs — pictures taken from above the earth — to study relationships involving people and places that are not easily seen from ground level. Aerial photographs of traffic patterns, for example, can be used to help plan new highways. Military planners can see troop movements and rocket launch sites. Foresters can spot diseased or insect-infested trees in rugged terrain that would be hard to reach on foot. Aerial photographs even show features of the ocean floor.



Because aerial photographs provide such accurate and detailed information, cartographers rely on them as a source of information when making maps. Most aerial photographs used to make maps are taken by cameras in high-altitude airplanes and are developed in strips of overlapping pictures. An instrument called a stereoscope converts a pair of overlapping aerial photographs into a three-dimensional view of the area.

Elevations appear somewhat distorted on aerial photographs because the camera taking the pictures is closer to the tops of the mountains than to the valleys. As a result, mountains appear larger than the more distant valleys. This distortion is corrected by using a viewing instrument called a stereoplotter, which gives a more accurate three-dimensional view of the earth.

**Satellite images.** Many of the satellites circling (revolving around) the earth have special sensors called multispectral scanners. These scanners record observations electronically and send them to ground stations. Computers then translate the data into electronic images, making false-color pictures. Even though the pictures are taken from far in space, they are so detailed that they can show houses or even sailboats on a lake.

An extraordinary group of earth satellites known as Landsats take many of the satellite images. These satellites circle the earth 14 times every 24 hours, silently scanning, collecting, and sending back a greater view of the world than any eye could ever see.

In addition to globes, maps, and remotely sensed images, geographers use tables, charts, graphs, and diagrams to help them in their work. Geographers also use computers to solve geographic problems as well as to make maps and graphics.

1. What components do maps have?
2. What is the unit for measuring latitude and longitude?
3. Why is the global grid significant?
4. What are the four most useful map properties?
5. Why are aerial photographs and satellite images especially useful to geographers?
6. Why do elevations appear somewhat distorted on aerial photographs?
7. How do computers help geographers?

## 2. Lexical and grammatical exercises

### 2. 1. Rearrange the letters in the anagrams to form equivalents for the Russian words.

|                                     |                                      |
|-------------------------------------|--------------------------------------|
| изменять(ся) — <b>arvy</b>          | широкий диапазон — <b>dwie nerag</b> |
| предоставлять — <b>pdroevi</b>      | сознающий — <b>arwae</b>             |
| сравнивать — <b>crepoma</b>         | развитие — <b>ntvopeldeme</b>        |
| делить, разделять — <b>srahe</b>    | поверхность — <b>sfuraec</b>         |
| распространять(ся) — <b>sadepr</b>  | с.-х. культура — <b>orpc</b>         |
| сгибать, складывать — <b>dflo</b>   | навык, умение — <b>sikl</b>          |
| накрывать, покрывать — <b>cvero</b> | привычка, обычай — <b>omcust</b>     |

включать в себя — **inuclde**  
 замечать — **nicote**  
 измерять — **msueare**  
 искажать — **doristt**

среда обитания — **btahait**  
 характерная черта — **fatecur**  
 исследование — **rrchease**  
 преимущество — **aantadvge**

### 2.2. Match the words close in meaning in A and B.

- 1) A. to come from; to occur; to carry out; to include; to attempt; to circle; to focus (on); to preserve; to provide; to acquire; to distinguish  
 B. to differentiate (between); to derive; to revolve; to try; to involve; to keep; to concentrate (on); to give; to get; to perform; to happen
- 2) A. distortion; environment; impact; branch; significance; location; elevation; spread  
 B. diffusion; surroundings; influence; field; importance; altitude; inaccuracy; place
- 3) A. crude; obvious; remote; aware; gradually  
 B. conscious; slowly; isolated; raw; distinct

### 2.3. Match the words in A with the words in B to form word combinations. Make up sentences with them.

- A. physical; cultural; detailed; natural; obvious; specific; important; major; accurate; distorted; perfect; flat; valuable; detailed; new; various; mental; satellite; electronic; remotely sensed
- B. representation; advantages; image; features; information

### 2.4. Match each of the following terms with the correct definition.

a) *remote sensing*; b) *stereoscope*; c) *multispectral scanner*; d) *aerial photograph*; e) *distortion*; f) *map projection*; g) *Landsat*; h) *legend*

- \_\_\_\_\_ 1. Gathering and recording information from a distance through aerial photographs and satellite images.
- \_\_\_\_\_ 2. Picture taken from above the earth.
- \_\_\_\_\_ 3. Instrument that takes a pair of overlapping aerial photographs.
- \_\_\_\_\_ 4. Instrument that records observations from space electronically and sends them to ground stations where computers translate the data into electronic images.
- \_\_\_\_\_ 5. Satellite that views the earth.
- \_\_\_\_\_ 6. One of the many different ways to show the spherical earth's surface on a flat map.
- \_\_\_\_\_ 7. It explains the meaning of symbols and colors used on a map.
- \_\_\_\_\_ 8. Inaccuracy contained on maps, which is a major disadvantage.

### 2.5. Match the words in A with the words in B to form word combinations.

- 1) A. to raise; to acquire; to share; to scratch  
 B. crude maps; crops; skills; traditions



- 2) A. distinct; ice-covered; cultural; naturally occurring; inevitable; rugged; remote; low-lying; human; physical; obvious; folded  
 B. distortions; phenomena; terrain; imprint; map; landscape; habitat; advantages; village; mountains; jungles; features
- 3) A. to spread; to represent; to vary; to mean; to record; to occur  
 B. electronically; greatly; literally; accurately; naturally; gradually

### 2.6. Fill in the missing forms of the words.

| Noun        | Verb     | Noun           | Adjective |
|-------------|----------|----------------|-----------|
| description |          | difference     |           |
|             | compare  |                | evident   |
|             | interact | distinction    |           |
| attempt     |          |                | various   |
|             | relate   | inaccuracy     |           |
| reference   |          |                | spatial   |
|             | distort  | characteristic |           |
|             | explore  |                | important |
| analysis    |          |                | practical |
|             | develop  | science        |           |
|             | discover | significance   |           |

### 3. Translation into Russian

- Geographers study the earth to determine what is where, why it is there, and what significance it has.
- Different approaches to the study of geography have led to the development of other fields of study.
- Physical geography is the study of the natural environment and the interrelationships of all the living things in that environment. It examines the shapes of the land and bodies of water, or topography, of a given location, along with its climate, soil, plants, and animals.
- Political geography focuses on the political organization of areas. It deals with the administration of areas, territorial acquisitions, political boundaries, and patterns of government. Political geography is closely tied to social geography, the study of the interrelationships of groups and communities. This field includes the study of human movements within and between communities.
- Economic geography focuses on resources and resource use, agriculture and land use, and global trade interactions. It also examines such diverse

geographic ideas as factory locations, transportation networking, and market distribution. Economic geography forms one of the broadest subdivisions of cultural geography and relies heavily on information from other fields.

- Historical geography examines the ways in which the relationship between people and their environments has changed over time. This field attempts to bring time and space together. Because understanding the present requires knowledge of the past, geographers place a great deal of emphasis on the study of historical geography.
- Urban geography focuses on the locations of cities, the services cities provide, and the movements of goods and people to and from cities. The rapid growth of cities in the modern world has made this field an increasingly important for study.
- Cartography is the art and science of mapmaking. Recent developments in mathematics, computers, and electronics have expanded cartography to include the study and analysis of aerial photographs and remotely sensed images.
- Remotely sensed images, including aerial photographs and satellite images, have greatly improved the making of maps. Their "bird's eye view" permits mapmakers to depict terrain changes far more accurately than it could be done from surveys made at ground level.
- Geographers use a wide variety of graphics to present the information they have gathered.

### 4. Complementary text

#### GEOGRAPHY AND PEOPLE: PTOLEMY

Ancient geography came to an end with the work of Ptolemy, the best-known and most widely acclaimed astronomer and geographer of the ancient world. Little is known about Ptolemy's life other than that he worked in the Roman Empire's great library in Alexandria, Egypt, between A.D. 127 and 150. It was in Alexandria, the cultural center of the ancient world, that he wrote his most important work on astronomy. It was so admired, however, that it became known as the *Almagest*, a combination of Greek and Arabic terms meaning "the greatest".

"A Guide to Geography". After completing his work on astronomy, Ptolemy began preparing "A Guide to Geography", an eight-volume work on all aspects of geography. Ptolemy began the work with a detailed discussion of different methods of mapmaking and a lengthy list of all the known places in the world, together with their latitudes and longitudes. The book also contained 26 colored maps and a carefully planned new map of the world. Ptolemy adopted the grid of latitude and longitude lines developed by the Greek geographer Hipparchus nearly



300 years earlier. This grid was based on the division of a circle into 360 parts. Using this system, every place on the earth could be given a precise location.

**The problem of accuracy.** Despite its appearance of accuracy, however, Ptolemy's geography was full of errors. In his time, for example, latitude could only be approximated and there was no exact way of determining longitude at all. Therefore each listing of latitude and longitude was, at best, only a rough estimate.

Besides, Ptolemy greatly exaggerated the size of the land area from Spain to China, vastly underestimated the size of the Atlantic Ocean, and estimated the circumference of the earth to be about half its actual size. Based on Ptolemy's inaccurate calculations, Christopher Columbus believed that Asia was close to Europe on the west. It was actually Ptolemy's error that encouraged Columbus to set forth on his westward voyage across the Atlantic Ocean.

**A lasting impact.** In spite of mistakes made more from the lack of accurate instruments than from ignorance, Ptolemy was extremely well-respected. "A Guide to Geography" was such a monumental work that its significance to the development of the field of geography cannot be overestimated. His work remained the major geographic study for nearly 1,000 years.

## 5. Writing

Write the translation of the following text or render its content in English.

### ГЛОБАЛЬНАЯ НАВИГАЦИОННАЯ СИСТЕМА GPS

За последние 10—15 лет в нашу жизнь буквально ворвалось несколько технических новшеств, сразу получивших глобальное распространение и самое широкое применение, причем не только для сложных научных и технологических целей, но и активно востребованных на бытовом уровне: персональные компьютеры, Интернет, сотовые телефоны... В этот ряд вполне по праву можно включить Глобальные Навигационные Спутниковые Системы: американскую GPS и российскую ГЛОНАСС.

Глобальность этих систем обеспечивается функционированием на орбитах набора видимых из любой точки Земли спутников, непрерывно передающих высокоточные измерительные сигналы. Тем самым вокруг нашей планеты создано как бы информационное координатно-временное поле, находясь в котором пользователь с помощью специального приемника может черпать из него данные о своем положении в пространстве и времени.

Космический сегмент, иначе называемый «орбитальная группировка», образуют действующие на орбитах спутники. Они распределены пространственно с таким расчетом, чтобы в любой точке Земли выше 15° над горизонтом находилось бы всегда от 4 до 8 спутников. Для этого запущено 24 основных и несколько резервных спутников (в 2001 г. их общее количество было 28), распределенных по 6 круговым орбитам на высоте около 20 200 км над поверхностью Земли. Плоскости орбит наклонены к плоскости экватора под углом 55° и равномерно развернуты друг относительно друга так, что их узлы (точки пересечения орбит с экватором) отстоят по долготе на 60°. Период обращения спутников составляет 11 час. 58 мин., т.е. ровно половину звездных суток, и, значит, видимая с земли конфигурация созвездия спутников повторяется каждый день на 4 минуты раньше, чем в предыдущий.

Первый космический аппарат GPS типа Block-I был запущен на орбиту 22 февраля 1978 г. С тех пор было последовательно разработано несколько новых модификаций космических аппаратов: Block-II, Block-IIA, Block-IIR, имеющих все более сложное и надежное оборудование и рассчитанных на срок службы 7—10 лет. Сейчас в основном на орбитах действуют космические аппараты последних двух типов.

## 6. Speaking

6.1. Retell the following text in English.

### THE PUZZLE OF GEOGRAPHIC NAMES

One of the most puzzling problems in cartography is the selection of the correct spelling of place names. This problem involves language, changes in government, and changes in national policy.

**Language.** In general, cartographers print names in their own language, even though the inhabitants of the region call the place by a different name. For example, on an American-made map of Europe you will probably see a label for the Danube River. The same river would be labeled *Donau* on a German map, *Duna* on a Hungarian map, and *Duna-rea* on a Romanian map. On the same American-made map you would see labels for Finland and Hungary, even though the people of these nations call their countries *Suomi* and *Magyarország*.

Another language problem involves repetition. For example, *rio* means "river", *sierra* means "mountain", and *sahara* means "great desert". Therefore labels such as Rio Grande River, Sierra Nevada Mountains, and



Sahara Desert are repetitious. They actually mean "River Grande River", "Mountain Nevada Mountains", and "Desert Desert".

Maps of China create special problems for American cartographers. Until recently maps used a system of transcribing the Chinese alphabet into English. In 1979, however, the Chinese government adopted a new system of transcription that more accurately reflects the sounds of the Chinese words for places.

**Changing names.** Cartographers also must deal with name changes. In recent years many nations have taken on new names. After World War II, for example, Germany was divided into the Federal Republic of Germany (West Germany) and the German Democratic Republic (East Germany). As European colonies throughout the world gained their independence, many changed their names. In Africa the former Belgian Congo became Zaire, the former British colony of Southern Rhodesia became Zimbabwe, and the former French colony of Dahomey became Benin. In the Pacific the New Hebrides became the Republic of Vanuatu and the islands of Yap, Kusaie, Truk, and Ponape became the Federated States of Micronesia.

Even internal political changes in a nation can bring about important place-name changes. In the Soviet Union, for example, the nation's second largest city, Leningrad, had three names since 1915. Before 1914 the city was called St Petersburg. It was named for Saint Peter, the keeper of the heaven keys. After Russia went to war with Germany in 1914 the name was changed to Petrograd. This name change took place in order to drop the German ending (burg) in the original name. In 1924, the Communist government changed the city's name again to honor the founder of the Soviet Communist party, Vladimir Lenin.

**Choosing the correct names.** Governments around the world have established agencies to help cartographers choose the correct place names and spellings on maps. In the United States this agency is the United States Board on Geographic Names. In Britain it is the British Permanent Committee on Geographical Names. Argentina, Brazil, Canada, and most European countries have similar agencies. Does Russia have a similar agency?

6.2. Find other examples concerning the history of geographic names and give a talk on the subject. Continue the story about the names of Leningrad—St Petersburg and Germany.

## 7. Summarizing the Unit

Make an outline of the Unit and render its content in a 4—6 min talk.

## UNIT 2

### LAND

#### 1. Reading and learning

Scan each text and formulate the main ideas. Read the text again carefully and memorize it, then retell the text close to the original.

##### 1.1. THE EARTH AND ITS STRUCTURE

The features of the earth's surface range from vast plains to towering mountain peaks, from tablelike plateaus to deep ocean floors. For centuries scientists have devised theories to help explain the diversity of the earth's surface features and the forces that change those features.

**The Earth's origin.** Scientists have only theories, or scientific guesses, about how the earth appeared. According to one theory, a hot, spinning cloud of dust and gas formed in space. Parts of this dust and gas cloud separated, forming the sun, the earth, and other planets. The part of the dust and gas cloud that became the earth slowly cooled. As it cooled, it gradually became a solid mass. There are scientists who believe the earth became a solid mass about 5.5 billion years ago.

**The Earth's interior.** Scientists have studied the surface of the earth for centuries. Yet each year brings new information about the earth's surface that is added to the data already known. Direct observation of the earth's deep interior, however, remains impossible. Currently scientists can gather information about the center of the earth only through indirect evidence.

Vibrations of the earth caused by earthquakes, or seismic waves, tell what the earth's inner structure is like. These waves change speeds as they move through different kinds of rocks: faster through solid material, slower through molten material. By studying the wave patterns, scientists can learn a great deal about the earth's interior. From such studies they have concluded that the three major layers of the earth's interior are the core, the mantle, and the crust.

**Drifting continents.** The earth today is very different from the earth of millions of years ago. The texture of the land, the locations of the landmasses, and the climate have undergone tremendous changes — changes that scientists even now can only begin to understand.

Most scientists are convinced that the earth's continents are slowly moving, or drifting. One of the first proponents of this idea was Francis Bacon, a seventeenth-century British scientist. After studying the latest maps of the earth and trying to piece together the shapes of the



continents, Bacon concluded that the continents once were joined, forming one huge landmass.

In 1912 a German geographer named Alfred Wegener proposed the theory of continental drift. Wegener believed that there was once a single supercontinent that he called Pangaea, from the Greek words *pan*, meaning "all", and *ge*, meaning "the earth". According to Wegener, Pangaea split apart millions of years ago to form two huge continents — Laurasia in the Northern Hemisphere and Gondwanaland in the Southern Hemisphere which later broke up to form continents. Wegener believed that the landmasses drifted for millions of years to their present locations. He also claimed that the continents are still drifting.

Wegener's theory caused a storm of controversy. Despite fossil and geological evidence, most scientists could not accept the idea. They argued that it was scientifically impossible for the continents to move across the solid seafloor. At the time Wegener and his supporters could not conclusively prove their arguments. New studies of the seafloor, however, have given more scientific evidence to support the theory of continental drift.

1. How can scientists obtain information about the deep interior of the earth?
2. Why have scientists concluded that the interior of the earth consists of different layers of solid and molten materials?
3. What are the three major layers of the earth?
4. What does the theory of continental drift state?
5. How did the work of Alfred Wegener support Francis Bacon's theory?
6. Why did Wegener's theory cause controversy?

## 1.2. INNER FORCES CHANGE THE EARTH'S SURFACE

**Plate tectonics.** In the 1950s scientists began studying the ocean floor in more detail than ever before. Their observations showed that the seafloors were slowly spreading apart along well-defined oceanic ridges. The discovery of seafloor spreading provided the evidence for the theory of plate tectonics. The theory of plate tectonics states that great faults, or cracks in the crust of the earth, divide it into huge sections called plates — 7 larger ones and several smaller ones. According to this theory, these plates, on which the continents and ocean lie, are continuously moving, as they "float" on the heavier rock of the earth's mantle. The plates move very slowly, perhaps no more than 1 to 6 cm a year.

Some plates move away from each other, while others move closer together. Plates moving closer together sometimes collide. Other plates brush against each other as they move side by side. This movement, for example, takes place along the San Andreas Fault, which separates the two plates in California.

In general, changes on the earth's surface always take place along the edges of the plates. Some of these changes occur in a matter of a few seconds. Others, however, occur over millions of years.

**Earthquakes.** Any shift in the earth's crust, no matter how small, causes the earth to tremble. About 800,000 earthquakes are recorded each year. But only 50,000 of them are strong enough to be felt by people living in the areas where they occur. Earthquakes usually take place along faults or at the edges of the earth's plates. About three quarters of the world earthquakes occur in a zone which borders the Pacific Ocean from New Zealand to the southern tip of South America. Because of its volcanic activity, this belt is known as the "Ring of Fire".

In 1935 an American seismologist named Richter created a scale for measuring the intensity of earthquakes. The Richter scale uses numbers ranging from 0 to 9 to describe an earthquake's intensity. An earthquake with a force of 8 or more on the Richter scale causes enormous damage. In some cases buildings collapse, dams burst, gas lines break, and roads are destroyed.

Seismologists estimate that the earthquake that shook San Francisco, California, in 1906 measured 8.3 on the Richter scale. That earthquake and the fires that resulted destroyed most of San Francisco. Even smaller earthquakes that take place in heavily populated areas can cause much damage and great loss of lives.

In 1988 a very severe earthquake was responsible for the death of many thousands of people in Armenia in the USSR.

**Volcanic eruptions.** Like earthquakes, volcanic eruptions usually occur near the boundaries of the earth's plates, either on land or under the sea. During a volcanic eruption, molten rock, or lava, flows out of the crater resulting in the formation of a volcanic cone. These mountains are called volcanoes.

An active volcano is one that always shows signs of volcanic action. Volcanic gas, steam and hot gases may release into the air. This type of activity might signal a forthcoming eruption. At the time of a full-scale eruption ash, lava and volcanic "bombs" might also be thrown out from the crater.

Paricutin, a volcano in western Mexico, erupted suddenly in 1943 and stopped erupting just as suddenly in 1952. The first sign was a crack in the ground of a cornfield, followed by rising hot gas and steam. Thirty minutes later, explosions began. Clouds of gas and ashes shot as high as 6 km into the air. For the rest of its active life, the explosions continued. The ashes that fell to the ground formed a cone-shaped mountain that now rises 410 m above the level of the cornfield. Because Paricutin has shown no further signs of volcanic actions since 1952, it is said to be dormant, or sleeping. At some future time, it may once again wake up to send more ashes to fall on the earth.

Mount St Helens, located in southwestern Washington, had been dormant for over 100 years when it erupted on May 18, 1980. The



eruption blew off 390 m of the mountain's top, sent smoke and ash as high as 18 km, and took 61 lives. It was the first volcanic eruption to take place in the United States since 1917.

Volcanic eruptions have killed nearly 200,000 people in the last 600 years. Despite their destructiveness, volcanic eruptions provide useful materials. Volcanic rock is widely used for road building. Volcanic ash fertilizes land, and some chemicals can be made from volcanic sulfur.

1. What is seafloor spreading?
2. What does the theory of plate tectonics state?
3. According to the theory of plate tectonics, on what do the plates move?
4. How does this theory relate to scientific knowledge about earthquakes and volcanic eruptions?
5. Why is the Pacific rim called the «Ring of Fire»?
6. How do seismologists measure the intensity of earthquakes?

### 1.3. THE EARTH'S SURFACE HAS A VARIETY OF LANDFORMS

**Mountain building.** As you have read, earthquakes and volcanic eruptions can change the earth's surface in a matter of seconds. However, the process of mountain building can take millions of years. Depending on how the mountains are formed, geographers classify them as fault block or folded mountains. Under pressure, the earth's crust may fold and the mountain ranges are formed. The Andes of South America, the Alps of Europe and the Himalayas of Asia are examples of folded mountains.

Sometimes sections of the earth's crust break up into blocks and mountains develop. One block, with its layers of rock, moves up or sinks down. In the eastern part of Africa faulting has been responsible for the formation of great depressions called rift valleys. Faulting helped give the Sierra Nevada Range in California its block shape.

**Surface forces create distinctive landforms.** As plate movements reshape the earth's continents and ocean floor, certain external processes are at work, changing surface features. These processes are weathering and erosion. They work much more slowly than earthquakes and volcanoes. In fact, like the process of mountain building, they often go unnoticed for generations. Over time, however, they can produce results as dramatic as the Grand Canyon, carved out by erosion — and it is more than 1.5 km deep.

Physical weathering breaks rocks down into smaller and smaller pieces. Chemical weathering alters the composition of rocks. When the minerals that make up limestone, for instance, dissolve in water it is called chemical weathering. Both types of weathering often occur simultaneously. Even

granite, one of the hardest rocks, slowly decomposes. The chemicals present in acid rain speed the process of weathering even more.

Erosion moves weathered products from one place and deposits them in another. The major agents of erosion include running water, waves, moving ice, and wind. Running water, found almost everywhere, probably, does more to change the earth's surface than any other agent of erosion.

Waves cause erosion and other changes along the shores of the ocean and large lakes. Along rocky coasts waves cut into the land causing parts of cliffs to drop into the water. In other spots waves wash up eroded materials to form sand beaches.

Large masses of moving ice, known as glaciers, erode the land in the colder regions of the world. As the glaciers move through mountain passes, they create distinctive U-shaped mountain valleys by eroding soil and rocks from the valley floor and walls.

Wind is a powerful agent of erosion, especially in regions that receive little rainfall. Winds carry sand, volcanic ash, and even gravel. High winds carrying such windblown materials cut even the hardest rocks into many different and often fantastic shapes.

Because of all these forces and processes, the surface of Earth has a tremendous variety of landforms or shapes of the earth's surface. Plain, plateau, hill, mountain, canyon, valley, island, ridge, and fjord are a few of the names given to these landforms. Landforms help to characterize the natural landscape of each place which is the combination of a place's physical features. Other aspects of the physical environment include climate, vegetation, and soils. Landforms have an important impact on human activity. Most landforms have both advantages and disadvantages for human use and settlement.

1. How do mountains form?
2. How does physical weathering differ from chemical weathering?
3. What are the most important agents of a) physical weathering; b) chemical weathering; and c) erosion?
4. How can erosion change the appearance of a landscape over time?
5. Why does acid rain speed the chemical weathering process?
6. Which changes — those caused by weathering or those caused by erosion — have had the greatest impact on human activity?
7. How do landforms affect human activity?

## 2. Lexical and grammatical exercises

### 2.1. Supply the geographic term that correctly completes each sentence.

1. The shapes on the earth's surface are called \_\_\_\_\_.
2. The \_\_\_\_\_ forms the solid outermost layer of the earth.
3. An idea for explaining something that is not proven is called a \_\_\_\_\_.



4. A \_\_\_\_\_ is characterized by a generally flat area that rises far above the surrounding land on at least one side.
5. \_\_\_\_\_ are formed as molten rock from within the earth pushes up layers of soft rock.
6. The \_\_\_\_\_ uses numbers to measure the intensity of an earthquake.
7. The slow process of breaking down rocks into smaller and smaller pieces is called \_\_\_\_\_.
8. \_\_\_\_\_ are solids deposited by water.

## 2.2. Fill in the missing forms of the words.

| Noun       | Verb   | Noun        | Verb      |
|------------|--------|-------------|-----------|
|            | appear | eruption    |           |
| argument   |        | collision   |           |
| border     |        |             | explode   |
|            | cause  |             | observe   |
|            | change | loss        |           |
| conclusion |        | destruction |           |
| erosion    |        |             | fertilize |

## 2.3. Underline one word in each line that is different. Explain your choice.

|           |            |         |            |
|-----------|------------|---------|------------|
| diversity | distortion | range   | variety    |
| boundary  | edge       | habitat | border     |
| convinced | sure       | certain | compared   |
| devise    | invent     | derive  | design     |
| observe   | gather     | scan    | notice     |
| separate  | divide     | collide | break      |
| collide   | brush      | float   | occur      |
| collapse  | burst      | release | explode    |
| dissolve  | fold       | erode   | decompose  |
| estimate  | measure    | alter   | calculate  |
| undergo   | cause      | suffer  | experience |
| develop   | alter      | change  | vary       |
| state     | claim      | remain  | argue      |
| join      | separate   | connect | unite      |
| destroy   | invent     | devise  | create     |

## 2.4. Match the words in A with the words in B to form word combinations.

- A. to devise; deep; to occur; severe; geological; volcanic ash; chemical; to undergo; seismic; the Richter

- B. waves; in a matter of a few seconds; interior; earthquakes; scale; tremendous changes; weathering; fertilizes land; a theory; evidence

## 2.5. Rearrange the letters in the anagrams to form equivalents for the Russian words.

|                           |                                    |
|---------------------------|------------------------------------|
| собирать(ся) — gheatr     | претерпевать (изменения) — udergno |
| удобрять — flitizere      | происходить — orcuc                |
| растворять(ся) — dvesisol | поддерживать — sporupt             |
| выпускать — reelsea       | дрейфовать — dftri                 |
| оставаться — rinmea       | раскалывать(ся) — siltp            |
| убеждать — cvincone       | утверждать — cimla                 |
| изменять(ся) — arlet      | суровый — seeevr                   |
| сделать вывод — ccondelu  | доказательство — cedevine          |

## 2.6. Match the verbs in A with the adverbs in B.

- A. to move; to mean; to represent; to occur; to be used; to prove; to be populated; to erupt
- B. continuously; literally; accurately; simultaneously; scientifically; heavily; suddenly; widely

## 2.7. Form sentences by combining the lines from the columns below. Use the correct form of the verb *cause*.

|                                |       |                         |
|--------------------------------|-------|-------------------------|
| Any shift in the earth's crust |       | enormous damage.        |
| Earthquakes                    | cause | a storm of controversy. |
| Theory                         |       | the earth to tremble.   |

## 2.8. Match the words from the list below with the correct line below.

ridge; lava; earthquakes; valley; plain; ash; cone; core; to prove; liquid; mantle; to propose; hill; crust; solid; molten; to accept; plateaus; gaseous; indirect; fossil; geological; volcanic; forthcoming; to devise; full-scale; volcanic eruption; to support

1. Features of the earth's surface: \_\_\_\_\_.
2. Natural phenomena: \_\_\_\_\_.
3. States of matter: \_\_\_\_\_.
4. Adjectives used with 'eruption': \_\_\_\_\_.
5. Major layers of the earth's interior: \_\_\_\_\_.
6. Products of volcanic eruption: \_\_\_\_\_.
7. Adjectives used with 'evidence': \_\_\_\_\_.
8. What can be done with a theory: \_\_\_\_\_.



### 3. Translation into Russian

1. The earth's surface displays an amazing variety of landforms.
2. The variety of landforms that cover the face of the earth have advantages and disadvantages for human settlement.
3. Geographers use slope, local relief, and other characteristics to classify landforms as plains, plateaus, hills, or mountains.
4. Fossils and geological evidence help scientists understand the changes the earth has undergone over the years. Scientists are also seeking answers about the earth's interior — the exact structure of the core, the mantle, and the crust.
5. Many theories have been presented about how the earth has changed over time. Francis Bacon was among the first to suggest that the continents were once joined as one huge landmass.
6. The evidence to support the theory of plate tectonics was provided by the discovery of seafloor spreading. The theory of plate tectonics states that the earth's outer shell is not one solid piece but is broken into plates that are constantly moving.
7. Earthquakes and volcanoes, which cause violent changes on the earth's surface, occur most often near major faults on the edges of the earth's plates.
8. Weathering and erosion can produce dramatic changes in the surface of the earth over time. They create distinctive landforms.
9. Movements of the earth's plates have changed its surface features.

### 4. Complementary text

Find geographic terms from the text below and give definitions to them.

#### THE CONTINENTAL SHELVES

The edges of continents slope under the surface waters of oceans and seas. These sloping edges are called continental shelves. From the shoreline, a continental shelf extends outward along most continents for an average of about 160 km. The average underwater depth is less than 200 m. The continental shelf hardly exists at all off the coast of Peru and Chile. There, it extends only a short distance before it drops off into a deep trench. Along the coast of Siberia in the Arctic Ocean, the continental shelf is much wider. There, it extends for almost 800 km. Where the shelf ends, the continental slope begins. The slope makes a steep drop of 1,800 to 2,700 m. After this steep drop, the continental edges merge with the crust that forms the ocean floor.

For people living on the earth, the continental shelves are very important. Many of the world's great fishing areas are in the shallower

waters over the continental shelves. A few of these areas are in the North Sea, in the Atlantic Ocean off the coast of Newfoundland, and in the Bering Sea. Special conditions in these places attract fish in great numbers.

The continental shelves also hold oil and natural gas trapped in pockets between layers of rock. Scientists and engineers now have the tools and equipment to discover these pockets and to bring the oil and gas to the surface. They have set up off-shore drilling and pumping platforms in the Gulf of Mexico, in the Pacific off the coasts of California and Mexico, and in the North Sea off the coast of Norway. As new pockets of oil and gas are discovered under the seafloor, other platforms will be set up. Many nations recognize the economic importance of the continental shelves and the waters over them. So they claim them as part of their national territories.

### 5. Writing

Write the translation of the following text or render its content in English.

#### КТО ПЕРВЫМ ИЗМЕРИЛ ЗЕМЛЮ?

Первое приблизительное определение размеров земного шара более 2 тыс. лет назад сделал древнегреческий ученый, хранитель Александрийской библиотеки Эратосфен Киренский. Он заметил, что в городе Сиене (современный Асуан), расположенном к югу от Александрии, 22 июня полуденное Солнце освещает дно самых глубоких колодцев, а в Александрии в этот же день солнце в полдень не доходит до зенита и предметы дают тень. Измерив, насколько полуденное солнце в Александрии отклонено от зенита, он получил величину, равную  $7^{\circ}12'$ , что составило  $1/50$  окружности. Из чего он справедливо заключил, что Сиена отстоит от Александрии на  $1/50$  окружности Земли. Для вычисления длины окружности земного шара оставалось измерить расстояние между Александрией и Сиеной, а затем умножить его на 50. Единственным доступным Эратосфену «прибором» для измерения такой большой дистанции был верблюжий караван. Зная, сколько времени верблюды тратят на переход от Александрии до Сиены, ученый определил, что эти города отстоят друг от друга на расстоянии 5000 египетских стадий (около 800 км). Окружность же всей планеты в 50 раз больше, она равна примерно 40 тыс. км. Теперь Эратосфен мог без труда вычислить радиус Земли — согласно его расчетам, радиус Земли оказался равным 6311 км. Это явилось первым и довольно точным представлением о размерах нашей планеты.



## 6. Speaking

### 6.1. Render the texts in English.

#### PREDICTING EARTHQUAKES

Picture this scene. It is the middle of the night. Thousands of people are sitting in open spaces far from buildings, bridges, and other structures. They have left their homes, even though the temperature is below zero. Fear shows on their faces as they crowd in small groups and try to keep warm. This actually happened in Haicheng, China, in 1975. The people in this town in northeastern Manchuria were told that an earthquake would strike within hours. And it did. Because they left their homes when they were warned, over 10,000 people saved their lives.

Only in the last half of this century progress has been made in predicting earthquakes. Seismologists (people who study earthquakes) now have many of the instruments they need to measure changes in the earth's crust.

**Recording shock waves.** Seismometers record shock waves — strong ones, weak ones, even the ones people do not feel. In using these instruments, seismologists look for changes in the number and speed of shock waves. Such changes often signal that an earthquake is likely to happen soon.

In warning about the Haicheng earthquake, the Chinese also used reports from farmers and other workers they had trained to read nature's signs. The Chinese believe that animals behave differently just before a quake strikes. The Chinese workers reported strange behavior in their barn-yard animals. They also reported that water in their deep wells turned very muddy. The seismologists knew that earth vibrations could muddy water. Adding these reports to what they had learned from their instruments, the Chinese were able to tell the place and the time of the earthquake.

**Problems in predicting earthquakes.** Accuracy is one problem, because earthquake predicting is in an early stage. Many instruments need to be set up in areas where earthquakes are likely to occur. Many sets of data need to be recorded and studied. Much more needs to be discovered about what triggers earthquakes and what signs coming earthquakes give.

Time is another problem. As yet, very accurate predictions for short time periods cannot be made. Seismologists can say that an earthquake is likely to strike a certain place every 50 to 100 years. They can say one is likely to strike within a year. But they often cannot tell the exact time or even the exact place. Accurate earthquake predicting on more than a hit-or-miss basis, is years away.

**Volcano prediction.** Volcanic eruptions are more predictable than the earthquakes. Although predicting volcanic eruptions is generally

difficult, some volcanoes give signs of a forthcoming eruption. In Hawaii, for example, some volcanoes expand and release gases before erupting. Minor earthquakes and a rise in temperatures are also early signs. Measuring these changes can help determine when an eruption is likely to occur.

#### MOUNT ST HELENS

In the spring and summer of 1980 a volcano named Mount St Helens suddenly and violently awoke after 120 years of inactivity. The volcano is located in the Cascade Range about 120 km south of Seattle, Washington. On March 27 a huge new crater opened at the top of Mount St Helens, and steam and smoke poured out for the first time in memory. The emissions continued sporadically for the next 51 days.

May 18 brought an enormous and devastating blast that drew the attention of all Americans on the erupting volcano. An earthquake registering about 5 on the Richter scale shook the north slope of the mountain. Gases within the mountain suddenly escaped with a force great enough to send a column of steam and volcanic ash 21,300 m into the air. No lava erupted, but the blast blew away the entire north slope of the once cone-shaped volcano. Trees in the way of the blast were blown down like match sticks. Torrents of boiling mud and water, traveling at over 320 kilometers an hour, flowed down the mountain into the Toutle River and eventually into the Columbia River. Seventy people died or were declared missing because of the blast. More than 11 million fish died in the heated water of the rivers. Thousands of birds and animals also died.

Prevailing winds picked up volcanic ash from the eruption and carried it eastward across the Cascades. The ash-choked skies reduced visibility to zero in Yakima, Washington, and other nearby cities. Road and rail traffic came to a standstill. Airplane travel within a radius of several hundred miles was canceled. A 5-centimeter layer of ash blanketed the land as far away as Idaho. Smaller particles stayed aloft in the air surrounding the entire earth during the next 17 days.

Mount St Helens looked like a completely different place, when after four more big blasts, it finally became quiet. It had a different shape, a lower elevation, and upper slopes that were totally devastated. Yet life began to return to the mountain immediately. Within a week, spiders busily spun webs. By the end of the summer ferns, other ground covers, and even trees sprouted from the ashes.

Peace and quiet once again prevail in the scenic Cascade Range. But the mountains, located on the North American plate, lie directly above the descending edge of the Juan de Fuca plate. Will it happen again? Geologists fear that another eruption will occur somewhere in the Cascades in the near future.



6.2. Find material about an earthquake or an active volcano, prepare a short speech. Your speech should include information on where the earthquake occurred, what its Richter scale measurement was, how much damage it caused, and what people felt while it was taking place. Speeches on volcanoes should include such points as the location of the volcano, the last time it erupted, the amount of damage this eruption caused, and what people feel being so close to a potentially dangerous area.

6.3. Discuss why people live in areas that have some disadvantages for human use and development. Provide examples to support your answer.

## 7. Summarizing the Unit

Make an outline of the Unit and render its content in a 4—6 min talk.

### UNIT 3

### WATER

#### 1. Reading and learning

Scan each text and formulate the main ideas. Read the text again carefully and memorize it, then retell the text close to the original.

##### 1.1. WONDERS OF WATER

Water is everywhere. It covers over three fourths of the earth's surface, lies underground, and is present in the air that surrounds the earth.

Water supports all forms of life — plants, animals, and humankind. Some very simple forms of life can exist without air. But no form of life can exist without water. Two thirds of the human body is made of water. Potatoes consist of about 80 per cent of water, and tomatoes about 90 per cent.

Water shapes and reshapes the crust of the earth. It does this whether it falls as rain, flows in rivers, collects in deep and shallow places, or freezes into ice. Water plays an important role in determining climate, in weathering rock and forming soil, and in making other natural resources usable. Water does all these things because it has special qualities that few other materials on the earth have. These special qualities make water a wonder on the earth and the earth a fit place on which to live. Water is present on the earth not only as a liquid — its most abundant form — but also as a gas and as a solid.

**Qualities of water.** One of water's most important qualities is its ability to store huge amounts of heat energy from the sun. Because water releases heat even as it freezes, it helps to keep air temperatures from getting too cold too fast.

Water dissolves materials. Many minerals and other materials that come in contact with water dissolve in it. Plants and animals need these materials to grow and to build healthy bodies. So do humans. All living things take in dissolved materials when they soak up or drink water. And the water that humans and animals drink helps them to digest the foods they eat.

**Water-supply problems.** Day after day, the movement of water from earth to the air and back again to earth takes place. The water cycle never stops renewing the earth's water supply. As you know, 2 per cent of earth's total water supply is locked in ice caps and glaciers. This is enough fresh water to supply each person on earth with a million gallons of water each year. Then why do people talk about water shortages?

One problem is distribution. Fresh water is not distributed evenly over the earth. Lands along the equator usually receive more than enough rain. But lands north and south of the equator often receive less than they need. There are some places where a dry season and a rainy season follow each other every year. There are other places that are dry all year. Parts of India receive over 200 cm of rainfall each year. But they receive most of it from May to October. From November to April, these parts receive less than 25 cm of rainfall a year. In one part of South America, hardly a drop of rain has fallen in over 20 years.

Another problem is pollution. Where water is available, it often has been polluted by the disposal of wastes from homes and factories. One city dweller out of five does not have safe water to drink. In rural areas, three persons out of four do not have safe drinking water. Every day about 15,000 persons around the world die of illnesses caused by polluted water. To support life, water needs to be kept free from pollution in any form.

1. What is the role of water on the earth?
2. What do we call the change of water from a liquid to a gas? From a gas to a liquid?
3. What are some of the water's special qualities?
4. What are the problems that affect the world's water supply?

##### 1.2. STOPS IN THE WATER CYCLE: WATER ON LAND

A drop of water travels through the water cycle in a never-ending journey from sea to land and back to the sea. It travels thousands upon thousands of miles as the journey is repeated time and time again. A drop of water may make several stops on land in its journey, staying in



one place for a short time — a few hours, a day, or a month. It may stay for a year, even thousands of years. But eventually every drop of water finds its way back to the sea. Consider the stops a drop of water may take once it rises from the sea as water vapor, condenses in the air, and falls back to earth in some form.

**Lakes.** One possible stop for a drop of water is a lake. Lakes form whenever two things are present. There must be a place lower than the surrounding land. And there must be a source of water to fill it. The scraping of glaciers over the land has dug out most of the places that form lakes. The eroding action of fast running water has dug out others. Still others have been formed when rocks within the earth shifted, leaving gaps in the earth's crust, or surface rocks have shifted, blocking valleys. Lake Nyasa in Africa is an example of a lake formed by the shifting of the earth's crust.

People also form lakes by moving earth, or building dams to block the flow of water. Once formed, these low places fill with water from melting glaciers, snow, and ice. They fill with rainwater flowing down from higher places. They also fill with water from underground springs or from layers of water that lie below the earth's surface.

Most of the world's lakes are freshwater lakes. Freshwater lakes have surface rivers or underground streams and springs flowing into them. They also have surface streams and rivers or underground streams flowing out of them. A few of the world's lakes are saltwater lakes. Saltwater lakes have streams flowing into them. But they have no streams flowing out. Lakes that have no outlet streams cannot renew themselves. As water evaporates, these lakes build up a heavy salt content in their water.

Some inland seas are really saltwater lakes. Because they are surrounded on all sides by land, the Caspian Sea, the Dead Sea, and the Aral Sea are really lakes. They are called seas only because their water is salty. The Dead Sea, the lowest surface lake in the world, is nearly 390 m below sea level.

Lakes, especially large ones, modify the climates of their surrounding lands. They do it in much the same way that oceans modify climate. Large bodies of water heat and cool more slowly than land. In summer, the water is cooler than the land. Breezes blowing off a lake cool the land. In winter, the water is warmer than the land. Breezes blowing off a lake warm the land.

**The use of lakes.** Lakes serve many of the purposes. People use them for swimming. They draw fish from lakes for sport and food. They build summer homes around them. Lakes also serve as transportation routes. For example, along with the St Lawrence River, the Great Lakes form an important inland waterway in the United States.

The freshwater lakes of the world have other uses. Lakes provide water for drinking and home use, for irrigation, and for industrial purposes. People living in the area around Lake Titicaca even harvest the reeds growing in the lake and use them to make boats.

**Wetlands.** Wetlands are shallow places in the land where water collects, or stands, either all year long or for only part of a year. Wetlands are often found along the edges of other water bodies. Where wetlands lie near the edges of oceans and seas, their water is salty.

Both saltwater and freshwater wetlands play an important role in nature. Wetlands "clean" the waters that flow into them by removing pollutants, such as nitrates, from fertilizers. Wetlands hold the overflow from other water bodies. They reduce flooding from heavy storms or from the melting of snow and ice in spring.

Certain plants — mangrove trees and some kinds of reeds and mosses — grow in wetlands and nowhere else. Many insects and some kinds of marine animals begin their life cycles in wetlands before moving to other places. And many wetlands provide nesting places for different kinds of waterfowl, such as ducks, herons, and egrets. Without wetlands, the plants and animals that live in them or depend on them in some way would disappear.

**People and wetlands.** Many people do not realize how important wetlands are. They think of them as places with land that could be put to better use. So they drain them and fill them up with trash and land from other places. Then they build homes, offices, factories, or shopping centers on them. As a result of this large areas of wetlands have disappeared. Still more wetlands disappear every year. Protecting wetlands has become a special concern of many countries.

One of the greatest wetland areas in the world is the Everglades, in Florida. Much of the Everglades has been made into a park and conservation area to protect the area and its wildlife from human abuse.

1. What is the water cycle?
2. In what different ways are lakes formed?
3. Why are some lakes saltwater lakes?
4. How do lakes modify climates?
5. What is the world's largest natural lake? Where is it found?
6. What are wetlands? Why are wetlands important?
7. How might heavy pollution in lakes, wetlands, rivers, and other water bodies affect the agriculture of a nation?
8. What are some of the things industries can do to prevent factories from polluting lakes, rivers, streams, other water bodies, and groundwater?

### 1.3. RIVERS AND STREAMS

Rain falls on the earth, snow and ice melt, and springs gush out of the ground. The water from these sources flows down mountainsides and hillsides, forming tiny streams that run into bigger ones. These streams join small rivers that flow into still larger rivers. Eventually they join a main river, one that empties into the sea. A main river and all its



tributaries, or branches, form a river system. All of the rivers and streams flowing into a main river form a larger drainage basin, one usually determined by the higher peaks and ridges of a mountain range. Every river and stream has a river source — a place where it begins, a river's mouth — a place where it empties into another body of water and a river's flow.

**The work of rivers and streams.** Rivers and streams are always at work on the land, destroying rock and soil (erosion), washing them away (transportation), and putting them down some place else (deposition). The first two processes — erosion and transportation — wear down the land, changing highlands into lowlands. The last process — deposition — builds up the land. Together these three processes keep a balance between the high places and the low places of the earth.

As a standing liquid, water changes rocks and soil chemically through its dissolving action. As ice, it breaks up rocks mechanically. But when it moves as ice or flows as water, it does its work of erosion.

Streams and rivers, like mountains, can be described as young or old. Streams flowing down steep slopes are considered young. They have fairly straight courses. Young streams are still cutting into their streambeds and forming their valleys, which are narrow and V-shaped. The land between stream valleys is usually high and broad.

As rivers become older, their currents slow down. Less erosion takes place, and more materials are deposited along their banks. Streambeds gradually widen and flatten out. Then floodplains build up. The soil of floodplains is extremely fertile. The world's four earliest civilizations developed along the fertile floodplains of the Tigris-Euphrates, Nile and Indus rivers. As the rivers advance into old age, they begin to change course. Instead of flowing straight through the land, they move from side to side, forming wide bends. At times of flash floods, old bends may be cut off. As new bends form, the old bends may remain as lakes.

**The world's great rivers.** There are many different things that make a river great. One thing is length. Even though the Amazon flows through an area where few people live, it is a great river. It is not only about 6,440 km long, but it also carries more water in its system than the Mississippi River, the Nile River, and the Yangtze River put together. The flow of the Amazon River is so powerful that the water of the Atlantic Ocean is fresh to many miles past the river's mouth.

On the other hand, the Rhine River in Europe is only about 1,500 km long. But it, too, is a great river. It flows through an area where great numbers of people live. Its waters are used to manufacture many industrial products, to generate power, to transport goods and people, and to provide water for home use, for sport and recreation, and for agriculture. Use is another measure of a river's greatness.

1. What is a river system? A drainage basin?
2. What is a stream or river called if it flows into another stream or river? What is it called if it flows out of a stream or river?

3. How do erosion, transportation, and deposition help rivers do their work of shaping the land?
4. How does the speed of a river's current affect the buildup of land along its bank and at its mouth?
5. What makes a river great?
6. What are some of the ways people use rivers?

## 2. Lexical and grammatical exercises

2.1. Make up sentences by combining the words and phrases from the columns below.

|       |  |   |
|-------|--|---|
| Water | is; dissolves;<br>has; reshapes;<br>lies; collects;<br>covers; plays;<br>flows; falls;<br>releases | an important role in weathering rock; as rain;<br>everywhere; heat even as it freezes; the crust of<br>the earth; in rivers; over three fourths of the<br>earth's surface; different materials;<br>underground; some special qualities; in deep<br>and shallow places |
|-------|--|---|

2.2. Underline one word in each line that is different. Explain your choice.

|            |         |          |               |
|------------|---------|----------|---------------|
| store      | keep    | release  | hold          |
| build up   | reduce  | increase | accumulate    |
| gap        | space   | break    | crust         |
| luck       | lack    | need     | shortage      |
| stream     | drop    | flow     | current       |
| abundant   | rich    | scarce   | fertile       |
| widen      | often   | shorten  | flatten       |
| consist of | provide | include  | be made up of |

2.3. Cross out a word in a line which is different. Number each line according to the headings given below.

|             |               |            |                |
|-------------|---------------|------------|----------------|
| evaporation | precipitation | irrigation | condensation   |
| irrigation  | fishing       | pollution  | transportation |
| tributary   | nest          | source     | mouth          |
| shore       | insect        | estuary    | floor          |
| diffusion   | erosion       | deposition | transportation |
| fertilizer  | nitrate       | wetland    | waste          |
| polluted    | available     | fertile    | fresh          |
| stream      | snow          | glacier    | ice            |

1. Something that can melt.
2. Purposes that lakes serve.
3. Words associated with seas.
4. Water pollutants.
5. Processes involved in the water cycle.



6. Words associated with rivers.
7. Work of rivers and streams.
8. Adjectives describing water.

**2.4. Rearrange the letters in the anagrams to form equivalents for the Russian words.**

|                                       |                              |
|---------------------------------------|------------------------------|
| край, граница — gdee                  | переваривать (пищу) — diegts |
| содержимое; содержание — cnonnte      | снабжать — plupys            |
| определять, обуславливать — deetrnemi | избавляться — dpissoe        |
| рассматривать, обдумывать — sicdeonr  | получать — irveeec           |
| отдых — rreceaotin                    | уменьшать — rucede           |
| орошение — rintirioga                 |                              |

**2.5. Make up sentences by combining the words and phrases from the columns.**

|                   |         |    |                       |
|-------------------|---------|----|-----------------------|
| Animals           | take    | of | 80 per cent of water. |
| Potatoes          | consist | in | dissolved materials.  |
| City dwellers     | depend  | on | wetlands.             |
| All living things | dispose |    | waste.                |

**2.6. Match the words in A with the words in B to form word combinations.**

- 1) A. water; fertile; steep; city; fresh; marine; river; mountain  
B. slope; soil; water; bank; shortage; range; dweller; animal
- 2) A. to digest; to surround; to support; to determine; to manufacture; to drain  
B. food; wetland; climate; the earth; product; life

**2.7. Match the words in A with their opposites in B.**

- A. abundant; surface; dry; safe; shallow; rugged; tiny; high; narrow; fresh
- B. dangerous; wide; low; flat; scarce; underground; huge; rainy; deep; salt

**2.8. Fill in the missing words in this paragraph.**

As heat from the sun warms water on the earth's surface, some of the water turns into \_\_\_\_\_, a gas that rises into the air. At higher altitudes, the water vapor \_\_\_\_\_ or cools into water droplets. The water droplets join together to form \_\_\_\_\_ in the air. Eventually, the water droplets become heavy enough to fall back to earth in some form of \_\_\_\_\_. Some of the water seeps into the ground to become part of the \_\_\_\_\_. Most of it, after a few stops on land, finds its way back to one of the four great \_\_\_\_\_ of the world. Because of the work of the

\_\_\_\_\_, the earth's water supply has stayed the same for millions of years.

**2.9. Select a good title for the above paragraph:**

1. How clouds form.
2. The unending water cycle.
3. Why water changes form.

**3. Translation into Russian**

1. Because of its special qualities, water supports all forms of life, shapes and reshapes the crust of the earth, influences weather and climate, and makes other natural resources usable.
2. Water's special qualities include its ability to store and release energy; its presence on the earth as a liquid, gas, and solid; its dissolving power; its surface tension; and its ability to climb up a surface against the pull of gravity.
3. The water cycle is the movement of water from earth to the air and back again to earth by the processes of evaporation, condensation, and precipitation.
4. About 70 per cent of the earth's surface is covered with water. Of this water supply, 3 per cent is fresh water. Because 2 per cent is frozen in ice caps and glaciers, only about 1 per cent is available for use in lakes, in rivers, in streams, and underground.
5. Rivers wear down the land through the processes of erosion and transportation. They build up the land through the process of deposition.
6. The Colorado River is a young river that is still cutting its bed; in a million years the Grand Canyon will probably be deeper; the area will be more populated and more industrialized.
7. The earth's water supply stays the same year after year because of the water cycle.
8. Polluted water carries germs. People who drink polluted water often get sick and may even die.

**4. Complementary text**

**WATERFALLS**

In places a river may descend vertically giving rise to a waterfall. The term cataract, usually designating a series of rapids in a large river, is often applied to waterfalls of large volume. Waterfalls develop due to many causes. The most common one is the presence in the river's course of rocks of unequal hardness or resistance.



The beautiful Lower Falls in the Yellowstone National Park appeared due to a body of resistant, igneous rock which here extends across the Yellowstone River. The rocks on either side of the river are of a rich yellow color, giving the river its name.

Some waterfalls appear as a result of different rates of erosion where a resistant layer of rock in a streambed lies over a less resistant rock. Subsequent erosion of the softer rock by the falling water periodically breaks off portions of the harder cap rock. Some of the largest cataracts in the world, Niagara Falls in North America and Victoria Falls in Zimbabwe, Africa, originated in this way.

**Niagara Falls.** Between Lake Erie and Lake Ontario the Niagara forms the famous Niagara Falls. The Niagara River was born near the end of the Glacial Period; it flowed northward as now, and about 10 km below the present falls it plunged over the edge of a limestone, which there forms an escarpment, or steep rock-slope. The limestone is resistant, but the swirling water at the base of the fall gradually undercuts the softer rocks below and the heavy limestone, robbed of its support, breaks off in huge blocks. Each time this occurs the crest of the cataract recedes a few feet farther upstream. Century by century the fall has worked its way upstream, leaving a deep gorge.

At the present time the cataract is divided into two parts. The lesser falls is on the American side and the great horse-shoe fall is on the Canadian side. So much more water pours over the latter that its crest is receding faster than that of the American fall. Millions of people come each year to see this spectacular natural wonder.

**Victoria Falls.** One of the world's largest and most magnificent waterfalls Victoria Falls lies on the border between Zambia and Zimbabwe in South Africa. These falls of the Zambezi River are said to be more imposing than Niagara. Beautiful Victoria Falls lies at the southern end of the Great Rift Valley. They are formed due to inequalities in a vast body of solidified lava in which the river is cutting this portion of its channel. The mist and noise produced by the 122-m drop of the Zambezi River inspired the waterfall's alternate name "smoke that thunders". Many tourists visit the falls each year.

**Iguaçu Falls.** Iguaçu Falls on the border between Argentina and Brazil is one of South America's great natural wonders. The falls range between 60 and 80 m high. In the dry season the river drops in two crescent-shaped falls, but in the wet season the water merges into one large fall more than 4 km wide.

Summarizing, we may say that waterfalls belong to the youthful stage of a river, are usually due to the presence of unequally resistant rocks in the stream channel. Waterfalls are often of imposing grandeur, but in time disappear by erosion.

Compare the waterfalls described in the text with other famous waterfalls. Especially voluminous or spectacular waterfalls are Angel Falls (979 m) in Venezuela,

the world's highest uninterrupted cataract; Tugela (948 m) in KwaZulu/Natal, South Africa; Cuquenán (610 m) in Venezuela; Takakkaw (503 m) in British Columbia; King George VI Falls (488 m) in Guyana; Krimmler (381 m) in Austria; Silver Strand Falls (357 m) in California; Wollomombi (335 m) in Australia and Gersoppa (253 m) in India.

## 5. Writing

Write the translation of the following text or render its content in English.

### КАКОГО ЦВЕТА МОРЕ?

Синим море кажется не всегда. Синий цвет — это цвет «океанских пустынь». Моря имеют различные цвета. В северных морях вода темно-зеленая; у берегов, особенно у впадения рек, — бурая или желтая. В штормовую погоду, когда ураганный ветер вздымает огромные волны и мчит по небу изорванные клочья дождевых облаков, море приобретает мрачный свинцово-серый цвет.

Что же придает поверхности моря тот или иной цвет или оттенок? Цвет моря зависит от толщи воды, в которой рассеивается и отражается дневной свет. Молекулы чистой морской воды отражают и возвращают к поверхности моря синие лучи. Если в воде много микроскопических зеленых водорослей, море кажется зеленым. Минеральные частицы и растворенное в воде органическое вещество (гумус), выносимые реками, а также бурые одноклеточные водоросли придают поверхности моря бурый или желтый цвет. Реки приносят с суши огромное количество глинистых частиц в Желтое море, и вода его имеет желтую окраску. Красный цвет воде Красного моря придают периодически развивающиеся в нем бурые микроскопические водоросли. Каспийская вода совершенно желтая в устье Волги, а по мере удаления в море приобретает цвет темного изумруда.

На цвет поверхности моря влияет цвет неба — безоблачное голубое небо усиливает синие тона, темные облака придают морю унылый свинцово-серый цвет.

## 6. Speaking

6.1. Render the text in English.

### EROSION AND NATURAL SCENERY

**Rocky gorges and mountains.** Running water has been the master sculptor of the ages. Without its work the surface of the Earth would present an aspect of dull monotony, with stretches of featureless plains,



and dreary plateaus devoid of scenic beauty. Instead of majestic peaks we should have only huge swells or blocks of uplifted rock without pass, valley, or canyon; no gorge of the Rhine, no Alpine peaks, no gorgeous the Grand Canyon in Arizona, or Iron Gates of the Danube, or Niagara. It is the work of weathering and erosion that gives us the endless variety of mountain sculpturing, and much of the charm of all natural scenery.

Rising in the heart of the Rocky Mountains, the Colorado River in its lower course traverses the arid plateaus and pours its muddy current into the Gulf of California. The river is more than 1,000 km long, but the Grand Canyon is about 200 km in length. The Colorado plateau has been slowly rising during long ages that the river has been eroding the deep gorge which is now 1.5 km deep and scarcely wider than the river at the bottom. Tributary gorges, into whose depth the sun penetrates scarcely two hours a day, branch out from either side. The nearly horizontal beds of rock, of gorgeous colors, and unequal hardness, weather into castellated forms and complete the most impressive example of river erosion that the world affords.

Speaking of the charm of the Grand Canyon of the Colorado a noted geologist has said: "Of all the gorges and canyons of the world, and perhaps of all works of nature, the most wonderful example is the Grand Canyon of the Colorado. It is not magnitude alone that gives this marvelous canyon its preeminence; it is the gorgeous and varied coloring of its mighty walls, the endless details in the sculpturing of its battlements and towers, the ever changing atmospheric effects of its profound depths and the wonderful stimulus to the imagination with which it feeds the mind."

**Limestone scenery.** Karst limestones are those rocks which contain at least 50 per cent calcium carbonate. Limestones are found in several places in the world. As rain water falls through the atmosphere it picks up carbon dioxide. As a result, the water becomes a weak solution of carbonic acid. This weak acid is capable of very slowly dissolving calcium carbonate as it makes its way in limestone rocks. In those areas where the surface rock is limestone, a distinctive type of landscape develops. This is known as karst scenery after the Karst region in Yugoslavia where it is very extensively found. Karst scenery has a number of typical features.

Limestone is a permeable rock. Streams flowing on the limestone soon disappear underground down enlarged vertical holes or shallow holes. Hidden below the surface there is a complex drainage system of streams, caves and caverns. Streams flow underground along channels which they create by dissolving the limestone rock. In some places so much solution takes place that eventually large underground caves are formed and a great variety of passages reaching on and on, up and down, in and out. If you were to enter a cave in a limestone area, you would probably hear the sound of water dripping from the roof. Over a long period of time dissolved limestone may be deposited in the form of long,

finger-shaped stalactites which, like icicles, hang from the roof of caves. As a stalactite grows downward from the roof and a stalagmite grows upward from the floor of the cave, they meet and form a rock pillar.

**6.2. Select one of the world's major rivers or lakes to report on. Mention whether a lake is naturally or artificially formed, note the source that keeps it filled, describe the cities or towns along its shores, and generalize about its importance to the economy of the surrounding area.**

## 7. Summarizing the Unit

Make an outline of the Unit and render its content in a 4—6 min talk.

### UNIT 4

## CLIMATE, SOILS AND VEGETATION

### 1. Reading and learning

Scan each text and formulate the main ideas. Read the text again carefully and memorize it, then retell the text close to the original.

#### 1.1. THE ATMOSPHERE MAKES LIFE ON EARTH POSSIBLE

Earth is unique among the planets in the solar system. One of the most unique features of Earth is the presence of a stable atmosphere. The various gases that surround a planet make up its atmosphere. Earth's atmosphere shapes our weather, climate, and vegetation patterns and makes life as we know it possible. Without air there would be no day-to-day weather changes. It would be extremely hot during the day and very cold at night. And, there would be no oxygen and no carbon dioxide to support human and plant life.

**Components of the atmosphere.** A great "ocean" of gases surrounding the earth for thousands of miles forms the earth's atmosphere, usually known simply as the air. More than 98 per cent of the gases that make up the atmosphere, however, are found within 26 km of the earth's surface. Farther above the earth, the gases — and the air — gradually thin out. Air in its natural state is a colorless, odorless, tasteless mixture of gases. Nitrogen makes up 78 per cent of dry air, oxygen makes up 21 per cent, and other gases such as carbon dioxide, helium, and ozone make up the remaining 1 per cent.



Along with gases, air nearly always contains small amounts of water vapor, dust, soot, pollen, seeds, and other particles. Winds, forest fires, and volcanic eruptions sweep many of these particles into the air naturally. Other particles release from chimneys, smokestacks, automobiles, and other polluters. Together, these particles create polluted air, such as the haze and smog that hangs over many cities today.

Weather is the condition of the atmosphere for a short period of time at a specific location. The average of daily weather conditions over a long period of time is known as climate. Certain location and place factors influence the distribution of climates over the earth's surface. These factors, known as climatic controls, are latitude, altitude, and proximity to land and water.

**Climate's role in the environment.** Climate has relationships to all other parts of the earth — its land, its water, and its atmosphere. These relationships work in two ways. Land, water, and the changes that take place in the air play their parts in shaping climate. At the same time, climate plays its part in helping to shape landforms and soils. Climate helps to keep the water cycle working. Climate, as average weather, also helps to determine what changes take place in the air from month to month and from year to year.

The relationships among land, water, air, and climate go even further. They have a direct influence on the kinds of plants and animals that live in a region. Climate also places limits on people's choices about how they will use the land, the water, and the forms of life found in a region.

Climate probably began to play its central role as a part of the natural environment as soon as the earth took form and settled in its orbit around the sun. Today scientists know some things about climate changes in the past. Lands around the equator have probably always been hot. But, there were periods when climates in the middle and high latitudes were warmer than they are today. There were other periods when climates outside the tropics were much cooler than they are today. These cooler periods usually resulted in the buildup of ice on the earth. Glaciers spread over large parts of the earth's land surface. Packs of ice covered large parts of the world's oceans and lakes. But always, the glacial periods were followed by warmer periods. This cycle of warming, cooling, and warming again has repeated itself several times in the past. The earth's last glacial period gave way to a warming period about 11,000 years ago.

After the last great continental glaciers withdrew (moved back) to the lands around the poles, the climates we know today emerged. Now we have hot climates around the equator, cold climates around the poles, and — as a general rule — climates with warm and cold seasons in the middle latitudes. Where temperatures are hot to warm and where precipitation is heavy to moderate, forests cover the land. Where temperatures are warm enough but where precipitation is lighter or falls only in one season, tall grasses cover the land. In very hot but dry places,

special forms of plants grow by storing water in their stems or by taking moisture from the air. In very cold places, tiny mosses and some very short grasses manage to survive.

Special forms of animal life, too, live in certain climate regions. Animals that swing from branches and climb up and down tree trunks live in forests. Animals that can hide among grasses or can outrun their enemies survive in grasslands. In very dry regions, there are animals that can go without water for long periods of time or that burrow underground to escape the heat. Animals with furs or thick skins live in very cold regions. Finally, every climate region has its own communities of insects and birds.

1. What are the components of the atmosphere?
2. Why are some scientists concerned about the atmosphere's levels of carbon and ozone?
3. Where are hot climates generally found today? Cold climates? Climates that have warm and cold seasons?
4. What are some of the ways climate limits people's choices about how they will live and meet their needs?

## 1.2. FOUR CONDITIONS IN THE EARTH'S ATMOSPHERE CAUSE WEATHER

There is a saying: "If you don't like the weather, wait an hour." This refers to how quickly weather conditions can change. By its nature, weather changes constantly. The term "weather" describes the condition of the atmosphere for a short period of time in a specific area. Because the atmosphere changes constantly, the weather, too, changes constantly. Four variable conditions in the atmosphere affect an area's weather: temperature, moisture, atmospheric pressure, and wind.

**Temperature.** The earth receives its warmth from sunlight, or solar radiation. The process by which sunlight warms the earth is called insolation. Only about 48 per cent of all sunlight actually reaches the earth's surface. Gases in the atmosphere either absorb or reflect the rest back into space. Land and water absorb the sunlight that reaches the earth's surface and change it into heat energy. This heat energy radiates back into the atmosphere, where it warms the air. At night the earth and the air slowly cool.

**Moisture.** It is the second variable element of weather. The air in the lower atmosphere always contains some amount of moisture. However, air higher than 6.4 km above the earth's surface rarely contains moisture. The amount of moisture in the air is called humidity. Humidity can be measured in two ways: absolute humidity and relative humidity.

As a rule warm air can hold more moisture than cold air. When air contains all the moisture it can, it becomes saturated and has a relative



humidity of 100 per cent. If the saturated air cools, the extra moisture condenses to a liquid state, forming clouds and fog. When the drops of water condensing in cooling air become large enough, they form precipitation — rain, snow, sleet, or hail. Rain forms when condensation takes place at temperatures above 0°C. Snow, sleet, and hail form when condensation takes place below 0°C.

**Atmospheric pressure.** The third variable element of weather is atmospheric pressure, or the weight of the air. The standard pressure exerted by the atmosphere at sea level is 760 millibars. The distance above the earth's surface — altitude — has a major effect on atmospheric pressure. At high altitudes pressure is lower because the earth's gravity holds fewer gas molecules. Temperature also affects air pressure. Warm air weighs less and exerts less pressure than cool air. As the light, warm air rises, a low-pressure center forms below it. Cool air is denser than warm air and tends to sink, forming a high-pressure area. In general, low-pressure areas tend to have unstable weather with clouds, rain, and storms. High-pressure areas tend to have clear, calm weather.

**Wind.** When air moves from high-pressure areas to low-pressure areas we call it wind. The winds that flow continually between global pressure belts are called prevailing winds. Prevailing westerlies, trade winds and doldrums form part of the global circulation of the atmosphere. But it is only a very general scheme of the atmospheric circulation. The real situation is more complicated due to the influence of various factors. For example, unequal heating of land and sea greatly affects weather conditions and causes the seasonal winds, such as monsoons, and also many types of local winds.

One of these wind patterns is found along the coastlines of large water bodies. During the day, the wind often blows strongly from the cooler water toward the land. A breeze blowing from the sea may lower temperatures of the adjacent land up to 6–7°C. As the sun sets, the breeze dies down. During the night the pattern reverses itself. The cooler air over the land then blows toward the water.

1. What four atmospheric conditions cause weather?
2. What are the global pressure belts? How are they formed?
3. What are westerlies, trade winds and doldrums? Where do they occur?
4. How important are weather and climate to the business and industry of your region?

### 1.3. VEGETATION AND SOILS

**Natural vegetation regions.** Vegetation is plant life. The kind of natural vegetation which a place has depends upon several factors: climate, relief, soils. Climate plays a particularly important role in the distribution of vegetation, as different kinds of plants need different amounts of heat and moisture in order to grow well. Trees, for example,

generally need more moisture than grasses. Broadly speaking, in areas which have a heavy and well-distributed rainfall, and at least one month per year with average temperatures above 10°C, the natural vegetation is likely to be forest. In forests trees are the dominant plants.

In areas where the rainfall is moderate or light and is very seasonal in its distribution, some type of grassland, where grasses are the dominant plants, is formed. In very dry or very cold conditions only a few plants can live. Plants able to live in deserts survive by adapting to the extremely dry conditions. In cold areas some vegetation survives by growing rapidly during the short period when the ground thaws.

The exact nature of the forest, grassland and desert types of vegetation, however, varies greatly. For example, the tropical rain forests of the Amazon basin are very different from the coniferous (needleleaf) forests of the interior of northern Canada and Russia or scrub forests typical for Mediterranean climate region. Similarly, the savanna grasslands of East Africa are very different from the temperate grasslands of the steppes of Russia.

**Soil composition.** Climate, vegetation and soil are closely related components of nature and their global distributions over the earth's surface are very similar.

Soils are a mixture of mineral and organic matter in which plants grow. Soils are of great importance to people. Compared with the total volume of the earth, the soil forms a very thin layer, from a few centimetres to several metres in thickness. Yet this thin layer of soil produces most of our food supply. This productive topsoil upon which agriculture depends has taken hundreds of years to develop, but if it is misused it can be destroyed within a very short time.

The soil has five basic components: mineral particles formed by the breakdown of rocks; decayed organic materials; water which has soaked into the ground as a result of precipitation; air; living organisms such as earthworms and many others.

**The formation of the soil profile.** Soil is the product of two major processes. These are the decomposition of rock and the decay of plant and animal life. The processes of physical and chemical weathering are responsible for breaking down the bedrock into fragments. These rock fragments provide the original material for the formation of soils. It is colonized by living things (organisms). Decayed plants and animals form humus, which makes up the top level. Soil rich in humus is usually fertile and is black or dark brown.

Below humus lies a layer of mineral particles that washes down from the humus. Finally there is a layer of parent material, or solid rock. This section down through a soil from the surface to the underlying rock is called the soil profile. In a mature soil, profile usually consists of successive (coming one after the other) layers — horizons. Different soil profiles are found under different conditions, and soils are recognized and classified on the basis of the parts of the profile which are present.



**Factors influencing soil development.** The climate is the most important factor of soil formation. It affects soil type both directly through the weathering effects, and indirectly as a result of its influence upon plant life. In tropics temperatures are high throughout the year, and as a result weathering takes place much more rapidly than it does in places which are further from the equator. It has been estimated that in tropical regions the effectiveness of weathering is almost ten times that of polar regions, and more than three times that of temperate regions. As a result deeper weathering is characteristic of tropical regions.

In the areas which have very heavy rainfall for much of the year there is a downward movement of water in the soil. The water dissolves the soluble materials and soluble humus in the soil, and carries both downwards. This process is known as leaching. The materials carried downwards by the water are redeposited at a lower level in the soil. In the areas which have long and severe dry season, evaporation is greater than precipitation for a large part of the year, and so water tends to move upwards by capillary action. On reaching the surface the water evaporates, leaving behind those salts which were dissolved in it.

Both plants and animals influence soil development. The amount of plant material which is returned to the soil, obviously depends to a great extent upon the kind of vegetation cover. Soils of forest areas generally have much higher humus content than those of savanna areas. Dead plants provide nitrogen and other elements such as phosphorous, calcium and potassium, which are broken down from decaying plant by bacteria, and which plants can absorb again by their roots. The influence of animals on the soil is largely mechanical. Earthworms are particularly important as they change the texture and chemical composition of the soil as it passes through their digestive system. Ants and burrowing animals also disturb and rearrange the soil making it more porous and sponge-like, so that it can retain water and permit the passage of air.

In many parts of the world, people play an important part in modifying the soil by their methods of farming.

1. How is vegetation related to climate regions?
2. Where are forests and grasslands usually found? What are the different types of forests and grasslands?
3. What are the basic components of the soil?
4. How is soil formation influenced by climate, vegetation, animals and topography?

## 2. Lexical and grammatical exercises

### 2.1. Match the words close in meaning in A and B.

- 1) A. cover; exert; make up; keep; vary; destroy; thaw  
B. form; hold; press; melt; break; hide; change

- 2) A. moisture; productive; rainfall; coniferous; layer; surroundings  
B. environment; water; precipitation; fertile; horizon; needle-leaved

### 2.2. Cross out a word in a line which is different. Number each line according to the headings given below.

|           |          |              |                             |
|-----------|----------|--------------|-----------------------------|
| forests   | grasses  | branch       | mosses                      |
| chimneys  | haze     | smoke-stacks | automobiles                 |
| colorless | endless  | tasteless    | odorless                    |
| helium    | dust     | pollen       | soot                        |
| heavy     | tall     | light        | moderate                    |
| snow      | hail     | wind         | sleet                       |
| ozone     | helium   | nitrogen     | carbon dioxide              |
| latitude  | altitude | magnitude    | proximity to land and water |

1. Particles contained in the air.
2. Polluters.
3. Degree of precipitation (rainfall).
4. Different kinds of vegetation.
5. Gases that make up 1% of dry air.
6. Quality of the air in its natural state.
7. Forms of precipitation.
8. Climatic controls.

### 2.3. Match the words in A with the words in B to form word combinations.

- A. stable; relative; prevailing; atmospheric; saturated; successive; vegetation; productive; solar; organic
- B. matter; radiation; air; topsoil; cover; humidity; wind; atmosphere; pressure; layers

### 2.4. Rearrange the letters in the anagrams to form equivalents for the Russian words.

|                            |                             |
|----------------------------|-----------------------------|
| следовать — wllfoo         | гниение — daecy             |
| устраивать(ся) — stlete    | средний — ragveea           |
| возникать — reeemg         | пищеварительный — deigsvtie |
| пережить; выжить — svveuri | зрелый — mtuare             |
| измерять — murasee         | растворимый — subolle       |

### 2.5. Rearrange the lines of the table matching a cause with a reason. Form sentences, e.g. *The warmer the air is the more moisture it can hold.*

| Cause                              | Reason                              |
|------------------------------------|-------------------------------------|
| we are far above the earth         | weathering takes place rapidly      |
| the temperature is high            | the gravity holds few gas molecules |
| burrowing animals disturb the soil | the air is thin                     |
| the altitude is high               | soil is porous                      |



## 2.6. Match each of the following terms with the correct definition.

- a) *deciduous*; b) *savanna*; c) *climate*; d) *continental influence*; e) *wind*;  
f) *atmospheric pressure*; g) *precipitation*; h) *condensation*; i) *weather*;  
j) *humidity*; k) *temperature*; l) *evaporation*

- \_\_\_\_\_ 1. Condition of the atmosphere for a short period of time.
- \_\_\_\_\_ 2. Process in which gaseous water vapor changes to a liquid.
- \_\_\_\_\_ 3. Moisture in the air.
- \_\_\_\_\_ 4. Condensation in the snow, sleet, or hail.
- \_\_\_\_\_ 5. Force exerted by the air.
- \_\_\_\_\_ 6. Movement that occurs when air flows from high-pressure to low-pressure areas.
- \_\_\_\_\_ 7. Average of daily weather conditions over a long period of time.
- \_\_\_\_\_ 8. Climatic effect on lands separated from the ocean by mountains or by hundreds of miles of land.
- \_\_\_\_\_ 9. Broadleaf trees that stop growing and shed their leaves when it gets cold or dry.
- \_\_\_\_\_ 10. Grassland found in tropical wet-and-dry climates.
- \_\_\_\_\_ 11. Measure of heat or cold.
- \_\_\_\_\_ 12. Change of water from its liquid form to gaseous water vapor.

## 3. Translation into Russian

1. The atmosphere is made up of gases. The two that are of the most concern to modern scientists are carbon dioxide and ozone.
2. The four conditions that cause weather are temperature, moisture, atmospheric pressure, and wind.
3. Changing atmospheric conditions can create violent weather.
4. Thunderstorms, tornadoes, hurricanes, and typhoons are among the most spectacular displays of weather and can be very dangerous and destructive.
5. Latitude, altitude, and proximity to land and water are controls that determine climate patterns.
6. Vegetation responds directly to climatic conditions and plant-growth patterns. Global vegetation regions are related to global climate regions.
7. Global vegetation regions include forest-lands, grasslands, vegetation in dry and cold regions, and mountain vegetation.
8. Heat energy does not pass through the air as easily as sunlight does. The lower atmosphere temporarily traps the heat, much like a greenhouse traps warmth. In a greenhouse the sunlight passes through the glass roof and walls and warms the air. The heat, however, does not immediately pass back through the glass to the outside air. Instead the heat is temporarily trapped in the warm air, keeping the greenhouse warm, just

as heat energy is temporarily trapped in the lower atmosphere, keeping the earth warm. This process, called the greenhouse effect, constantly warms the earth.

## 4. Complementary texts

### VIOLENT WEATHER

Thunderstorms, tornadoes, hurricanes, and typhoons can create a spectacular display of weather — a display that also can be dangerous. Such unstable weather conditions result from certain combinations of temperature, moisture, atmospheric pressure, and wind.

Thunderstorms occur whenever hot and humid air rises rapidly. Electrical charges build up in the rising air as moisture condenses, clouds form, and rain begins to fall. When the negative charges in the clouds make contact with the positive charges on the earth's surface, a streak of lightning flashes across the sky. Thunder, the shock waves caused by the lightning bolt, rumbles after the flash. Lightning is one of nature's most dangerous elements. Each lightning bolt carries a powerful electric charge. When these charges touch people or buildings, they can cause death and property damage.

Tornadoes, with winds of between 480 and 800 km per hour, rank among the most violent of nature's storms. The twisting, funnel-shaped cloud of a tornado often descends from the clouds of a severe thunderstorm. As the tornado gets closer to the earth's surface, its winds swirl everything in its path into the funnel. It is not uncommon for the powerful winds to lift small buildings and move them hundreds of yards. Although very destructive, tornadoes are usually small. The path of destruction of an average tornado measures only a few hundred meters wide and about 25 km long. Tornadoes occur throughout the world.

Large low-pressure areas with strong winds can create violent storms over tropical ocean areas, usually in the late summer and early fall. The storms that form over the Atlantic Ocean and the Gulf of Mexico are called hurricanes. Similar storms that form over the Pacific Ocean are called typhoons. Winds must blow 120 km per hour or more before a storm is classified as a hurricane or a typhoon. Once formed the storms are circular, with "eyes" of very low pressure at their centers. The air in the eye usually remains calm, but winds swirl around it at high speeds. Hurricanes and typhoons typically measure 160 to 960 km across. The eye of most storms has a diameter of 15 to 40 km.

Hurricanes and typhoons move in unpredictable patterns, eventually pounding coastlines with high winds, high waves, and heavy rains. Because they gather their strength from the warm ocean waters, however, they usually die out quickly once they reach land — not, however, before causing tremendous damage to coastal areas.



Unlike other storms, hurricanes and typhoons have names. Each year the National Hurricane Center in Coral Gables, Florida, chooses an alphabetical listing of names to identify the season's storms. The names selected for the first three hurricanes of 1989 were Allison, Barry, and Chantal.

## EL NIÑO

The Peru Current, which flows northward along the western coast of South America, sometimes behaves in ways that scientists do not fully understand. Because this usually occurs soon after Christmas, it is called *El Niño*, Spanish for "The [Christ] Child".

**Upwelling.** Upwelling — a climatic condition brought on by winds that persistently drive water away from the coast — is of great biological importance to the west coast of South America. When upwelling occurs, the cold subsurface water of the Peru Current rises to replace the usually warm water. The rising, cooler water is rich in nutrients for phytoplankton — microscopic ocean plants. Tiny marine animals called zooplankton feed on the trillions of phytoplankton. At the upper end of the food chain, fish thrive on the abundance of food. This process makes the coasts of Ecuador, Peru, and Chile among the world's most productive fishing areas.

Occasionally northerly winds replace the prevailing southerly winds and the cold Peru Current moves westward. In its place comes a warm current — *El Niño*. The warm waters of *El Niño* stop the upwelling and completely break down the normal ecological system. Most of the marine life moves in search of plankton-rich cooler waters and the fishing fleets follow.

**Effects of *El Niño*.** In 1972 *El Niño* appeared quite suddenly. Warm water herded fish into a narrow band of cool water along the coast of Peru. Several thousand fishing vessels closed in. Together they caught as much as 180,000 tons of fish in a day.

When *El Niño* stopped, upwelling resumed. But most of the fish were gone. Without fish to consume the plankton, they overmultiplied and exhausted their food sources. Billions died and decomposed on the ocean floor. Decomposition used large quantities of the water's oxygen, making the ocean off Peru unable to support fish until balance was restored.

**Worldwide influences.** Scientists now recognize that *El Niño*'s influences reach far beyond the west coast of South America. Indeed, it is now known that *El Niño* interacts with worldwide weather patterns. Rainfall shifts from the normally wet western Pacific toward the drier eastern Pacific. The Philippines and Indonesia experience drought. Intense heat and drought sweep Australia. Ecuador and Peru receive heavy rain and floods take heavy tolls in human lives and property losses.

Record-breaking snowfalls paralyze the east coast of North America, while western Canada and Alaska experience unusually mild winters. All result from a still-unexplained change in the weather.

## 5. Writing

Write the translation of the following text or render its content in English.

### КРИВОЕ ЗЕРКАЛО ЗЕМЛИ

Венера — ближайшая к Земле планета Солнечной системы. Основные параметры Венеры делают ее едва ли не близнецом нашей планеты: радиус — 0,95; объем — 0,9; масса — 0,8; средняя плотность — 0,95; сила тяжести — 0,9 от всех аналогичных земных величин. До начала эры космических полетов не были известны ни температура поверхности Венеры, ни давление, ни состав атмосферы, ни особенности рельефа. Диапазон гипотез о «венерианской действительности» был весьма широк, но все они имели одну общую черту — так или иначе ученые рассчитывали встретить на планете условия, не слишком сильно отличающиеся от земных.

Атмосфера Венеры содержит 97 % углекислого газа ( $\text{CO}_2$ ), 3 % азота, и 1 % приходится на пары воды и некоторые другие газы. Такой состав резко отличается от преимущественно азотной атмосферы Земли. Температура атмосферы у поверхности Венеры чрезвычайно высока — около  $470^\circ\text{C}$ . Причем ее перепады от дня к ночи составляют не более  $1^\circ$ , а от экватора к полюсам — не более  $12^\circ$ . Но вот с высотой температура заметно понижается: на вершинах наиболее высоких гор она почти на  $100^\circ$  ниже, чем в низменностях. Атмосферное давление на поверхности Венеры, почти в 100 раз превышающее земное, можно сравнить с давлением воды в земных океанах на глубине около 1 км.

Плотность атмосферы у поверхности Венеры примерно в 50 раз больше, чем тот же земной показатель. 40 % массы венерианской атмосферы находится в пределах 10 км от поверхности планеты. Можно сказать, что воздух там в определенной степени вязкий и движение в такой плотной газовой среде должно чем-то напоминать перемещение в воде.

Как на планете, подобной Земле, сложились совершенно иные климатические условия? Под влиянием каких процессов возникла венерианская атмосфера? К ответу на эти сложнейшие вопросы, важные даже не столько для понимания эволюции самой Венеры, сколько для прогноза будущего самой Земли, ученые сегодня смогли лишь приблизиться.



## 6. Speaking

### 6.1. Retell the following texts in English.

#### DESERT LANDSCAPES

Most dictionaries define a desert as “a wilderness,” “a barren place”, or “a place without people”. But these definitions could apply equally well to polar areas or to many mountain regions. What, then, makes a desert distinctive among physical settings?

**Geographic definitions.** When geographers use the word desert, they have something special in mind. A geographer's desert may be crowded with people. For example, Cairo and Alexandria, Egypt, both lie in a desert, yet millions of people live in these two cities. So “wilderness,” “barren,” and “place without people” really do not provide a useful geographic definition of desert.

To the geographer, lack of water is the fundamental factor that defines a desert. Deserts have little surface water, limited groundwater, and unreliable rainfall.

**Unreliable precipitation.** Annual average precipitation figures for deserts often are almost meaningless. Although statistics may say that a desert area receives 12.5 cm of rain a year, the figure does not mean that amount of rain falls every year. This is because averages are calculated by adding all the precipitation received over a period of years and then dividing the total by the number of years. So in one year, for example, a place may receive 25 cm of rain. The next year it may receive no rain at all. The yearly average for those two years would be 12.5 cm. Such an average number is misleading because all the precipitation for a given year may fall in one or two heavy showers. Such heavy rains usually pelt the hard, dry earth and run off rather than penetrating the surface.

**Colors of the desert.** Two colors symbolize life and death in many desert areas. The primary desert color — brown — illustrates the lack of water. Often this color stretches as far as the eye can see. And even though the brown desert may burst into bloom after a rain, the colorful outburst is short-lived and brown soon returns.

The other desert color — green — identifies the few arable areas. Here life-giving water is available from rivers such as the Nile or from underground reserves. People can be found, often in large numbers as in Cairo, living on these green ribbons in the world's deserts.

The line between green and brown is often sharp in desert regions. The rich green of an irrigated oasis or river valley suddenly ends. Beyond is the vast, dry emptiness of brown terrain.

## DESERTIFICATION

To understand the events that have occurred in recent years along the southern edges of the Sahara, you must know two key terms — Sahel and desertification.

**The Sahel.** Located south of the Sahara, the semi-arid Sahel covers large parts of Burkina Faso, Chad, Gambia, Guinea-Bissau, Mali, Mauritania, Niger, and Senegal. Today the loss of valuable soil threatens to transform the entire Sahel into desert.

**Desertification.** A combination of human activities and continued drought cause desertification — the spread of desert conditions. Desertification began to engulf the Sahel in 1968. No rains came and though drought persisted, nomadic herders continued to graze their livestock. Pastures became increasingly eroded. Soon vast areas were so desperately overgrazed that no pastures remained.

In addition to overgrazing the land, the nomads cut the few trees and shrubs for firewood. This deforestation leaves the soil bare and open to devastating winds that sweep the soil away. But wood provides 80 to 90 per cent of the region's energy and cutting the trees is a necessity. As a result, deforestation is extremely rapid. Each year sahelian residents strip trees from 2,600 to 3,900 square kilometers of woodland and reforest only one-tenth of that. And always the winds come to sweep the soil away.

Although the nations of the region recognize the dangers of deforestation and have established tree-planting campaigns, the programs have had limited success. The people of the Sahel think of trees in terms of firewood, not as protection against the relentless march of the desert.

**Effects of desertification.** Desertification has had disastrous effects on the region. Hundreds of thousands of people and millions of animals have died of starvation. And as the Sahara relentlessly gobbles up the Sahel at the rate of 6 kilometers per year, more and more flee to the region's impoverished cities. Having lost their herds — their traditional source of livelihood — nomads now crowd into wooden and tin shacks and depend on assistance from others to survive. Nouakchott, Mauritania, for example, has absorbed more than 500,000 refugees since the drought began. Meanwhile, a reddish-orange cloud of sand and soil blocks the sun from view as the Sahara continues to expand.

6.2. Find material about different kinds of violent weather phenomena: thunderstorms, tornadoes, hurricanes, typhoons, etc. and describe some cases of weather hazards.

## 7. Summarizing the Unit

Make an outline of the Unit and render its content in a 4—6 min talk.



## UNIT 5

### THE EARTH'S RESOURCES

#### 1. Reading and learning

Scan each text and formulate the main ideas. Read the text again carefully and memorize it, then retell the text close to the original.

##### 1.1 THE USE OF RESOURCES

**Natural resources.** Resources help people satisfy their needs and wants. Natural resources — a naturally occurring material that can be used to produce goods and services — occur as part of the environment and are an important part of an area's characteristics. Renewable resources can be used over and over again, but scarce and non-renewable resources must be conserved or recycled for use by future generations.

Earth is a planet rich in the materials necessary to support life. People can live only by making use of the earth's natural resources. Resources include not only minerals, soil, water, forests, and wildlife, but also air and the energy of the sun when people know how to make use of them. People convert the things that nature provides into useful machines, tools, and foods. Even the most desolate and isolated areas of the world contain at least some resources, or materials that people use to meet basic needs and wants.

As people use natural resources, they change the natural landscape. Changes in the landscape brought about by mining and farming illustrate this idea. Yet the use of natural resources also brings about changes in the cultural landscape. Centuries ago the Romans built stone aqueducts to carry water to many parts of the Roman Empire. For some people, this made water readily available for the first time. Today vehicles use highways, canals, and airways to speed the movement of valuable resources throughout the world. Not all people in the world use natural resources in the same way. Factors that affect the use of natural resources include cultural differences, technological change, economic factors, and geopolitics.

**Cultural differences.** People in different times and places may have different ideas about whether something supplied by nature is or is not a natural resource. Years ago, for example, Native Americans viewed the Great Plains of the United States as hunting grounds, while settlers moving west across the frontier saw the Great Plains as a place for farms and towns.

Even people in the same culture may view and use resources differently. A farm family may see a forest as a source of winter warmth

and cooking fuel. Loggers may see the forest as a place to find jobs. Campers may see the forest as a recreational area in which to spend vacations.

New technology also affects how people value and use natural resources. Before tractors and trucks, farmers considered mules to be a highly valued resource. Mules pulled plows and carried crops to market. Today tractors and trucks do the work once done by mules. For this reason, people value mules less than they did in the past.

Technological change also creates uses for previously unvalued natural materials. In the 1700s people did not use uranium ores and did not value them as natural resources. Uranium ores gained value only after modern advances made them useful as a resource for nuclear energy.

**Economic factors.** These factors also play an important part in the way people use natural resources. Scarcity and rising prices have always led people to seek cheaper substitutes for costly resources. In colonial days, for example, people burned whale oil for lighting. As demand for whale oil rose, more and more whales were hunted. Eventually overhunting made whales harder to find and prices rose. People then looked for cheaper substitutes. In time they found a way to make kerosene from petroleum. Because kerosene cost less than whale oil, it quickly replaced whale oil as a lighting fuel.

Another factor that affects the use of natural resources is geopolitics — the relationship between geography and political policy. The international trade of scarce minerals provides an example of the importance of geopolitics in today's world.

Most mineral deposits are unevenly distributed across the earth. This uneven distribution has resulted in increased world trade as countries lacking certain mineral resources buy what they need from other countries. Depending on the circumstances, a price increase or interruption in supply could result in great changes in the country importing the mineral. Geopolitics is becoming an increasingly important force in the world today.

1. Why are natural resources important?
2. How can the use of natural resources change a) the natural landscape and b) the cultural landscape?
3. What different factors affect the value and use of natural resources?
4. How did technological advances and economic factors change the way people met their needs?

##### 1.2. RENEWABLE AND NON-RENEWABLE RESOURCES

Natural resources can be categorized as either renewable or non-renewable. Renewable resources are replaced naturally and can be used

over and over again. Non-renewable resources, however, are almost impossible to replace and their supplies lessen with each use.

**Renewable resources.** For many years people thought that water was one of the most abundant natural resources. Scientists regard water as a renewable resource because it is constantly recirculated by the water cycle. However, water is a fragile resource. Water re-entering the water cycle often carries traces of fertilizers, pesticides, industrial chemicals, and sewage. These contaminants pollute the water and can destroy its value as a resource.

Forests are renewable resources if people plant new trees to replace those cut down. Fish and wildlife are renewable resources if people leave enough fish and wildlife to reproduce and if they preserve natural habitats.

Perhaps the natural resource that people most take for granted is soil. But even soil must be protected to remain a valuable resource. Soil has three general levels. Decayed plants and animals, or humus, make up the top level. Soil rich in humus is usually fertile and is black or dark brown. Below the humus lies a layer of mineral particles that washes down from the humus. Finally, there is a layer of parent material, or solid rock. The weathering of this rock forms most of the soil.

Clearing the land of its natural vegetation encourages soil erosion. Farming the same crops in the soil depletes it of valuable minerals. Irrigating the soil can result in salinization, or a salt build-up that eventually destroys the soil's productivity. For these and other reasons, scientists consider soil to be a renewable resource only if people take measures to prevent erosion, grow plants that restore nutrients, or use natural or chemical fertilizers.

**Non-renewable resources.** Such important resources as coal, oil, natural gas, iron ore, copper, bauxite (the principal source of aluminum), gold, and silver are non-renewable resources. As people use these resources, they cannot be replaced.

Resource depletion can be slowed through recycling. Recycling is the process by which products that have been used and discarded can be reused. Conservationists, people who work to protect natural resources and natural environments, support recycling because it slows the use of the earth's resources. Paper, which is made from trees, is one of the most commonly recycled materials. Youth groups and charitable organizations often collect newspapers and other paper products to sell to recycling factories. The factories grind up the old paper and make it into new paper. Many greeting cards, for example, are printed on recycled paper. Recycling paper saves millions of trees each year.

1. What is the difference between renewable and non-renewable resources?
2. In order to be classified as a renewable resource, what steps must be taken to protect the soil?
3. Why do many people favor recycling?

### 1.3. ENERGY RESOURCES SUPPORT INDUSTRIALIZATION

Muscle power was once the chief source of energy. The muscles of men, women, children, and animals provided the energy needed to plow fields, raise crops, move goods, and manufacture finished products. Today the industrialized countries of the world largely use fuels instead of muscles for energy. To produce the fuels needed, these countries constantly search for energy resources.

**Fossil fuels.** Today about 95 per cent of all energy generated in the world comes from coal, oil, and natural gas. These materials are fossil fuels, energy sources formed from the remains of plants and animals that died millions of years ago.

Oil replaced coal in the 1950s as the world's most important energy source. Oil was sometimes called "black gold", because chemists found so many uses for it. Oil is more than a major source of energy. It is also a raw material for making plastics, cloth, medicines and thousands of other products. Scientists now believe, however, that more than half of all the world's oil will be used up by the year 2050. This has resulted in attempts by the oil-consuming nations to rely less on oil, turning instead to other energy sources.

As supplies of some energy resources are limited people discover new ones or new ways to use old ones. Many countries want to become less dependent on fossil fuels. These countries are searching for ways to use nuclear energy, hydroelectricity, and solar energy to meet energy needs. Geothermal, wind, and tidal energy also are other alternative energy sources.

**Nuclear energy.** The chief benefit of nuclear energy is that the electricity it generates is relatively cheap. Because it requires only small amount of uranium, costs per unit of electricity are low.

Nuclear energy has certain negative aspects, however. Construction costs for a nuclear plant are high and a safe way to move and dispose of hazardous wastes from nuclear power plants has not yet been found. What concerns most people about nuclear energy is that nuclear materials are extremely dangerous. A 1979 accident at Pennsylvania's Three Mile Island and a more devastating accident at Chernobyl in the former Soviet Union in 1986 illustrate the potential danger of nuclear energy. In addition, by-products of nuclear energy can be used to make atomic bombs.

**Other sources of energy.** Hydroelectric plants use the energy of moving water to drive engines that generate electricity. Such plants are costly to build but efficient to run because water is an abundant resource.

The sun provides an inexpensive and virtually inexhaustible power source. Several devices have been built to use solar energy, but most remain experimental. However some devices to collect the sun's energy



have already become common. Various kinds of solar-heated houses have been built, especially in places that have a lot of sunshine. Scientists have made solar cells that change sunlight into a reliable source of electricity. The cells are used on space satellites and even in small calculators.

People have long used energy of the winds. Perhaps the most familiar form of wind power is windmills. The main job of the early windmills was to grind grains. They were also used to pump water. Today different type of windmills is built. Their job is to generate electricity. Wind energy is widely available but is less reliable than other sources. Since winds vary from place to place, windmills are more practical in some areas, although in other places they do not work at all.

Geothermal energy is another option that is getting attention these days. This energy comes from the intense heat that is stored within the earth. Geothermal plants use water and gases heated under the earth's surface to power engines that generate electricity. Geothermal plants are located in Italy, Mexico, Japan, Iceland, Russia and the USA. Like wind energy, geothermal energy is usable in only some parts of the world. The same problem limits the use of tidal energy, which can be harnessed in only a few areas.

1. What are the three major fossil fuels?
2. What products might countries lack if there are oil shortages?
3. How do the oil-consuming nations deal with the claim that the world's oil resources will soon be depleted?
4. What are the advantages and disadvantages of nuclear energy, hydro-electricity, and solar energy?

## 2. Lexical and grammatical exercises

### 2.1. Supply the geographic term that correctly completes each sentence.

1. Materials people use to meet basic needs are called \_\_\_\_\_.
2. A \_\_\_\_\_ can be replaced naturally and can be used over and over again.
3. A \_\_\_\_\_ is an inorganic substance in the earth's crust, such as gold and iron ore.
4. \_\_\_\_\_ is the soil layer that consists of decayed plants and animals.
5. \_\_\_\_\_ makes it possible to reuse products that have been used and discarded.
6. A person who works to protect natural resources is a \_\_\_\_\_.
7. \_\_\_\_\_ are oil-based materials.
8. An energy source that has been formed from the remains of plants and animals that died millions of years ago is known as a \_\_\_\_\_.

### 2.2. Match the words in A with the words in B to form word combinations.

- 1) A. hunting; decayed; muscle; hazardous; resource; fossil; mineral; natural  
B. fuel; depletion; power; ground; gas; deposit; waste; plant
- 2) A. to gain; to manufacture; to meet; to plow (plough); to raise; to pump; to deplete; to prevent; to generate; to preserve  
B. electricity; oil resources; erosion; basic needs; goods; fields; value; natural habitat; crop; water

### 2.3. Cross out a word in a line which is different. Number each line according to the headings given below.

|             |             |             |             |
|-------------|-------------|-------------|-------------|
| forest      | bauxite     | soil        | wildlife    |
| sun         | wind        | fossil      | geothermal  |
| iron ore    | sun energy  | copper      | fossil fuel |
| overhunting | overfishing | overlapping | overgrazing |
| abundant    | scarce      | exhaustible | fragile     |
| fertilisers | traces      | sewage      | pesticides  |

1. Overuse of something.
2. Renewable natural resources.
3. Pollutants.
4. Resources that can be depleted.
5. Non-renewable natural resources.
6. Kinds of energy.

### 2.4. Fill in the missing forms of the words.

| Noun        | Verb     | Noun       | Adjective    |
|-------------|----------|------------|--------------|
|             | deplete  |            | hazardous    |
| contaminant |          | scarcity   |              |
|             | increase |            | attentive    |
| consumption |          | efficiency |              |
|             | supply   |            | recreational |

### 2.5. Match the verbs close in meaning in A and B.

- A. bring about; demand; encourage; dispose (of); deplete; concern; gain; rely (on); replace; supply; search (for); prevent; convert
- B. provide; reduce; worry; depend (on); acquire; substitute (for); look for; stop; change; discard; require; stimulate; cause

## 2.6. Make up phrases. Choose right prepositions.

|                     |     |                          |
|---------------------|-----|--------------------------|
| soil rich           |     | granted                  |
| take                |     | the first time           |
| cheaper substitutes |     | salinization             |
| demand              | in  | fossil fuels             |
| look                | for | costly resource          |
| changes             | on  | whale oil rose           |
| result              | of  | the circumstances        |
| depend              |     | hazardous wastes         |
| rely                |     | cheaper substitutes      |
| dispose             |     | the natural landscape    |
|                     |     | humus is usually fertile |

## 2.7. Match the words in A with the words in B to form word combinations.

A. naturally; unevenly; readily; virtually; previously; relatively; commonly; highly; extremely; increasingly

B. cheap; valued resource; important; occurring material; dangerous; recycled materials; available; inexhaustible power source; distributed; unvalued natural materials

## 2.8. Match the words and word combinations with the phrases from 2.7.

Water (for some people); most mineral deposits; mules; uranium ore; natural resources; geopolitics; paper; electricity generated by nuclear energy; sun; nuclear materials.

## 3. Translation into Russian

1. Natural resources are naturally occurring materials that are used to produce goods and services.
2. People use natural resources in many different ways.
3. Energy resources support industrialization.
4. Human innovations help the earth produce more agricultural resources.
5. All places on the earth have advantages and disadvantages for human settlement. A natural resource is a great advantage to a group of people able to use it. Land, soil, and water are examples of natural resources. Other examples include fish, wildlife, vegetation, and minerals. Minerals are inorganic substances found in the earth's crust, such as coal, copper, and iron ore.

6. The use and value placed on the earth's abundant resources are affected by cultural differences, changing technologies, economic factors, and geopolitics. Technological advances have changed the patterns of resource use throughout the world.
7. Some natural resources are renewable — they are replaced naturally and supplies can be used over and over again. Other natural resources are non-renewable — their supplies diminish with use and are not replaced.
8. Both renewable and non-renewable natural resources help people satisfy their needs and wants.
9. Mineral resources are unevenly distributed on the earth. This uneven distribution leads to global interdependence.
10. Energy resources are essential to industrial societies. Coal, oil, and natural gas are non-renewable fossil fuels. Hydroelectricity and solar energy are based on abundant or renewable resources, but each of these alternative energy sources, along with nuclear energy, currently has disadvantages.
11. Industrial societies depend on non-renewable energy sources but are experimenting with other sources such as hydroelectricity, nuclear energy, and solar energy.

## 4. Complementary text

### MINERAL WATERS. HOT SPRINGS. GEYSERS

#### I

**Mineral waters.** As ground water seeps through the soil and rocks, it dissolves small amounts of mineral matter. In limestone regions, the water is "hard", due to the dissolved lime which it contains. Some waters contain enough iron to make it noticeable to the taste. Sulfur waters have the disagreeable odor of bad eggs. In somewhat rare cases the waters of springs contain a quantity of dissolved salts which have medicinal value; such springs lead to the establishment of hospitals and watering places (health resorts), for example, Spa in Belgium, Bath in England, Karlovy Vary in Czech Republic, Baden in Austria. Besides, large quantities of mineral waters are bottled and sold.

**Hot springs.** Hot springs or thermal springs are continuous flows of hot water from the ground usually associated with present or former volcanic activity. Such waters are believed to rise from considerable depths — hundreds of meters — where they have been in contact with heated rocks, due possibly to intrusions of lava. In some instances beautiful formations are built around the mouths of the springs as the water cools and deposits its dissolved mineral matter. Few sights in nature are more



beautiful than terraces formed by the hot springs. Warm mineral waters are very good for health and relieve aches and pains.

**Geysers.** In New Zealand, Iceland, the USA and Russia (Kamchatka Peninsula) there are hot springs of an unusual type, known as geysers. Old Faithful geyser in Yellowstone Park is an excellent example. About every 55 minutes, the water in the crater at the mouth of the geyser tube begins to boil violently, deep rumbling sounds are heard in the earth around, and shortly a huge fountain of hot water and steam is hurled high into the air; this continues for several minutes, then stops. The performance is repeated with clocklike regularity hour after hour. There are about 100 geysers in this park, some spouting (erupting) every few minutes, some at regular intervals of hours or days. Besides the geysers there are some 3,000 hot springs in the park. As you walk about in the geyser basins you hear the rumbling of boiling waters under you, and see jets of steam issuing from crevices all around.

## II

**Mineral water** is spring water containing a high proportion of mineral salts or gases in solution. It consequently may have an action on the human body different from that of ordinary water. As a remedial agent, mineral waters have been used from early times, and were familiar to the ancient Greeks and Romans. They are usually classified as alkaline, saline or iron-containing, sulphurous, acidulous, and arsenical. Many mineral waters are used as table beverages and to dilute spirits or wines. Saline waters are taken for their medicinal effects.

**Hot springs** and geysers are usually found in areas which have experienced volcanic activity in the fairly recent past. In such areas the ground water may be heated by contact with volcanic magma or volcanic gases.

The water produced by hot springs usually contains larger quantities of dissolved minerals than do ordinary springs, because the solubility of minerals often increases as the temperature rises. The minerals often colour the water various shades of yellow and red. When the hot spring water cools at the surface, the minerals are deposited to create a distinct landform feature.

A **geyser** is a more spectacular feature than a hot spring, with the temperature of the water rising to as high as 200 °C. A geyser contains a lot of steam under great pressure, and some of this is released when the geyser erupts. Eruptions occur at regular intervals and the amount of water ejected in a single eruption varies from a few litres to hundreds of thousands of litres.

For example, Old Faithful geyser in Yellowstone National Park emits about 50,00 liters of water to an average height of 50 m. Although not the largest geyser in the park Old Faithful is the most predictable and well-known. Eruptions occur at 45 to 80 minute interval depending on the length of the previous eruption. Geysers are also found in Iceland, in

New Zealand, in Russia and in Italy. In some places only hot gases are issued (emitted) from a vent. Such a feature is called a fumarole.

Make the outlines of the texts above; pick out from the two texts phrases, stating the same idea; compare pairs of word-combinations having the same meaning, e.g.: *geysers hurl water* = *geysers erupt water*, etc.

## 5. Writing

Write the translation of the following text or render its content in English.

### БЕЗОПАСНАЯ ОПАСНОСТЬ

Если обратиться к сухим цифрам статистики, то вполне обоснованно можно сказать, что атомная энергетическая промышленность по сравнению с другими ее видами максимально безопасна. Доля погибших в результате аварийных ситуаций, произошедших на атомных электростанциях, ничтожно мала по сравнению с теми, кто явился жертвой аварий на газовых, гидро- и угольных ЭС. Хотя тот, кто знает, какое количество жертв принес Чернобыль, вряд ли поверит в это безоговорочно. Опять же, если следовать статистике, число погибших, работавших в ту ночь на ЧАЭС, составило 31 человек. Всего же по официальным данным правительств Украины, Белоруссии и России, в той или иной степени, по самым скромным подсчетам, пострадало более 9 миллионов человек. А полное количество жертв — в соответствии со специальным докладом ООН, посвященным оценке влияния аварии на окружающий мир, — можно будет посчитать не раньше 2016 г. Дело в том, что, по утверждению медиков, основной пик массовых индуцированных онкозаболеваний с наибольшей интенсивностью должен последовать через 25 лет после аварии для ее ликвидаторов и через 50 — для жителей загрязненных территорий.

И все же, несмотря на столь ужасающие аргументы, ядерная энергия для жителей Земли является едва ли не самым перспективным видом топлива, особенно в том случае, если произойдет истощение природных запасов угля, газа, нефти и торфа, а такая тенденция наметилась уже в 60 — 70-х годах XX века. А вот запасов радиоактивного урана на Земле достаточно. К тому же этот вид топлива в результате специальной обработки способен воспроизводиться.

Примерно одна тонна природного урана после необходимой обработки способна обеспечить получение 45 000 000 киловатт-часов — это же количество получается при сжигании 20 000 тонн угля и 30 000 000 кубометров газа. При добыче урановой руды вод-

ный экологический баланс Земли, как это ни странно, нарушается гораздо меньше, чем при добыче угля.

С другой стороны, их строительство обходится намного дороже, чем, например, ТЭС или ГЭС. Да и ущерб, причиняемый выбросами и утечками радиоактивных изотопов, настолько велик, а ликвидация его настолько дорогостояща, что это не может не вызывать неоднозначного отношения мировой науки к эффективности использования атомной энергии.

## 6. Speaking

### 6.1. Retell the following text in English.

#### HOW A TINY COUNTRY BECAME RICH

When an English sea captain first saw the Pacific island of Nauru in 1789, he called it Pleasant Island. It was a good name for the coral island. The low cliffs formed a backdrop for the palms along the beach. The people of Nauru probably numbered about 1,000 in 1789. Like other Pacific Islanders they lived by fishing, growing a few roots, and harvesting coconuts and bananas. They made little use of the rocky plateau that covered four fifths of their island. Nothing much grew among the rocks except a few coconut palms.

In 1900 a New Zealander discovered that Nauru's rocky plateau consisted of high-grade phosphate. It is very valuable for fertilizer. A few years later a foreign company began to mine the phosphate rock and ship it abroad. The mining of this tiny island with an area of only 21 square km has continued to the present day. Over the years millions of tons of the island's rocky center have been dug up and exported.

After Nauru became independent in 1968, income from the export of phosphate made it a rich country. Nauruans have never done much work in the mine. Foreign workers do most of the hard labor. Today most Nauruans have other jobs with the mining company or work for the government. They no longer fish — except for fun. They do not depend on coconuts and bananas for food. They import most of their food, along with automobiles, motor scooters, radios, and other manufactured goods. During times of drought they even import water from Australia or Japan. Nauruans pay no taxes, but the government provides free medical and dental care, education, bus transportation, and even copies of the island's only newspaper. The export of phosphate pays for all of this. Nauruans live by the sale of one important resource — the island itself.

The number of people on Nauru has grown with its wealth. Its population in 1900 was probably not much larger than it was in 1789. Today about 8,000 people live on Nauru. This is seven or eight times the

number of people that were there when the English captain first sighted Pleasant Island.

**The change of attitude.** The history of Nauru is unusual. Before 1900 the people of Nauru had very little use for the rocky plateau on their little island. They had no use for the rocks except to make sinkers for their fishing lines. They thought it very strange that outsiders went to so much trouble to dig the rocky dirt on their island. For the people of Nauru in 1900, the rock was not a form of wealth. Today they well understand that phosphate rock is Nauru's greatest wealth, their most valuable natural resource.

The people of Nauru have lived well in recent years by selling their major natural resource. Unfortunately, the supply of phosphate rock on the tiny island is limited. The supply will be used up in the near future. Some day the last scoop of rock will be loaded on board ship, and the mine will be closed. What will happen then? Some islanders are reported to reply with an old saying: "Tomorrow will take care of itself." Fortunately, other Nauruans think that they had better plan today to take care of themselves tomorrow.

The government of Nauru has invested part of the profits from the phosphate abroad. Nauru owns the tallest building in Melbourne, Australia, as well as hotels and other buildings on different Pacific islands. The government hopes that in the future Nauruans will be able to live on the income from foreign investments. Perhaps they will be able to. In any case, they will not be able to depend on phosphate mining much longer.

The Nauruans are not the only people to face the problem of what to do when they have used up a limited resource. The people of the whole world face this problem as they use up more and more of the earth's limited resources.

The world has used a great deal of oil. What will happen as the world keeps using more oil? Some people give the same answer as those Nauruans who say, "Tomorrow will take care of itself." Others believe that we should carefully conserve the oil we still have and that we could develop other resources to take the place of oil.

### 6.2. Give examples you know of the rational or careless use of natural resources.

### 6.3. Select any natural resource, tell how it was used in the past, how it is used today, and what technological developments led to this change in use. Prepare an oral or written presentation focusing on how technological improvements have changed the way the natural resource that you have chosen is used.

## 7. Summarizing the Unit

Make an outline of the Unit and render its content in a 4—6 min talk.



## UNIT 6

### THE WORLD OCEAN

#### 1. Reading and learning

Scan each text and formulate the main ideas. Read the text again carefully and memorize it, then retell the text close to the original.

##### 1.1. THE RESTLESS OCEAN

Oceans, seas, and other bodies of salt water cover 70 per cent of the earth's surface. This vast "world ocean", which is still being explored, forms an important component of the physical environment. It interacts with the atmosphere, affects world climates, influences world trade routes, provides a source of energy, and contains a wealth of mineral and fish resources. In recent years "ownership" of the ocean has become an increasingly important question as nations argue about the rights to use its resources.

If we look at the map we'll see that no continent or island completely blocks one part of the ocean from another part. A series of narrow waterways and other sea passages connect the earth's oceans, forming a single world ocean. Around the edges of this vast world ocean lie seas, gulfs, and bays that extend its waters. Nevertheless different parts of the world ocean have different names. These names were given at various times in history, before people realized there was really only one world ocean.

[The world ocean is usually subdivided into four main oceans — the Pacific, Atlantic, Indian, and Arctic. These oceans can be thought of as components of the world ocean.]

**General ocean circulation.** The amount of water on the earth remains constant. The water cycle continually recirculates water from the ocean to the atmosphere to the earth's surface. At the same time, other forces also move water through the world ocean. The most important of these forces are currents and tides.

Gigantic river-like streams called ocean currents circulate the waters deep within the world ocean. These currents redistribute the sun's heat energy through the ocean in much the same way that the prevailing winds redistribute heat energy through the atmosphere.

Geographers identify two types of ocean currents. Warm ocean currents flow from the equator toward the North and South poles. They carry warm water into cold regions and help make climates milder, especially in winter. Cold ocean currents flow from the poles toward the equator or rise up from the deepest layers of the ocean's water. They

carry cool or cold water into warm regions. As you know ocean currents strongly influence the climates of nearby coastal regions.

Ocean currents do not flow in a direct course due to the earth's rotation. The Coriolis force deflects moving water in much the same way as it deflects the prevailing winds. In the Northern Hemisphere, ocean currents deflect to the right of their intended course. In the Southern Hemisphere, they deflect to the left. This deflection produces a clockwise circulation of water in northern oceans and a counterclockwise circulation in southern oceans.

The Gulf Stream is a warm current in the North Atlantic Ocean. The Gulf Stream originates in the tropical waters of the Caribbean Sea. From there it moves into the Gulf of Mexico and along the east coast of North America as far north as Newfoundland. The warm waters then cross the Atlantic as the North Atlantic Current, bringing mild winters to northwestern Europe.

The cold Labrador Current flows south along the shores of Canada as far as Newfoundland. It carries icebergs with it, and it keeps the coastal regions of northeastern Canada very cold in the winter and cool in the summer. The cold Canary Current flows south on the eastern side of the Atlantic to complete the circulation. Currents in the Pacific Ocean follow the same general pattern as those in the Atlantic.

**Finding hidden flow patterns.** A new technique has enabled oceanographers, scientists who study the ocean, to learn much more than they ever knew before about the circulation patterns of ocean currents. This new technique, called ocean acoustic tomography, provides three-dimensional images of the movement of ocean water.

Preliminary studies indicate that ocean currents are as complex as movements in the atmosphere. Studies also show that the image of a smoothly circulating system of ocean currents is a misconception. In fact, only the surface currents have been mapped, while major deep currents remain hidden. For example, oceanographers have just identified (found) a vast flow of salt water running beneath the Gulf Stream in the opposite direction. This previously unknown flow is a key factor in the processes of the Gulf Stream, which affects the world's climates.

Oceanographers now realize that ocean currents do change and are, to some extent, unpredictable. In addition, currents play a far greater role in determining climate than previously thought. Scientists hope that new information about ocean currents will help them predict major changes in climate conditions in the future.

1. Why are problems with water an international concern?
2. What are the four main components of the world ocean?
3. In what way is it true to say there is only one world ocean?
4. How do ocean currents affect climate?
5. What are the two types of ocean currents?
6. What ocean current was recently identified?



7. In which direction do the ocean currents in the Southern Hemisphere tend to move — clockwise or counterclockwise?

## 1.2. TIDES

**Ocean tides.** Apart from currents ocean water moves in another way. It rises and falls with the tides. On most coastlines, the tide moves slowly out from shore for about six hours. This is low tide. For the next six hours, the tide moves back slowly. This is high tide. Most places along ocean shores have two low tides and two high tides each day. In some parts of the world, the difference between high tide and low tide is as great as 15 m. In others, it is hardly noticeable. The differences between high and low tides in different parts of the world ocean are caused by several things. These are the shape of the coastline; the slope of the continental shelf; and the depth, size, and shape of that part of the ocean.

The tides are produced by the gravity of the moon and the sun pulling on (attracting) the earth. Most of the pull comes from the moon, because it is closer to the earth. As it orbits the earth, the moon is always pulling on the side of the earth nearest to it.

Sailors always check the times of high tide. High tides, when ship channels are deeper, are the best times for oceangoing vessels to enter and leave harbors. Besides, the in-and-out action of tidal waters keeps harbor waters clean.

**Tidal energy.** Incoming tides produce an enormous amount of energy. This power can be used to produce electricity. One experimental tidal energy plant (tidal power plants) is located on the estuary of the River Rance in north-western France. It went into operation in the summer of 1966. The incoming tide of the river flows through a dam, driving turbines, and then is trapped behind the dam. When the tide ebbs (falls), the trapped water is released and flows back through the dam, again driving the turbines and producing electricity cleanly and efficiently from a renewable resource. Such tidal power plants are most efficient if the difference between high and low tides is great, as in the Rance estuary, where the difference is 8.5 m. The highest high tides in the world occur in the Bay of Fundy in Canada, where the difference between high and low tide is about 18 m. The erection of a tidal power plant across an arm of the Bay of Fundy, has long been thought about; however, the project has not yet started.

1. What are the ways in which oceans move?
2. Why do high tides and low tides occur? (What causes ocean tides to form?)
3. What causes the differences between high and low tides in different parts of the world?
4. Why do sailors need information about the height of tides?
5. How is it possible to use tidal energy?

## 1.3. USING THE RESOURCES OF THE WORLD OCEAN

**Mineral resources.** The ocean floor contains a variety of mineral resources. Some valuable minerals simply lie on the ocean floor. Other resources, mainly oil and natural gas, have formed in the rocks of the seafloor. Still other resources, including salt and other minerals, are found in seawater. Scientists believe that the ocean's mineral resources could supplement the decreasing reserves of non-renewable resources on land. At the same time all agree that the ocean's wealth must be conserved so that it can be used by future generations.

Offshore oil fields account for about 20 per cent of the world's oil production today. All known offshore oil fields are located in waters above the continental shelf. Two of the more important fields underlie the Gulf of Mexico and the North Sea. The continental shelf also contains vast supplies of natural gas. Today, there are over 100 offshore natural gas platforms, many of which are located off South Asia. One platform pumps natural gas from an offshore gas field to the refinery near Bombay, India, through a pipeline.

Ocean water contains traces of all the minerals found on land. These minerals, which exist in the water in the form of salts, account for seawater's salinity, or salt content. If all the water in the world ocean were dried up, the salts would form a layer on the ocean floor 152 meters thick.

**Fishing resources.** The world ocean makes up the largest biological environment of our planet. Marine biologists continually discover new species of life as changing technology allows them to probe deeper and deeper into the world ocean. Each form of life is a part of a complex process in which small plants and animals provide food for larger animals living in the sea. Microscopic plants and animals called plankton make up the bottom of the food chain.

The best fishing grounds (banks) for many kinds of fish are those rich in plankton. Large numbers of plankton concentrate in these fishing grounds because they have cooler water flowing through them or coming up from deeper levels. They are also shallower places in the sea, where sunlight can penetrate below the surface. The richest fishing banks are found off the coast of Newfoundland in North America, along the west coast of South America, in the North Sea, and off the coast of Asia in the Pacific Ocean.

Fishing ranks among the world's most important economic activities. Over 5 million people make their livings by fishing. And even more people process, package, and sell fish. The total fish catch each year is enough to supply about 18 kg of fish for each person in the world. About half of this fish catch comes from the Pacific Ocean. The Atlantic Ocean provides about one third of the total.

Most fishing today is done on a large scale, using fleets of ships equipped with machines that do much of the work. Some countries, Japan and Russia, for example, send out fishing fleets that often stay at



sea for two hundred days at a time. The boats in these fleets are equipped with machinery that lowers and raises nets. Refrigerating equipment freezes the tons of fish, keeping them fresh for processing. Some fleets even have ships that do part of the processing at sea. Helicopters and electronic equipment are often used to locate schools of fish.

Using this modern equipment, most fishing nations increase their fish catches each year. In one way, this is good. More food is needed to keep up with growing populations. But in another way, it is bad. The ocean world is in danger of being overfished. Fish are being taken from the oceans faster than they can reproduce themselves.

Today many people are working to protect this vital resource. Several international laws have been created to regulate the use of the world ocean and avoid disputes among countries. Several nations, for example, have signed the Law of the Sea Treaty, sponsored by the United Nations.

1. What are some of the resources of the ocean world?
2. What minerals are found in the ocean floor?
3. What are the steps of the ocean food chain?
4. How is overfishing related to the expansion of territorial limits?
5. What steps do you think nations can take to reduce overfishing?

## 2. Lexical and grammatical exercises

2.1. Match the words in A with the words in B to form word combinations.

- 1) A. hardly; smoothly; usually; universally; strongly; previously; efficiently; increasingly  
B. produced; sub-divided; unknown; noticeable; influenced; accepted; important; circulating
- 2) A. prevailing; electronic; clockwise; preliminary; three-dimensional; flow  
B. winds; circulation; images; studies; pattern; equipment

2.2. Underline one word in each line that is different. Explain your choice.

|           |             |          |              |
|-----------|-------------|----------|--------------|
| sea       | edge        | bay      | gulf         |
| pattern   | tide        | wave     | current      |
| vast      | enormous    | tiny     | immeasurable |
| narrow    | wide        | thin     | limited      |
| crude     | refined     | rough    | raw          |
| severe    | harmless    | smooth   | mild         |
| deep      | bottomless  | shallow  | abyssal      |
| nearby    | distant     | close    | neighbouring |
| necessary | avoidable   | required | vital        |
| make up   | account for | form     | constitute   |

2.3. Rearrange the letters in the anagrams to form equivalents for the Russian words.

|                         |  |
|-------------------------|--|
| простирать(ся) — eenxtd | нефтеперегонный завод — finerrey       |
| сохранять — servenoc    | неверное представление — mioiscconeptn |
| суровый — versee        | трубопровод — pilinpee                 |
| флотилия — felet        | замораживать — zereef                  |
| структура — pteratn     |  |

2.4. Match the verbs in A with their opposites in B.

- increase; destroy; dry; lower; warm; pull; find; release; fall; leave; waste
- soak; push; erect; freeze; hide; raise; rise; decrease; enter; conserve; trap

2.5. Match the words close in meaning in A and B.

- affect; distribute; realize; produce; contain; avoid; account for; penetrate
- influence; divide; explain; include; escape; get inside; generate; be aware (of)

2.6. Match each of the following terms with the correct definition.

a) *ocean acoustic tomography*; b) *rift*; c) *food chain*; d) *continental shelf*; e) *abyssal plain*; f) *Coriolis force*; g) *oceanographer*; h) *strait*

1. Narrow body of water linking large bodies of water.
2. Technique that provides a three-dimensional image of water movement.
3. Scientist who studies the ocean.
4. Edge of a continent extending beneath the ocean.
5. Wide crack in the oceanic ridge.
6. Deepest part of the ocean.
7. Complex feeding system that nourishes sea creatures.
8. Effect produced by the earth's rotation that deflects winds and currents to the right of their course in the Northern Hemisphere and to the left in the Southern Hemisphere.

2.7. Find nouns in the text and explain the use of the definite, indefinite and 0-articles.

### Pollution of the world ocean

The ocean has long served as a dumping ground for waste products. Today the effects of this long-term dumping are becoming increasingly obvious. The water in many areas is now too polluted for fish to survive. Oil spills from drilling rigs and ship collisions pollute the ocean. The dumping of industrial and other wastes far out at sea adds to the problem.

Pollution of the ocean concerns all nations. Some pollutants are easily broken down by natural means, and are harmless to the sea. Other pollutants, however, enter the ocean's food chain, where they remain for years. In addition, ocean currents carry pollutants far from where they originally entered the water. For example, the pesticide DDT has never been used in Antarctica. Yet scientists have discovered its presence in the livers of penguins and seals living in Antarctic waters.

### 3. Translation into Russian

1. Oceans, seas, and other bodies of salt water are interconnected, forming a single world ocean that is usually divided into four main parts — the Pacific, Atlantic, Indian, and Arctic oceans.
2. The world ocean helps determine climate and shapes landforms.
3. The waters of the ocean are in constant motion. The most important movements are caused by the circulation of ocean currents and by tides.
4. Generally ocean water moves because its different parts have different temperatures. Just as some parts of the earth's land surface are colder than others, so some parts of the world's ocean surface are colder than others. These differences in water temperatures bring about a general mixing, or circulation, of ocean water.
5. Spectacular landforms, including the continental shelf and slope, the oceanic ridge, oceanic trenches, and the abyssal plains, lie beneath the ocean.
6. Ocean waters hold a wealth of food resources. They are part of a complex food chain built on plankton.
7. Over 5 million people make their livings by fishing.
8. One tidal power plant has already been built in France.
9. Many problems, such as territorial disputes, overfishing, and pollution, cloud the future use of the world ocean. Such problems arise from the absence of universally accepted rules governing ownership of the ocean and its resources.
10. The world's nations recognize the ocean's importance and are continually seeking solutions to territorial disputes and other potential problems.

### 4. Complementary texts

#### OCEAN SHIPPING

The ocean world does more for people than just make water cycle work and influence weather and climate. Many ships travel on it, carrying people and goods from one to another of the world's many ports.

In the past, people have traveled and carried goods over the oceans and seas in rafts, in reed boats, in canoes, and in wooden boats with wind-driven sails. In recent times, diesel motors have replaced steam engines. Steel ships have replaced wooden ones. Length has increased and so has size. Today there are ships for carrying passengers, ships for carrying grains or ores, refrigerated ships for carrying fruit and meat, container ships that carry prepackaged goods for easy loading and unloading, and supertankers for carrying petroleum. Ships have radar and other kinds of navigational aids. They have machines that do the work of loading and unloading goods.

Even with these improvements, ocean shipping still has problems. And many of them have to do with size. Their larger sizes make ships more difficult to navigate through narrow or dangerous waters, increasing the risk of accidents, such as oil spills. Ships carrying larger and heavier loads ride lower in the water. They need deeper channels to enter and leave harbors. These needs often limit the number of ports at which these ships can dock. They also limit their use of the Suez Canal, the Panama Canal, and the St Lawrence Seaway.

The Suez Canal links the Mediterranean and Red seas, shortening the journey between European countries and Asia by thousands of miles. Since it opened in 1869, it has been enlarged several times.

The Panama Canal links the Atlantic and Pacific oceans. The task of modernizing the canal, which opened in 1914, is so great and so costly that serious thought has been given to constructing a new canal at another location. Whether this will ever be done depends on shipping needs and on world politics.

The St Lawrence Seaway opened in 1959. It extends from the mouth of the St Lawrence River to the western end of the Great Lakes. From about the middle of November to early April, the waters of the seaway are frozen solid. This is probably a greater disadvantage than the size of its locks, none of which can hold the largest vessels.

#### COLON AND PANAMA CITY

Colon and Panama City have special locations. Colon lies at the Caribbean opening of the Panama Canal. Panama City lies at the canal's Pacific opening.

**Colon.** Since 1953 Colon has had a free trade zone. In this zone goods can be imported and exported without payment of duties, or taxes on imports and exports. The free trade zone has created an economic boom for the city.

More than 300 export and import firms now operate in the free trade zone, making Colon a center of activity. Trading vessels constantly sail into and out of port. Industry also has started to grow. For example, a petroleum refinery on Las Minas Bay, just 8 kilometers east of Colon,



refines crude oil imported from Venezuela. The refinery meets all of Panama's oil needs and exports petroleum products to other Central American nations.

Besides all this activity, a steady line of ships from all over the world anchor off Cristobal, a town just south of Colon, waiting for their turn to proceed through the canal. As a result, Colon's streets are always crowded with merchants and tourists inspecting the duty-free bargains that fill the windows of the city's shops.

**Panama City.** Even though its location on the canal also brings Panama City much activity, its tone differs. As the capital of Panama, it is much larger than Colon and is marked by impressive government buildings and skyscrapers. Parks with well-tended flowerbeds and pleasant walkways stretch along its waterfront.

Panama City, like Colon, attracts visitors and business people from all over the world. Yet Panama City's role as an international urban center is not limited to its port. The Pan-American Highway links Panama City with the rest of Panama as well as with the other Central American nations and Mexico to the north. A towering bridge over the canal brings the highway into the heart of Panama City.

**Site and situation.** The sites of these two cities are special because of their ties to the canal. The canal, in turn, provides the cities with a special urban situation. The flags of ships from all over the world flutter in the tropical breezes over Colon and Panama City as the ships enter or exit one of the most important waterways on earth — the Panama Canal. Few cities located only 80 kilometers apart have such far-reaching influences as Colon and Panama City.

## 5. Writing

Write the translation of the following text or render its content in English.

### ЧУДЕСА И ТАЙНЫ ОКЕАНСКИХ ГЛУБИН

Крошечный батискаф под названием «Элвин» с двумя учеными и штурманом на борту погружается в глубь Тихого океана недалеко от берегов Эквадора. Какова цель экипажа? Куда они направляются? К месту, которое называют Галапагосским рифтом. «Элвин», оснащенный прожекторами, фотоаппаратурой и множеством приборов для научных исследований, сквозь почти трехкилометровую толщу воды опускается в царство вечного мрака, которое до сих пор оставалось недоступным для людских глаз.

Начиная с 1977 года, когда «Элвин» впервые отправился исследовать морские глубины, с помощью батискафа был сделан целый ряд удивительных открытий. Даже опытные исследователи чув-

ствовали себя так, словно обнаружили жизнь на другой планете. Задачей «Элвина» было отыскать гидротермальные источники — подводные гейзеры, выбрасывающие в океан потоки горячей воды. Галапагосский рифт в этом отношении представляет собой немалый интерес, поскольку является частью зоны с высокой вулканической активностью. Подводный рифт примыкает к сложной горной цепи, протянувшейся по дну всего Мирового океана. Ее называют глобальной системой срединно-океанических хребтов. Эта громадная гряда протяженностью более 65 000 км, подобно шву теннисного мяча, опоясывает всю планету. Если бы ее не покрывала толща воды, эта гряда, занимающая пространство более обширное, чем все основные наземные горные системы, вместе взятые, была бы, несомненно, доминантой рельефа планеты.

Одна из основных особенностей системы срединно-океанических хребтов заключается в том, что, по сути, это парная система: две гряды тянутся параллельно друг другу, возвышаясь на 3000 м над средним уровнем океанического ложа. Между этими грядами пролегают глубочайшие на планете подводные желоба, или ущелья, достигающие 20 км в ширину и 6 км в глубину, что в четыре раза глубже Большого Каньона в Северной Америке. Дно этих ущелий рассечено трещинами, с которыми связана высокая вулканическая активность. Когда ученые начали изучать Срединно-Атлантический хребет — часть системы срединно-океанических хребтов, лежащую в пределах Атлантического океана, — показания приборов свидетельствовали о такой вулканической активности, что, по словам Яна Эриксона, автора книги «Морская геология» (Marine Geology), «казалось, будто недра Земли выходят наружу».

После 90-минутного погружения «Элвин» стал двигаться горизонтально, непосредственно над морским дном. Были включены прожекторы. Не удивительно, что исследователи почувствовали себя как на другой планете! Лучи прожектора высветили несколько теплых источников на дне океана — там, где температура воды обычно близка к нулю. Рядом можно было увидеть нечто еще более необычное — целые сообщества прежде не известных науке живых существ.

Через два года в области срединно-океанического хребта недалеко от берегов Мексики экипаж батискафа обнаружил сверхгорячие источники. Некоторые из них напоминали призрачные дымовые трубы, достигающие в высоту 9 м. В том районе были найдены многие виды животных, обитающих близ Галапагосского рифта.

## 6. Speaking

6.1. Read the text about Tromelin Island. State your opinion regarding which country you think should have the territorial rights to the island.

## TROMELIN ISLAND

Tromelin Island is located off the east coast of Africa in the Indian Ocean, east of Madagascar and 480 km (300 miles) north of Mauritius. It has a few coconut palms and a weather station, but no drinking water and no inhabitants. Once important for the harvesting of bird droppings, from which fertilizer is made, Tromelin has little economic value today. Nevertheless, the pear-shaped piece of sand that measures less than 1.6 km by about 1 km is the center of an international dispute.

**Ownership claims.** France, Mauritius, Madagascar, and the Seychelles all claim Tromelin as part of their national territory. France presently governs Tromelin as part of the Reunion Islands, a French possession since 1638. Neighboring Mauritius claims Tromelin as well as the rest of the Reunion Islands. Mauritius was itself part of the Reunion group before gaining independence in 1968. Madagascar, the nearest nation geographically to Tromelin, insists that Tromelin and the four other uninhabited islands of the Reunion group were part of Madagascar long before the French arrived. The Seychelles also makes a claim based on geography, stating that Tromelin belongs to it as part of the Seychelles-Mauritius Plateau under the sea.

**What's at stake?** At first glance a territorial dispute over such an insignificant island seems ridiculous. In today's world, however, it appears that the nation that owns Tromelin can claim ownership of a 200-mile (320-kilometer) exclusive economic zone around the island. This claim will give the successful claimant the ownership of fishing rights and mineral resources of seafloor around Tromelin.

**No settlement in sight.** No settlement of the dispute is in sight, although the United Nations seeks to prevent scrambles for islands such as Tromelin. As early as 1967 the United Nations General Assembly voiced concern over potential conflicts arising from territorial sea claims. A series of UN actions led to the Third Law of the Sea Conference in 1973. At this conference general agreements were reached on a number of ocean-related issues. These agreements eventually led to the adoption of the Law of the Sea Treaty in 1982. That treaty grants ownership of territorial sea only to islands capable of sustaining life or economic activity. Of course, only nations signing the treaty feel obliged to abide by its laws. France refuses to sign the controversial treaty, so it is not bound by any of decisions made by the United Nations based on the treaty.

6.2. Find material and give a talk about other territorial disputes based on geography.

## Summarizing the Unit

Make an outline of the Unit and render its content in a 4—6 min talk.

## PART II

# SOCIO-ECONOMIC GEOGRAPHY

## UNIT 7

### THE WORLD CULTURES

#### 1. Reading and learning

Scan each text and formulate the main ideas. Read the text again carefully and memorize it, then retell the text close to the original.

#### 1.1. WORLD CULTURES: UNITY AND DIVERSITY

Landforms, climate, weather, vegetation, resources, and the world ocean make up parts of the earth's physical environment. However, the study of geography involves much more than a study of the earth's physical features. Just as important is a study of the earth's various cultural features. Every human group leaves a distinct imprint on the earth. The earth's cultural variety finds expression in different population trends, social characteristics, political systems, and economic systems.

Humans can be divided into many ethnic groups — that is large groups of people who have more in common with each other than they do with other peoples. Some ethnic groups differ physically from others. However, all humans are born with certain physical differences. They differ in height, skin, eye and hair color, features of the face and other ways. Often there are no overall physical differences between one ethnic group and another. Other differences between human groups are differences in culture.

Culture is the sum of what a human group acquires through living together, including language, knowledge, skills, art, literature, law, customs, and life styles. When studying about a group's culture, it helps to divide cultural characteristics into two categories — material culture and nonmaterial culture. Material culture includes all the physical objects that people make. Examples of material culture include buildings, clothing,



tools, paintings, etc. The ideas of a society — expressed in its language, values, political and economic systems, and so on — make up its nonmaterial culture. Both material and nonmaterial culture tell us a great deal about a society's way of life.

In spite of the differences all human cultures have found the same general ways of living on the land. They have developed some kind of clothing, shelter and methods of preparing food. They all have a spoken language — even though it differs from place to place. Nearly all human groups have developed some kind of art, music, and religion.

**Language.** Both spoken and written the language makes it possible for people to communicate with each other. Scientists have identified over 3,000 different languages in the world today. Some languages are spoken by relatively small numbers of people. Other languages are spoken by millions of people. They include English, which is the official language of many countries around the world. Most of these languages began in one area and then spread to other parts of the world.

Scholars believe that the thousands of languages spoken today develop from a few common languages. As early people migrated throughout the world and lost contact with other groups, different languages evolved. Languages that have the same origin are called language families. The two largest language families in the world today are the Sino-Tibetan family, spoken mainly in Asia, and Indo-European family, of which English is a part.

Even though most speakers of different languages within the same language family cannot understand each other's languages, certain words are similar. The English word *sister*, for example, resembles the word for sister in several other Indo-European languages. The French *soeur*, the German *schwester*, the Italian *sorella*, and the Russian *sestra* reflect common origins.

Language is never static. It always changes and develops. Changes in languages can take place over a relatively short period of time. The most notable recent additions include terms related to technological advances, such as the words *computer chip* and *software*.

**Art.** Like language, art could vary from place to place. Eskimos would carve a face on a piece of driftwood to be used as a fishing float. For a ceremonial dance, West Africans would carve a mask out of wood and decorate it with copper. American Indians would wear ornaments they made out of shells, feathers, and animal bones. The objects out of which different peoples made their art depended on local resources. But the designs could come from people's imagination.

From the tropics to the tundra, humans looked up at the sky and wondered where the stars came from, and what would happen when they died. As each group faced these questions, it began to develop its own religion.

**Cultural regions.** Geographers divide the world into several cultural regions, or areas in which the people share similar cultural characteristics.

They identify the cultural regions of the world in many different ways. The following list reflects one way accepted by geographers — Anglo America, Latin America, Europe, North Africa and the Middle East, Africa South of the Sahara, South Asia, East Asia, Southeast Asia, and Oceania.

1. Why is culture studied by geographers as well?
2. What are the main cultural characteristics?
3. How did different languages evolve?
4. What do the different religions of the world have in common?
5. How do geographers divide the world into cultural regions?

## 1.2. POLITICAL BOUNDARIES AND GOVERNMENTS

The "borders" between cultures usually, but not always, coincide with political boundaries between countries. To illustrate, we can speak of the Japanese culture, the Mexican culture, and the French culture. Today political boundaries divide the world into more than 160 different nations.

**Political boundaries.** They usually follow physical landforms on the earth. The high Andes Mountains, for example, divide Peru from Brazil and Chile from Argentina. The Rhine River forms part of the border between France and Germany. Other boundaries, however, do not follow physical features. The long border between Canada and the western United States, drawn along the 49° N latitude line, cuts across many different landforms.

Many political boundaries separate groups of people with different cultures. The border between Spain and France, for example, separates the Spanish people, with their distinctive culture and language, from the French people, who have their own traditions. In other cases, however, the boundaries are arbitrary lines that include several different, and often opposing, groups. Many boundaries in Africa, for example, were drawn by Europeans, who ruled much of that part of the world until the mid-20th century. Such countries often have serious difficulties because so many different groups are within their borders.

**Size and shape.** Some countries span (extend across) continents and cover several different time zones. Others are so tiny that a person can walk across them in a single day. Geographers call such small countries microstates. Years ago size was a measure of a country's pride. Wars were fought to acquire more land and to add to a country's prestige. However, big does not always mean better. Large countries are more likely to have a large workforce and an adequate supply of natural resources. Yet they face potential problems concerning food supplies, defense, transportation, communication, and political unity.

Countries vary not only in size but also in shape. Political geographers often classify nations according to their shape, or spatial form. Two of the most common classifications they use are compact nations and fragmented nations.



Compact are nations that have generally round or rectangular shapes and land areas not separated by large bodies of water or by the territory of other countries. In a compact nation all points on the country's borders lie about the same distance from the geographic center of the country. This makes communication and transportation easier. Examples of compact nations include Poland, Uruguay, and Kenya.

Fragmented are nations that have land areas that are geographically separated from other parts of the country. New Zealand, which occupies several islands in the South Pacific, is one example of a fragmented nation. Other examples include Italy, Indonesia, and Japan. Alaska and Hawaii, which are geographically separated from the rest of the United States, make it a fragmented nation. Fragmented shapes make communication and transportation more difficult than in compact nations. In fact, some fragmented nations have had such serious breakdowns in communication that they eventually divided into two or more countries. East and West Pakistan, for example, originally were part of the same country. Communication and government administration were difficult because the two parts of the country were thousands of miles apart, separated by India. Finally, in 1971 the people of East Pakistan revolted and formed their own nation — Bangladesh.

1. How are political boundaries drawn?
2. What different purposes do political boundaries serve?
3. Is Russia a fragmented or a compact nation? Why?
4. Why is communication and transportation easier in compact nations?

### 1.3. WORLD NATIONS AND ECONOMIC DEVELOPMENT

The economic features of a country — the way it produces, distributes, and exchanges goods and services — form an important part of its life. Economic geographers study economic patterns to understand how countries meet the needs and wants of their people.

**Levels of economic development.** The countries of the world today reflect a wide range of economic development. Some countries are highly industrialized, producing a variety of goods and services. Other countries have one-crop economies that specialize in the production of one or a very few products. Most often agricultural products or raw materials make up these goods. Such specialization leads to instability because the whole economy depends on the world price of a single good. The Ivory Coast, for example, depends on coffee production. If the price of coffee remains high, its economy grows. If the price drops the economy suffers.

The level of development of a country's economy largely depends on natural resources or raw materials, human resources or labor, and capital

resources. Natural resources that are especially important to a nation's economy are its fossil fuels, minerals, trees, and water. Human resources include a country's workers. Capital resources include the money, tools, equipment, and inventory used in the production process.

A country lacking any one of the factors of production finds it difficult to reach a high level of economic development. Without energy resources, for example, a country lacks the power needed to run factories. A country without a skilled workforce or technical equipment may be unable to support heavy industries.

Economic geographers divide the countries of the world into two broad categories — developed and developing nations. Each country's level of economic development forms the basis of its classification.

**Developed nations.** They are highly industrialized nations with high standards of living. Today only about 30 of the world's countries, or about 35 per cent of the world's people, fit this category. These nations, which include the United States, Canada, and most countries of Western and Eastern Europe, use advanced technology to make their systems of farming, manufacturing, and distribution highly productive. They also have highly skilled workers and good educational systems.

International trade accounts for (explains) much of the wealth of developed nations. They import goods they lack and goods they cannot produce as cheaply as other countries. They export surplus goods and goods they can produce more efficiently than other countries.

Developed nations offer most of their citizens adequate food, clothing, and housing. Their governments also offer such services as fire and police protection; transportation and communication systems; schools, libraries, and museums. In general, the people have a high standard of living.

Economic geographers often use per capita gross national product to determine a country's standard of living. You can figure per capita gross national product, or per capita GNP, by dividing the total dollar value of all goods and services produced in a country by the number of people living in the country. The per capita GNPs of developed nations tend to be high.

**Developing nations.** Economists classify more than 130 countries of the world today as developing nations. Developing nations feature agricultural economies and traditional life styles. These countries have little or no industry. Some lack the energy resources to power factories. Others lack money to develop the resources they have. As a result, developing nations must depend on the countries of the developed world to satisfy all or part of their needs and wants.

The per capita GNPs of developing nations tend to be low. Although some developing nations have several large cities, overcrowding, inadequate housing and sanitation, and unemployment present serious problems. Most of the people in developing nations live in rural parts of the country and depend on subsistence agriculture. The literacy rate, or the percentage of people who can read and write, is low. Usually, there are few workers with specialized training.



Most developing nations have high birth rates and declining death rates. As a result, their populations grow rapidly. Often, developing nations cannot feed, educate, or care for their people. In Ethiopia and Bangladesh, for example, the growing population strains resources (uses them beyond reasonable limits) and contributes to the outbreak of famine.

1. What is the main economic division of the world?
2. What two categories describe the levels of economic development of the nations of the world? What are the characteristics of each?
3. What hampers (slows down) economic growth in developing nations?

## 2. Lexical and grammatical exercises

2.1. Make up sentences by combining the lines from the columns. Put the verbs from the second column into the passive.

|                           |          |   |
|---------------------------|----------|---|
| Humans can                | draw     | by Europeans.                           |
| Some languages            | fight    | by relatively small numbers of people.  |
| Alaska and Hawaii         | separate | into many ethnic groups.                |
| Wars                      | divide   | to acquire more land.                   |
| Many boundaries in Africa | speak    | geographically from the rest of the US. |

2.2. Match the words in A with the words in B to form word combinations.

- A. highly; eventually; increasingly; comparatively; extremely; geographically; relatively; virtually; commonly; previously
- B. small; cheap; divided; important; separated; dangerous; valued resource; recycled materials; unvalued natural materials; inexhaustible power source

2.3. Make up sentences by combining the lines from the columns.

|            |           |  |
|------------|-----------|--|
| Some       | countries | have little or no industry.                              |
| Large      |           | vary not only in size but also in shape.                 |
| Most       |           | cover several different time zones.                      |
| Developing |           | are highly industrialized.                               |
| Developed  |           | are likely to have adequate supply of natural resources. |
|            |           | of Western and Eastern Europe use advanced technology.   |
|            |           | are highly industrialized with high standards of living. |

2.4. Fill in the gaps with one of the following: *other; the other; others; another*.

1. Some ethnic groups differ physically from one \_\_\_\_\_.
2. \_\_\_\_\_ differences between human groups are differences in culture.
3. \_\_\_\_\_ are so tiny that a person can walk across them in a single day.
4. Most of these languages spread to \_\_\_\_\_ parts of the world.
5. \_\_\_\_\_ lack money to develop the resources they have.
6. Sometimes the details of a ceremony in one group are very similar to those of \_\_\_\_\_ group.

2.5. Make up sentences by combining the lines from the columns.

|                                    |          |                                  |
|------------------------------------|----------|----------------------------------|
| Most developing nations have       | high(ly) | standards of living.             |
| Developed nations are nations with |          | industrialized.                  |
| Developed nations have             |          | birth rates.                     |
| Some countries are                 |          | its economy grows.               |
| If the price of coffee remains     |          | productive manufacturing system. |

## 3. Translation into Russian

### rites of passage

In the past the oceans and the land could act as barriers to people. Through most of human history, there were no easy ways of crossing those barriers. Most people did not travel much, or very far. They had little or no contact with people outside their own small area. They did not always know what their neighbors 15 km away looked like. At the same time many nations have similar traditions and even ceremonies. What could have caused this similarity between groups often living far apart? One reason is the fact that all humans belong to the same family called *Homo sapiens* (Latin for "thinking human").

Sometimes the details of a ceremony in one group are very similar to those of another group. Thus, for example, nearly all human groups have held special ceremonies for young people becoming adult. To help young adults cope with their changing role in life, society develops special ceremonies or events called rites. Perhaps the most important of these rites are rites of passage. Of the many role changes you undergo, the change from youth to adulthood is one of the most important. You take on the responsibilities and rights reserved for the adults in your

society. Rites of passage signify to you that change is taking place and new things are expected of you.

A variety of ceremonies accompany the change to adulthood. Some of them carry religious meanings. Others, such as getting a driver's license or graduating from high school, are civil matters. Still others, such as marriage, can have both religious and legal significance. But all have the same purpose — to let you know you are entering adulthood.

In Africa life revolves around family and tribal traditions. African traditions usually feature more rites of passage for boys than for girls, partly because in earlier times boys had to prove they were ready for the adult responsibilities of being a hunter or warrior. How boys prove their manhood varies from tribe to tribe. One tribe may require a boy to prove his hunting skill, another — his bravery, and another his endurance. A young Masai boy in Kenya, for example, must prove his courage by grabbing a wild lion by the tail.

Many of these rituals remain a vital part of African culture. Boys in many West African tribes must prove they are ready to protect their families and their tribes. To prove this, a boy must kill a wild beast without help from anyone. Warriors escort the boy to the edge of the dense jungle, but he enters it alone. He carries only a bow, one arrow, and a knife dipped in poison. On his own he must select a worthy animal as his quarry, track it, and kill it. He returns to the tribe as a man only if he brings proof of his kill. The more dangerous the animal he kills, the greater is his prestige. Such a test of manhood is dangerous. Some boys never return. Yet tribal members have accepted such a test for centuries. They believe that it is better to die fighting than never to know you are brave. And when the time comes, all boys are eager to prove themselves.

#### 4. Complementary text

##### THE GYPSIES

Brightly painted wagons, colourful costumes, and wild violin music are part of a culture unique in the world. The culture belongs to bands of nomads who owe allegiance to no government. This is the culture of the Gypsies, also called Romanies. Although Gypsies live on every continent except Antarctica, they remain concentrated in the nations of Eastern Europe. Population geographers have had a difficult time taking a census of the Gypsies.

**Gypsy origins.** Gypsy origins remain shrouded in mystery. The Gypsies language, Romany, is an offshoot of Sanskrit, the ancient language of India. Because of this link, scholars have theorized that Gypsies trace their descent to people who originally lived in India. For unknown reasons the Gypsies began migrating to Europe thousands of

years ago. By the 1600s Gypsies lived in Europe and North America, and even in the Americas.

**Gypsy society.** Gypsies usually live in bands of from 10 to several hundred families. A chief, elected for life, heads each band and governs with the help of a council of elders. The entire band shares the responsibility of raising the group's children. Such an upbringing gives the children a sense of loyalty to the band and helps to explain why Gypsies seldom leave the band into which they were born. Gypsies depend on cooperation among band members. Taking advantage of another Gypsy is considered dishonorable.

**A history of discrimination.** As have many nomads, the Gypsies have suffered discrimination from people through whose domains they pass. They have been accused of bringing bad luck, being the source of disease, and of lying and cheating. Persecution reached its height during World War II when German Nazis imprisoned and executed more than 500,000 Gypsies.

**Gypsies today.** Although some Gypsies have given up their nomadic life style and settled in various countries, many still follow traditional ways. As they travel through the countryside, they earn their living as migrant agricultural workers and performers, fortune-tellers, or entertainers.

However, the traditional life style of the Gypsies is rapidly disappearing. Increasing urbanization, political tensions, and the policies adopted by many national governments are forcing Gypsies to give up their nomadic life style and find permanent jobs.

#### 5. Writing

Write the translation of the following text or render its content in English.

##### КОЛИЧЕСТВО И ГРУППИРОВКА СТРАН

В настоящее время на политической карте выделяется около 230 стран и территорий. Более 190 из них являются суверенными государствами, обладающими самостоятельностью во внутренних и внешних делах.

Страны группируются по различным признакам. Чаше других используются классификации стран по величине их территории, численности населения и по особенностям их географического положения.

По размерам территории выделяются семь самых больших стран, площадью свыше 3 млн. км<sup>2</sup> каждая, которые в совокупности занимают около половины всей земной суши. Это Россия, Канада, Китай, США, Бразилия, Австралия, Индия.



По численности населения выделяют десять самых больших стран, с числом жителей более 100 млн. человек в каждой. На них в совокупности приходится 60 % населения земного шара. Это Китай, Индия, США, Индонезия, Бразилия, Россия, Япония, Пакистан, Бангладеш, Нигерия. На политической карте мира преобладают средние и небольшие страны. Наиболее маленькие страны называют микросоударствами (Лихтенштейн, Люксембург, Монако).

По особенностям географического положения страны разделяют на приморские, полуостровные, островные, страны-архипелаги. К последней группе относят Японию, Индонезию, Филиппины. Особо выделяют страны, лишенные выхода к морю. Это затрудняет использование этими странами морских торговых путей и ресурсов Мирового океана. Всего таких стран 36.

## 6. Speaking

### 6.1. Retell the following texts in English.

#### RELIGION

Apart from languages and art, religion makes up a part of a group's nonmaterial culture. Every culture in the world has religion in one form or another. In most cultures religion is a set of beliefs in a supreme being or beings. In general religions give people a model for human behavior. Most include the idea that good behavior will be rewarded and that bad behavior will be punished. Often a trained group of religious leaders leads the people in religious observances. Priests, ministers, and rabbis, for example, conduct weekly services and preside at confirmations, baptisms, weddings, and funerals.

Religion affects many aspects of daily life. In the United States, for example, many workers have Sundays off because that is the traditional day of Christian church services. In Israel, a Jewish country, most workers have Saturdays off because Saturday is the Sabbath, or day of rest.

Three major world religions — Christianity, Judaism, and Islam — began in the Middle East. From there they spread to other parts of the world. Two of the world's religions, Hinduism and Buddhism, began in ancient India and most of their followers live in Asia. Confucianism remains largely confined to China and Japan.

#### HOLY CITIES

Many of the world's religions hold certain places holy. Two of the most important holy places are Jerusalem and Mecca. Jerusalem is

sacred to three great religions — Christianity, Islam, and Judaism. Mecca is the sacred city of Islam.

**Jerusalem.** For 2,000 years Christian pilgrims have flocked to Jerusalem's Church of the Holy Sepulchre, erected near the site of Jesus' crucifixion. Beyond this site lies the Via Dolorosa, or the Way of the Cross, the route that Jesus followed on the way to his crucifixion. The city also holds many other sites sacred to Christians.

For the Muslim faithful Jerusalem contains the magnificent golden Dome of the Rock, Islam's oldest religious building. Muslims believe that Muhammad ascended into heaven from the mosque's site. Nearby stands the silver-domed El Aqsa Mosque, the third holiest mosque in Islam.

Followers of Judaism find faith and unity in another sacred symbol — the Wailing Wall, or Western Wall. The wall marks the remains of the Jewish Temple that Roman soldiers destroyed in A.D. 70. The wall's name comes from the tears and prayers that Jewish pilgrims offer as they remember the sad events in their proud history and mourn the destruction of the Temple.

Jerusalem today is the capital and largest city of Israel. The Israeli government is very conscious of the city's special place in the world. To protect its holy places Israel imposes a seven-year prison sentence on anyone who attempts to damage any religious site. In addition, anyone who tries to prevent someone from entering a holy place can be imprisoned for five years.

**Mecca.** Quite unlike Jerusalem, which has holy significance to three of the world's great religions, Mecca has religious significance mainly for Muslims. Only Muslims may enter Mecca, the holiest city of Islam.

Muhammad was born in Mecca. Also the city is the site of the Kaaba, the shrine toward which all Muslims turn during their prayers. Islam requires all Muslims to make the pilgrimage to Mecca, at least once in their lifetime if they are able to do so. A pilgrimage must be made between the eighth and thirteenth days of the last month of the Muslim year. During those five days more than 1 million pilgrims pour into the city. Approximately half of the pilgrims come from Saudi Arabia. The other faithful come from all over the world.

Since the 1950s the Saudi government has spent great sums to modernize Mecca. Today modern hotels house the pilgrims, and hospitals and clinics provide health care.

The special importance of Jerusalem and Mecca gives each a vitality. Visitors and residents alike feel the unique energy of these two holy cities.

6.2. Prepare a 3—4 min talk on an economically developed country (average income, GNP, industries, export crops, etc.).

6.3. Prepare a 4—5 min talk on two countries — one economically developed, the other developing — that belong to one cultural region. Think of the historical, environmental, cultural factors that account for the differences between the countries chosen.

6.4. Prepare a 2—3 min talk on one of the languages of international communication (its origin, the number of speakers, the countries where it is spoken, etc.).

## 7. Summarizing the Unit

Make an outline of the Unit and render its content in a 4—6 min talk.

# UNIT 8

## POPULATION

### 1. Reading and learning

Scan each text and formulate the main ideas. Read the text again carefully and memorize it, then retell the text close to the original.

#### 1.1. POPULATION TRENDS

Earth's population, or the number of people living on the planet, constantly increases. In fact, in the time it takes you to read this sentence at least two more people will be born. Population figures are always approximations. No one can know exactly how many people there are in the world because birth and death records are not always well kept, especially in developing countries. In general it is considered that the total population of the world is exceeding 6 billion people.

**Stages of population growth.** The population growth rate has not always been as high as it is today. Scientists, who study population trends, have found that population growth rates differ in different parts of the world and vary with the levels of a country's economic development. As a nation develops, it moves through four stages of population growth. In the first stage of population growth the number of people increases slowly. The birth rate, or the number of children born per 1,000 people, is high. But the death rate, the number of people who die per 1,000 people, also is high. Few children live to be adults. Sickness, malnutrition, and starvation kill large numbers of people every year. Life expectancy — the average number of years a person is expected to live — is only about 30. This means that the rate of natural increase, or the difference between the birth rate and the death rate, remains low.

In the second stage of population growth technological advances in farming, nutrition, medicine, and sanitation result in increased supplies and improvements in health care. So people live longer and many more

children than before live to become adults. The death rate drops rapidly and the population begins to grow rapidly.

In the third stage most children live to be adults. In order to raise their standard of living many adults begin limiting the size of their families, thus lowering the birth rate. The population still grows, but at a lower rate than before.

Finally, in the fourth stage both the birth rate and the death rate are very low. At this stage, the population growth rate slows dramatically and may even approach zero population growth, or a point at which the birth rate and the death rate are about equal. In stage four the rate of natural increase is almost as slow as it was in stage one. The four stages of population growth may not always apply to every country of the world but the understanding of the demographic tendencies helps put the world's population growth into perspective.

**Uneven distribution of population.** People make their homes in every geographic region except Antarctica but the world's population is not evenly distributed over the earth. In some places hundreds of thousands of people live within the limits of a single city. In other places only a few people live scattered over miles and miles of farmland or wilderness. More people live in areas with fertile soil and a mild climate, for example, than in areas with rugged terrain and a harsh climate. The number of people per sq. km of a given land is called population density. Nearly 90 per cent of the world's land area remains "empty" or sparsely populated. The remaining 10 per cent is densely populated. For example, Asia has 55 per cent of the world's people and 13 per cent of its land. Hence the population density here is very high.

**Population movements.** Over a period of time population patterns were influenced by two population movements. One is migration, the movement of people from place to place. The other is urbanization, the movement of people from rural areas to urban areas within nations.

The many migrations that have taken place throughout history have helped to give many populations a mixture of races, ethnic groups, languages, and religions. Migration does not add to world population. But it does change the population of specific areas. Migration from one country to another can be classified as emigration or immigration. Emigration is the movement of people out of a country. Immigration is the movement of people into a country.

People migrate for many reasons. Oppression, war, or natural catastrophes force some people from their homes. Other people move to an area because they are attracted by better conditions or new opportunities — political or religious freedom, better jobs, a more favorable climate, and so on. In the early 19th century, for example, more than 50 million people left their homelands in Europe to seek better opportunities in North and South America.

The movement of people from rural to urban areas has been taking place for thousands of years. In recent years, however, urbanization has



taken place at a faster rate than ever before. Urbanization has increased dramatically over the last 200 years. Today 70 per cent or more of the people in industrialized nations live in urban areas. In developing countries, the urban population is generally about 30 per cent. However, urbanization in many developing countries is increasing rapidly. One of the most striking features of contemporary urban growth is the increase of large cities with a million or more people. Most of these million cities are in the economically developing world and they have a tendency to grow rapidly.

1. What does the population growth rate depend on?
2. What do the patterns of population density in a country reveal about its people?
3. What explains uneven population distribution?
4. What population movements do you know?
5. Why do people move from one location to another?

## 1.2. URBANIZATION

Cities originated more than 8,000 years ago when the development of agriculture freed groups of people from the need to search for food on a daily basis. In the 18th and 19th century cities began growing more rapidly. Over the years they have continued to grow.

**From first human settlements to modern cities.** Scholars believe that the first cities developed in the Tigris-Euphrates River Valley, where farmers learned to grow surpluses of food. These surpluses meant that it was no longer necessary for all the people to devote all of their energy to growing food. Instead some people could work at other tasks, such as making tools or weaving cloth. Dividing tasks among workers is called specialization of labor.

The first cities were actually tiny villages. Over time some of these villages grew larger and larger, eventually becoming great cities. Yet even the greatest cities of the past, such as Athens, Greece, and Beijing, would not be considered large today. They included no more than 100,000 people. Today many cities have populations in the millions.

Cities are unevenly distributed over the earth's land surfaces. Some areas have so many cities that it is difficult to tell where one city stops and another starts. Other areas have no cities at all — only miles and miles of uninhabited land.

Cities today serve many functions. Geographers classify towns and cities as urban areas, from the Latin word *urbs*, meaning "city." Places outside cities are classified as rural areas, a term borrowed from the Latin word for "countryside."

From the earliest times cities of all sizes have served many of the same functions. Even the smallest city serves as the central place, or

the location of specialized activities and services for the area around it. Among the most important functions of cities are transportation, manufacturing, commercial, and administrative functions. Most cities serve several functions at the same time. Today, however, we recognize many cities by the special functions that they provide. Some cities serve as transportation hubs, for example, while others act as centers of trade or as cultural centers. Thus, for example, where road, rail, river, or air routes cross, such big hubs as Paris, Frankfurt, Shanghai appear.

All towns clearly have a residential function — they are places where people live. All towns also have a social function: they usually provide educational facilities, such as schools and colleges; health facilities, such as clinics and hospitals; places of worship, such as churches, mosques and temples and also places of entertainment. Many of them also are used by people from the surrounding rural areas.

All towns also have a commercial function: they are places where business takes place, they have shops and markets for the sale of goods, and also financial institutions such as banks. Some towns are particularly important as commercial centers. Examples include seaport towns, river ports and those towns which have grown up where inland routes meet.

There are a number of towns which have grown greatly as a result of the development of mining. Thus Johannesburg, South Africa, serves as a mining and processing center for gold and other minerals. The examples of Russian towns centred around mineral deposits are numerous mining centers in the Ural Mountains, which are very rich in minerals. Such isolated mining centres as Vorkuta and Norilsk are located in the far north of this country.

In recent decades manufacturing industry has become important in many parts of the world. As a result many of the larger towns now have an industrial function. Some manufacturing centers, however, are quite small. When prices for their products are high, manufacturing cities grow rapidly, but they lose population when prices decline. Some cities even disappear.

Cities centered on raw material production become ghost towns when supplies of non-renewable resource which they depend on are used up or are no longer needed. In the 1950s, for example, 2,000 people lived and worked in Cobalt, the USA, the town that appeared near a large cobalt mine. By the 1980s the mine had closed and all the people moved away.

Several towns can be described as tourist centres. In and round them are many hotels which provide all the things people need and want mainly to holiday visitors. In Russia, for example, resort towns are a feature of the North Caucasus region, including Sochi, Pyatigorsk, and Mineralnyye Vody. Elsewhere the capitals of provinces and other administrative divisions are the main towns,

having grown to considerable size as the organizing centres for their territories.

1. Where do scholars believe that the first cities developed? Why did cities develop there? What discovery led to the beginning of cities?
2. How did industrialization encourage the growth of cities?
3. What is urbanization?
4. How might the functions of cities differ in developed countries and developing countries?
5. Why do transportation centres often become cultural centres?

### 1.3. URBAN PROBLEMS AND CHANGE

In many parts of the world the rapid growth in the size of towns has led to serious problems called urban problems.

**Traffic problems.** As the population has grown in size as people have become better off, the number of motor vehicles on the roads has grown enormously. In many towns this has led to severe traffic congestion. On the overcrowded roads vehicles can often travel only slowly, and sometimes traffic comes to a complete standstill. Minor accidents happen often. Traffic congestion is particularly bad during the so-called rush-hours, although in fact these periods often last for much more than an hour. The rush-hours are those times of a day when the traffic is the heaviest. There is a morning rush-hour when many adults are trying to get to work and children to school; and there is an evening rush-hour when the same people are trying to get back home. In addition to the frustration which they experience while travelling on the roads, in many large towns private motorists also often have problems of finding enough parking space when they arrive at their destinations.

In some of the largest cities of the world such as London, New York and Tokyo attempts have been made to overcome the problem of traffic congestion on the roads by building underground railways.

In some towns a system of one-way streets, those along which all vehicles travel in one direction only, has been adopted in an attempt to enable traffic to travel more quickly and safely. This is often quite successful, although the one-way system can be confusing to people who are not familiar with it. In some towns pedestrian zones have been created. These are streets which are closed off to vehicles except for those delivering goods to shops etc., and are reserved solely for the use of pedestrians (people on foot). The aim of creating pedestrian zones is to make conditions safer for people in busy shopping areas.

In the past, main roads generally went right through the middle of towns. This greatly added to traffic congestion, especially as many of the vehicles travelling through the town were heavy lorries. This problem can be overcome by building by-pass roads. These roads go around the

edge of the town. The vehicles travelling to destinations beyond the town can use these roads, and so avoid passing through the town centre. Although this may make their journey slightly longer in distance, it often makes it much quicker. Also, of course, it reduces the amount of traffic in the town itself.

**Housing.** Most people who leave rural areas for the cities come looking for jobs and a better standard of living. They come, however with little education. Some may be illiterate (unable to read and write). When they come to the city they are not qualified for the jobs that will pay them well. They either remain unemployed, or they take the jobs that no one else wants.

As city population increases, so do demands for housing, water, electricity, sewage disposal, schooling, and medical care. Cities in industrialised countries have difficulties meeting these demands. Cities in developing nations have even greater difficulty providing for the people who think that in the cities they will find the fulfillment of their dreams.

The flow of large numbers of people into the towns often leads to the growth of slum settlements. They are unhealthy and provide a very unsatisfactory environment for the people. The problem of the growth of slums can only be overcome by spending more money on developing rural areas to make them more attractive places to live, especially in terms of employment opportunities. The governments of some countries have tried to do this by giving special incentives if people are willing to set up new factories in rural areas.

1. What are the main problems in cities?
2. What can help to ease the problems of a) traffic congestion; b) pollution; and c) road safety?
3. How can governments solve the problem of slums?
4. What social problems do people coming to towns from rural areas confront?
5. What problems does Moscow face?

## 2. Lexical and grammatical exercises

### 2.1. Match each of the following terms with the correct definition.

- a) *urbanization*; b) *immigration*; c) *demographer*; d) *agriculture*;  
e) *density*

- \_\_\_\_\_ 1. Scientist who studies population trends.
- \_\_\_\_\_ 2. Movement of people into a country.
- \_\_\_\_\_ 3. Number of people per square kilometer of a given land area.
- \_\_\_\_\_ 4. The art and science of farming.
- \_\_\_\_\_ 5. The large-scale movement of people from rural to urban areas.



## 2.2. Match the words in A with the words in B to form word combinations.

- 1) A. to keep; to weave; to meet; to experience; to fulfil; to overcome  
B. dreams; demands; problems; frustration; records; cloth
- 2) A. exhaust; life; health; traffic; food; sewage; growth; population; by-pass; transportation; rush; pedestrian  
B. congestion; surpluses; fumes; expectancy; disposal; care; density; hours; zone; roads; rate; hub

## 2.3. Match the words in A with their opposites in B.

- A. rapidly; major; sparsely; harsh; children; rural; remain; drop; raise; except
- B. adults; mild; densely; slowly; urban; minor; include; lower; migrate; rise

## 2.4. Fill in the gaps with the appropriate form of the verb *increase*.

1. Earth's population constantly \_\_\_\_\_.
2. The rate of natural \_\_\_\_\_ remains low.
3. Technological advances result in \_\_\_\_\_ supplies.
4. Urbanization has \_\_\_\_\_ dramatically over the last 200 years.
5. Urbanization in many developing countries is \_\_\_\_\_ rapidly.
6. As city population \_\_\_\_\_, so do demands for housing.
7. Rapidly \_\_\_\_\_ numbers of motor vehicles clog narrow streets.

## 2.5. Rearrange the letters in the anagrams to form equivalents for the Russian words.

|                               |  |
|-------------------------------|--|
| трущоба — <b>smlu</b>         | занятость — <b>dtioeinstan</b>               |
| голодание — <b>ronavastti</b> | чувство разочарования — <b>fsrutтираon</b>   |
| превышать — <b>eeexcd</b>     | приближенное значение — <b>aoxppritioman</b> |
| брать в долг — <b>wrrboo</b>  | недоедание — <b>lonnutritima</b>             |
| посвящать — <b>doteev</b>     | современный — <b>tecomnporrya</b>            |

## 2.6. Put the verbs in brackets into Present Perfect.

1. Scientists \_\_\_\_\_ (find) that population growth rates differ in different parts of the world.
2. Many migrations \_\_\_\_\_ (take) place throughout history.
3. Over the years cities \_\_\_\_\_ (continue) to grow.
4. The towns \_\_\_\_\_ (grow) greatly as a result of the development of mining.
5. In some towns pedestrian zones \_\_\_\_\_ (create).
6. The population growth rate \_\_\_\_\_ (be) as high as it is today.
7. In recent years urbanization \_\_\_\_\_ (take) place at a faster rate than ever before.
8. In recent decades manufacturing industry \_\_\_\_\_ (become) important in many parts of the world.

9. The rapid growth of towns \_\_\_\_\_ (lead) to serious problems called urban problems.
10. The number of motor vehicles on the roads \_\_\_\_\_ (grow) enormously.
11. In many towns this \_\_\_\_\_ (lead) to severe traffic congestion.
12. A system of one-way streets \_\_\_\_\_ (adopt) to enable traffic to travel more quickly and safely.

## 3. Translation into Russian

1. Nearly all of the 6 billion inhabitants of the earth live on about 10 per cent of the earth's land surface.
2. Even though migration does not add to world population, it does change the population of specific regions or countries.
3. Agriculture made the development of cities possible, because people no longer had to travel constantly in search of food.
4. Industrialization encouraged the growth of cities in several important ways. As farms became more mechanized, fewer farm workers were needed. Unemployed farm workers moved to cities to find work in the rapidly growing factories. Cities grew up near the factories because workers needed to live close to their jobs.
5. The four most important functions of cities are transportation, manufacturing, commercial, and administrative centers. Most cities serve more than one of these functions at the same time.
6. Land uses in modern cities include a mixture of residential, commercial, and industrial purposes.
7. City lands are organized into four zones: the inner, middle, suburban, and outer zones. The inner zone includes the central business district and generally is located on the city's original site. Transition between urban and rural areas is not abrupt.

## 4. Complementary text

### HISTORY OF CENSUS

The term "census" (Latin *censere*, "to assess") is primarily referring to the official and periodical counting of the people of a country or section of a country; it also means the printed record of such a counting. In actual usage the term is applied to the collection of information on the size and characteristics of population, as well as on the number and characteristics of dwelling units, various business enterprises, and governmental agencies.

The earliest known census enumerations were conducted for purposes of levying (demanding) taxes or for military conscription. Clay tablet fragments from ancient Babylon indicate that a census was taken there as early as 3800 BC to estimate forthcoming tax revenues. The ancient Chinese, Hebrews, Egyptians, and Greeks also are known to have conducted censuses. Not until the Romans began a count of their empire's inhabitants, however, did enumerations take place at regular intervals. The Roman censuses, designed for both taxation and military conscription, were the responsibility of local censors. In addition to registering the population and collecting taxes, the censor was also in charge of maintaining public morals.

With the dominance of the feudal system in the Middle Ages, information on taxation and personnel for military conscription became unnecessary. Not until the 17th century did a nation again attempt an accurate count of its population. Sweden has been cited as the forerunner in the collection of information on its inhabitants. Its churches were required by law to keep continuous records of births, deaths, and marriages occurring among all people residing within the parish boundaries. Such vital statistics registrations are still maintained in Scandinavia, Finland, the Netherlands, and Belgium.

The first true census in modern times, however, was taken in the colony of New France (France's North American empire), where the enumeration of individuals began in 1665. The rise of democratic governments resulted in a new feature of the census process. The 1790 census of the United States was the first to be made public after gathered information was tabulated.

During the 19th century and the first half of the 20th century, the practice of census spread throughout the world. International organizations, such as the United Nations, have encouraged all countries to adopt uniform standards in taking their censuses. Decennial censuses are now taken by many countries throughout the world.

## 5. Writing

Write the translation of the following text or render its content in English.

### ДЕМОГРАФИЧЕСКАЯ ПОЛИТИКА

Очевидно, что резкое замедление темпов роста населения (или даже убыль населения) или резкое увеличение темпов прироста населения негативно сказываются на демографической и социально-экономической ситуации в мире. Поэтому большинство стран мира стремится управлять воспроизводством населения. Для этого проводится демографическая политика — система

административных, экономических, пропагандистских и других мероприятий, с помощью которых государство воздействует на естественное движение населения (прежде всего на рождаемость) в желательном направлении.

Контроль над рождаемостью стал впервые осуществляться в XVIII веке во Франции, где в связи с угрожающим снижением темпов рождаемости предпринимались попытки ее стимулирования. Сейчас порядка 130 экономически развитых стран и 80 развивающихся стран проводят демографическую политику, направление которой зависит от демографической ситуации в стране. Мерами такой политики, направленной на увеличение рождаемости, являются единовременные ссуды молодоженам, пособия в связи с рождением детей (по прогрессивно возрастающей шкале), продолжительные декретные отпуска, льготы на приобретение жилья и др. В Западной Европе демографическая политика наиболее активно проводится во Франции и Швеции. В США она практически не проводится, за исключением некоторых льгот семьям.

Большинство стран с высоким уровнем рождаемости осуществляют демографическую политику, направленную на сокращение рождаемости и естественного прироста. Первой на путь планирования семьи вступила Индия, но самых значительных успехов в регуляции темпов прироста населения добился Китай. Основными мерами, обеспечивающими снижение рождаемости, стали повышение возраста вступления в брак (в Индии — 21 год для мужчин и 18 лет для женщин, в Китае — 22 и 20 лет соответственно), стимулирование создания семей с одним или двумя детьми. В странах Юго-Западной Азии и Северной Африки активность демографической политики невелика, т. к. мусульманство поощряет ранние браки, многодетность, многоженство.

Вопросы демографической политики являются важнейшими для развития всего мира, но различный подход разных стран делает невозможной стабилизацию темпов роста численности населения планеты в ближайшем будущем.

## 6. Speaking

6.1. Retell the following texts in English.

### MEXICO CITY

**Site.** Mexico City serves as Mexico's capital city, but is important economically as well as politically. More than 45 per cent of Mexico's industrial employees work in Mexico City and the surrounding suburbs.



They produce almost one-half of the country's total of manufactured goods. This importance has caused rapid growth. Today more than 15 million people live in the sprawling metropolitan area. Mexico City occupies a dry lake basin surrounded on all sides by high volcanic mountains. Because of its elevation of 2,240 meters, frost sometimes occurs even though at 19° 30' N latitude the city is close to the Tropic of Cancer.

**Serious problems.** Because of its beauty, people often call Mexico City the "Paris of the Americas". But Mexico City also has major problems such as housing shortages, traffic congestion, and air pollution. The city cannot house all of the people who have moved there. Thousands of Mexicans from rural areas flock to Mexico City each year. They seek employment and better opportunities for their children. So just a few short blocks from the beautiful tree-lined boulevards sit squalid slums that house 46 per cent of the city's population. Thousands of the poorest families live in kitchenless shacks or lean-tos and cook along the sides of the streets. Other families occupy the roofs of factories or live in shacks that barely cling to steep-sided ravines. They scavenge rubbish dumps for discarded food and things to sell.

Traffic jams and air pollution afflict the city. Rapidly increasing numbers of motor vehicles clog narrow streets that were originally laid out for a much smaller city. The exhaust fumes remain trapped over the city by surrounding mountains instead of dispersing. The air in Mexico City now has the highest carbon monoxide level of any city in the world. Public health officials are concerned about the effects this pollution will have on the health of the population.

Mexico City also faces the continuing danger of earthquakes. Powerful earthquakes in 1985 and 1986 killed thousands of city residents and destroyed large parts of the city. Nearby volcanoes, so spectacular to view from the city on a sunny day, remind residents of Mexico City's location near a tectonic plate boundary.

Despite these many problems Mexican officials continue to seek ways to improve the quality of life for the city's people. Strict building codes now make new buildings less vulnerable to earthquakes, while new social programs seek to lessen the effects of poverty.

## TOKYO

Nearly 8.5 million people now live in Tokyo's 578 square kilometers. This gives Tokyo a population density that is nearly twice as high as the population density of New York City. Four other cities — Shanghai, Mexico City, Beijing, and Seoul — have more inhabitants than Tokyo, but none is more densely populated.

**Tokyo's many aspects.** Tokyo reflects great diversity. In some ways it is very modern and cosmopolitan. Tall buildings, freeways jammed with

traffic, and streets aglow with neon signs resemble their counterparts in many of the world's other great cities. So, too, do the crowded baseball stadiums, golf courses, and movie theaters.

In other ways, however, Tokyo retains many Japanese traditions. Though most people wear street clothes that would not be out of place in any modern city, on almost every corner there is likely to be a man or woman dressed in traditional Japanese clothes. Intermingled with modern restaurants that serve everything from hamburgers to the finest European dishes are shops selling local delicacies. Down many twisting alleys are ancient Japanese shrines. And if it is festival time, people dressed in styles of long ago may be carrying a shrine through the streets on their shoulders to allow the deity who lives in the shrine a yearly inspection of the neighborhood it protects.

**A Tokyo address.** Getting around in Tokyo can be difficult. Because only a few of the most important streets have names, few street signs exist. The numbering system for buildings is very confusing because buildings are not numbered up and down the street as in many Western cities. Instead the buildings are renumbered every time a new one is built.

Fortunately the excellent Tokyo subway system helps visitors untangle the confusing layout. Seven subway lines crisscross the city, carrying more than 3 million passengers a day. All subway stations have names and instructions in both Japanese and English. Each station also features an up-to-date map that shows the streets and the building numbers of the surrounding neighborhood.

**Hub of the nation.** Although much of Tokyo was leveled during a violent earthquake in 1923 and again in the bombing raids of World War II, the city has been rebuilt. Today, with earthquake-resistant skyscrapers, Tokyo remains the center of Japanese government, business, and industry. One of every four Japanese corporations has its headquarters in Tokyo and one of every six factories is located in the city or in a nearby community. Tokyo has become the focus of a vibrant nation and one of the world's great cities.

6.2. Discuss the following idea: Why do some cities grow into sprawling metropolitan areas, while others remain small?

6.3. Discuss the history of the city where you live or any other city you like. Focus on why the city is located where it is, what conditions caused the city to grow and how the city has dealt with the urban problems. Compare them with the problems of Mexico and Tokyo.

## Summarizing the Unit

Make an outline of the Unit and render its content in a 4—6 min talk.

## UNIT 9

### AGRICULTURE

#### 1. Reading and learning

Scan each text and formulate the main ideas. Read the text again carefully and memorize it, then retell the text close to the original.

##### 1.1. AGRICULTURAL LAND USE

Agriculture is an important economic activity. It includes growing crops and rearing animals. Agriculture produces a wide range of products for manufacturing industries as well as food. Unlike manufacturing and services, agriculture relies heavily on the physical environment, especially climate, and the life cycles of plants and animals. Both are largely outside the control of farmers. Agriculture also uses a larger proportion of the Earth's surface (around 37 per cent of the land area) and provides more employment worldwide than any other economic activity.

**Factors involved in land use.** The way in which people use their land and organize their agricultural activities varies greatly. Physical, economic and human factors all exert an influence upon agriculture, although the importance of each varies from place to place. These factors are also interrelated.

At the global scale the distribution of agriculture is most influenced by climate. Large parts of the planet are unsuitable for farming because they are either too cold or too dry. All crops have minimum requirements for heat. Growth usually begins when the mean daily air temperature rises above 6°C. Moreover, temperatures need to be above this critical level for at least 120 days. As you go nearer to the poles, temperatures fall and the growing season shortens, until cultivation is impossible. This is the main reason why cultivation rarely extends beyond latitude 60° in the northern hemisphere. Crops also have minimum moisture requirements. Thus the world's hot deserts, such as the Saharan, Arabian and Australian deserts, are too dry for cultivation unless water is available for irrigation. High mountains such as the Himalayas and Andes support few farming activities. As well as severe climates they also have steep slopes and thin soils.

In the more developed countries of the world, where scientific knowledge is applied to farming, economic and human factors tend to play a particularly important role. Physical problems can to some extent be overcome. In Holland, for example, a lot of the present farm land has in fact been reclaimed from beneath the sea. In Australia, water from the Snowy River has been diverted to irrigate land in south-eastern Australia, so making it

possible to increase crop yields there. In Canada and the USA scientific plant breeding has made it possible to extend the cultivation of wheat into areas which were previously thought to have been too dry or too cold.

**Agricultural systems.** In the economically developed world, almost all farming is commercial. Farmers produce crops and livestock products for sale to make a profit. In the economically developing world farmers and their families grow crops mainly for their own consumption. What's left may be sold or traded for other products in local markets. We often call this type of self-sufficient farming subsistence agriculture.

Farmers practice different kinds of subsistence farming, based on their needs and locations. Farmers in the densely populated river valleys of India, the People's Republic of China, and Southeast Asia use intensive subsistence farming, planting as much food as possible on any lands that will support crops. Shifting cultivation is the traditional method of farming in the tropical rainforest. It is a form of subsistence agriculture, often combined with hunting, and practiced by small tribal groups. The rainforest has very poor soils — so poor that permanent cultivation is impossible. Shifting cultivators make temporary clearings in the forest. The ash from the burnt vegetation fertilizes the soil and allows cultivation for up to two years. Initially yields are good. However, cropping (farming without rotating crops) and heavy rainfall quickly remove plant nutrients from the soil, and it loses fertility. After two years, cultivation is no longer worthwhile, the plots are abandoned and fresh clearings are made in the forest. Shifting cultivation is a sustainable type of farming. This means that it does no long-term damage to the environment, if the intervals between cultivation are long enough to allow the forest trees to regenerate and the soil to recover its fertility.

Commercial farming differs in many ways from subsistence farming. Commercial farming can be either mixed or specialized. Between 5 and 10 per cent of the commercial farmers practice mixed farming, raising several different crops and animals for income. Mixed farming has several important benefits. Growing different crops allows farmers to alternate (rotate) crops in the fields. This practice of crop rotation replaces nutrients that the previous crops took from the soil. Economically, growing different crops makes farmers less vulnerable to falling prices for farm products.

Most commercial farmers practice specialized farming, raising a single cash crop or kind of animal for income. Specialized commercial farmers on plantations and very large farms raise most of the world's cotton, wheat, cattle, sheep, dairy products, poultry, rubber, rice, sugarcane, pineapples, bananas, tobacco, coffee and tea.

1. What does agriculture include? What does it produce?
2. What factors determine what can and will be grown in a given place?
3. How do farming activities differ between industrialized and non-industrialized countries?



4. What are the advantages and disadvantages of a) shifting cultivation; b) mixed farming?
5. What are the main differences between plantation agriculture and subsistence agriculture? Which is the better system?

## 1.2. DEVELOPMENT OF AGRICULTURE

In very early times people did not know how to grow crops, nor did they have domestic animals. They lived entirely by hunting and gathering. This meant they gathered wild plants they found to be safe to eat, and also hunted wild animals including birds and fish for food. As the edible (good to eat) wild plant life of an area was quickly used up, and as the wild animal life was soon either killed off or frightened away, early people had to move around in order to get their food supply. Such a way of life is described as nomadic.

As time went by, people learned how to domesticate wild animals, and so became livestock rearers. They also learned to cultivate plants, and so became crop-growers. In only a few remote and difficult environments people continue to practice the hunting and gathering way of life.

**The green revolution.** To produce food, people have long depended on the natural resources of their environments. But during the 1960s, scientists in Mexico and the USA developed new varieties of wheat, while scientists in Japan, Taiwan and Philippines developed new varieties of rice. These new varieties were better able to survive poor weather conditions. They also produced higher yields. Most important they grew more quickly making it possible for farmers to grow at least one extra crop during the growing season. This was the beginning of the green revolution. The new "miracle seeds" made it possible for the supply of food to grow at a faster rate than the number of people. For example, India, which until the 1960s had suffered frequent food shortages, became self-sufficient in cereals.

Despite its successes, the green revolution has not benefited everyone. The new seeds required a great deal of fertilizers to get the best results. Chemical fertilizers are expensive, and many farmers could not afford them. One more drawback (disadvantage) of the new varieties of rice is that they need irrigation. This is a problem because many of the poorest parts of the world, such as Ethiopia, depend on rain-fed agriculture. Finally, farmers must buy seeds every year as the seeds from these cereals are infertile.

Feeding more than 6 billion people on the earth is no easy task. In many parts of the world food still remains a problem. Some people believe that the world population eventually will outgrow the food supply. Others are more hopeful pointing to scientific research currently under way to find ways of growing more food.

**Crops for the future.** Another way to raise farm production is to expand the use of crops grown today and to cultivate new crops. Soybeans, for example, may become an important source of protein in the future.

Farmers are also experimenting with other new crops. Channel millet is a grain found in the Australian desert that needs only one watering to produce a crop. The high-protein winged bean, which grows wild in Southeast Asia, grows easily and improves soil fertility. The prickly pear, a nutritious cactus, grows in desert regions.

Aquaculture also is a kind of agriculture. Aquaculture consists of raising fish in ponds and coastal areas. Farmers raise catfish, trout, and salmon in artificial ponds and lakes. Oysters and other shellfish develop in special beds built in shallow coastal waters. Aquaculture already has succeeded in increasing the supply of fish. Farmers in the People's Republic of China, for example, harvest large numbers of fish from artificial ponds each year.

Many scientists also believe that world food supplies can be increased through genetic engineering. Using genetic engineering scientists transfer certain genes from one plant or animal to another. Scientists foresee a time in the near future when plants can be specially «designed» to be high in protein and other nutrients and to resist frost or repel damaging insects.

**Agribusiness.** In addition to local climatic and soil conditions, crops grown or animals reared are influenced by local market opportunities and government policies. Modern large-scale highly efficient farming, based on scientific and business principles is known as agribusiness. It is a part of an integrated food system, which extends all the way from agricultural suppliers to food manufacturers and supermarkets. Usually several farms belong to a single family business, though each one is run separately. Being part of a large business enterprise can reduce the costs. For instance, buying fertilizer and pesticides in bulk (in large amounts) is cheaper; machinery can be shared between several farms. Crop yields are high because inputs of agrochemicals (fertilizers and pesticides) and capital equipment are high.

1. Can you think of examples when people continue to practice the hunting and gathering way of life?
2. In what ways can farmers increase the food supply?
3. What are some of the scientific innovations that have helped increase food supplies?
4. What is green revolution?
5. What are the major features of agribusiness?

## 1.3. AGRICULTURAL CHANGE

Over the last thirty years agricultural change in the economically developing world has been closely related to population growth. There has been an urgent need to increase food production to feed the increasing population. Some countries have responded with high-tech solutions, others have preferred a low-tech approach. Whatever the approach, the

pressure to produce more food has often caused serious damage to the environment.

In the economically developed world, recent agricultural change has most often been due to government policies. In the 1970s and 1980s the European Union (EU) policies favored expanding food production. This caused huge economic problems through overproduction and it was also ruinous for the environment. As a result, policies in the 1990s have shifted. Now, the emphasis is put on reducing food production and protecting the environment.

The EU has made great efforts to reduce the output of farming. Indirectly this will also benefit the environment. In 1984 milk quotas were introduced to limit production in dairy farming, and since 1988 arable farmers have been paid to grow nothing! By taking 15 to 18 per cent of their arable land out of production for at least 5 years, they receive compensation of around £250 per hectare per year. By 1995, 13 per cent of all arable land in the UK lay unused and the EU's food mountains were drastically reduced.

Since 1992 the level of price support per tonne for crops has been reduced. Gradually price support is being replaced by fixed payments for each hectare cultivated. This should make it less attractive for farmers to get more from each hectare cultivated. The result — lower inputs of fertilizers and pesticides — should benefit the environment.

Various schemes, providing grants to farmers, have been devised to improve the countryside. In the UK, for example, local authorities pay farmers to plant new hedges and improve existing ones. A farm woodland scheme gives annual payments for planting trees on arable and grassland. In these areas farmers are paid to farm using traditional methods. They are not allowed to use chemical fertilizers; they can cut hay or silage only after certain dates each year. In return, farmers are paid up to \$600 per hectare per year. In some areas farmers are paid compensation by the British government for farming with lower levels of nitrates. Again this reduces farming intensity. Grants are also available to help farmers convert farmland to other activities such as golf courses, camp sites, theme parks and so on.

Some farmers have turned to organic farming. It is farming without using any artificial fertilizers or pesticides. The result is that each hectare produces less and the products cost more for the consumer to buy. Although the products of organic farming are more expensive, many customers will pay more for them because they contain no harmful chemicals. Organically grown crops are also attractive because they are produced by a sustainable system which does not damage the environment.

1. What were the consequences of the overproduction of food?
2. What made the EU farmers reduce the output of farming? How did they do this?
3. Why is organic farming attractive for farmers, customers and governments?

## 2. Lexical and grammatical exercises

### 2.1. Fill in the gaps with the following lexical units.

*fertilizer; irrigation; "miracle seeds"; priorities; surplus*

1. India changed its \_\_\_\_\_ by deciding to develop farming before industry.
2. The new \_\_\_\_\_ made it possible for farmers to grow more crops per year.
3. A great deal of \_\_\_\_\_ is needed to get the best results from the new seeds.
4. Farmers need to grow a \_\_\_\_\_ of food in order to sell it at the market for money.
5. Dams were built to provide \_\_\_\_\_ for farms in dry years.

### 2.2. Match the words in A with the words in B to form word combinations.

- 1) A. to recover; to alternate; to make; to divert; to cause; to reduce; to resist; to abandon; to feed; to run; to protect; to rear  
B. a plot; the population; damage; the environment; costs; animals; frost; a profit; a river; fertility; crops; a business
- 2) A. subsistence; daily; chemical; crop; the near; camp; integrated; coastal; genetic; government; dairy; shifting  
B. products; cultivation; future; system; policy; agriculture; waters; air temperature; sites; fertilizers; yield; engineering

### 2.3. Form sentences by combining the lines from the columns. Use the verbs from the second column in the passive or active.

|                      |          |   |
|----------------------|----------|---|
| Agriculture          | do       | to farming.                             |
| Scientific knowledge | succeed  | as nomadic.                             |
| Sustainable farming  | describe | on rain-fed agriculture.                |
| Commercial farming   | increase | from subsistence farming.               |
| Aquaculture          | apply    | through genetic engineering.            |
| Ethiopia             | depend   | in increasing the supply of fish.       |
| Such a way of life   | rely     | no long-term damage to the environment. |
| Food supplies can    | differ   | heavily on the physical environment.    |

### 2.4. Match the words close in meaning in A and B.

- 1) A. to use up; to encourage; to raise; to abandon; to foresee; to allow; to alternate  
B. to grow; to exhaust; to leave; to keep changing; to make possible; to predict; to favour



- 2) A. harvest; production; mean; due to; vulnerable  
 B. average; weak; output; because of; crop

**2.5. Match the words in A with their opposites in B.**

- A. domestic; gentle; to benefit; temporary; mild; to survive  
 B. to damage; severe; to die; wild; steep; permanent

**2.6. Rearrange the letters in the anagrams to form equivalents for the Russian words.**

требование — **tueqmeirren**

уязвимый — **leevubraln**

домашний скот — **ltocivkes**

приручать животных — **destomateic**

власти, администрация — **tritiehous**

кочевой — **nadomic**

пахотная (земля) — **ablræ**

доход — **iomenc**

съемный — **edleib**

урожай — **delyi**

### 3. Translation into Russian

1. Farmers use natural resources, such as soil and water, to produce a variety of foods and other agricultural resources.
2. Commercial farmers raise crops or livestock for income. Most commercial farms are specialized, growing a single cash crop. A smaller but growing number are mixed farms.
3. Several types of subsistence agriculture are practiced in the non-industrialized countries of the world.
4. Several scientific and farming techniques to increase the world's food supply are currently being explored.
5. Because of varying natural conditions, only about a third of the world's land area is suitable for agricultural production.
6. In developing nations, most people directly involved in farming practice a subsistence form of agriculture, using mostly hand or animal labor, and often produce an inadequate food supply.

### 4. Complementary text

#### PLANTATION AGRICULTURE

Plantation agriculture is an extensive system of agriculture, in the sense that very large amounts of land are involved. Plantation agriculture is very widely practiced in many parts of the tropics. It is also found in some subtropical areas. It is not indigenous to the areas where it is now practiced, but was introduced by the Europeans during colonial times.

Plantations (sometimes called estates) are very big farms which usually grow one type of crop. This practice is known as monoculture. Crops are grown almost entirely for sale, and are very often intended for export.

A lot of paid workers are employed. On very large plantations housing is often provided for the workers, and there are sometimes other facilities available such as schools and clinics. Because of their large size, plantations are able to make use of specialization of labor. Different groups of workers can be trained to carry out particular tasks, at which they become very skilled.

A great deal of capital is involved to buy land and machinery, build housing and roads, etc. Many plantations have their own factories for processing their crops, and even their own light railway systems for transporting the crops from the field to the factory.

Methods of cultivation are usually modern and efficient. Much use is made of artificial fertilizers, pesticides and herbicides (chemicals used to kill weeds). As a result, crop yields are often higher on plantations than on peasant farms. Modern factory methods also give a more uniform and better quality product, which is likely to fetch a higher price on the world market.

One of the main weaknesses of the plantation system lies in the fact that plantations rely upon a single crop. As a result, plantations are greatly affected by rises and falls in world market prices. The fact that on a plantation a single crop is grown over a very large area increases the risk of the spread of disease. Disease is not likely to spread as quickly on a peasant farm, because several different kinds of crops are grown.

### 5. Writing

Write the translation of the following text or render its content in English.

#### СЕЛЬСКОЕ ХОЗЯЙСТВО: СОСТАВ И ОСОБЕННОСТИ РАЗВИТИЯ

Сельское хозяйство — вторая ведущая отрасль материального производства. В ее состав входят земледелие и животноводство. Земледелие, в свою очередь, подразделяют на полеводство, садоводство и виноградарство. В животноводство входит много подотраслей, но основные — выращивание крупного рогатого скота, свиноводство, овцеводство, птицеводство.

Сельское хозяйство — самый древний вид хозяйственной деятельности человека. Выделяют земледельческие народы и земледельческую культуру (Египет, Центральная Америка), приморские

народы и приморскую культуру (контактные приморские зоны) и кочевые народы и культуру (Центральная Азия и др.).

В мире нет ни одной страны, жители которой не занимались бы сельским хозяйством и смежными отраслями — лесным хозяйством, охотой, рыболовством. В них занято около 1,1 млрд. человек. Выделяют множество типов ведения сельского хозяйства, но их можно объединить в две большие группы: товарное сельское хозяйство, которое включает интенсивное земледелие и животноводство, а также экстенсивное земледелие парового и залежного типа и пастбищное животноводство; традиционное потребительское сельское хозяйство, включающее более отсталое плужное и мотыжное земледелие, пастбищное животноводство, кочевое и полукочевое скотоводство, а также собирательство, охоту и рыболовство.

В экономически развитых странах преобладает первый тип сельского хозяйства. Преобразование его (повышение урожайности путем селекции новых сортов, расширение ирригации и др.) и создание системы агробизнеса (переработка, хранение, перевозка, сбыт, выпуск техники и удобрений наряду с производством сельскохозяйственной продукции) придает сельскому хозяйству развитых стран индустриальный характер. Появился новый тип производства — высокомеханизированные крупные фермы и фабрики, эффективные, но наносящие вред природе.

В развивающихся странах преобладает малотоварное сельское хозяйство, преимущественно растениеводство, представленное мелкими хозяйствами, которые обычно обеспечивают пропитание семьи. В этом секторе сохраняется и подсеčno-огневое земледелие. В некоторых развивающихся странах представлены также крупные фермы и плантации, относящиеся к товарному хозяйству. Они обычно расположены в наиболее благоприятных для выращивания той или иной культуры местах и часто более ориентированы на внешний, а не на внутренний рынок.

## 6. Speaking

### 6.1. Retell the following texts in English.

#### CHEMICALS IN OUR FOOD — TWO SIDES OF AN ARGUMENT

Much of the food that leaves a farmer's field undergoes several processing steps before it reaches our tables. Grain is ground into flour or meal, often enriched with vitamins and minerals lost in processing, and then turned into cereal or bakery products. Meat is smoked,

pickled, or otherwise treated to keep it from spoiling. Salt, pepper, garlic, other herbs and spices, and flavorings improve the taste of food. Dyes injected into fruit or added to other foods make them more eye-appealing. Vitamins, minerals, smoke, dyes, stabilizers, thickeners, salt, and other flavor enhancers, substances with chemical-sounding names — all these things are food additives.

In the past, most — if not all — food additives came from nature. Today, technology has made it possible for many natural additives to be replaced with manufactured ones — additives made by putting chemicals together. Some people say we should be just as concerned with the effects these manufactured additives have on our bodies as we are with the effects of chemicals on the land, in the water, and in the air. These people fear we are polluting our bodies with too many chemicals. They think these chemicals may cause diseases such as cancer.

Food processors try to justify their use of manufactured additives. They point out that every living and non-living thing on earth is made up of chemicals or combinations of them. Even when eating "natural" foods, people are eating chemicals. Processors argue that manufactured additives do all the things that natural additives do, but they do them with less cost to the consumer. They also point out that manufactured additives do some things that natural ones cannot do. For example, they enrich milk, flour, and other foods with vitamins and minerals lost in processing. Or they make foods tastier for people who cannot eat salt or sugar.

Food companies admit that large doses of some manufactured additives can cause diseases. At present, the use of some of them is banned. Words of caution on the packaging of some products are added.

#### CHINA TRIES ORGANIC FARMING FOR A CHANGE

Almost any vegetable can be found in perfect form in China's open-air markets. In all this abundance, however, is an invisible threat: haphazard use of farm chemicals that leave poisonous residues.

The Ministry of Agriculture is responding to rising concerns about food quality by promoting "green food," fresh and processed food certified as contamination-free. Living standards have gone up. People are more concerned with the quality of their food. Many Chinese farmers and consumers have been sickened by fertilizers and pesticides in recent years. Chinese newspapers report cases like one in Guangzhou in 1996 when 112 people were hospitalized with dizziness, vomiting and stomach pains after eating fertilizer-tainted vegetables.

China has farm chemical regulations that if followed precisely would leave only a negligible, safe residue on market vegetables. But authorities are unable to monitor and control chemical use on China's small family farms. When farmers find pesticides or fertilizers don't work, they tend



to apply them more frequently or use something stronger. Rising use of chemical fertilizers also has caused environmental damage: hardened soil, polluted water and fish kills.

The Ministry of Agriculture's Green Food Development Center encourages farmers to supply safer food. It trains them to use traditional farming methods, such as compost for fertilizer, and biological controls, such as planting crops that repel insects next to crops the insects attack. The center also puts its green and white logo on foods it certifies as having been grown with minimal amounts of non-toxic or low-toxic chemicals on land that is free of industrial pollution. With only one-third the world's average farmland per capita, China must rely on agricultural chemicals to farm intensively.

But it can replace chemicals with other methods on a limited scale and meet a growing demand for safer food. The Chinese are concerned about residues of farm chemicals on their food, so the market is very good for the Liuminying organic farm, a national model farm outside Beijing. People buy vegetables raised in the farm's greenhouses at a new organic foods market in Beijing. Some of the products go to restaurants that are trying to become competitive by advertising pollution-free food. The market has started because there are many people who are afraid to buy the vegetables because of chemicals and night soil — human waste used as fertilizer.

But food certified as uncontaminated still represents less than one per cent of all food grown in China. Agricultural officials estimate consumers will pay no more than five per cent extra for it.

Chinese companies are also trying to build a reputation for clean vegetables and other foods. The Ministry of Agriculture's "Green Food" logo appears on hundreds of products, including Happy Longlife coffee, Lightning River milk powder and Clear Water canned bamboo shoots.

**6.2. Define the problems confronting the efforts to feed the world's people and discuss the attempts to meet these problems.**

**6.3. Make a list of and discuss possible advantages and disadvantages to economically developing countries of exporting food. (Points for consideration might include: jobs, skills, balance of trade, food shortages, value added to processed foods, etc.).**

**6.4. Prepare arguments in favor and against (a) chemicals in food; (b) organic food.**

## 7. Summarizing the Unit

Make an outline of the Unit and render its content in a 4—6 min talk.

## UNIT 10 INDUSTRY

### 1. Reading and learning

Scan each text and formulate the main ideas. Read the text again carefully and memorize it, then retell the text close to the original.

#### 1.1. INDUSTRIAL ACTIVITY AND LOCATION

**Types of industrial activity.** People make a living in many different ways. Geographers often find it convenient to group occupations or economic activities into three main sectors known as the primary, secondary and tertiary sectors.

Such activities as agriculture, fishing, forestry and mining deal with producing raw materials such as crops, fish, timber and minerals. Many of these products are not directly consumable; they need to be processed first. For this reason we refer to these activities as belonging to the primary sector. Generally the materials produced by such activities, except for some of those used as food, are passed on in raw form, or in semi-processed form, to the stage of manufacturing.

The secondary sector mainly consists of manufacturing industry, but it also includes electricity generation and construction work. Manufacturing industry is concerned with changing materials from a raw form into a form in which people can use them. For example, raw cotton is of little use. It has to be sent to textile factories to be spun and woven into cotton cloth. In this form it becomes useful to people.

The tertiary sector includes service activities such as work in shops, offices, hotels, in the education and health services and also in transport and communications.

**The distribution of industrial activities.** The importance of manufacturing industry varies from one country to another. Manufacturing is least important in the world's poorest countries. For example, economically developing countries in Africa, such as Burundi, Uganda and Malawi, have fewer than five per cent of their working population in manufacturing industry. In contrast, manufacturing employs at least 20 per cent of the working population in economically developed countries.

The importance of manufacturing varies very much between countries. If we turn the clock back to Europe in the early eighteenth century we find that most people worked in agriculture. Then, around 1750, a remarkable change began to happen. Industries started to use

coal as a source of power; new machines were invented; and manufacturing moved from cottages and workshops to factories. As a result, industrial production increased considerably.

We refer to these changes as the industrial revolution. The industrial revolution both transformed industry and changed the lives of millions of people as they left farming for the newly built factories in the towns.

This so-called industrial phase lasted until the mid-twentieth century. By 1995, much of the economically developed world is in the post-industrial period. As manufacturing increases in efficiency and machines replace workers, more and more people move to work in the tertiary sector. At the same time, people become better off, and spend more on services such as health care, leisure, tourism, travel and so on. As a result, more jobs develop in the tertiary sector. Thus, now in the UK, as in other economically developed countries, employment is dominated by service activities.

We can think of the changing pattern of manufacturing employment as a simple cycle. Different countries are in different stages of this cycle. The poorest are still in the pre-industrial stage and depend heavily on subsistence agriculture. In contrast, some countries, such as China and Brazil, are industrialising rapidly. Others, such as South Korea and Taiwan, are newly industrialising countries which have recently completed the industrial stage.

1. How do geographers group economic activities?
2. What activities deal with producing raw materials?
3. What is manufacturing industry concerned with?
4. What is industrial revolution?

## 1.2. MINING

The extraction of minerals from the ground is of great importance in many countries, but makes very little contribution to the economic life of many others.

**Methods of mining.** A wide variety of different methods of mining are used throughout the world. In some places the valuable mineral lies within a few metres of the surface and can be easily reached. In other places the mineral deposits may be at much greater depths, and expensive equipment is needed to work (mine) them. In such cases mining is usually done by large companies, which have the capital and technical know-how which is needed to develop them.

Where the mineral deposit lies within a few metres of the surface it can be mined by open-cast methods. In open-cast mining the few metres of the unwanted material lying on top of the mineral deposit is removed. If the mineral-bearing rock is soft it can be simply dug out.

If the mineral deposit is covered by a great thickness of other rock, open-cast methods become too expensive and therefore some kind of underground mining has to be used. This generally involves digging vertical shafts, which in mines in some parts of the world extend downwards to a great depth. From these shafts, horizontal tunnels are driven outwards until the mineral deposit is reached.

In the case of petroleum and natural gas, the deposit is reached by a well. It is called drilling. This may take place either on dry land or on the seabed.

**Problems of the mining industry.** Throughout the world the mining industry is associated with a number of problems. Perhaps the most serious of these problems relates to the fact that mineral deposits are non-renewable resources. That is to say, they eventually become exhausted (worked out). In this respect the mining industry is very different from other forms of land-use such as agriculture and forestry. In both cases production can go on for ever, if the land is properly managed. The length of the working life of mineral deposits varies greatly. It depends upon the size of the original deposit, and also upon the rate at which extraction takes place. In recent years the governments of many countries throughout the world have become increasingly concerned about the rate at which their valuable mineral resources are being used up.

Another problem in many of the less developed countries has to do with the ownership of the mining industry. The development of large-scale mining using modern methods requires an enormous outlay (money invested in a project) of capital, and also a high level of managerial and technical expertise. In the past many such countries did not have this capital and expertise, and so had to rely upon foreign mining companies to develop their mineral deposits for them. Profits from mining thus tended to leave the country. In recent years the governments of many countries have objected to the fact that their valuable natural resources are controlled by foreign companies. In some countries the government has attempted to deal with the problem by nationalising either the whole of the mining industry, or at least certain sections of it. Nationalisation means that ownership passes to the government of the country concerned. In other countries the government has simply preferred to take shares in the foreign mining companies. In this case the original company generally continues to provide the necessary managerial and technical expertise, but the government now takes a share of the profits. It is also in better position to exercise control over the way in which the country's mineral resources are managed.

Another problem has to do with the price of minerals on the world market. In the past mineral prices have tended to fluctuate greatly over fairly short periods of time. These price fluctuations have very serious consequences for tiny countries whose economy depends heavily upon the production of a limited range of minerals. In particular it greatly affects their ability to earn the foreign currency which they need in order to pay for their imports.



Yet another problem has to do with the impact which mining can have upon the landscape. Mining can damage the environment in several ways. In many countries, however, the government now enforces strict regulations regarding open-cast mining. Where this is the case, mining companies are required to restore the land fully once they have removed the valuable mineral deposit. In Jamaica, for example, there is an agreement among the bauxite companies on the techniques to be used in restoring land which has been mined. The first half metre or so of top soil is carefully removed and stored, so that it can be replaced once the mine becomes worked out. Some of the bauxite companies in Jamaica have planted forests on mined-out land. Other restored land has been used to grow vegetables and to rear (raise) livestock.

1. Explain what is meant by: a) open-cast mining; b) underground mining; c) drilling; d) nationalisation.
2. Under what circumstances is the open-cast method of mining likely to be used?
3. Briefly discuss the major problems associated with mining.

### 1.3. OIL AND NATURAL GAS

Petroleum or crude oil is a thick liquid which occurs in certain kinds of rock beneath some parts of the earth's surface. As it is brought out of the ground, petroleum is of very little use. It can, however, be broken down to give us a wide range of useful things. Natural gas is sometimes found together with petroleum, and also occurs in deposits on its own.

Petroleum and natural gas are believed to have been formed many millions of years ago, especially during the Cretaceous and Tertiary periods of the earth's history. At that time, much of what is now land was covered by shallow seas. In those seas lived countless millions of tiny plants and animals. It is thought that by some means the remains of the marine animals and plants were changed into drops of oil or into natural gas. The oil and natural gas accumulated in porous rocks such as sandstones.

Once oil has been produced from an oil field, it is treated with chemicals and heat to remove water and solids, and the natural gas is separated. This process is called refining. The oil is then stored in a tank, or battery of tanks, and later transported to a refinery by lorry, railway tank car, barge, or pipeline.

**The oil boom.** The Middle East is a region that is extremely rich in oil. Iran, Saudi Arabia, and Kuwait are three of the world's top oil-producing countries. Certain natural conditions make the Middle Eastern oilfields especially productive. First of all, the oilfields in the Middle East are extremely large. Also, the oil in the ground is under very high natural pressure. For this reason, few wells and little pumping are required to bring the oil to the surface. In some cases, the crude oil rises by itself. Finally, Middle Eastern oil lies under easily accessible land. In

Southeast Asia, on the other hand, the oil lies under dense jungles. In South America, oil must be pumped from impassable swamps. Because Middle Eastern oil is in open country, production costs in this region are lower than in Southeast Asia or South America.

When Middle Eastern oil was first discovered, European companies quickly moved in. They succeeded in gaining the right to pump and market the oil. The Middle Eastern countries, as colonies of European powers, received only a small share of the oil wealth. After World War II, however, the independent Middle Eastern lands began to demand a bigger share. In 1951, the government of Iran took over (began to control) all oil production. Since that move, Middle Eastern lands have won a greater and greater share of the wealth from oil. In 1960, Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela formed the Organization of Petroleum Exporting Countries (OPEC). This organization succeeded in increasing Middle Eastern shares in oil wealth. In less than ten years, OPEC increased Middle Eastern shares from less than 50 per cent to more than 80 per cent.

Highly industrialized countries in other parts of the world became more and more dependent on Middle Eastern oil. Even the increased oil production in the North Sea could not meet the needs of Western Europe, Japan, and North America. The OPEC countries grew powerful as they recognized the world's need for their oil. In 1970, they were able to take complete control of both the production and pricing of Middle Eastern oil. In 1973, the price of Saudi Arabian oil jumped by about 300 per cent. But oil prices began to fall by the early 1980s. Many non-OPEC countries began producing more oil. OPEC does not have the same power that it had in the 1970s. This has caused problems between member countries as they try to determine how to regain some of their control over oil prices.

**Profits and progress.** At first, the sudden wealth from oil benefited only the few who were in a position of political power. Then governments began to expand the benefits that oil wealth brought to their countries. They took on (started) major development and improvement projects. Nomadic grazing, poor farming, and fishing and pearl diving were the most common ways people in Kuwait could make a living. Now, the government operates a water-distillation plant built from oil money. For the first time in its history, Kuwait uses irrigation for agriculture. The city of Kuwait has become a large, modern city.

Saudi Arabia and Iran have also made vast improvements with oil income. Saudi Arabia built thousands of kilometres of highways. It also built electric and water conservation plants and expanded its irrigation networks. Iran has built steel mills (plants) and machine-tool plants with its oil wealth. It has also spent a great deal of money on the program to teach its people to read and write.

1. What three natural features make Middle Eastern oilfields especially productive?

2. What is OPEC?
3. What changes has wealth brought to Kuwait? To Saudi Arabia?
4. Oil has been very important to the countries of the Middle East. What are some of the benefits? What are some of the problems? Which are greater, the problems or benefits?

## 2. Lexical and grammatical exercises

### 2.1. Match the verbs close in meaning in A and B.

- A. concern; produce; fluctuate; consist (of); go on; lead (to); rear; require; attempt; exhaust
- B. cause; work out; raise; worry; manufacture; demand; continue; include; try; change

### 2.2. Fill in the missing forms of the adjectives.

| Adjective | comparative | superlative |
|-----------|-------------|-------------|
|           | less        |             |
| poor      |             |             |
|           |             | the worst   |
| great     |             |             |
| far       |             |             |
|           |             | the lowest  |
| big       |             |             |
|           |             | the best    |

### 2.3. Match the words in A with the words in B to form word combinations. Give Russian equivalents.

- 1) A. as a; in different; for this; in contrast; better; in this  
B. ways; reason; off; respect; to; result
- 2) A. to invest; to make; to mine; to invent; become; extend  
B. downwards; mineral deposit; a living; better off; money; new machines
- 3) A. pearl; nomadic; crude; technical; electricity; oil; enormous; porous; easily; remarkable  
B. oil; grazing; outlay; change; diving; field; generation; accessible; rocks; know-how

### 2.4. Rearrange the letters in the anagrams to form equivalents for the Russian words.

(по)следствие — coeqnsncuee      валюта — cncreury  
добыча — eacrtxtion      бурение — dnllriig  
колебаться — fctluuate      владение — oewnrishp

### 2.5. Cross out a word in a line which is different. Number each line according to the headings given below.

|           |               |               |          |
|-----------|---------------|---------------|----------|
| spend     | depend        | contribute    | focus    |
| refer     | contribute    | object        | succeed  |
| open-cast | consumable    | underground   | shaft    |
| costs     | outlay        | price         | profit   |
| ownership | agriculture   | forestry      | mining   |
| crop      | cloth         | timber        | minerals |
| depend    | succeed       | invest        | result   |
| education | manufacturing | communication | health   |

1. Raw materials.
2. Verbs used with the preposition 'on'.
3. Verbs used with the preposition 'to'.
4. Verbs used with the preposition 'in'.
5. Adjectives used with 'mining'.
6. Money you spend.
7. The tertiary sector includes...
8. Forms of land use.

### 2.6. Form phrases by combining the lines from the columns.

|                             |       |                                       |
|-----------------------------|-------|---------------------------------------|
| oil benefited only the few  | whose | extraction takes place                |
| it depends upon the rate at | that  | is extremely rich in oil              |
| tiny countries              | who   | economy depends heavily upon          |
| a region                    | which | were in a position of political power |

### 2.7. Form sentences by combining the lines from the columns. Explain the difference in the usage of the words *few* and *little*. Give your examples.

|                                   |        |                                    |
|-----------------------------------|--------|------------------------------------|
| The mineral deposit lies within a |        | use.                               |
| The extraction of minerals makes  | few    | hectares of land.                  |
| Vegetation is removed from a      | little | metres of the surface.             |
| Raw cotton is of                  |        | contribution to the economic life. |

## 3. Translation into Russian

1. Mining can damage the environment in several ways.
2. It may disfigure the landscape. Open-cast mining in particular can lay waste to very large areas of land, producing an ugly landscape often dominated by piles of waste material and water-filled hollows.



3. Large areas of vegetation may be destroyed in order to clear the land for mining. This also leads to the destruction of the natural habitat for animal and bird life.
4. The removal of vegetation may lead to soil erosion.
5. Large-scale mining may disrupt natural drainage patterns.
6. Toxic (poisonous) wastes from the mines and processing plants can pollute streams, lakes and other surface water over a large area.

#### 4. Complementary text

##### A MODERN INDUSTRIAL GIANT

**Japanese islands.** A group of islands is called archipelago. The Japanese archipelago has over 3,000 islands. They stretch 2,250 km along Asia's east coast. If all Japan's islands were combined in one landmass, Japan would be smaller than California. The Japanese islands are very hilly and mountainous. They are part of a long volcanic fringe called the "Ring of Fire". Volcanic eruptions and earthquakes have been frequent throughout Japanese history.

There has not been a serious earthquake since 1923. Yet mild earthquakes occur in Japan nearly every day. There are over 60 active volcanoes in Japan. That is ten per cent of all the active volcanoes in the world.

Most of Japan's land surface is steep slopes and narrow valleys. Most of the rivers are too steep for large boats to sail. Centuries ago Japanese farmers began to terrace the mountain slopes. The steep slopes were turned into farmlands. Even with these spectacular terraces, only one sixth of Japan's land can be farmed.

**Economy.** Despite its size, Japan has become a modern industrial giant. Modern industry began in the 1890s with the use of machines to manufacture silk, a fabric that had a heavy worldwide demand then. Money from exported silk helped finance the development of other industries. Soon Japan was importing cotton and manufacturing cotton goods. Japanese businesses sold these goods all over the world. Japanese silk still makes up about 60 per cent of the world's supply. But the manufacture of silk has declined considerably since the development of synthetic fabrics.

Heavy industry and the manufacture of electrical goods have grown rapidly in Japan. The country, however, has very few mineral resources with which to support its manufacturing industries. Lead, zinc, and sulfur are the only minerals produced in large amounts enough to meet Japan's manufacturing needs. Japan imports most of its industrial raw materials and great amounts of fuel. Trade with the United States, Canada, Australia, Saudi Arabia, and other countries is therefore very important to Japanese industry. With the help of imported raw materials,

Japan has become the world's leading producer of cars, television sets, videocassette recorders and other major electronic equipment. Japan has a reputation for making high-quality goods. It ranks second in steel production, producing about 16 per cent of the world's steel supply.

Industrial growth has helped build large, modern cities. Tokyo is the world's second largest urban area, with a population approaching 17 million. Other metropolitan areas with populations of 2 million or more are Osaka, Nagoya, and Kitakyushu. The streets of many of Japan's large cities, like those in European or American cities are crowded with cars and people. High-speed commuter trains connect Tokyo with its suburbs. Other high-speed trains shuttle (carry backwards and forwards) Japanese travelers between Tokyo, Yokohama, and other cities.

Few buildings in Japanese cities are higher than five or six storeys because Japan has about 1,500 earthquakes each year. Buildings of this size are less likely to experience severe damage if a strong earthquake should strike. Japan's many industries provide a variety of jobs for its people. Many Japanese employees stay with one employer their whole lives. Because of their loyalty, the Japanese seldom have to worry about being dismissed. Employers, in turn, reward their workers with lifelong benefits.

On the whole, Japan's recent history makes its story a successful one. But Japan's success has had its price. One problem is pollution. Another problem is Japan's heavy dependence on other countries for raw materials to feed its industries. Despite these problems, Japan's development since World War II has given its people a high standard of living. In both agriculture and industry, the Japanese people have found ways to make much out of little.

#### 5. Writing

Write the translation of the following text or render its content in English.

##### РЕСУРСОБЕСПЕЧЕННОСТЬ

Географическая оболочка земли обладает огромными и разнообразными ресурсами. Однако запасы разных их видов неодинаковы и распределены неравномерно. В результате отдельные районы, страны, регионы, даже материки имеют различную ресурсообеспеченность. Под ресурсообеспеченностью обычно понимают соотношение между величиной природных ресурсов и размерами их использования. Она выражается либо количеством лет, на которое должно хватить данного ресурса, либо его запасами из расчета на душу населения. Например, по расчетам ученых, мировые запасы минерального топлива превышают 12,5 трлн. т. Это значит, что при современном уровне добычи их может хватить более чем

на 1000 лет. Однако, если учитывать запасы, доступные для извлечения, а также постоянный рост потребления, обеспеченность сократится в несколько раз. Другим примером, иллюстрирующим различия в ресурсообеспеченности, может служить характеристика душевой обеспеченности землями в разных странах мира. Так, при среднемировом его показателе 0,25 га на душу населения, он колеблется от 0,04 га в Японии до 3,00 га в Австралии.

Существуют заметные различия в уровне и характере обеспеченности природными ресурсами различных стран. Ближний Восток, например, выделяется крупными ресурсами нефти и газа. Андские страны богаты медными и полиметаллическими рудами. Государства, располагающие большими массивами тропических лесов, обладают ресурсами ценной древесины. В мире есть несколько государств, имеющих практически все известные виды природных ресурсов. Это Россия, США и КНР. Высокообеспеченными с точки зрения природных ресурсов являются Индия, Бразилия, Австралия и некоторые другие страны. Многие государства обладают крупными запасами мирового значения одного или нескольких ресурсов. Так, Габон выделяется запасами марганца, Кувейт — нефти, Марокко — фосфоритов. Большое значение имеет комплексность имеющихся природных ресурсов. Например, для организации черной металлургии в отдельно взятой стране желательно располагать ресурсами не только железной руды, но и марганца, хромитов и коксующегося угля.

Большинство стран располагают некоторым набором природных ресурсов. Однако встречаются государства с очень скудными их объемами, но это не всегда обрекает страну на нищенское существование. Например, Япония, являясь высокоразвитой страной, имеет ограниченное количество минеральных ресурсов. И наоборот, обладая большим их числом и количеством, можно нерационально ими воспользоваться и не достигнуть больших успехов в социально-экономическом развитии.

## 6. Speaking

### 6.1. Retell the following text in English.

#### MINERAL RESOURCES AND INDUSTRY OF AFRICA

African countries have abundant natural resources. They possess some of the world's richest deposits of certain minerals, gold and diamonds are among the most important. South Africa is the world leading supplier of diamonds and gold. Gana used to be called Gold Coast. Some gold is still being mined there. Zaire and Zambia supply

most of the cobalt and copper used throughout the world. Other minerals important to the modern nations include chromium, platinum, bauxite, iron ore, phosphate, tin and manganese. The newest resource for development is oil. Nigerian oil is especially important.

Many countries, however, have not yet developed the technology to use these resources efficiently. Africa still has few manufacturing industries and the governments try to set up more processing plants. Economists classify all the countries of Africa except South Africa as developing nations. There are, however, definite signs of the economic growth of the African nations. One of them is urbanization. Some cities are growing very fast. Lagos, for example, has the highest rate of growth in the world.

**The Republic of South Africa.** Today South Africa has Africa's largest, most diversified, and most developed economy. European interest in South Africa began with the Portuguese in the 15th century. They explored the coast in search of gold and the sea route to the East. In 1488 the ships of Bartolomeu Dias were blown round the Cape of Good Hope during a storm. Ten years later another Portuguese explorer, Vasco de Gama, rounded the Cape before successfully reaching India. Other Europeans, mainly the English and the Dutch, used the Cape as a base for taking on meat and water. In 1652 they established a settlement on the Cape.

South Africa is very rich in mineral resources. Gold and diamonds are the best known, and together with coal have traditionally had most economic importance. Most of South Africa's diamonds come from diamond fields near Kimberley. Almost all the gold comes from the High Veld, especially from a region called The Rand. Johannesburg, the most populated city in Sub-Saharan Africa, is in The Rand. South Africa also has many other commercial mineral deposits, including uranium, copper, nickel, platinum, uranium, asbestos, chromium, phosphates, vanadium, tin, titanium, beryllium, manganese and iron ores.

The chief manufactured goods are clothing, processed foods, chemicals, and metal items, including iron and steel products. South Africa does not have to depend on other countries for these items. Most of the factories in South Africa are in or near the cities of Pretoria, Johannesburg, Durban, Port Elizabeth, and Cape Town. The gold and diamonds allowed South Africa to become a modern, industrial nation. South Africa can pay for expensive irrigation systems for dry farmland. It has capital to support good schools and universities and is able to construct good houses with modern facilities. Some South Africans live a very comfortable life.

South Africa has some of the best farmland in the world. Many kinds of crops are grown here. This is because there are several different climates in South Africa. The first type of climate and farmland is Mediterranean. The Mediterranean climate is good for growing fresh fruit, especially grapes, and wheat. Farther inland is quite dry. Here sheep and cattle are raised. The second type of climate and farmland is the subtropical sugar lands. They are in the coastal area near the city of Durban.



The upland hilly grassland of the plateau in South Africa is the High Veld. It is the third type of climate and farmland. The rainfall is seasonal, but the High Veld has a good underground water supply. Farmers of the High Veld grow most of the corn in South Africa. They feed the corn to beef cattle.

The country has a well-developed tourist industry. The tourists are attracted by numerous natural reserves, sunny beaches and excellent service. The internationally famous Sun City resort, the entertainment mecca of Africa, attracts some three million visitors a year. It offers everything one could ever want from a holiday in Africa: luxury accommodation, entertainment (such as parasailing, jetskiing, and balloon flights), wildlife and superb climate. There is also the Lost City, one of the world's most exciting tourist destinations. It is set in a man-made rain forest. The Lost City Golf Course has a colony of 33 crocodiles as a permanent hazard, which helps to make an interesting game. Another element of the Lost City is the Valley of Waves, the world's most advanced water park which offers dramatic water slides and an enormous wave pool on which 2 m surfing waves are generated.

#### 6.2. Discuss the following topics:

- a) What parts of Africa are rich in mineral resources and which have almost none.
- b) What important minerals and energy sources seem to be in short supply in Africa.
- c) Why South Africa was a good place for European settlement.

## 7. Summarizing the Unit

Make an outline of the Unit and render its content in a 4—6 min talk.

## UNIT 11

### INDUSTRIAL CHANGE

#### 1. Reading and learning

Scan each text and formulate the main ideas. Read the text again carefully and memorize it, then retell the text close to the original.

##### 1.1. MANUFACTURING INDUSTRY

Manufacturing industries use either raw materials or put together (assemble) parts to make products. Because of the work and materials involved in both types of manufacturing, the final products have added value.

Some manufacturing industries simply process raw materials. These industries, which include oil refining and iron making, are known as processing industries. Their main purpose is to supply other manufacturing industries with essential materials. Another group of industries, such as textiles and pottery, use raw materials without any processing to make finished products. Finally, assembly industries buy components (parts) from other firms, and put them together to make a finished product. Motor vehicle manufacture is probably the best-known example of an assembly industry.

**Iron and steel industry.** Iron and steel making is an important industry for a modern industrial economy. Many industries, such as car making, construction and engineering use steel as their basic material.

There are three main operations in iron and steel making. First, coking coal and limestone are used to smelt iron ore in a blast furnace to make iron. Second, the iron is refined in a furnace to produce steel. And third, the steel is shaped to make a range of products such as beams, rails, plate, coil and so on.

In a modern integrated iron and steel works, all three operations take place on the same site. This helps to cut both transport and fuel costs. For example, molten iron is taken directly from the blast furnace to the steel making plant. Such integrated iron and steel plants are very large and often occupy sites covering six or seven square kilometers. Large plants are essential if the costs of making steel are to be kept as low as possible.

Iron and steel is a heavy industry. Its raw materials are bulky; they are used in very large quantities and are expensive to transport. During manufacture, though, these raw materials lose a lot of their weight. This has had an important effect on the industry's location. In order to keep its transport costs low, the iron and steel industry has always located as close as possible to its materials. Thus, for example, for most of the nineteenth century, iron making in UK located on the coalfields. Later, with the discovery of iron ore deposits, plants were built on the orefields.

Since 1945, the industry has relied increasingly on imported materials. This has led to a movement to coastal locations. Here imported iron ore and coking coal, brought in by 200,000 tonne bulk carriers, can be processed most cheaply.

**Car manufacturing industry.** Car manufacturing is an assembly industry. Components such as engines, radiators, spark plugs, windscreens, seats etc., made by hundreds of different firms, are put together at an assembly plant. We refer to this system as horizontal organisation.

Car making is a leading industry in the developed world. Although production is growing rapidly in some economically developing countries, like Brazil and China, in the mid-1990s nine out of every ten cars were still made in the developed world.

Huge transnational corporations (TNCs) dominate world car production. Many of these companies, e.g. General Motors, Ford,

Toyota, Nissan, are household names (well-known and often talked about). TNCs operate assembly plants and component factories in many different countries.

1. What types of manufacturing industry do you know?
2. What is the difference between them?
3. What are three main operations in iron and steel making?
4. Where are major car making factories located?
5. Suggest possible reasons why it is an advantage for component suppliers in the car industry to locate close to assembly plants.

## 1.2. INTEGRATION AND GLOBALISATION

**Ford Motors.** Ford is an American TNC with its headquarters in Detroit. After General Motors, it is the world's second largest car manufacturer. At the beginning of the 20th century, Ford first developed the mass production of vehicles using moving assembly lines.

The company opened its first overseas plant in Manchester, UK, in 1911. In 1995, it had assembly plants throughout the USA and the European Union, as well as in Mexico, South America, East Asia, South-east Asia and Australia. In total, Ford employed 350,000 people worldwide. Before the end of the 20th century Ford aimed to build assembly plants in China and India. In Europe, Ford's operations are fully integrated. In fact, it has a common car range for the whole of Europe. For example, the plants at Dagenham (UK) and Valencia (Spain) produce all of the Fiestas sold in Europe, while Halewood (UK) and Saarlouis (Germany) plants make Escorts. What advantage does this policy have? Essentially, it lowers costs and helps to make Ford more competitive. By concentrating on just a few models for the entire European market, Ford can make a large number of cars. This is important because the costs of developing new models (research, design, new machine tools etc.) are enormous. For example, in 1995 Ford decided to build a new Jaguar car at Coventry. The cost of developing this new model is very high. Overall expenses are lowered if a factory specialises in making a single model or component. These savings are vital to the success of large-volume car producers like Ford.

In the next few years Ford aims to go even further and integrate its operations at a global scale. In fact, the Mondeo is Ford's first truly "global" car: it is manufactured worldwide and sold in markets in many different countries. Other car companies such as General Motors, Toyota and Nissan are following Ford's example and moving towards the globalisation of production.

**High-technology industries in the UK.** High-technology (high-tech) industries cover a wide range of activities, including micro-electronics, computers, telecommunications, biotechnology, pharmaceuticals and

many others. Like iron and steel and car making, high-tech industries need a lot of investment. However, one special feature of high-tech industries is the importance they give to researching and developing new products. In the UK, for example, around six per cent of manufacturing jobs are in the high-tech sector. In fact, high-tech industries are the UK's leading exporters. However, like car manufacturing, high-tech industry is dominated by transnational corporations. GlaxoWellcome is a UK-owned company which is a market leader in pharmaceuticals, but the electronics industry in the UK is almost entirely controlled by foreign (mainly US and Japanese) companies. Many of these companies, such as IBM, Motorola, Apple, Mashushita, Fujitsu and Sony are well-known.

**Footloose but not free: the location of high-tech industries.** Most high-tech products have relatively low weight and bulk. This means that the cost of transport, both of components for assembly, and of finished products for market, is fairly low. Therefore, compared to iron and steel industry, transport is not of such importance to the location of high-tech industries. Similarly, other traditional locational factors, such as supplies of materials and energy, have little importance. Industries, such as high-tech, which are not limited in their choice of location by transport materials or energy, are called footloose. Yet, despite having a much freer choice of location than heavy industries, high-tech industries cannot locate anywhere they like.

1. What is the world's first largest car producer?
2. What is Ford Motors famous for?
3. What aspects does the development of new car models include?
4. In what way do the locational factors for high-tech firms differ from those for more traditional industries?
5. Why cannot high-tech industries locate anywhere they like?

## 1.3. COTTAGE INDUSTRIES AND APPROPRIATE TECHNOLOGY

Most manufacturing industries in economically developed countries are capital intensive. They use advanced technology and highly educated labour forces, and take place in purpose-built factories. Their products are increasingly sold globally.

Similar industries exist in most large cities in economically developing countries. However, much manufacturing here is different. This is because it is usually small-scale, based on simple technology, and uses local materials and traditional skills to produce goods for the local community. Such industries are often located in people's homes in rural areas, or in small workshops in towns. These so-called cottage industries were once common in Europe before the industrial revolution.

Some economically developing countries like China, India and Brazil are building capital-intensive, advanced-technology industries, but most



governments and aid organisations do not see these big projects as the best way forward for the developing world. Industries using advanced technology may bring prestige to the country but they rarely benefit the majority of the people. The most successful schemes are based on low technology, use local materials and traditional skills, and cost relatively little to introduce. They involve the local people who are consulted about their specific needs. One of such schemes in economically developing countries is based on these principles and uses technology which is appropriate for local people's needs (appropriate technology).

**Case study: silk reeling in India.** More than 500,000 people in India work in different stages of the silk industry, from the production of raw silk (sericulture), to reeling (turning the raw silk to yarn) and weaving.

Reeling is mostly a cottage industry. It is labour intensive and a vital source of income and employment for India's poor rural population. Reeling involves unwinding threads from silk-worm cocoons using a simple reeling machine known as a "charaka". Firstly, farmers breed silk worms which feed on mulberry leaves. When the silk worms pupate, they spin silk cocoons which the farmers then take for auction in local markets. Reelers, who are mainly women, buy these silk cocoons and separate the strands on their "charakas". The women then sell the yarn to weavers. Some women operate small businesses, buying the raw silk and employing three or four reelers.

Aid organisations, which are keen to promote appropriate technology, support the silk-reeling industry because it is based on simple technology. For example, in southern India, aid workers have helped improve the business and marketing skills of local reelers. In addition, they helped to design a new reeling machine. Reelers have tested three new machines which they found were easier to use, produced better quality yarn and increased output. All these improvements came through the involvement of local reelers, using their ideas and skills. This development should greatly improve the lives of local people and at little cost.

1. Where are most manufacturing industries located in economically developing world?
2. Why are labour-intensive industries often well suited to many economically developing countries?

## 2. Lexical and grammatical exercises

### 2.1. Match the words close in meaning in A and B.

- 1) A. to rely (on); to cut down; to supply; to manufacture; to dominate; to involve  
B. to depend (on); to produce; to include; to provide; to control; to reduce
- 2) A. expenses; purpose; essential; entire; most; site; component; suitable  
B. necessary; costs; whole; place; part; appropriate; majority; aim

### 2.2. Match the words in A with the words in B to form word combinations. Find their Russian equivalents in the list (1) — (8) below the table.

- A. added; oil; finished; blast; household; assembly; coking; mass  
B. coal; production; line; product; value; furnace; name; refining

(1) добавленная стоимость; (2) перегонка нефти; (3) готовое изделие; (4) домна; (5) коксующийся уголь; (6) серийное производство; (7) сборочный конвейер; (8) хорошо знакомое имя

### 2.3. Fill in the missing forms of the words.

| Noun        | Adjective | Noun   | Verb      |
|-------------|-----------|--------|-----------|
|             | available | weight |           |
| competition |           |        | refine    |
|             | expensive |        | introduce |
| skill       |           | aim    |           |

### 2.4. Match the words in A with the words in B to form word combinations. Give Russian equivalents.

- 1) A. advanced; manufacturing; molten; overall  
B. expenses; iron; industry; technology
- 2) A. process; refine; cut; introduce  
B. iron; a new scheme; costs; raw materials

### 2.5. Make up sentences by combining the lines from the columns of the table. Put the verbs from the second column into the passive.

|                           |                |                                   |
|---------------------------|----------------|-----------------------------------|
| High-tech industry        | dominate       | in their choice of location.      |
| Coking coal and limestone | use            | by transnational corporations.    |
| High-tech industries      | refine         | in a furnace to produce steel.    |
| The iron                  | (not) limit    | to smelt iron ore.                |
| Cottage industries        | often (locate) | in people's homes in rural areas. |

## 3. Translation into Russian

### EUROPE'S MICROSTATES

Six tiny nations, among the world's smallest, lie scattered throughout Europe. Imagine six nations whose combined areas occupy less than 975 square kilometers, approximately the area of New York City. Each of

these nations is an independent country with its own government, economy, and history.

**Andorra and Malta.** Andorra, by far the largest of these microstates, covers 487 square kilometers. Sandwiched between Spain and France in the Pyrenees Mountains, the 43,000 Andorrans depend on tourism to provide between 80 and 90 per cent of their income.

Malta, an island nation in the Mediterranean Sea, covers 316 square kilometers. An economy based on tourism and textile manufacturing supports the population of 355,000.

**Liechtenstein.** Wedged between Switzerland and Austria, Liechtenstein has a population of only 28,000. Most Liechtensteiners live in tiny rural villages and work in small factories or businesses. The nation itself depends on two major sources of income — the sale of postage stamps, which are highly prized by collectors all over the world, and taxes levied on foreign businesses. Liechtenstein's business and income taxes are quite low when compared with those in most other nations of the world. As a result, about 5,000 foreign companies use the nation for their corporate headquarters.

**San Marino.** San Marino, completely surrounded by Italy, is barely one-third the size of Liechtenstein. Yet it traces its independence back more than 1,600 years. Its 24,000 people pride themselves on being citizens of the oldest republic in the world.

San Marino's picturesque capital, also named San Marino, sits at the very peak of the country's highest mountain. The entire setting, with its magnificent vistas, fortress walls, and numerous festivals, makes it a favorite spot for tourists. Indeed, tourism provides the major source of income for San Marino. Like Liechtenstein, San Marino also is noted for its postage stamps.

**Monaco and Vatican City.** Perhaps more well-known than the other microstates are the two smallest nations in the world, Monaco and Vatican City. Monaco occupies 1.9 square kilometers of land. Famed for its resortlike atmosphere on the Mediterranean coast, Monaco ranks as one of the favorite vacation spots in the world.

Vatican City's total area is just 44 hectares. Vatican City, ruled by the Pope, serves as the spiritual and governmental headquarters of the Roman Catholic Church. Vatican City lies entirely within the city of Rome. Yet its area is recognized as the territory of an independent nation.

## 4. Complementary text

### MODERN INDUSTRIALISATION: SOUTH KOREA

Like Japan, South Korea has developed its industries despite having few natural resources of its own. Since the early 1970s South Korea has been transformed from one of the poorest, to one of the richest countries in Asia.

**South Korea's industrial miracle.** From the start the South Korean government planned the country's industrial development. It protected its own industries from foreign imports. At the same time it encouraged industries making goods for export, by giving them subsidies and cheap loans. Firms were told what to do and what factories to build. Daewoo, began making cars on the orders of the government. Yet until 1970 it was a small textile company.

Between 1973 and 1979 the South Korean government promoted heavy industries such as metals, machinery, chemicals and shipbuilding. This policy proved very successful. The state-sponsored Posco iron and steel company is now the second largest steel maker in the world and in 1993 South Korea overtook Japan as the world's leading shipbuilder.

Since the mid-1980s the emphasis has shifted from heavy industries to cars, high-tech (e.g., semi-conductors) and electronics (TVs, videos, etc.). Hyundai, Daewoo, Kia and Samsung are South Korea's four main car makers. South Korean manufacturing industry is dominated by four huge companies. Samsung, Hyundai, Daewoo and LG produce 60 per cent of the country's exports. By 1995 Samsung had become the fourteenth largest company in the world, and the biggest maker of semi-conductors. Unlike American or UK companies, Korean companies are involved in a range of industries. Apart from semi-conductors and cars, Samsung makes electronic watches, computers, video recorders, heavy machinery, ships, petrochemicals and medical equipment.

**Overseas investment.** In the 1990s South Korea's companies began to globalise their operations. The four leading companies started to invest heavily in the USA and Europe, as well as in East Asia. The UK has been South Korea's most popular location in Europe. Investment in the UK gives Korean firms a manufacturing base in the UK, which allows them to get round trade barriers. Samsung recently poured about \$700 million worth of investment into electronics on Teesside (UK). This largest Korean investment project in Europe started production in 1995. Eventually it will employ 3,000 people.

## 5. Writing

Write the translation of the following text or render its content in English.

### МИРОВОЕ ХОЗЯЙСТВО

Мировое хозяйство — исторически сложившаяся совокупность национальных хозяйств стран мира, связанных между собой всемирными экономическими отношениями. Мировое хозяйство является результатом тысячелетней эволюции производительных сил. Оно возникло в XVI веке, когда в результате Великих геогра-



фических открытий международная торговля охватила все регионы земного шара. Во второй половине XIX века происходило становление и расширение мирового хозяйства благодаря развитию транспорта. Главным этапом формирования современной системы мирового хозяйства стал конец XIX и XX век, что было результатом совокупного развития крупной машинной индустрии, транспорта и мирового рынка.

Понятие мирового хозяйства тесно связано с понятием международного географического разделения труда (МГРТ) и экономической интеграции. МГРТ выражается в специализации отдельных стран на производстве определенных видов продукции и услуг и в последующем обмене ими. МГРТ присущи объективные противоречия. Так, например, чрезмерная специализация страны на поставках небольшого количества товаров ставит ее хозяйство в слишком сильную зависимость от колебаний конъюнктуры на мировых рынках. Специализация же на отраслях обрабатывающей промышленности служит мощным фактором развития всего хозяйства. Примерами отраслей специализации могут служить автомобилестроение, судостроение, электротехническая промышленность Японии, зерноводство Канады и Аргентины, выращивание кофе в Бразилии и Колумбии.

Существующая географическая модель мирового хозяйства постоянно развивается. До конца XIX века в мире преобладал один центр — Европа, затем образовался второй, вскоре ставший главным — США. В период между двумя мировыми войнами возникли еще два центра мирового значения — СССР и Япония. После Второй мировой войны началось формирование новых центров в Азии (Китай, Индия, нефтедобывающие страны Юго-Западной Азии), а также в Канаде, Австралии, Бразилии. В последние десятилетия на мировую арену вышли новые индустриальные страны во главе с «четырьмя азиатскими тиграми» — Кореей, Тайванем, Гонконгом, Сингапуром. Таким образом, в наши дни географическая модель мирового хозяйства приобрела полицентрический характер.

## 6. Speaking

### 6.1. Retell the following text in English.

#### FACTORS INFLUENCING THE LOCATION OF INDUSTRY

Important locational factors include the following:

**Nature of the ground surface.** Ideally you would look for a large area of reasonably flat land on which to site your factory: this would make the job

of building easier. Obviously, the amount of land needed would vary according to the type of factory planned. Those factories which use large quantities of bulky raw materials need plenty of space in which to store them.

**Availability of water supply.** All factories need water. But certain types use very large amounts and so need to be located near a good water supply such as a river.

**Availability of suitable labour.** Some types of industries are much more labour-intensive than others. They need large numbers of workers in relation to other inputs such as raw materials and capital. Such factories need to be located in areas where there is a fairly dense population. In some cases industries need their workers to be highly skilled, and it is an advantage for them to be located in areas where there are already people with experience of doing that particular work.

**Availability of raw materials.** If a factory uses large amounts of very heavy or very bulky raw materials, it is usually a good idea to build it near to where those raw materials are produced, as this cuts down transport costs. Also, if the raw material is more perishable or more fragile than the finished product, then it is also a good idea to build factory in the area where the raw materials are produced. This type of industry is sometimes called raw material-oriented industry, because its location is mainly determined by its raw materials.

Some of the raw material-oriented industries are concerned with the processing of local agricultural products. A good example of raw material-oriented industry is the manufacture of raw sugar from sugar cane. It takes about 10 tonnes of sugar cane to produce 1 tonne of sugar, and so transport costs are greatly reduced if the sugar factories are located in the main cane-growing areas. Also, the sugar content of the cane declines rapidly if it is left lying around, and so ideally it needs to be processed within about 48 hours of being cut.

In the case of forest industries, saw mills are usually located in or near to forested areas. Fish processing plants are usually located at ports. In the case of minerals, alumina factories are often set up in the bauxite-producing areas.

In the case of industries using large amounts of imported raw materials, it is a good idea to locate them at seaports, because this cuts down transport costs. Good examples of such industries are oil refineries using imported petroleum and flour mills using imported wheat.

**Availability of power.** Although all industries need power, there are a few whose location is mainly determined by its availability. These are known as power-oriented industries. A good example of such an industry is aluminium smelting. For example, although both Guyana and Jamaica produce large amounts of bauxite, neither country has as

yet been able to develop an aluminium-smelting industry. This is mainly because neither produces enough cheap electricity.

**Availability of markets.** Some industries are best located near to their markets, and so are known as market-oriented industries. Market-oriented industries tend to be located in or near to towns. This is because that is where the largest number of people live, and where there is the biggest market (demand) for manufactured goods.

**Availability of transport.** Transport is needed both to bring raw materials to the factory site, and also to distribute the finished products to the consumer. In the end, the cost of transport is paid for by the consumers of the finished products, as it has to be added on to the price which they pay for them. Clearly, in siting a factory transport links are essential, although the relative importance of transport does vary with the type of industry involved.

**Influence of government.** In some countries the government plays an active part in influencing the distribution of manufacturing industry. In order to discourage people from flocking into the towns in search of work, they may encourage industrialists to set up factories in the rural areas. They can do this by giving longer tax holidays to companies which set up factories in such areas. They may also build factories in rural areas, and let them to industrialists at low rents.

**Effect of interdependence.** There are certain advantages to be gained by locating a factory near to other factories which are already in operation. For example, there is already an automobile factory in operation. Originally this factory would have had to import the paint which it needed. In response to demand, a new factory has been set up nearby to produce paint for the automobile industry. In the manufacture of paint, chemicals are used. As a result, there is an opportunity for the development of a local chemical industry.

6.2. Explain what is meant by: a) raw material-oriented; b) power-oriented; c) market-oriented; d) labour-intensive industry. What are the peculiarities of their location? Give examples of each of these types of industry from your own country or from elsewhere in the world.

6.3. Discuss whether Russia is an appropriate place to build assembly plants and component factories of transnational corporations.

## 7. Summarizing the Unit

Make an outline of the Unit and render its content in a 4—6 min talk.

## UNIT 12 TOURISM

### 1. Reading and learning

Scan each text and formulate the main ideas. Read the text again carefully and memorize it, then retell the text close to the original.

#### 1.1. THE NATURE OF THE TOURIST INDUSTRY

A tourist is a person who travels away from his or her home area in order to have a holiday. The tourist industry looks after holiday visitors by providing them with such things as accommodation (places in which to stay), food, transport, entertainment and shopping facilities.

In the last few decades the number of people travelling to foreign countries for holidays has grown greatly. The growth of international tourism has been made possible by improvements in transport, especially the development of faster air travel, and by the fact that in some parts of the world many people are now much richer than they were in the past. Generally speaking, only in the more developed countries of the world people can afford to travel abroad for pleasure.

Today tourist industry became a multisectoral activity that requires inputs from many industries — agriculture, construction, and manufacturing — and from both the public and private sectors to provide the goods and services used by tourists.

**The growth of tourism in the Caribbean.** The West Indian tourist industry began as early as the end of the 19th century, when a few wealthy North Americans and Europeans started to take winter holidays in the Bahamas and Jamaica. In the early part of this century the number of visitors increased slowly, and between the two world wars other islands were able to build up a small tourist industry. The real development of the West Indies as a major holiday resort area did not begin until after the Second World War. Since 1950 the number of visitors to the Caribbean region has increased rapidly.

A number of factors have helped in the growth of the region's tourist industry.

**Accessibility.** The Caribbean is relatively near to the main population centres of the eastern parts of the USA and Canada. Because of the high living standards which they enjoy, a larger proportion of the inhabitants of these two countries can afford to travel abroad for holidays than in any other part of the world. Because of the relatively short distances involved, air fares from the eastern part of North America to the Caribbean are much lower than those to most other resort areas.



**Climate.** For the North American and European tourist one of the most attractive features about the Caribbean region is the climate. Weather conditions are particularly pleasant between December and April. At this time of year weather conditions are at their worst in the areas from which most tourists come.

**Sea and sand.** Many of the Caribbean territories have excellent beaches, some of them being of pure white coral sand. The surrounding waters are warm throughout the year, and in many places they are extremely clear. Conditions are ideal for such aquatic (water) sports as swimming, scuba diving, sailing and windsurfing.

**Scenery.** While many of the tourist visitors to the Caribbean spend much of their time between the beach and the sea, several territories can also offer magnificent scenery in the interior. This is especially the case in the more mountainous countries such as Dominica, Haiti, Jamaica and St Lucia.

**The political climate.** Political stability favors the development of the tourist industry, as the average tourist tends to be easily frightened away from an area by any suggestion of violence or unrest (instability). With a few notable exceptions, the countries of the Caribbean have shown a fairly high degree of political stability in recent times. The stable and democratic form of government has certainly been a factor which has helped the tourist industry of the region to flourish. It is noticeable that in countries such as Cuba, the Dominican Republic and Haiti which have from time to time been subject to political unrest, the tourist industry has not shown the same steady growth as elsewhere.

**Government encouragement.** The governments of many Caribbean countries have done a great deal to encourage the growth of the tourist industry. Many of them have set up Tourist Boards which have offices in countries in North America and Europe. These boards advertise the attractions of their country's resort areas. Some governments have also done a lot to improve facilities for tourists, by improving docking facilities for cruise ships, building better roads and so on.

**The origins of tourists.** By far the greatest number of tourist visitors to the Caribbean region is from the mainland of North America. Visitors from the USA usually make up more than two-thirds of the total arrivals in many countries. Canadians are also frequent visitors to several of the Caribbean countries. Because of the greater distances and travel costs involved, visitors from Europe tend to be far less numerous.

The holiday visitors to the Caribbean can be divided into two main groups. One group visits the region on board cruise ships (cruise passengers), while the other actually stays in a country (stop-over passengers). In the early days of the Caribbean tourist industry, most of the visitors to the region arrived on board cruise ships. Although this is no longer the case, the cruise ship trade is still important in several Caribbean countries. In 1980 for the region as a whole, about one-third of the total visitors were cruise-ship passengers. Some holiday-makers

prefer to take their holiday in the form of a cruise, as it means that they can visit several different countries.

Most of the cruises to the West Indies start from ports in the USA, although there are some which start in Europe. A typical cruise from the USA lasts between one and three weeks, with several different islands being visited. The cruise-ship usually stops for one day in each of the ports in order to allow its passengers to go ashore for a few hours sightseeing and shopping. During the night, the ship moves on to its next port of stop.

Some Caribbean countries get a lot of cruise-ship visitors, while others are not visited by cruise ships at all. The countries which are most visited by cruise ships are generally those which have the best docking facilities for large ships, and which also have good facilities for entertaining the passengers.

1. What are tourists?
2. Why do so many tourists spend their holidays in the Caribbean region?
3. Why are some Caribbean territories able to attract more visitors than others?
4. What countries provide the largest number of tourist visitors?
5. Why are visitors from Europe to the Caribbean far fewer in number than those from North America?
6. Why do some countries get a lot of cruise ships calling, while others get very few?

## 1.2. THE EFFECT OF TOURISM

There are great differences of opinion on this subject. Some people point out that the development of the tourist industry has greatly helped to strengthen the economy of many Caribbean countries. At the same time there are others who feel that the tourist industry has had harmful social effects which greatly outweigh its possible advantages.

**The effect on the economy.** Overall, the effect of the tourist industry upon the economy of the Caribbean is considered beneficial. In particular, the tourist industry brings a lot of foreign currency into the region. It creates employment and provides a market for local handicraft industries as well as for local agriculture and fisheries.

The tourist industry makes a very important contribution to the economy of the region as a whole, although its importance varies greatly from one country to another. In several countries, including the Bahamas, the British Virgin Islands, the Cayman Islands and the US Virgin Islands, the tourist industry forms the basis of the local economy. Even some of the countries which in the past have attracted few holiday visitors now feel that the development of the tourist industry offers them the quickest means of strengthening their economy. This is especially

true for the smaller countries which lack mineral resources, and which prospects for the development of manufacturing industry are not good.

The number of visitors to the different countries of the Caribbean varies greatly, but numbers alone do not give a true picture of the importance of tourism to the local economy. Even more important than the number of visitors a country has, is the amount of money which the visitors spend. This is dependent upon several things, but especially upon the average length of stay. For example, cruise ship passengers usually make a much smaller contribution to the local economy than do stop-over passengers. This is partly because they stay for a shorter period of time, and also because they are accommodated aboard their ship, and so do not need to pay hotel bills. Those countries in which cruise ship passengers form a large proportion of the total visitors can therefore be expected to gain less economic benefit from tourism than those in which stop-over passengers are most numerous. However, not all the money spent by tourists remains within the country. Indeed, the critics of tourism claim that a very large part of the tourist expenditure goes straight back abroad. In some resort areas many of the large hotels and other tourist amenities (hotels, beaches, aquaparks) are owned by foreign companies, and most of the profits from their operations therefore leave the country. Also in many cases, much of the food and other items which are consumed by the tourists during their stay have to be imported, and so are paid for in foreign currency.

Tourism also makes other contributions to the local economy. In some cases the growth of the tourist industry has provided a valuable stimulus to local agriculture and to the local fishing industry, as tourist hotels provide a ready market for fresh fruit, vegetables, flowers, fish, dairy produce and meat. Local handicraft industries also benefit from the growth of tourism. The making of handicrafts in sisal, straw and wood has become very important in such countries as the Bahamas, Haiti and Jamaica.

However, the growth of tourism is not without problems. A flourishing tourist trade which has taken many years to build up can decline. This can be the result of unfavourable political developments, outbreaks of disease and natural disasters in the resort areas themselves, or the result of economic problems in the countries which supply most of the visitors.

**The social impact.** In the major resort areas the tourist industry is certainly important as a provider of employment. There is not only a direct employment provided in the hotels and guest houses to tourists, but much additional work is created in transport and entertainment and many people benefit from it. On the other hand, employment in tourism tends to be seasonal in nature. At the height of the tourist season there is a large demand for workers, but at other times of the year there are relatively few visitors, and some hotels may shut down entirely for the period.

In addition to its impact on the economy, the growth of tourism has been responsible for bringing together peoples whose cultures and lifestyles are different. But not everyone has been entirely happy with the

social consequences of tourism. For example, in some Caribbean countries casinos and other gambling houses have sprung up with tourism. Many people feel that these activities help to demoralise Caribbean society and that they should not be allowed to exist. Others argue that gambling provides relaxation and attraction for tourists and should therefore be permitted.

There have also been complaints that some foreign tourists dress too scantily, and that this is an insult to the dignity of the people of the region. There are other critics of the tourist industry who suggest that it has been responsible for an increase in prostitution and drug abuse in the resort areas.

Other people complain about the effect of tourism upon the local cost of living. The land sold for building hotels and other tourist facilities often has a far higher price than the current local price. This has had a considerable impact upon the price of land in general. In many cases this tremendous increase in land values has prevented local people from being able to buy even a small plot of land for their own use.

1. What effect does the growth of the tourist industry have upon the economy of the Caribbean, upon the way of life of the region's people and upon its ecosystems?
2. Has the growth of the tourist industry been beneficial, or has it been harmful?
3. The number of holiday-makers visiting the region is much higher at certain times of year than at others. What problems might such seasonal variations cause for people in the tourist industry? What could they possibly do in order to spread out the flow of visitors more evenly over the year?

### 1.3. TOURISM AND THE NATURAL ENVIRONMENT

In the Caribbean the natural environment is very fragile and sensitive. It must be properly managed to serve the needs of local people. If the natural environment is mismanaged the tourist resource base could disappear, and with it the tourist industry itself.

Some of the most beautiful and appealing tourist destinations in the Caribbean are very small islands. The smaller the island, the more delicate is the natural environment. These islands have an acute shortage of land and fresh water, and problems with the disposal of sewage and other waste. Any attempts to solve these problems must take the whole environment into consideration.

Tourism affects the natural environment in the Caribbean in many ways. Land has to be set aside for building tourist accommodation, and other facilities such as roads and airports. The way in which the land is used affects the vegetation and scenery. In Barbados, for example, thirty or so years ago there was a special kind of forest which extended for several kilometres along the west coast. There were also small areas of



mangrove swamp along the coast. This coastal area is heavily built by hotels and the natural vegetation has disappeared.

The sea adjoining the tourist resorts is affected by the increase in waste disposal that comes with major tourist developments. In some cases sewage, detergents and greasy water from kitchens are not properly treated before disposal, and the sea becomes polluted. This makes conditions less pleasant both for tourists and for local residents.

Local coral reefs are also endangered by pollution. Coral reefs are very beautiful. They attract scuba divers and other tourists who admire them through glass-bottomed boats. They form the habitat (living place) for many species of fish, for sea urchins and for many other forms of marine life. Coral reefs also play a vital role in protecting the seashore from erosion. Tourists may be directly responsible for damaging the marine ecosystem, by collecting corals and sea shells as souvenirs. In other cases they are indirectly responsible for such damage, as they buy these items from local people who have collected them to sell.

**Managing the natural environment for tourism in the Caribbean.** The problem that now confronts the governments of the Caribbean is to find a suitable balance between the environment and tourism. This can only be achieved by careful planning. If the natural environment is not protected, then tourism will decline.

National parks have been set up in some countries. In Dominica there is a national park covering about 6,500 ha. This park encloses high mountains, and contains many different species of forest trees and birds. The Guadeloupe National Park, which occupies about 30,000 ha of land, encloses high mountains, forests and a volcano.

In the Bahamas the Exuma Cays (small islands) have been given over to a national land-and-sea park. In this park there are birds, marine plants and animals which are protected by the Bahamas National Trust. In addition, there is a wildlife reserve on Conception Island and a flamingo colony on Great Inagua Island under the protection of the Bahamas National Trust.

In Trinidad and Tobago there is a special body that looks after the coastal areas. It is attached to the local Institute for Marine Affairs. The coastal area is one of Trinidad's most critical and sensitive resources, and the Department is concerned with making the best possible use of this resource, not only for tourism but for many other purposes as well.

In Jamaica there is a government agency responsible for the conservation and management of the island's natural resources. The Recreation and Conservation Division is especially concerned with the management of coastal resources.

1. How does tourism affect the natural environment in the Caribbean?
2. What endangers the coral reefs? Why are they important for the Caribbean?
3. What places should be protected in the Caribbean?

## 2. Lexical and grammatical exercises

### 2.1. Complete the gaps using the correct forms of the verbs in brackets.

#### TRENDS IN TOURISM

Throughout history, people \_\_\_\_\_ (travel) all over the world for a variety of purposes. However, it is only in the last fifty years that people \_\_\_\_\_ (travel) in such huge numbers for pleasure. Until this century only the very rich and leisured people in society \_\_\_\_\_ (have) the free time and the money to travel outside their own local area. For instance, it is known that wealthy Romans \_\_\_\_\_ (go) to seaside resorts in Greece and Egypt. In the seventeenth century the sons of the British aristocracy \_\_\_\_\_ (travel) throughout Europe to improve their knowledge. With the railways and the industrial revolution in Britain working-class people \_\_\_\_\_ (begin) to travel. By the 1870s a typical family holiday \_\_\_\_\_ (be) a day's trip to the seaside. A century later, during the 1970s, the advent of the cheap package holiday \_\_\_\_\_ (result) in many people being able to enjoy the sun, beaches and food of Spain. Growing affluence, faster planes and improved facilities \_\_\_\_\_ (mean) that more and more people travel abroad every year and now people \_\_\_\_\_ (begin) to want to travel farther afield.

### 2.2. Match the words close in meaning in A and B.

- 1) A. to confront; to shut down; to enclose; to spring up; to flourish; to look after  
B. to appear; to be successful; to serve; to deal with; to surround; to close
- 2) A. adjoining; accommodation; inhabitant; suggestion; consequence; acute  
B. resident; idea; next to; a hotel room; result; serious

### 2.3. Match the words in A with the words in B to form word combinations.

- A. on board; stop-over; high living; pure white; vital; average; drug; political; harmful social; magnificent
- B. tourist; coral sand; effects; cruise ships; abuse; passengers; role; standards; scenery; stability

### 2.4. Make up sentences by combining the lines from the columns. Use the right form of make.

|                       |      |   |
|-----------------------|------|---|
| Visitors from the USA |      | conditions less pleasant.                 |
| The tourist industry  |      | possible by improvements in transport.    |
| Water pollution       | make | up more than two-thirds of the arrivals.  |
| Its growth            |      | an important contribution to the economy. |
| Switzerland           |      | up of three major physical divisions.     |

### 2.5. Fill in the missing forms of the words.

| Noun       | Verb       | Noun   | Verb       |
|------------|------------|--------|------------|
|            | dispose of |        | arrive     |
| permission |            | danger |            |
|            |            |        |            |
|            | grow       |        | strengthen |

### 2.6. Match the words in A with the words in B to form word combinations. Give Russian equivalents.

A. to take into; generally; in order; on; to be; in

B. to; particular; the case; the other hand; speaking; consideration

### 2.7. Rearrange the letters in the anagrams to form equivalents for the Russian words.

процветать — **fisluruh**

поощрять — **euragnce**

перевешивать — **oweutihg**

частый — **fqrneet**

привлекательность — **aatttirocn**

ремесло — **hicfraandt**

последствие — **cseequnonce**

пункт назначения — **dtioeinstan**

## 3. Translation into Russian

### HISTORY OF TOURISM

Tourism can be recognized as long as people have travelled. The narrative of Marco Polo in the 13th century; the "grand tour" of the British aristocracy to Europe in the 18th century; and the journeys of David Livingstone through Africa in the 19th century are all examples of early tourism. Thomas Cook is popularly regarded as the founder of inclusive tours with his use of a chartered train in 1841 to transport tourists from Loughborough to Leicester.

Before the 1950s, tourism in Europe was mainly a domestic activity with some international travel between countries, mainly within continental Europe. In the period of recovery following World War II, a combination of circumstances provided an impetus to international travel. Among the important contributing factors were the growing number of people in employment, the increase in real disposable incomes and available leisure time, and changing social attitudes towards leisure and work. These factors combined to stimulate the latent demand for foreign travel and holidays. The emergence of tour operators, who organized inclusive holidays by purchasing transport, accommodation, and related services and selling these at a single price,

brought foreign holidays within the price-range of a new and growing group of consumers. The "package" or "inclusive" tour democratized travel in Europe; foreign holidays were no longer the preserve of the affluent (rich) and socially elite classes.

## 4. Complementary texts

### TOURISM IN COUNTRIES AROUND THE MEDITERRANEAN SEA

Tourist industry is of great importance in many parts of the world. One region which is very popular with holiday-makers is that which borders the Mediterranean Sea. One of the main features of the Mediterranean type of climate is the fact that the summers are generally hot, sunny and have very little rain. This attracts many visitors from the more northerly parts of Europe, where the summers tend to be cooler, wetter and cloudier. The lands around the Mediterranean Sea have many good beaches.

Unfortunately, one problem is the fact that many parts of the Mediterranean Sea have become badly polluted. The Mediterranean lands can also offer much of cultural and architectural interest. Of particular importance in this respect are the remains of the civilisations of ancient Egypt, Greece and Rome.

One great advantage of the Mediterranean region for holidaymakers from northern Europe is its easy accessibility. Tourists from such countries as Sweden, the United Kingdom, Germany, and Russia can get to Spain or Italy much more quickly and cheaply than they can to the Caribbean.

### TOURISM IN SWITZERLAND

Another European country with a well-developed tourist industry is Switzerland. Every year more than 10 million foreign tourists visit Switzerland.

Switzerland is different in several ways from the countries of the Caribbean and Mediterranean regions. Firstly, it is much farther from the Equator, and for this reason temperatures are much lower than in the Caribbean. Secondly, it is a land-locked country (it does not have a coastline but is completely surrounded by other countries). Thirdly, Switzerland is a mountainous country. Visitors find the mountains attractive to look at. Also, because of their height, temperatures in the mountains are unusually low and there is a great deal of snow during the winter months.



Switzerland is made up of three major physical divisions. The Jura is a region of rugged hills, which rise to over 1,500 m above sea level. The Plateau is lower and has gentler slopes. This is where the bulk (most) of Swiss people live, and where most of the country's industrial activities take place. The Alps reach a height of over 4,500 m.

The Swiss tourist industry is very different from that of the Caribbean region, and even from that of the Mediterranean. Having no coastline, beaches are clearly not one of Switzerland's major attractions, although in summer people can swim in the lakes. The most important attraction of Switzerland is its scenery, especially its mountains and lakes. In summer people visit Switzerland for sightseeing and for walking in the mountains. In winter Switzerland has a very different sort of tourist trade. Because of the altitude, mean temperatures in the mountains in winter are well below freezing point. At this time of year precipitation comes in the form of snow. The higher mountain slopes are in fact snow-covered for several months, and conditions there are ideal for such winter sports as skiing and sledging.

Compare tourism potential of the Mediterranean, Switzerland and the Caribbean region.

## 5. Writing

Write the translation of the following text or render its content in English.

### ПРИРОДНО-РЕКРЕАЦИОННЫЕ РЕСУРСЫ

Природно-рекреационные ресурсы — объекты и явления природы, которые можно использовать в целях отдыха, туризма и лечения. Как видно из определения, этот вид ресурсов выделяется не по особенностям происхождения, а по характеру использования. Главными формами таких ресурсов являются «зеленые зоны» вокруг больших городов, заповедники, национальные парки. Эти территории особенно подвержены воздействию человеческого общества и требуют особого внимания и охраны.

Заповедником считается природная территория (или акватория), полностью исключенная из хозяйственного использования для охраны и изучения природного комплекса в целом. Одной из основных задач заповедников является сохранение природных ландшафтов, типичных или уникальных для данной территории. Более либеральной формой охраняемых территорий является заказник, где постоянно или временно запрещены только отдельные виды хозяйственной деятельности. Обычно он создается для охраны одного или многих видов животных или растений: запре-

щаются сбор растений, охота, лов рыбы на несколько лет или на определенный сезон.

Следующим видом охраняемой территории является национальный парк. В мировой практике широко используется организация таких территорий, где на малонарушенных ландшафтах сочетаются задачи охраны природы и контролируемого отдыха, чаще всего познавательного туризма. Обычно в национальных парках есть уникальные природные и другие объекты. В некоторых допускается ведение сельского хозяйства для местных нужд. Крупнейшие по площади национальные парки расположены в Гренландии, Ботсване, Канаде, Монголии и на Аляске. Всего в мире насчитывается более 2,5 тыс. крупных заповедников, резерватов, природных и национальных парков. Они занимают площадь свыше 4 млн. км<sup>2</sup>, или 2,7 % земной суши.

В настоящее время наряду с рассматриваемыми территориями начали выделять памятники природы, под которыми понимают достопримечательные участки суши или акватории с охраняемым ландшафтом (озеро, пойма, роща редких деревьев и т.д.) или отдельный охраняемый объект (водопад, пещера, уникальное дерево).

Иногда совместно с природно-рекреационными территориями рассматривают культурно-исторические достопримечательности — памятники истории, археологии, архитектуры, искусства. Примерами культурно-исторических достопримечательностей мирового значения могут являться Московский Кремль, Петродворец под Санкт-Петербургом, Вестминстер в Лондоне, Версальский дворцово-парковый комплекс под Парижем, Колизей в Риме, Акрополь в Афинах и др.

В соответствии с федеральным законом «Об особо охраняемых природных территориях (ООПТ)» в России различаются семь категорий ООПТ: государственный природный заповедник, национальный парк, государственный природный заказник, памятник природы, природный парк, дендрологический парк и ботанический сад, лечебно-оздоровительная местность и курорт. По значению для сохранения биоразнообразия среди них выделяются заказники и памятники природы, которые вместе занимают 4,1 % всей площади России.

Заповедники России достаточно полно представляют природные экосистемы разных ландшафтных зон страны и сохраняют популяции и местообитания большинства редких растений и животных, занесенных в Красную книгу России. Часть заповедников входит в международную сеть биосферных резерватов, а несколько заповедников входят в состав природных объектов, включенных в список всемирного и культурного наследия. Главное отличие российских заповедников от заповедников других стран заключается в том, что они имеют в своем составе научные отделы,

которые проводят исследования, как правило, круглогодичные, по общей для всех заповедников программе.

## 6. Speaking

### 6.1. Retell the following text in English.

#### RECENT DEVELOPMENTS OF TOURISM

The economies of scale which made foreign travel possible for so many people also broadened the travel horizon. As technological developments in the airline business produced bigger and faster aeroplanes, it also had the effect of shrinking distances in terms of journey times. Today, a 400-passenger aeroplane can fly non-stop from London to Johannesburg in 11 hours; or from London to Bangkok in 14 hours. Long-haul holiday destinations are now realistic in relation to journey times and attractive in terms of price as air fares are, relatively, much cheaper than they were 15 years ago. Long-haul holiday travel is becoming a growing sector in international tourism demand.

In addition to holiday-based tourism there is also an important business tourism market. Business travellers use transport, accommodation, and services in similar fashion to holiday-travellers. However, as their expenditure is usually a business rather than a personal expense, they have a shorter length of stay than holidaymakers but tend to have a much higher expenditure per visit. A specialist submarket, the Meetings, Incentives, Convention, and Exhibition sector has developed and is represented in many countries of the world. Quality convention and exhibition centres can be found in virtually every major city in the world. Asian cities, for example, Jakarta, Hong Kong, and Singapore, have recently developed state-of-the-art facilities, competing favourably with established centres in Europe and North America. Conventions and exhibitions attract visitors from different parts of the world who often would not normally visit a given destination. In 1994 this market was estimated to generate \$97 billion in revenue globally.

The rapid growth of international tourism is reflected in the growth in membership of the World Trade Organization, which in 1995 had 125 country members and 250 affiliate members. With few exceptions most countries have established a National Tourism Organization (NTO), usually funded directly by government, for example, the British Tourist Authority, Australian Tourist Commission, and South African Tourist Board. These NTOs are the focus of government and private sector activity to represent abroad the tourist assets of the country. Government support for NTOs is based on the need to secure the economic benefits that tourism can generate. The importance of tourism as an earner of

foreign exchange is seen in India and Thailand where tourism is the prime source of foreign exchange revenue. In labour terms it is probably the major source of employment in the United Kingdom. As a stimulus to regional development it has been a major factor in the Gold Coast area in Queensland, Australia, and in places such as Natal in South Africa.

The growth of tourism on an international scale has brought with it problems particularly related to its impact on societies and the natural environment.

The uncritical acceptance of the benefits of tourism prevalent in the 1970s began to give way to a more balanced approach to the role of tourism in development, particularly related to its noneconomic impacts. Tourism planners began to include socioeconomic and environmental factors in their work; concerns about overdevelopment of coastal regions in Spain, poor resort planning in Pattaya, Thailand, and sex tourism in Bangkok and Manila were all issues that were seen as negative features. By the 1990s economic advantages were no longer the only criteria to support the development of tourism; increasingly, development is linked to the concept of sustainability.

Sustainable tourism can be defined as "a process which allows development to take place without degrading or depleting the resources which made the development possible." Sustainability in tourism as a concept is often referred to as "ecotourism", "green tourism", or "responsible tourism".

Whatever its description it is seen as a means of recognizing that the Earth has finite resources and in tourism as in other sectors, there are limits to development, particularly in site-specific locations. Current concerns are to be found in tourist usage of game parks in Kenya, deterioration of the Great Barrier Reef in Australia, and damage caused by irresponsible trekking in mountain areas of Nepal. The interdependence between tourism, culture, and the environment, has become a critical consideration in the formulation of tourism policies. Sustainability applies not only to small-scale tourism projects; it is equally, if not more important in areas where there is high-volume tourism, as in the Mediterranean basin countries where environmental pollution is of major concern.

There is no reason to believe that tourism will decline as an international activity in the future. All the indications are that it will increase to become a significant feature of economic and social development in many countries. The challenge, then, is to ensure that such growth can be accommodated within a sustainable framework.

**6.2. Discuss the problem of tourism industry development showing its advantages and disadvantages for the economy, social life and natural environment of the countries.**

**6.3. Discuss Russia's potential for tourism.**



6.4. Make a travel advertisement for the trips to the country you prefer. Emphasize things that you think people would most want to see. For additional information consult an encyclopedia or other sources.

6.5. Organise a class debate on the tourist industry. One side should support the idea that the tourist industry is a good thing for the Caribbean or any other region, while the other side should argue that its harmful effects are greater than its benefits.

6.6. Organise a role play, with various class members playing the parts of different people in the Caribbean. The roles to be played might include those of a barman or chambermaid in a tourist hotel, a wood carver or worker in straw, a taxi driver, a church leader, an official of the local tourist board, a local farmer and a local person who wants to buy a home in a tourist resort area.

## 7. Summarizing the Unit

Make an outline of the Unit and render its content in a 4—6 min talk.

# UNIT 13

## TRANSPORT AND TRADE

### 1. Reading and learning

Scan each text and formulate the main ideas. Read the text again carefully and memorize it, then retell the text close to the original.

#### 1.1. DIFFERENT FORMS OF TRANSPORT

The world has much diversity. And the world will retain much diversity in the future. Yet changes have occurred because of what writers sometimes call "the shrinking world". This term does not mean, of course, that the distance around the world has shrunk. The shrinking world refers to the shortening of travel time. Columbus took 70 days to cross the Atlantic. Now the trip is a short plane flight. As a result of the shortening of travel time, contacts between regions have greatly increased. Both people and goods move with greater ease from one land to another.

**Inland water transport.** Transport by water is the cheapest of all forms of transport. It is particularly suitable for carrying heavy and bulky (large) goods over long distances. The main disadvantage of water

transport is that it is slow, compared with rail, road and especially air transport.

Inland water transport involves the use of rivers, lakes and in some countries canals (man-made waterways). Rivers which are suitable for boats to travel on are called navigable. Although rivers provide a useful means of transport, they cause problems for the builders of roads and railways. Small rivers are usually crossed by building bridges. Large rivers may have to be crossed by using ferry boats. In some countries tunnels have been built to take roads underneath rivers.

**Ocean transport.** In the past people traveling between the continents made the journey by sea. This often took several weeks. Today ocean-going ships are little used for the transport of passengers. There is, however, one special type of passenger ship which is still widely in use. That is the cruise liner, which is almost like a floating hotel. Cruise liners are popular with people who like spending leisurely (relaxing) holidays at sea.

Although today ocean-going ships are of limited use for passenger transport, they are still a very important means of carrying heavy and bulky goods over long distances. Cargo boats are relatively slow, but they have the important advantage of being able to carry goods much more cheaply than is possible by air.

In the past cargo ships carried goods loaded loose in their holds (the spaces below the deck), but in recent years container ships have become increasingly important. A large container is about the size of a railway wagon. The goods are packed into the containers before being put on the ship. Perishable goods (things which quickly go bad) can be transported in refrigerated containers.

**Railways.** They are a suitable means of transporting heavy and bulky goods over long distances. A railway train can pull a large number of wagons, and can thus transport as much freight (goods) as a whole fleet of lorries. In some countries trains are very fast, and so attract a large number of passengers.

**Road transport.** It is particularly suitable for the short distance transport of passengers, and for the movement of light freight. It is also much more flexible. The growth of road transport has led to a number of problems. One of them is the problem of traffic congestion. This is particularly serious during the rush hours. Another growing problem is noise and atmospheric pollution. Cars are a major source of pollution. They produce CO<sub>2</sub>, one of the major causes of the greenhouse effect. One of the possibilities to solve these problems is using environmentally-friendly kinds of transport, e.g., bicycles.

**Air transport.** It is the fastest means of transport, but it is also the most expensive. It is especially suitable for carrying passengers over very long distances. It is also suitable for the long distance transport of mail and other goods which are of very high value in relation to their weight, or which are very perishable goods.

**Pipelines.** They are mainly used for the transport of liquids such as petroleum, petroleum products and water, for gases and electricity. They are also used for the transport of solids in suspension. Sometimes pipelines are laid on the surface of the ground, but more commonly they are buried in shallow trenches. In some parts of the world pipelines are laid on the seabed (submarine pipelines). This is an efficient method of transportation and it is fairly cheap as it does not require large amounts of fuel to operate. It provides a safe means of transporting such things as petroleum, refined petroleum products and natural gas, all of which are very inflammable (easily catch fire).

1. What is meant by a navigable river?
2. Why do very few passengers travel by any type of ocean-going ship other than the cruise liner?
3. Compare water and air transport; road and rail transport.
4. What is the main advantage and disadvantage of containerization?
5. What are the main advantages and disadvantages of transport by pipeline?

## 1.2. INTERNATIONAL TRADE

In the very early days people produced everything they needed themselves. They made their own clothes, produced their own food and built their own shelters. At a later stage in human history people began to specialize in doing particular kinds of work, so they no longer produced all of their needs. This meant that they had to get some of the things which they needed from other people, and had to supply these people with something else in return. At first this was done by bartering (simply exchanging one thing for another). Trade by barter is still to a limited extent practiced in some parts of the world. In most areas, however, money is now the main medium of exchange.

The buying and selling, or exchanging, things is known as trade. Trading involves the buying and selling of both goods and services. Trade can be divided into two broad types: domestic and external. Domestic trade or internal trade involves the buying and selling entirely within one country. The trading of goods may take place in market places or in shops, or it may involve people selling goods from door to door or on the street.

External trade or international trade or foreign trade involves the transfer of goods and services between different countries. Basically, countries trade with each other because they are better at producing certain things than others. Climatic variations among countries offer different possibilities for agriculture. For example, in the Caribbean it is possible to grow successfully a whole range of tropical crops such as bananas, cocoa, coconuts, cotton, and sugar cane and so on. None of

these crops can be grown in colder countries such as those of Western Europe. On the other hand, wheat cannot be grown successfully in the Caribbean, but grows well in colder countries such as Canada. As a result, the Caribbean depends upon colder countries to provide it with wheat or wheat flour and they in turn purchase tropical crops from the Caribbean.

It is easy to understand why nations import goods they cannot produce. If people want to eat bananas, bananas must be imported from the countries where they are grown. But why are clothing, toys, and automobiles imported if they are also made in the country? There are two answers: quality and price.

A country that specializes in making a certain product may produce goods of such quality that buyers abroad prefer them to goods made in their own countries. The Swiss, for example, have long specialized in making watches and scientific instruments, which they export to countries that make these products, too. American companies specialize in making office machines and computers, which they export to other countries.

Lower prices are probably connected with the success of imports. Workers in Hong Kong, Taiwan, China and South Korea are paid less than those in the developed countries. As a result the items made in Asia are cheaper. The cost of labor is figured in the price of the item. Sometimes a country is able to make goods more cheaply because it has newer and more efficient factories and plants. In general the country with the most recently built steel mills can produce the cheapest steel.

The transfer of goods is only one aspect of the international balance of payments. A country gets payments not only for the goods which it sells to other countries, but also for the services which it offers them. At the same time, a country also has to pay for the services performed for it by the people of other countries. These are some of the most important sources of invisible earnings and payments: foreign travel — foreign visitors bring in foreign exchange; international transportation — some countries have to make payments to foreign airline and shipping companies for the carriage of passengers and goods; banking and insurance — payments to foreign banks and insurance companies for their services; income on investment — countries in which a great deal of capital has been invested have to pay interest and dividends on that capital; government transactions — money in the form of aid from foreign countries and international organizations.

1. What do you think the main disadvantages of trading by barter are? How has the introduction of money helped to solve these problems?
2. Why are some countries able to make goods more cheaply than others?
3. Why do nations buy goods and services they can produce?



### 1.3. GOVERNMENT REGULATION OF TRADE

Because of the large amounts of foreign currency which are involved, governments in many parts of the world are interested in monitoring their country's foreign trade. Most countries are keen to develop their export trade in order to increase their earnings of foreign exchange. At the same time they like to keep down the flow of imported goods in order to reduce the loss of foreign exchange.

Governments often impose (charge) tariffs in order to protect their own country's growing industries. These are taxes or duties on goods as they cross an international border. For example, in Trinidad and Tobago protection tariffs have been placed on motor vehicles, in order to protect the region's young automobile assembly industry. The imposition (introduction) of tariffs increases the price of imported goods. This makes the consumer less keen to buy them while domestically produced goods get a price advantage. Another purpose of imposing tariffs is to raise money for the government.

The government can declare that only a certain proportion of a product may be imported or exported. A quota is the maximum quantity of a product that may be admitted in a country during a certain period of time. Quotas are usually applied to commodities (items, products) that exceed the world demand. By setting quotas, a country limits the amount of goods that may be imported.

Many countries now have a "negative list" of goods which the government will not allow to be imported. Import controls are often imposed to encourage the production of particular kinds of goods within the country.

**Regional integration and trading blocs and agreements.** A great number of countries in different parts of the world have recognized the advantages of trade associations. Within these associations member countries cooperate in matters relating to trade and economic development. A major objective of all such associations is to raise the standard of living of the people in the member states.

The problems of short-term fluctuations in price can be solved by setting up commodity trade agreements, such as the International Coffee Agreement and the International Sugar Agreements. The purpose of international organizations, such as World Trade Organization or European Free Trade Association is to regulate tariffs and to reduce trade restrictions between member countries.

**International trade in petroleum.** In recent years the price of petroleum on the world market has shown great fluctuations. In 1960 the Organization of Petroleum Exporting Countries (OPEC) was set up in an attempt to maintain oil prices for the benefit of the producing countries. During the 1970s and early 1980s OPEC was certainly very successful in forcing up world oil prices. This massive increase in oil prices caused great economic hardship in those countries which needed

to import oil. In the middle and late 1980s the influence of OPEC on world oil prices began to decline. Western industrialized countries which provide the main market for oil began to place more emphasis on the use of other energy sources, such as coal and nuclear power. They also made an effort to use oil more efficiently. At the same time, they were able to buy a greater proportion of their oil needs from non-OPEC members, such as the former USSR. As a result, world oil prices began to fall.

1. Why do nations restrict trade? What methods do they use? What are the results?
2. How may tariffs should be used to protect home industries?
3. What do you think the "negative list" of goods for Russia should be?

## 2. Lexical and grammatical exercises

### 2.1. Match the words close in meaning in A and B.

- 1) A. to purchase; to provide; to encourage; to retain; to transfer; to trade  
B. to supply; to move; to keep; to buy; to exchange; to support
- 2) A. buyer; cargo; objective; barter; fluctuation; money  
B. exchange; instability; currency; purpose; freight; customer

### 2.2. Underline uncountable nouns. Translate the words into Russian.

pollution; crop; noise; weight; congestion; transport; mail; need; freight; objective; interest; trade; income

### 2.3. Rearrange the letters in the anagrams to form equivalents for the Russian words.

капиталовложение — iestnnmevt  
проценты — ieersntt  
доход — iomnce  
груз — caorg  
паром — frrey

ограничение — rtresicotin  
трудность — hdarsiph  
меновая торговля — bterar  
превышать — eeexcd  
покупать — pcurhsae

### 2.4. Match the words in A with the words in B to form word combinations. Give Russian equivalents.

- 1) A. shrinking; traffic; plane; rush; cruise; navigable; refined; efficient; major; invisible  
B. river; objective; flight; petroleum; liner; earnings; hour; congestion; world; method
- 2) A. retain; exceed; impose; cause; raise; cross; pay; offer  
B. possibilities; tariffs; the demand; diversity; money; interest; a river; problems

### 2.5. Make up sentences by combining the lines from the columns.

|                               |      |                                      |
|-------------------------------|------|--------------------------------------|
| The shrinking world refers    | in   | two types: domestic and external.    |
| Trade can be divided          | to   | making office machines.              |
| American companies specialize | on   | goods as they cross a border.        |
| These are taxes or duties     | into | the shortening of travel time.       |
| Air transport is suitable     | for  | the long distance transport of mail. |

## 3. Translation into Russian

### HUBS AND SPOKES: AIR TRAVEL IN THE USA

Domestic flights in the USA are organised on the principle of hubs and spokes, like a bicycle wheel which has a hub at the centre and lots of spokes radiating out from it in all directions. One such hub is Houston in Texas: flights to over 100 other airports radiate out in different directions from there and half of these are non-stop flights.

For example, if you want to get from Miami to Los Angeles, you can catch a Continental Airlines flight from Fort Lauderdale (a few miles north of Miami and less hassle than Miami International Airport), change planes in Houston and fly on to Orange County (John Wayne Airport) or Hollywood-Burbank Airport — both of which are much more relaxing and less crowded ways into Los Angeles than the appalling Los Angeles International Airport.

The hub and spoke network has made flights cheaper and means that even quite small places are connected to each other by a major airline or feeder service. Another advantage of the system is that connecting flights are to some extent guaranteed. If one incoming flight is up to one hour late, all the connecting flights (up to 30 or 40) will be held until it arrives. So if you're on a delayed flight, that's good news — but it's bad news for everyone else because they all have to wait for your plane to land. From the point of view of overseas connections, many hubs also operate as entry points or "gateways", where passengers flying in from another country can join the hub and spoke system.

The same type of system does operate in other parts of the world: for example, you can fly from one part of Europe to another via Frankfurt or Paris or Amsterdam or London, but the difference in other parts of the world is that the fares are not any cheaper so there's no special advantage. When flying in to the USA it's advisable to avoid any major gateway, such as Los Angeles International, Miami, and JFK New York (John Fitzgerald Kennedy) in favour of a smaller gateway like Charlotte, Pittsburgh or Orlando.

## 4. Complementary text

### THE BATTLE OF THE BICYCLE

In Denmark, and in particular Copenhagen, the cycling culture is so strong that most car drivers are terrified of the cyclists, much in the same way Hindu driver may fear wandering cows in the streets of Bombay.

**Bicycle mail.** Every morning a third of the Danes pick up their bicycle clip and the other third their car keys, while the final third watch from the windows of public buses and trains. To be honest, the future of the car looks rather grim. There are already more cyclists here than in any other European city. As soon as the first wave of commuting cyclists decreases around 9.30 a.m., the streets come alive with a new species of cyclist. Dressed in black lycra leggings and bright yellow and green jackets, with rucksacks on their backs, crowds of bicycle couriers move from office to office. The first bicycle couriers started up in Copenhagen in 1989 when it became clear that bicycles were quicker than taxis within central city areas with traffic jams and one-way streets. Today three bicycle courier firms operate around the city with each courier peddling up to 100 km a day, some even going into Sweden.

**Geography lessons.** So why is cycling in Copenhagen so popular? One of the answers is the flatness of the terrain and a relatively small size of the city. Distances are short and at night two-thirds of Copenhageners make their way home to the suburbs. However, the answers to the question are not only geographical but political and philosophical. In 1905 Europe's first Cyclist Federation was founded in Denmark with the aim of improving cycling conditions. Since then numerous cycle paths have been built around the city, and different cycling schemes have been introduced.

**Business bicycles are in fashion.** One of these schemes is a government initiative to replace the company car with the company bicycle. Many inner-city firms have been offered bicycles to encourage staff to take a bicycle rather than take a taxi to their local meetings. If all goes well, windswept, rosy-cheeked businessmen with the company annual report in the front basket may soon become the style. This is not such a great change to business philosophy. Economically speaking the bicycle is certainly the cheapest form of transport, and within central Copenhagen it is usually the quickest. One can often see people with mobile phone in one hand and handle bar in the other, speeding past the lakes on their way into the city.

**The Town Bike comes to town.** In the furthest stage of the battle between a car and a bike the Danes have come out with their latest invention: the Town Bike. The first of its kind in the world; this is a nomadic breed of bicycle that can be readily adopted by anyone within



the central city area. Just jump off the train at one of the principal stations and exit into a crowd of bicycles outside.

Among these you should be able to spot a rather distinctive looking creature with large blocked-in wheels displaying the name of the sponsor. All you need is to put a coin into the slot and it is yours for the day. No worries about locking it, having it stolen (even mending a puncture). Just return it to one of the 100-odd bicycle racks situated around the city and even the coin will return safely into your hand. This is a wonderful opportunity for visitors to explore the charms of the city. This town bike scheme is part of The Healthy Cities Project, established by the World Health Organization to promote health for all.

## 5. Writing

Write the translation of the following text or render its content in English.

### МЕЖДУНАРОДНЫЕ ЭКОНОМИЧЕСКИЕ ОТНОШЕНИЯ

К международным экономическим отношениям можно отнести мировую торговлю, международные кредитно-финансовые отношения, международное производственное сотрудничество, международные научно-технические связи, предоставление международных услуг.

Мировая торговля — самая старая и традиционная форма внешних экономических связей. В то же время она является и одной из наиболее динамичных сфер мирового хозяйства. По темпам роста мировая торговля опережает и промышленное производство, и ВВП. Главный регион мировой торговли — зарубежная Европа, затем следует Азия, Северная Америка. США занимают первое место по объему внешнеторгового оборота. Доля в мировом товарообороте Латинской Америки, Африки, Австралии и стран СНГ еще очень низка. Главной организацией, регулирующей вопросы мировой торговли, является Всемирная Торговая Организация.

Международные кредитно-финансовые отношения — более молодая форма международных экономических отношений. В ней подразделяют два направления: международные займы и кредиты и прямые зарубежные капиталовложения. До Второй мировой войны главными экспортёрами капитала были страны-метрополии (Великобритания, Франция, Нидерланды, Бельгия), а направлялся он преимущественно в их колонии, где вкладывался в добывающую промышленность и плантационное хозяйство. С началом НТР вклады стали направляться в первую очередь в обрабатывающую промышленность и сферу услуг.

Предоставление международных услуг занимает 1/5 мирового экспорта. 20—30 лет назад эта форма в основном подразумевала транспортные услуги, оказываемые морскими державами. В настоящее время все более распространяются услуги в области информации и телекоммуникации. Основная торговля услугами происходит на рынке, образованном экономически развитыми странами Запада: на них приходится около 90% мирового экспорта услуг. Одной из форм обмена услугами является международный туризм.

## 6. Speaking

### 6.1. Retell the following text in English.

### TRANSCONTINENTAL RAILROADS

Although sleek jet aircraft crisscross Russia and the United States today, barely 100 years ago these nations had no transcontinental surface links at all. In the United States the transcontinental railroad was completed in 1869, and in 1916 the world's longest transcontinental rail line, the Trans-Siberian, finally linked Moscow with the Pacific Ocean.

For a large nation transcontinental links are essential. They help unite the nation. They keep one language in use and one set of political ideals alive. They bind the nation into a single economic network. And, perhaps most important, they link the people psychologically.

**The United States.** By the middle of the 19th century most Americans recognized the need for a transcontinental railroad. People were pouring into the Oregon Territory, and California had already become a state. Finally, in 1862, Congress passed a law launching the first railroad to the Pacific. Two companies agreed to take on the job. The Central Pacific Railroad began in the west and tackled the difficult task of bridging the Sierra Nevada in California. The Union Pacific built westward across the Great Plains and crossed the Rockies.

At Promontory, Utah, a short distance from Ogden, in mid-May 1869, a small group of workers and a handful of officials watched as dignitaries drove in the final spike, made of gold, that completed North America's first intercontinental rail line.

**Russia.** In 1860 the port of Vladivostok was founded on the Pacific Ocean in territory recently taken from the Chinese. By that time the Russian Empire stretched across the entire Asian continent. It soon became clear to Russian leaders that a transcontinental railroad was essential to bind together their broad country. In 1892 the construction of the Trans-Siberian Railway began. It was finally completed in 1916.

To appreciate the immensity of this undertaking, it helps to gain some sense of the time that is involved, as well as the number of miles

that must be traveled, to cross Russia. The journey between Moscow and Vladivostok takes seven full days. Passengers and freight that start at the Polish border travel 10,110 km. No other train trip in the world even comes close to this distance. The distance equals that from San Francisco to London. It is this tremendous distance that makes the Trans-Siberian Railway such an essential link in the political, economic, and cultural life of Russia.

6.2. Talk about the importance of the rail transport for the development of a country's economy.

## 7. Summarizing the Unit

Make an outline of the Unit and render its content in a 4—6 min talk.

### UNIT 14

## AN INTERDEPENDENT WORLD

### 1. Reading and learning

Scan each text and formulate the main ideas. Read the text again carefully and memorize it, then retell the text close to the original.

#### 1.1. THE INTERDEPENDENCE OF INDEPENDENT NATIONS

After World War II, 51 countries of the world formed the United Nations. The member nations of the UN agreed to work together for world peace, but they also declared that each nation remained independent. Yet the independent nations of the world are, in fact, interdependent. In other words, they depend on each other in many ways.

The interdependence of nations is by no means new. Nations have long depended on trade with other nations for goods they needed or wanted but did not produce. In the time of Columbus, Europeans sailed to Asia in order to buy spices that they could not grow at home. Since then, international trade has grown greatly.

Today people of one nation use not only food from other countries but many other things as well. Children play with toys from Germany, Norway, Taiwan, and a number of other places. One may wear a shirt made in South Korea, a sweater of Australian wool made in Hong Kong,

and shoes manufactured in Italy or Spain. Many people drive automobiles made in Japan. The stereos and television sets in many homes are also made in Japan. Florists sell flowers grown in the Netherlands, and hardware stores have tools made in Sweden.

**Doing business in many nations.** The symbols of businesses, that often appear on products and in advertisements are called logotypes, or logos. Some logos are as well-known as national flags. A person traveling abroad will see the familiar logo of an oil company on ships at sea and at service stations and on storage tanks in foreign countries. Magazines published in Italy, India, Spain, and a number of other countries contain advertisements for brand names well-known all over the world.

Products bearing American or British brand names in Europe, Asia, and Latin America are not necessarily imports. Many corporations are multinational (transnational). A transnational corporation has plants or businesses in more than two countries. The logos of American automobile makers appear on cars made in Europe, Asia, and Latin America. A number of American corporations operate plants or businesses in other countries, and a number of corporations from other countries operate plants or businesses in the United States. National boundaries do not limit the business of multinational corporations.

**Computers, satellites, and "offshore offices".** The development of computers and communication satellites has made it possible for a business in one country to have office work done in another. Many companies in Japan, Australia, and the United States have part of their office work force in India, China, the Philippines, or the Caribbean countries. Workers in these "offshore offices" send information by computers to the home offices. New ways of sending and storing information have changed the ways that businesses operate. If satellite communication becomes less costly, "offshore offices" may become even more common. Banks and insurance companies may become still more multinational. National boundaries in the future may do even less to limit the ways the world does business.

1. What is a transnational corporation?
2. What names of transnational corporations do you come across in Russia?
3. Make a list of things in your home that were either grown or made in other countries.
4. How do companies do business in more than one country?

#### 1.2. WHY AND HOW NATIONS WORK TOGETHER

**Rules of the sea.** In order to trade with each other, nations must have some common rules or understandings. Some of the rules are very old. When traders began to sail the seas, they developed customs and laws



governing the way they sailed and did business. More than 2000 years ago, the Greeks and the Romans had such rules. They called the rules the law of the sea.

Nations today still observe a set of laws, now called maritime law, for ships on the high seas. The high seas are the oceans and saltwater seas beyond the strip of territorial waters along a country's coast. Many countries now extend their control over surface waters to 200 miles from their coasts. Under maritime law the high seas belong to no country. All ships are free to sail the high seas. Each country is responsible for keeping law and order on ships flying its flag. All ships follow certain common safety rules in order to avoid accidents at sea. If an accident takes place, maritime law has rules for fixing responsibility. Rules of the sea are as necessary as rules of the road. Nations have sometimes ignored maritime law. In times of war some countries have denied freedom of the high seas not only to enemy ships but to those of other countries trading with an enemy. But in times of peace, nations generally observe these international laws simply because the laws are so useful. Maritime law is necessary if countries use the seas for trade.

**Airspace and outer space.** When people traveled on land and sea only, there was little question about who owned airspace. For the most part, people followed an old rule — whoever owns the land, owns what is above it. Once people began to fly balloons and airplanes, the old rule no longer served. Questions arose about the right to fly over land. Some people thought there should be freedom of the air just as there was freedom of the high seas. But nations refused to accept this rule, partly because of the danger of bombing from the air. Instead it was agreed that the airspace over a country is part of that country, although the air does not belong to individual people. Airplanes from one country must have permission to fly into another country's airspace. Airplanes from all countries may fly over the oceans because no country can claim the high seas.

Even though each country governs its own airspace, the great number of international flights makes it necessary for pilots to follow the same flight rules. For this reason the nations set up the International Civil Aviation Organization. It recommends standard rules.

Sometimes national control of airspace has resulted in tragedy. On September 1, 1983, a Korean airliner flying from Anchorage, Alaska, to Seoul, South Korea, entered Soviet airspace. A Soviet fighter plane shot it down. All 269 people on board the Korean plane were killed. The shooting down of a civilian passenger plane shocked people throughout the world. However, the Soviet government insisted that its plane was only defending Soviet airspace.

The launching of space satellites that orbit the earth raised an important new question: How far up does a nation's air-space go? Could one nation refuse to allow the satellites of another nation to pass over its territory? The nations realized that the old rule about airspace could not apply to outer space. In 1963 it was agreed that no nation could claim

outer space. Any nation could send satellites into space for exploration or other peaceful purposes. According to the 1963 agreement, nations would not explode a nuclear device in space or use space for other military purposes.

There are still some problems with the international law of outer space. Where does a country's airspace end and outer space begin? The world has not yet worked out an exact definition of outer space. Outer space is generally taken to be the area beyond the earth's atmosphere in which an unpowered satellite may remain in orbit. This means that the limit of a country's airspace is somewhere between 70 to 100 miles (113 to 161 km) above its surface. It has also proved difficult to distinguish clearly between peaceful and military uses of space. A number of experiments in space could have military uses.

1. Why have nations accepted common rules for the use of the high seas, airspace, and outer space?
2. What are some of these rules?
3. What are some of the problems with the international law of outer space?
4. Can any nation send satellites into space for exploration and communication?

### 1.3. TOGETHER IN POLITICS, ECONOMY, AND SPORTS

The United Nations is the largest of the international organizations. When the UN was created in 1945, it had 51 member nations. Today there are more than three times that number of nations.

The UN has two governing bodies, the General Assembly and the Security Council. Every member nation has a seat and a vote in the General Assembly. Only 15 nations are members of the Security Council. The five permanent Council members are China, France, Russia, the United Kingdom, and the United States. The General Assembly elects ten other Security Council members. Each of the permanent members has veto power. This means that the Security Council can take no action that has been vetoed, or voted down, by any of the permanent members.

The first purpose of the United Nations is to help keep peace in the world. Those who wrote the Charter of the United Nations expressed the hope that the organization would save the world from the "scourge of war." It has not done so. However, the UN has become a center where nations meet to talk over their problems and try to find solutions. Special agencies of the UN, such as the Universal Postal Union and the International Telecommunication Union, give nations a means for working together for a better world.

The UN has a number of other special agencies. One provides for refugees, people driven from their homes by war or revolution. Another

agency, UNICEF, raises funds to help children in the less-developed countries. The World Health Organization works to better the health of all peoples, but especially those in the developing countries. The International Monetary Fund helps nations manage their credit and money systems. It is also through these different agencies that nations work together within the UN. The United Nations is not a world government; rather, it is a very flexible instrument through which nations can cooperate to solve their mutual problems.

**Other groups through which nations act.** Countries that belong to the United Nations may also belong to a regional organization. The members of these groups are located in a certain region, or part of the world. A regional organization may have some of the same purposes as the UN. For example, the Organization of American States (OAS), like the UN, aims to keep peace and provide for the peaceful settlement of disputes. The OAS includes most of the countries in North and South America.

The European Economic Community (EEC), sometimes called the Common Market, is made up of European countries. The organization was set up to help make trade easier between the member nations. Countries in other parts of the world have also formed regional groups, although none are so closely connected as the European Economic Community. African countries have the Organization of African Unity (OAU). There is an Association of Southeast Asian Nations (ASEAN) and an Arab League made up of countries in the Middle East and North Africa.

**International games.** The Olympics Alliances are as old as the ancient Greek cities. The Greek cities were much like modern nations. Each city made its own laws, governed itself, defended itself, made alliances, and sometimes fought wars. Every 4 years, athletes from the Greek cities journeyed to Olympia. They came to take part in games held to honor their gods. All wars stopped during the season of the Olympic Games so that athletes and spectators could travel to Olympia.

About a hundred years ago, a French scholar, Pierre de Coubertin, proposed that modern nations revive the Olympic Games. He believed that the games would constitute the highest of international activities. He insisted that if athletes from different nations came together, the cause of peace would receive a new and powerful support. Coubertin convinced a group of leaders from different nations to hold the first modern Olympic Games at Athens in 1896. Since then the Olympic Games have been held in different countries on 4 continents.

The games have not made the world more peaceful. Modern nations, unlike the Greek cities, do not stop fighting during the games. Instead the games were suspended once during World War I and twice during World War II. Yet the Olympic Games have become a truly international activity. An international committee controls the games, and athletes from many nations take part. The Olympic Games are yet another way in which the people of independent nations act together in an interdependent world.

1. What is the difference between the governing bodies of the United Nations?
2. What do nations do through the special agencies of the UN?
3. What are regional organizations?
4. Why are the Olympic Games called an international activity?

## 2. Lexical and grammatical exercises

### 2.1. Fill in the missing forms of the words.

| Noun     | Verb   | Noun    | Verb      |
|----------|--------|---------|-----------|
|          | permit |         | govern    |
| refusal  |        | veto    |           |
|          | solve  |         | advertise |
| proposal |        | defence |           |

### 2.2. Match the words in A with the words in B to form word combinations. Give Russian equivalents.

- 1) A. remain; sail; observe; avoid; work out; express; deny; explode; hold; fight  
B. the hope; the Olympic games; a law; a definition; the sea; a nuclear device; wars; independent; accidents; freedom
- 2) A. maritime; high; surface; outer; permanent; mutual  
B. space; members; law; problems; sea; waters
- 3) A. in; for; by; since; on; such  
B. the other hand; no means; other words; then; this reason; as

### 2.3. Rearrange the letters in the anagrams to form equivalents for the Russian words.

гибкий — **fxiblele**  
взаимный — **mtuula**  
зритель — **scpettoar**  
враг — **neemy**  
беженец — **rgeeefu**  
защищать — **dneefd**

голос; голосовать — **vteo**  
избирать — **ectle**  
соблюдать (закон) — **oerbsve**  
разрешение — **ponmisersi**  
избегать — **aidvo**  
приостанавливать — **ssupden**

### 2.4. Put the verbs in brackets into the correct form. Decide whether the sentences refer to the future or present.

1. If satellite communication \_\_\_\_\_ (become) less costly, "offshore offices" may become even more common.
2. If an accident \_\_\_\_\_ (take) place, maritime law has rules for fixing responsibility.



3. Maritime law is necessary if countries \_\_\_\_\_ (use) the seas for trade.
4. If athletes from different nations \_\_\_\_\_ (come) together, the cause of peace would receive a new and powerful support.

### 3. Translation into Russian

1. Nations depend on trade of goods they need or want but do not produce.
2. National boundaries do not limit the business of multinational corporations.
3. Nations follow various rules in using the high seas, airspace, and outer space.
4. International bodies, such as the United Nations and its agencies, provide ways for nations to work together.
5. A logotype identifies a company's products.
6. A country that produces more of a product than it uses has a surplus.
7. Multinational corporations own and operate businesses in different countries.
8. Refugees are people who will leave their homeland because of a war as well as for political or religious reasons.

### 4. Complementary text

#### HISTORY OF NATIONAL PARKS

Conservation work ranges from major international effort to more local tasks such as managing woodland and water supplies, etc. Today one of the main international organizations concerned with conservation is the World Wildlife Fund (WWF), established in 1961 to raise money in order to finance essential projects in any part of the world. Another body is the International Union for Conservation of Nature and Natural Resources (IUCN), founded with United Nations' aid in 1948, and devoted to the conservation of nature in all its forms.

One of the pioneering ideas of conservation was that of creation of national parks. National parks and nature reserves are areas selected by governments or private organizations for special protection against damage or degradation. They are chosen for their outstanding natural beauty, as areas of scientific interest, or as forming part of a country's cultural heritage, and often also to provide facilities for public recreation.

The concept of creating national parks and nature reserves developed in the early 19th century in response to increasing industrialization

which had begun to cause large scale damage or destruction to natural environments in Western Europe and North America. Many heavily populated countries already had urban parks and public gardens, while some rural areas had long been reserved as hunting grounds or private estates by monarchs and nobles. In most parts of the world, however, human activity had little impact on enormous areas which were sparsely inhabited or untouched wildernesses, such as the Great Plains of North America, the Amazon Basin, the forests of sub-Saharan Africa, or the Australian bush. These did not seem to need special protection, since most of them were still inaccessible or hostile to human beings.

The modern idea of deliberately conserving special areas of the countryside and opening them to the general public rather than reserving them for the wealthy and privileged, originated in the 19th century. For example, in 1832 the American artist George Catlin called for the protection of wildernesses in the western United States in order to preserve the landscapes which he had painted; and in 1835 the English poet William Wordsworth suggested in a guidebook to his native region, the Lake District, that it should become "a sort of national property" (although, unlike most later campaigners for national parks, he was against large numbers of people being allowed to visit it).

Yellowstone National Park, covering parts of Montana, Wyoming, and Idaho, is regarded as the first national park in the world. It was designated by the United States Congress in 1872. The term "national park", however, was first used for the Royal National Park established in New South Wales, Australia, in 1879. The concept of national parks then spread to Canada and New Zealand during the 1880s and several more parks had been established in all four countries by 1909, when the first national park in Europe was designated in Sweden. Similar parks were created in Japan, Mexico, the former Soviet Union, and several British colonies during the 1930s and in Britain, France, and elsewhere in Europe during the 1950s. Some of these incorporate former royal hunting grounds.

### 5. Writing

Write the translation of the following text or render its content in English.

#### ИНТЕРНЕТ

Известно, что первая в мире компьютерная сеть проектировалась для обмена данными между центрами управления войсками США в рамках ядерного противостояния с Советским Союзом. Она разрабатывалась организацией ARPA (Advanced Research Projects Agency Network), созданной Министерством обороны

США для исследований в области ядерного оружия и ракетной техники. Началом ее деятельности в этой области принято считать 1962 год. В том же году доктор наук Джозеф Ликлайдер из Массачусетского технологического института представил общественности свой доклад, в котором было дано теоретическое описание Глобальной сети, доступной для всех желающих, и объяснены общие принципы ее работы. Выступление докладчика было названо фантастикой, но не прошло и 10 лет, как первая компьютерная сеть ARPAnet — прообраз Интернета — была создана.

Если говорить о дальнейших этапах создания Интернета, то стоит упомянуть о том, что в 1965 году Томас Мэрилл из Массачусетского технологического института и Лари Робертс из Института Беркли в Калифорнии с помощью проводной телефонной линии осуществили передачу данных между двумя своими компьютерами. Сегодня большинство подключений к Интернету осуществляется именно с использованием обычных телефонных линий.

В 1971 году в США с компьютера на компьютер было отправлено первое текстовое сообщение с помощью программы, названной E-mail. Как гласит «легенда», это были просто буквы первой строчки клавиатуры «QWERTYUIOP».

Следующим шагом в развитии Сети было создание персональных компьютеров, способных, объединившись, в ней работать. Со временем количество пользователей Сети росло, ее военное значение уменьшалось, и постепенно к Сети стали подключаться частные пользователи. К середине 1980-х годов число пользователей Сети возросло настолько, что прежняя цифровая адресация их «почтовых ящиков» стала неудобной и была заменена более вариативной — буквенной. В дальнейшем, когда Интернет перешагнул границы США, было решено ввести по домену для каждой страны в мире — так получились домены **uk** (Великобритания), **ca** (Канада), **jp** (Япония) и т.д. В 1991 году в Советском Союзе был осуществлен первый сеанс связи с Всемирной паутиной и зарегистрирован домен **su**. В первое время возможности советского Интернета были весьма ограничены: пользователи могли лишь отправлять сообщения. После распада Советского Союза домен **su** просуществовал еще три года, пока 7 апреля 1994 года не был зарегистрирован новый национальный домен — **ru** для Российской Федерации. Эту дату и принято считать днем рождения российского Интернета.

Доменные имена — основная ценность Интернета, ведь в виртуальном бизнесе хорошо запоминающийся web-адрес — это половина успеха. В 1990-е годы содержание домена не стоило ни рубля и его имя никак не регламентировалось. Такие имена, как **world.com**, **internet.com** или **auto.com**, можно было присвоить без труда. Начиная же с 1995 года, за регистрацию имен стали брать небольшую плату. Вскоре стартовые цены за доменные имена выросли несоизмеримо. Так, за **mtv.com** было уплачено 100 000 долла-

ров, **business.com** обошелся в 7,5 млн долларов, а покупка имени **music.ru** обошлась в 50 000 долларов. По сути, эти суммы выплачивались всего лишь за право обладать набором символов. А самая курьезная сделка — это покупка в Рунете в 1998 году домена **mail.ru** всего за 500 долларов.

## 6. Speaking

### 6.1. Render the text in English.

#### NATIONAL PARKS TODAY

In addition to the original purposes of landscape conservation and public recreation many parks have been established to protect endangered species of animals or plants and to promote scientific research. They may therefore be seen as nature reserves, a term which refers to a variety of areas in which rare animals, plants, or whole environments are protected and studied. Hunting and other disruptive activities are limited or banned and public access is often strictly controlled or even forbidden. These areas may be inside national parks — for example, the Kanha Tiger Reserve in Kanha National Park, northern India — and in general they are smaller than most national parks.

Many national parks and nature reserves are affected by a conflict between the needs of conservation and recreation; by their sheer numbers, visitors may unintentionally destroy the landscapes or interfere with the flora and fauna that the parks were created to protect. In response to this threat, parts of several American national parks have been closed to the public and a limit placed on the number of visitors permitted to enter certain fragile areas.

Designated trails or roads have been created, as in several African national parks, and guided tours made compulsory, as in some national parks in India. The designation of national parks and nature reserves can also conflict with other possible uses for the land and resources, especially in the relatively remote, sparsely populated, and politically unimportant areas which tend to be most suitable for conservation. They may be attractive, for example, to military forces for training purposes, as, for example, inside four of the ten national parks in Britain. Some conservation areas may be threatened by commercial exploitation of their minerals or trees: for example, national parks in Tasmania and in South Island, New Zealand, were extended in the 1980s to protect rain forests from logging. Electricity companies may develop hydroelectric schemes or build nuclear power stations. In many developing countries farmers, hunters, or mineral prospectors eager for uncultivated land or unexploited resources may intrude into protected areas.



The elephants in African national parks, for example, were in serious danger from poaching during the 1970s and 1980s. In Amazonia National Park, Brazil, frequent confrontations occur between native groups and incoming farmers and prospectors. In parks where quarrying, mining, electricity generation or other largescale activities are permitted, they are carefully and expensively monitored to minimize pollution and degradation of the landscape.

The conservation of such areas of natural beauty, cultural heritage, or scientific interest is especially problematic in developing countries where, in contrast to those industrialized nations which were the first to establish national parks and nature reserves, governments and pressure groups often find that proposals to impose limits on further development are too costly or unpopular. The United Nations Educational, Scientific, and Cultural Organization (UNESCO), the United Nations Environment Programme (UNEP), and the Food and Agriculture Organization (FAO) all support and sponsor national parks and nature reserves in developing countries; in addition UNESCO has placed many national parks and nature reserves, in both developed and developing countries, on its World Heritage List of unique environments.

6.2. Find material about any national park or other protected territories and prepare an oral presentation.

6.3. Discuss the problem of the international regulations over the use of different earth's resources. Give arguments for and against such regulations.

6.4. Find material and prepare a talk about the work of one of the following special agencies of the United Nations: International Labor Organization (ILO); Food and Agriculture Organization (FAO); UN Educational, Scientific, and Cultural Organization (UNESCO); World Health Organization (WHO); International Monetary Fund (IMF); International Telecommunication Union (ITU); World Meteorological Organization (WMO); World Bank.

## 7. Summarizing the Unit

Make an outline of the Unit and render its content in a 4—6 min talk.

## PART III

# ECOLOGY AND ENVIRONMENT

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## UNIT 15

### ECOSYSTEMS

### 1. Reading and learning

Scan each text and formulate the main ideas. Make up 5 questions. Read the text again carefully and memorize it, then retell the text close to the original using the main ideas as a plan.

#### 1.1. ECOLOGY

The study of plants and animals in relation to their physical and biological environment is called ecology. The physical environment includes light and heat or solar radiation, moisture, wind, oxygen, carbon dioxide, nutrients in soil, water, and atmosphere. The biological environment includes organisms of the same kind as well as other plants and animals.

Because of the diverse approaches required to study organisms in their environment, ecology draws upon such fields as climatology, hydrology, oceanography, physics, chemistry, geology, and soil analysis. To study the relationships between organisms, ecology also involves such sciences as animal behaviour, taxonomy, physiology, and mathematics.

An increased public awareness of environmental problems has made ecology a common but often misused word. It is sometimes confused with environmental programmes and environmental science.

The term "ecology" was introduced in 1869 when the German biologist Ernst Haeckel first used it in discussing his studies of plants in relation to their environment; it is derived from the simple Greek word *oikos* meaning "a house", "a household" or "a place to live in", sharing the same root word as economics. Thus, the term implies the study of the economy of nature.

If you look at maps of the global distribution of climate, vegetation and soil in an atlas one feature stands out: their similarity. This suggests that these three components are all closely related. The best way of looking at the terrestrial and aquatic landscapes is to view them as ecosystems (a word coined to stress the concept of each habitat as an integrated whole). A system is a collection of interdependent parts that function as a unit and involves inputs and outputs.

The major parts of an ecosystem are the producers (green plants), the consumers (herbivores and carnivores), the decomposers (fungi and bacteria), and the non-living, or abiotic, component, consisting of dead organic matter and nutrients in the soil and water. Inputs into the ecosystem are solar energy, water, oxygen, carbon dioxide, nitrogen, and other elements and compounds. Outputs from the ecosystem include heat of respiration, water, oxygen, carbon dioxide, and nutrient losses. The major driving force is solar energy.

Plants, animals and decomposers are linked to each other, and to the physical environment, by complex flows of energy and cycles of matter. All ecosystems are powered by sunlight. Ecosystems function with energy flowing in one direction from the sun, and through nutrients, which are continuously recycled. The green leaves of plants trap the sun's energy and combine it with carbon dioxide, water and mineral nutrients to make sugars and other carbon compounds. We call this process photosynthesis. Thus the plants are the primary producers and the basic food source for all animals in the ecosystem. Some animals feed directly on plants; others feed on other animals. In this way energy is transferred through the ecosystem in a food web or food chain. At each stage in the food chain there is less energy available, because plants and animals use energy in respiration, and in simply keeping alive.

Ecosystems cycle nutrients such as phosphorus, potassium, and calcium. Most mineral nutrients come from the weathering of rocks. Released into the soil they are taken up by the roots of plants and are transferred by animals along food chains. Eventually, all nutrients are returned to the soil when an organism dies. Here dead plants and animals are broken down by fungi, bacteria, and other decomposers. Without decomposers, ecosystems would quickly run out of mineral nutrients.

## 1.2. GLOBAL AND LOCAL ECOSYSTEMS.

### TROPICAL RAINFORESTS

Ecosystems are groups of plants, animals and decomposers and their physical environment. Ecosystems vary in scale from local to global. The tropical rainforest, temperate deciduous forest, northern coniferous forest, grassland, savannah, desert are global or large-scale ecosystems. Local or small-scale ecosystems include such terrestrial, freshwater and marine systems as lakes, rivers, ponds, wetlands, coral reefs, mangroves, etc.

The equatorial lowlands are home to the most productive and most diverse ecosystem on the planet — tropical rainforests. It contains 90 per cent of all living species. The rainforest covers lowland areas within 10 degrees of the equator, and is spread mainly across South America, central Africa and South-East Asia.

Tall forest trees dominate the rainforest. They absorb and use the sun's energy and control the environment for all other life forms. The equatorial climate has an enormous influence on rainforest vegetation. Annual rainfall is high, ranging from 1,500 to 4,000 mm, and temperatures are constant, between 25 °C and 30 °C all year round. This gives ideal conditions for plant growth and helps to explain the huge biomass and biodiversity of the rainforests. On average, one hectare of rainforest supports up to 5,000 trees and a mass of living matter — biomass — weighing more than 11,000 tonnes. So diverse is the plant and animal life in the rainforest that some scientists believe that nearly 90 per cent of all species are found there.

Like a city, with two- and three-storey apartment buildings, and soaring office towers, the rainforest has its own vertical structure. The topmost layer is the canopy. Viewed from above, the canopy is like a green ocean. Sunlight streaming down on the canopy is converted into plant growth. This abundant food source attracts huge populations of insects, mammals and birds. Lianas and other climbing plants hang from the forest trees. Many have aerial roots and obtain their nutrients from rainwater.

Beneath the canopy, life is a struggle. The trees cast a dense shade, so that ground vegetation is sparse. Saplings may wait for years until a forest giant dies and leaves a gap in the canopy. Then, with a sudden burst of growth, they push towards the light.

Meanwhile, there is intense activity from fungi and microorganisms on the forest floor, as they decompose and recycle the dead organic material. So efficient are they in this warm and humid environment that there is no thick layer of leaves on the forest floor.

It would seem logical that soils, which support dense vegetation, would be highly fertile. In fact the reverse is true. The soils are low in essential nutrients. Also, heavy rainfall quickly washes away any nutrients not taken up by the trees.

So with impoverished soils how does the rainforest survive? The secret is the rainforest's rapid nutrient cycle. Dead plant and animal remains, which reach the forest floor, are quickly broken down and the nutrients immediately absorbed by the trees. Thus the soil contains only a limited store of nutrients, which are mainly locked up in the trees. This has a lesson for farming. Destroy the trees and you remove the nutrients from the system, dooming permanent cultivation to failure, i.e. making it inefficient.

Amazonia is the largest area of rainforest on the planet. The rainforest in Amazonia, like those in Africa and Asia, is under threat.



Deforestation is taking place at an alarming rate. Exploitation of forest resources is rapidly destroying the rainforest. Agriculture, settlement, road building, mineral extraction, and logging cause deforestation.

### 1.3. AQUATIC ECOSYSTEMS. SEASHORE COMMUNITIES

Where the land and the open sea meet very specific ecosystems are formed. The true seashore is the region between the highest and lowest tide levels. Most parts are covered and uncovered by the tide twice every day. The tides are caused by the pull of the Moon and, to a lesser extent, the Sun. The range of tidal movement varies from place to place. There are only a few centimetres between high and low tide levels in parts of Mediterranean, but in some parts of the world the tide may rise and fall as much as 15 metres.

The variation of seashore landscapes is very great. The type of the shore depends very much on the rocks and the geography of the area. Exposed coasts with hard rocks form craggy cliffs and rocky shores. Softer rocks, such as sandstones, form sandy beaches. Sandy beaches also develop in sheltered areas because the sea deposits the material that it has removed from somewhere else. Very sheltered inlets have muddy shores. This is especially true of river mouths. The rocky shores support the most varied life because only on the rocky shores the seaweeds can get a hold (attach). The seaweeds provide food and shelter for the animals.

Conditions on the seashore are constantly changing. It means that plants and animals of the seashore have to be able to withstand far greater changes than either that of the land or of the open oceans. Despite all the problems the seashore is rich in life of many kinds, with animals and plants adapted to the variations within the habitat.

Representatives of almost all the major groups of plants and animals are found there. Many animals visit the seashore without actually living there. Fishes come into the shallow water when the tide is in, and birds flock down to the shore to feed when tide is out. The tides do not worry these animals because they can move about easily.

The seaweeds, mollusks, and other creatures that live permanently on the shore are greatly affected by the tides. They have to be able to live in the water and out of it because part of the time they are covered with salt water, at other times they are exposed to the air and to fresh rainwater. They are basically sea creatures and their main problem is to survive exposure to the air when the tide goes out. The seashore therefore has a number of zones, distinguished by the length of time that they are exposed to the air and each supporting its own collection of plants and animals forming still smaller ecosystems.

Plants and animals living on the shore also have to stand the battering by the waves: in times of storm the waves come crashing on to the beach with unbelievable force.

## 2. Lexical and grammatical exercises

2.1. Rearrange the letters in the anagrams to form equivalents for the Russian words.

|                             |                                 |
|-----------------------------|---------------------------------|
| приют; укрытие — slterhe    | молодое деревце — sainplg       |
| опасность, угроза — tathre  | морская водоросль — sweeead     |
| диапазон — ngrae            | питательное вещество — nnriett  |
| подход — oaarcpph           | травоядное животное — rbivohere |
| дыхание — spreironati       | плотоядное животное — orcaivern |
| хвойный — coounirfes        | заготовка леса — inloggg        |
| изобильный — aabnnndut      | подвергать действию — oseexp    |
| вещество — tmatre           | повторно использовать — rycleec |
| обезлесение — deseorfttanio | делить(ся) — sreha              |
| неудача, провал — ilurfae   | подразумевать — ilymp           |
| морской — minare            | волнующий, тревожный — ainlrnga |

2.2. Match the words in A with the words in B to form word combinations. Give Russian equivalents.

- A. sparse; mineral; river; soaring; shallow; driving; deciduous; organic; food; diverse; fertile; recyclable
- B. container; water; approaches; soil; extraction; force; vegetation; chain; matter; tower; mouth; forest

2.3. Match the parts of the sentences using either 'like' or 'such as'.

|                                  |         |                                     |
|----------------------------------|---------|-------------------------------------|
| Ecosystems cycle nutrients       |         | sandstones form sandy beaches.      |
| Viewed from above, the canopy is | like    | those in Africa, is under threat.   |
| The rainforest in Amazonia,      | such as | a green ocean.                      |
| Softer rocks,                    |         | phosphorus, potassium, and calcium. |

2.4. Read the definition of a word and rearrange the letters in the anagrams.

|           |  |
|-----------|--|
| sviurve:  | to continue to exist, especially in a difficult or dangerous situation |
| edfe:     | to give food to a person or an animal; to eat food                     |
| atre:     | the speed at which something happens                                   |
| bithaat:  | the type of place that an animal or a plant normally lives (grows) in  |
| aiavblae: | able to be obtained, taken, or used                                    |
| cndouomp: | a chemical substance that consists of two or more elements             |
| earlee:   | to let a substance or energy spread into the area around it            |
| pdaat:    | to change to suit different conditions                                 |

**ympil:** to mean but not express  
**iingstuisdh:** to be aware of the differences between things  
**tttaacr:** to get the attention of  
**intducroe:** to bring into existence / practice  
**danst uto:** to be much more impressive or important than others

## 2.5. Fill in the missing forms of the words.

| Verb     | Adjective      | Noun     | Adjective   |
|----------|----------------|----------|-------------|
| attract  |                | essence  |             |
|          | distinguishing |          | aware       |
| continue |                |          | similar     |
| depend   |                | mud      |             |
|          | dominant       |          | stable      |
| die      |                |          | inefficient |
|          | increasing     | exposure |             |
| vary     |                |          | extensive   |

## 2.6. Match the verbs close in meaning in A and B.

- A.** coin; absorb; struggle; obtain; trap; charge; relate; require; confuse; imply; transfer; soar; convert; spread; distinguish; cast  
**B.** need; move; fill; invent; differentiate; change; gain; fly; fight; take in; throw; mistake; suggest; link; extend; catch

## 2.7. Choose a word from the list below to fit the word combinations in each line. For example: *average* fits line 1.

*average; confuse; relation; range; way; enormous; attract; extent; rate; require*

- ~ temperature; on ~; above / below ~; an ~ of 6 pounds
- ~ amount; ~ number; ~ influence; ~ source of energy
- ~ insects; ~ to be ~ed to; ~ the attention of; to sound ~ive
- ~ an effort; ~ knowledge; ~ (special) attention; conditions ~d
- birth ~; high / low ~; at an alarming ~; at a ~ of one a month
- to a limited ~; to a greater ~; to some ~; ~ to which
- limited ~; the whole ~; a wide ~ of; within the ~ of
- in ~ to; a ~ between; close ~ship; ecological ~ship
- the best ~; in some ~; a ~ of thinking; one ~ to do sth
- ~ with; ~ terms; ~ customers; to be less ~ing

## 2.8. Choose the correct word.

- Outputs from the ecosystem include (**heat / hot**) of respiration.
- Some animals feed directly (**with / on**) plants.
- Deforestation is taking place (**with / at**) an alarming rate.
- Ecosystems vary (**in / on**) scale from local to global.
- The term is derived (**into / from**) the simple Greek word *oikos*.
- Tall forest trees (**dominate / are dominated by**) the rainforest.
- Sea creatures have to survive exposure (**in / to**) the air when the tide goes out.
- In fact the reverse is (**true / truth**).
- The rainforest has (**it's / its**) own vertical structure.

## 3. Translation into Russian

### ICY LAKE HOUSES EXTREME ECOSYSTEM

Beneath nearly 20 meters of solid Antarctic ice, lies a salty lake that has been sealed off from the atmosphere for about 3,000 years. According to estimations Lake Vida contains the thickest non-glacial lake ice cover on earth, which houses centuries-old bacteria. The findings could help researchers in their hunt for evidence of life in other extreme environments, such as Mars.

Lake Vida is located in the McMurdo Dry Valleys region of Antarctica, and its surface remains frozen year round. In fact, scientists thought that it was one of several lakes that are completely frozen to their beds all year long. The team of researches determined that the ice cover conceals water that is salty enough to remain liquid at temperatures below -10°C, and that sediments locked within the ice core a few meters above the water-ice boundary date to 2,800 years ago. What is more, bacteria found in the dirt revived once they were liberated from the ice and exposed to water. The scientists concluded, "The ice cover of these lakes represents an oasis for life in an environment previously thought to be inhospitable. These life forms may possess novel ice-active substances such as antifreezes and ice nucleation inhibitors that allow the organisms to survive the freeze-thaw cycles and come back to life when exposed to liquid water."

Indeed, the frigid temperatures proved perfect for preserving the DNA of the ancient organisms. By studying them, the scientists hope to gain a better understanding of how life might have evolved in other regions of Antarctica such as Lake Vostok, which sits under four kilometers of the East Antarctic ice sheet. The icy lake could also inform potential scenarios for life on a young Mars. Mars is believed to have a water-rich past, and if life developed there, a Lake Vida-type ecosystem may have been the final niche for life on Mars before the water bodies froze solid.



## 4. Complementary activities

Develop your skills: guessing the words.

In the following excerpt from "Memoirs 1950 — 1963", former United States ambassador George Kennan describes the Soviet Union. As you read you come across the words you do not know. You may be able to guess what these words mean out of the context. Notice the underlined words. Try to define the words as they are used. On a sheet of paper write the Russian equivalent or an English synonym for each word without using a dictionary. Then use a dictionary to check your understanding. How close were you to the correct meaning of these words?

It was summer — the marvelous summer of central Russia, with its deep blue skies, its fields and ravines, its evergreens and birches and poplars, its straggling villages and onion-domed churches, its far horizons with always the dark dim line of distant forests.

The common people, beginning now to recover to some extent from the horrors and privations of the war, and animated, in these final months of the Stalin era, by a fear of all political involvement and a revulsion to all thought and talk of internal politics, were their characteristic patient, irrepressible vitality — creating a life for themselves, such as they could, within the rigid limits prescribed by the system.

The collective farmers were permitted now to sell. At open outdoor markets, such surplus produce as they could grow on their own small private plots. The city suburbanities had likewise their kitchen gardens and sometimes even an animal or two. These various private activities tended to merge; and in this way there was growing up, particularly on the outskirts of Moscow, a form of petty free enterprise — a free enterprise strictly limited but active, busy and, in its way, hopeful. There was, therefore, something old-Russian about these suburban communities — an atmosphere of health and simplicity and subdued hope.

*What is the author's general opinion of Russia and its people?*

## 5. Writing

Render the following text in English.

### ГЕОЭКОЛОГИЯ. ЭКОСФЕРА.

Геоэкология — это исследование Земли как системы с особым интересом к глобальным (общемировым) вопросам. Корень «гео» в слове «геоэкология» восходит к греческой богине Земли Гее. Он

традиционно охватывает науки о Земле, подчеркивая их единство и взаимозависимость. Корень «гео» ставит на первое место Землю в целом, подчеркивая необходимость понимания, прежде всего, общеземных, глобальных процессов, а затем уже, на этой базе, явлений, относящихся к отдельным регионам и местностям. Геоэкология имеет дело не с Землей в целом, а лишь с относительно тонкой поверхностной оболочкой, где пересекаются геосферы (атмосфера, гидросфера, литосфера и биосфера) и где живет и действует человек. Из имеющихся нескольких названий этой комплексной оболочки термин «экосфера» наиболее точно отражает ее суть и потому является наиболее подходящим, хотя пока не общепринятым.

Экосфера — это всемирная область интеграции геосфер и общества. Геоэкология — междисциплинарное научное направление, изучающее экосферу как взаимосвязанную систему геосфер в процессе ее интеграции с обществом. Геоэкология появилась, когда деятельность человека стала существенным фактором преобразования Земли.

Наряду с понятием «экосфера» существует еще несколько подобных понятий, употребляемых в литературе. Выражение «окружающая среда» употребляется наиболее часто. Ему соответствуют: «environment» по-английски и по-французски, «umwelt» по-немецки, «medio ambiente» по-испански, «ambiente» по-итальянски.

Часто возникает необходимость образовать прилагательное от словосочетания «окружающая среда». Но от двухсловного выражения трудно образовать соответствующее ему прилагательное. Поэтому в русском языке термину «окружающая среда» соответствует прилагательное «экологический». Это создает определенную путаницу в понятиях. В английском языке ситуация проще: слову «environment» соответствует прилагательное «environmental», отличающееся по смыслу от слова «ecological», происходящего от «ecology». Но зато в испанском языке есть прилагательное «medioambiental», образованное от термина «medio ambiente» (окружающая среда).

Как и экосфера, термин «окружающая среда» подчеркивает взаимоотношения общества с окружающей его природой. В отличие от экосферы, где основа — глобальная, а на ее базе возникают локальные задачи, экологические проблемы в понятии «окружающая среда» носят скорее локальный характер, а из них уже выстраиваются глобальные проблемы. Кроме того, в названии «окружающая среда» просвечивают интересы, ориентированные на человека. Часто даже говорят и пишут «окружающая человека среда». Таким образом, понятие «окружающая среда» антропоцентрично, то есть оно ставит в центр нашего мира человека, забывая о том, что человек — это часть природы. Термин «экосфера» более нейтрален, или даже биоцентричен.

## 6. Speaking

### 6.1. Retell the following text in English.

#### NATURAL CHANGES IN ECOSYSTEMS

The natural world is in a constant state of flux. Changes can be seen at all time-scales, from the shortest to the longest. Short-term changes, which are observable by people, are often cyclical and predictable: night and day, the monthly cycle of the tides, the annual change of the seasons, and the growth, reproduction, and death of individuals. Viewed at this level many ecosystems, when not disturbed by humans, appear superficially to be stable and unchanging, maintained in equilibrium by the "balance of nature".

It is becoming increasingly apparent that this is not the case. However, longer-term changes — those running over decades, centuries, millennia, and ultimately over tens of millions of years — are far less easy for us to track. The science of ecology itself is less than a century old — the merest blink of an eye in the history of most natural ecosystems. Moreover, it is evident that most of these longer-term changes are not regular and predictable at all.

Globally, climate is undoubtedly the most important factor in the short to medium term. On land, temperature, rainfall, and seasonality are the three factors, which are most important in determining the distribution of ecosystems. Changes in anyone of these can have a lasting effect. In recent geological time the most dramatic example of this is undoubtedly the series of Ice Ages, which characterized much of the Pleistocene epoch. These protracted periods of global cooling had a major effect on the world's ecosystems, causing the spread of ice cover in temperate areas and the shrinking of moist forest habitats in parts of the tropics.

Climatic change with a wide geographical influence can also occur over shorter time-scales. One of the most striking examples is El Niño, a warm-water current, which periodically sweeps across the Pacific. This has a major impact on marine ecosystems, leading, for example, to the death of reef corals in many parts of the Pacific, and the lowering of fisheries production in the Humboldt Current ecosystem off Chile and Peru. El Niños occur irregularly and vary in intensity and impact; it is rare for more than 20 years to pass without one and occasionally they may be separated by only 1 or 2 years. El Niños also affect terrestrial ecosystems through changing rainfall patterns, particularly in the Americas.

Local events can also have major effects on ecosystems: fires, floods, and landslides are all natural events which can have catastrophic local impact. This impact is not necessarily negative: many ecosystems actually require periodic disturbance to maintain themselves. Fire-climax

ecosystems, in which periodic burning is an essential part of the growth cycle, are widespread in semi-arid areas such as much of Australia.

At longer time-scales geological processes and evolution itself play a crucial role in changing the functioning of ecosystems. Continental Drift literally changes the face of the planet, creating new landscapes and destroying others, while evolution leads to new life-forms which may themselves create new ecosystems at the same time as leading to the extinction of other species and the loss or transformation of the ecosystems of which they were a part.

However, this does not mean that there is no continuity in natural ecosystems. Many show great resilience and persistence through periods of many millions of years. Examples of ecosystems which have apparently remained stable for a very long time include those on the vast deep-sea plains, the Mediterranean-type ecosystems of southern Africa and western Australia, and some areas of tropical rainforest, such as those in parts of the south-east Asian mainland and in the mountains of eastern Africa.

6.2. Find material and prepare a talk about any large-scale or small-scale ecosystem and the changes occurring in it.

## 7. Summarizing the Unit

Make a summary of the Unit and render its content in a 4—6 min talk.

## UNIT 16

### ENVIRONMENTAL PROBLEMS

#### 1. Reading and learning

Scan each text and formulate the main ideas. Make up 5 questions. Read the text again carefully and memorize it, then retell the text close to the original using the main ideas as a plan.

##### 1.1. THE STATE OF THE WORLD AT THE TURN OF THE MILLENNIUM

As we look back at the many spectacular achievements of the century just ended, the landing on the Moon stands out. At the beginning of the century, few could imagine humans flying, much less breaking out of



Earth's field of gravity to journey to the Moon. And few could imagine how quickly the world would go from air travel to space exploration. Indeed, when the century began, the Wright brothers were still working in their bicycle shop, trying to design a craft that would fly. Just 66 years passed from their first precarious flight in 1903, to the landing on the Moon. Although their first flight was only 40 m, it opened a new era, setting the stage for a century of breathtaking advances in technology.

In 1945, engineers at the University of Pennsylvania successfully designed what many consider to be the first electronic computer. This advance was to have an even more profound effect than the Wright brothers' invention, as it set the stage for the evolution of the information economy. Computer technology progressed even more rapidly, going from the era of large computers to personal computers in just a few decades. A new industry evolved. New firms were created. IBM, Hewlett-Packard, Dell, Apple, Microsoft, Intel, and America On-Line became household names. Fortunes were made overnight. When the listed stock value of Microsoft overtook that of General Motors in 1998, it marked the beginning of a new era — a shift from a period dominated by heavy industry to one dominated by information.

The stage was set for the evolution of the Internet, a novel concept that has tied the world together as never before. Although still in its early stages as the new century begins, the Internet is already affecting virtually every aspect of our lives — changing communication, commerce, work, education, and entertainment. It is creating a new culture, one that is evolving in cyberspace.

But there is a great contrast between our bright hopes for the future of the information economy and the deterioration of Earth's ecosystem. Although the contrast between our civilization and that of our hunter-gatherer ancestors could scarcely be greater, we do have one thing in common — we, too, depend entirely on Earth's natural systems and resources to sustain us. Unfortunately, the expanding global economy is outgrowing those ecosystems. Evidence of this can be seen in shrinking forests, eroding soils, falling water tables, collapsing fisheries, rising temperatures, dying coral reefs, melting glaciers, and disappearing plant and animal species.

As pressures mount with each passing year, more local ecosystems collapse. Soil erosion has forced Kazakhstan, for instance, to abandon half its cropland since 1980. The Atlantic swordfish fishery is on the verge of collapsing. The Aral Sea, producing over 40 million kilograms of fish a year as recently as 1960, is now dead. The Philippines and Cote d'Ivoire have lost their thriving forest product export industries because their once luxuriant stands of tropical hardwoods are largely gone. The rich oyster beds of the Chesapeake Bay that yielded more than 70 million kilograms a year in the early twentieth century produced less than 2 million kilograms in 1998. As the global economy expands, local ecosystems are collapsing at an accelerating pace.

The first region where decline is replacing progress is sub-Saharan Africa. In this region of 800 million people, death rates are rising, infant mortality is rising, and life expectancy — perhaps the most basic measure of economic development — is falling because of the virus that leads to AIDS. (Before AIDS, life expectancy in Zimbabwe was 65 years. In 1998, it was 44 years. By 2010, it is projected to fall to 39 years.) In several countries more than 20 per cent of adults (one fifth of the adult population) are infected by the virus. In the absence of a low-cost cure, some 23 million Africans are beginning a new century with a death sentence imposed by the virus. It is becoming an epidemic of epic proportions. It is also a tragedy of epic proportions.

## 1.2. ENVIRONMENTAL TRENDS OF THE NEW CENTURY

As the 21st century begins, several well-established environmental trends are shaping the future of civilization. Some of them are: population growth, rising temperature, falling water tables, shrinking cropland per person, collapsing fisheries, shrinking forests, the loss of plant and animal species.

Just weeks before the new millennium began, world population reached 6 billion. But in the world where 1.2 billion people are hungry, 1.2 billion lack access to clean water, and nearly 1 billion adults are illiterate, passing this demographic landmark was not a cause for celebration.

The projected growth in population over the next half-century may more directly affect economic progress than any other single trend, aggravating nearly all other environmental and social problems. Between 1950 and 2000, world population increased from 2.5 billion to 6.1 billion, a gain of 3.6 billion. And even though birth rates have fallen in most of the world, recent projections show that population is projected to grow to 8.9 billion by 2050, a gain of 2.8 billion. Whereas past growth occurred in both industrial and developing countries, virtually all future growth will occur in the developing world, where countries are already overpopulated, according to many ecological measures. Where population is projected to double or even triple during this century, countries face even more growth in the future than in the past.

Our numbers continue to expand, but Earth's natural systems do not. The amount of fresh water produced by the hydrological cycle is essentially the same today as it was in 1950 and as it is likely to be in 2050. So, too, is the sustainable yield of oceanic fisheries, of forests, and of rangelands. As population grows, the shrinking per capita supply of each of these natural resources threatens not only the quality of life but, in some situations, even life itself.

A second trend that is affecting the entire world is the rise in temperature. The evidence that Earth's climate is getting warmer has

mounted dramatically. Some 3,000 sq km of the west Antarctica ice sheet broke up within one-year period. One iceberg that broke free, some 65 km in length, has long been floating in the Southern Ocean.

It is believed that the rise of global temperature results from increasing atmospheric concentrations of carbon dioxide (CO<sub>2</sub>). When the Industrial Revolution began more than two centuries ago, the CO<sub>2</sub> concentration was estimated at 280 parts per million (ppm). By 1959, when detailed measurements began, using modern instruments, the CO<sub>2</sub> level was 316 ppm, a rise of 13 per cent over two centuries. By 1998, it had reached 367 ppm, climbing 17 per cent in just 39 years. This increase has become one of Earth's most predictable environmental trends.

Global average temperature has also risen, especially during the last three decades — the period when CO<sub>2</sub> levels have been rising most rapidly. The average global temperature for 1969–71 was 13.99 °C. By 1996–98, it was 14.43 °C, a gain of 0.44 °C. If CO<sub>2</sub> concentrations double pre-industrial levels during this century, as projected, global temperature is likely to rise by at least 1 °C and perhaps as much as 4 °C. Meanwhile, sea level is projected to rise from a minimum of 17 cm to as much as 1 m by 2100. This will alter every ecosystem on Earth. Already, coral reefs are being affected in nearly all the world's oceans, including the rich concentrations of reefs in the vast eastern Pacific and in the Indian Ocean, stretching from the east coast of Africa to the Indian subcontinent. For example, record sea surface temperatures over the last two years may have wiped out 70 per cent of the coral in the Indian Ocean. Coral reefs, complex ecosystems that are sometimes referred to as the rainforests of the sea, not only serve as breeding grounds for many species of marine life, they also protect coastlines from storms and storm surges.

The modest temperature rise in recent decades is melting ice caps and glaciers. Ice cover is shrinking in the Arctic, the Antarctic, Alaska, Greenland, the Alps, the Andes, and the Tibetan Plateau. Scientists reported in mid-1999 that the two ice shelves on either side of the Antarctic Peninsula are in full retreat. Over roughly a half-century through 1997, they lost 7,000 sq. km. But then within a year or so they lost 3,000 sq. km.

Another sign of climate change was the emergence of one of our ancestors from the ice. In the fall of 1991, hikers in the southwestern Alps near the border of Austria and Italy discovered an intact human body, a male, protruding from a glacier. Believed to have been trapped in a storm some 5,000 years ago and quickly covered with snow and ice, his body was remarkably well preserved. And in the late summer of 1999, another body was found protruding from a melting glacier in the Yukon Territory of western Canada, this one some 2,000 years old. Our ancestors are emerging from the ice with a message for us: Earth is getting warmer.

One of the least visible trends that is shaping our future is falling water tables. In addition to the traditional problems associated with irrigation, such as waterlogging, salting, and silting, which go back several thousand years, we now face a new threat: aquifer depletion. Aquifer depletion is confined largely to the last half-century, when powerful diesel and electric pumps made it possible to extract underground water at rates that exceed the natural recharge from rainfall and melting snow.

Forests, too, are affected by human demands. Over the past half-century, the world's forested area has shrunk substantially, with much of the loss occurring in developing countries. And the forested area per person worldwide is projected to shrink from 0.56 hectares today to 0.38 hectares in 2050. This figure reflects both population growth and the conversion of some forestland to cropland. In many situations, the rising worldwide demand for forest products — lumber, paper, and firewood — is already exceeding the sustainable yield of forests.

In some ways the trend that will most affect the human prospect is an irreversible one — the accelerating extinction of plant and animal species. The share of birds, mammals, and fish vulnerable or in immediate danger of extinction is about 20 per cent of all species. The leading cause of species loss is habitat destruction, but habitat alterations from rising temperatures or pollution can also affect both plant and animal species. As human population grows, the number of species with which we share the planet shrinks. As more and more species disappear, local ecosystems begin to collapse.

### 1.3. REPLACING ECONOMICS WITH ECOLOGY

An economic system that worked well in the past times when the demands of a smaller economy were well within the capacities of Earth's ecosystems is no longer working well. Today the global economy outgrows the various natural capacities of Earth. If the trends outlined in the last section cannot be reversed, we face a future where continuing environmental deterioration almost certainly will lead to economic decline. The challenge is to redesign the economic system so that it will not destroy its environmental support systems, so that economic progress can continue.

The gap between economists and ecologists in their perception of the world as the new century begins could not be wider. Economists see a world economy that has grown by leaps and bounds over the last half-century, but ecologists see growth based on the burning of vast quantities of cheap fossil fuels, which is destabilizing the climate. They are keenly aware that someone buying a gallon of gasoline pays the cost of pumping the oil, of refining it into gasoline, and of distributing the gasoline to the service station, but not the cost to society of future climate disruptions.



Again, while economists see booming economic indicators, ecologists see an economy that is altering the climate with consequences that no one can foresee.

Today ecologists look at the deteriorating ecosystem and see a need to restructure the economy. For example, stabilizing Earth's climate now depends on reducing carbon emissions by shifting from fossil fuels to a solar/hydrogen energy economy. Solar is here defined broadly, including not only direct sunlight but also indirect forms of solar energy — wind power, hydropower, and biological sources, such as wood. Fortunately, the technologies for tapping this enormous source of energy already exist.

We can now see electricity generated from wind being used to electrolyze water and to produce hydrogen. Hydrogen then becomes the basic fuel for the new economy, relying initially on the distribution and storage facilities of the natural gas industry. Put simply, the principles of ecological sustainability now require a shift from a carbon-based to a hydrogen-based energy economy.

While stabilizing climate is largely a matter of investing in new energy sources, stabilizing population is more a matter of changing reproductive behavior. The annual addition to world population increased steadily from 38 million in 1950 to the historical peak of 87 million in 1989. After that, it dropped to 78 million in 1998. While the annual additions in many developing countries have been increasing, they have been declining elsewhere. Some 32 countries — virtually all of industrialized Europe, from the United Kingdom to Russia, plus Japan and Canada — have succeeded in stabilizing their population size. Births and deaths are essentially in balance, as they must be in a sustainable society. This group of countries contains some 15 per cent of the world population. In every developing country where population growth has slowed dramatically, family planning programs have enjoyed strong government support.

In stabilizing climate and stabilizing population, there is no substitute for leadership. Examples of this abound in both initiatives. Denmark, for instance, has simply banned the construction of coal-fired power plants. Meanwhile, it has adopted a series of economic incentives for investment in wind power that has fostered the development of the world's largest wind turbine manufacturing industry. As a result, in 1998 wind turbines of Danish design accounted for half of all turbines installed worldwide. Though scarcely a major industrial power, Denmark has a commanding position in this fast-expanding new industry.

The challenge is either to build an economy that is sustainable or to stay with our unsustainable economy until it declines. It is not a goal that can be compromised. One way or another, the choice will be made by our generation, but it will affect life on Earth for all generations to come.

## 2. Lexical and grammatical exercises

### 2.1. Rearrange the letters in the anagrams to form equivalents for the Russian words.

|                                 |   |
|---------------------------------|---|
| тенденция — <b>dtntre</b>       | ухудшение (состояния) — <b>eerrattiioodn</b>  |
| обогнать — <b>oakevrte</b>      | средство поощрения, стимул — <b>ceiinnvte</b> |
| отступать — <b>rreeatt</b>      | развлечение — <b>meeerntttainn</b>            |
| налагать запрет — <b>nba</b>    | увеличивать(ся) в размерах — <b>eanxpd</b>    |
| сдвиг; смена — <b>tsifh</b>     | размножаться; разводить — <b>deebr</b>        |
| заиливание — <b>ilstgin</b>     | очищать (от примесей) — <b>rinefe</b>         |
| замена — <b>sstttuubei</b>      | вкладывать деньги — <b>iesnvt</b>             |
| предок — <b>atoncesr</b>        | заболачивание — <b>intewrllaggg</b>           |
| доступ — <b>ecacss</b>          | (по)следствие — <b>squccoeeeenn</b>           |
| покидать — <b>aaonnbd</b>       | подтверждение — <b>eedenvic</b>               |
| вымирание — <b>xeonnetiti</b>   | неуклонно; постоянно — <b>sytedila</b>        |
| прирост — <b>inag</b>           | достижение — <b>tacihcnemve</b>               |
| неграмотный — <b>iitteellra</b> |   |

### 2.2. Match the words in A with the words in B to form word combinations. Give Russian equivalents.

- A. life; novel; accelerating; aquifer; carbon; space; ecological; low-cost; listed; household; death; economic
- B. sustainability; concept; name; stock; cure; depletion; emission; exploration; pace; incentives; expectancy; sentence

### 2.3. Complete the words using their definitions.

- ac \_ i \_ ve: to succeed in doing or gaining something, usually with effort
- a \_ o \_ t: to decide to start using a particular idea, plan, or method
- th \_ i \_ e: to be successful and profitable
- s \_ r \_ n \_ : to become smaller in amount, value, or range
- e \_ o \_ ve: to gradually change and develop over a period of time
- \_ ec \_ i \_ e: to become less or worse
- ov \_ r \_ ig \_ t: in a very short time
- vu \_ ne \_ ab \_ e: easily damaged by something negative or harmful
- c \_ al \_ en \_ e: a situation that tests somebody's abilities in a stimulating way
- \_ is \_ u \_ ti \_ n: a situation in which sth cannot continue because of a problem
- di \_ t \_ ib \_ te: to share an available supply of something
- e \_ ti \_ at \_ : an amount you guess or calculate using the information available
- ou \_ l \_ n \_ : to give essential elements of an argument or plan
- ac \_ ou \_ t \_ o \_ : to form, use, or produce a particular amount or part of sth

## 2.4. Fill in the missing forms of the words.

| Noun        | Verb     | Noun      | Verb       |
|-------------|----------|-----------|------------|
| evolution   |          |           | emit       |
|             | emerge   | threat    |            |
| effect      |          |           | distribute |
|             | alter    | excess    |            |
| destruction |          | image     |            |
|             | perceive |           | sustain    |
| success     |          | reference |            |

## 2.5. Match the words close in meaning in A and B.

- A. thrive; sustain; associate; emit; yield; advance; alter; exist; abandon; aggravate; expect; deteriorate; mount; dominate

B. progress; produce; control; connect; discharge; flourish; worsen; support; increase; leave; hope; be; decline; change
- A. evolution; matter; consequence; craft; verge; share; threat; outline; quantity; shift; pace; series; surge; projection

B. wave; estimate; development; result; portion; danger; substance; set; plan; amount; ship; edge; (re)move; speed
- A. profound; virtually; overnight; novel; considerably; steady; roughly; vast; spectacular

B. impressive; enormous; new; deep; practically; suddenly; stable; approximately; essentially

## 2.6. Choose a word from the list below to fit the word combinations in each line. For example: *pass* fits line 1.

*pass; adopt; virtually; aggravate; incentive; matter; consequence; face; achievement; advance; accelerating; novel; profound*

- |                    |                 |                    |                |
|--------------------|-----------------|--------------------|----------------|
| 1. years ~;        | to ~ smb;       | to ~ a landmark;   | to ~ a law     |
| 2. organic ~;      | a ~ of time;    | a ~ of money;      | subject ~      |
| 3. cultural ~s;    | spectacular ~;  | ~s in agriculture; | ~s of science  |
| 4. ~ a problem;    | ~ the guilt;    | ~ a trend;         | to be ~d with  |
| 5. ~ identical;    | ~ unknown;      | ~ impossible;      | ~ every aspect |
| 6. to ~ north;     | to ~ a task;    | to ~ an obstacle;  | to be ~d with  |
| 7. disastrous ~;   | social ~;       | as a ~;            | with ~s        |
| 8. tax ~;          | economic ~;     | powerful ~;        | to offer an ~  |
| 9. ~ a scheme;     | ~ a suggestion; | ~ proposals;       | ~ an approach  |
| 10. ~ analysis;    | ~ effect;       | ~ knowledge;       | ~ influence    |
| 11. ~ concept;     | ~ solution;     | ~ way;             | ~ idea         |
| 12. significant ~; | brehtaking ~;   | technological ~;   | theoretical ~  |
| 13. ~ force;       | ~ extinction;   | ~ pace;            | ~ agent        |

## 2.7. Match the words in A with their opposites in B.

- A. shrink; outstanding; succeed; retreat; preserve; lack; household; precarious; pass; collapse; predictable; reflect; refine; luxuriant; thrive
- B. have (enough); flourish; stretch; fail; unknown; destroy; advance; absorb; stop; safe; unlikely; average; decline; pollute; sparse

## 2.8. Choose the correct word.

- World population (**achieved / reached**) 6 billion.
- Irrigation goes back several (**thousand / thousands**) years.
- The (**on / per**) capita supply of these natural resources is shrinking.
- Climate now depends (**from / on**) reducing carbon emissions.
- The rates of extraction (**exceed / speed**) the natural recharge from rainfall.
- Denmark has adopted (**a / —**) series of economic incentives.
- The Atlantic swordfish fishery is on the (**surge / verge**) of collapsing.
- Life expectancy is falling because (**of / —**) the virus that leads to AIDS.
- These rich oyster beds yielded more than 70 million kilograms (**a / in a**) year.
- 12 per cent of the birds are threatened (**of / with**) extinction.
- Some countries have succeeded (**in / at**) stabilizing their population size.

## 3. Translation into Russian

### GLOBAL CHANGE

For decades, analysts have been using the year 2000 as the end point for their long-term forecasts and projections. Now that this year has become a vantage point for looking backward, the view is breathtaking. The last half-century has been a period of sweeping, unprecedented change: change in the economy, change in society, and change in the very biosphere of the planet. Indeed, very few projections for the year 2000 have come anywhere close to the mark. Today we live in a world that is economically richer than could have been hoped for a half-century ago, but one that is ecologically poorer than hardly anyone could have imagined.

Here are some of the trends of the last 50 years:

- There are now just over 6 billion people on the planet, up 3.5 billion since 1950, which means more than a doubling in just 50 years. Most of the growth has come in developing countries, many of them already overcrowded. The number of city residents has grown even faster — up fourfold since the middle of the 20th century.

- The world economy has grown even more dramatically: almost sevenfold in 50 years. This added wealth translates into vast



improvements in living standards — from nutrition to housing, health care, and transportation. But 1.2 billion people still live in severe poverty, and an estimated 1.1 billion do not have clean, safe water to drink.

- The world grain harvest has nearly tripled since 1950, allowing billions of people to enrich their diets. But the abundance of food has come at a price: falling freshwater aquifers and severe water pollution from massive use of fertilizers and pesticides. Despite the increase in production, over a billion people are still undernourished, while another billion are actually over-nourished, which has created a global epidemic of obesity that is now spreading to the developing world.

- Emissions of carbon dioxide, the leading greenhouse gas, have risen by nearly 300 per cent since 1950, boosting its concentration in the atmosphere to its highest level in at least 420,000 years. New scientific studies project dramatic changes in the climate in the current century, leading to increased storm intensity, agricultural losses, and economic disruptions due to accelerated global warming from the additional greenhouse gases.

- The world has lost more than half its wetlands and over one quarter of its coral reefs — losses that continue to accelerate. And the species that depend on these natural habitats are also in decline. Of the approximately 9,900 bird species that have been identified, 12 per cent are threatened with extinction.

As the world becomes ever more complex, predicting the future becomes an ever less productive enterprise. But planning for the future can minimize the risks and maximize the opportunities presented by a fast-changing world. From this perspective, the challenge of the 21st century is to extend the economic progress of the last 50 years while halting the ecological decline and social misery that have sometimes marked this remarkable period.

## 4. Complementary activities

**Develop your skills: understanding descriptions.**

a) High mountains and old volcanoes divide the plateau's southern end into several very densely populated basins.

b) Rugged, snowcapped mountains rise from the middle of the parched, semiarid grasslands.

Geographers study the physical and cultural features of the earth. They observe and then describe those features. The excerpts above describe the physical setting of Mexico. In the first excerpt the adjectives such as *high* and *old* are used to describe the mountains around the Mexican Plateau. The verb *divide* is also used to illustrate the effect these mountains have on the plateau's surface. The adverbial phrase *densely populated* describes the area's basins. In the second excerpt adjectives such as *rugged*, *snowcapped*, *parched*, and *semiarid* are used to help form a mental picture of the landscape.

Many types of modifying words and phrases are used to describe physical and cultural features and actions. Using such words and phrases gives you a clearer image of what a place is actually like.

To understand geographic descriptions, follow these guidelines:

**1. Read the description carefully.** Identify the basic information that the description contains. Note in general what basic landforms or cultural features are being described.

**2. Identify the descriptive words.** Note the adjectives, adverbs, and other modifying words and phrases in the description. Link the descriptions to the physical settings they modify. If necessary, use a dictionary to define specific descriptive terms.

**3. Form a mental picture.** Put all the information in the description together to form a mental picture of what is being described. Note how each descriptive word or phrase helps you bring the mental image of the geographic concept more sharply into focus.

Read the excerpt below. The excerpt describes the cultural landscape of Mexico City. In the excerpt the geographer uses several descriptive words — *few*, *short*, *beautiful*, *squalid*, *steep-sided*, and others — to tell you that you will find poor families living in miserable shacks close to the cleanest parts of the city. The descriptive words help you “see” the conditions in the slums of Mexico City.

So just a few short blocks from the beautiful tree-lined boulevards sit squalid slums that house 46 per cent of the city's population. Thousands of the poorest families live in kitchenless shacks or lean-tos and cook along the sides of the streets. Other families occupy the roofs of factories or live in shacks that barely cling to steep-sided ravines.

To practice this skill read the passage below. List the adjectives that describe the Mexican Plateau. Define, in your own words, what each adjective means.

Mexican Plateau. The centrally located Mexican Plateau, a southern extension of the Interior Plains of the United States, forms Mexico's largest physical region. Few people live in the dry north. High mountains and old volcanoes divide the plateau's southern end into several very densely populated basins. The basins and surrounding mesas, elevated plateaus with steep sides, have rich volcanic soil suitable for farming. Mexico's largest cities — Mexico City, Puebla, and Guadalajara — occupy these basins today.

## 5. Writing

**Render the following text in English.**

### ИСТОРИЯ ВОЗДЕЙСТВИЯ ЧЕЛОВЕКА НА ПРИРОДУ

На первых этапах своего существования человек собирал плоды экосистем суши (леса, степи, саванны и пр.), съедобные водо-

росли, моллюсков, ракообразных и др., ловил рыбу и охотился. Это был период, когда человек зависел от ресурсов биосферы и для поддержания своего устойчивого состояния инстинктивно должен был действовать, не нарушая эти ресурсы, а существуя за счет ежегодного прироста биомассы. Охотничье-собирательский тип хозяйства не выходил за пределы устойчивого использования ресурсов биосферы и практически не влиял на природу Земли.

Дальнейший рост населения и его потребностей не мог быть обеспечен посредством охоты, рыбной ловли и собирательства: этих ресурсов стало недостаточно. Это привело часть человеческого общества к одомашниванию диких животных с постепенной селекцией пород и, следовательно, к пастбищному скотоводству, а другую часть общества — вначале к примитивному, а затем все более усложняющемуся земледелию. Тем самым человек перешел от относительно устойчивого использования геосферы, мало ее изменяющего, к ее преобразованию.

Следующим серьезным шагом в развитии человечества, а также в антропогенном преобразовании природы стало обращение к ресурсам литосферы, а именно добыча полезных ископаемых. Сначала это были металлические руды, в основном для изготовления орудий труда, а затем во все большей степени и другие полезные ископаемые. Роль их для человеческого общества все более усиливалась, дойдя до такой степени, что добыча и использование горючих ископаемых (нефть, газ, уголь) стали одним из краеугольных камней современной экономики, но в то же время и одним из важнейших неблагоприятных факторов состояния окружающей среды.

Развитие промышленности и сельского хозяйства стало следующим важнейшим фактором изменения природы, связанным с истощением природных ресурсов, загрязнением окружающей среды. Локальные и региональные промышленные революции чаще всего сопровождались тяжелыми экологическими последствиями. К ним относятся, например, лондонские туманы, загрязнение Рейна и озера Эри, тяжелая экологическая ситуация в старопромышленных районах России и др. Развитие сельского хозяйства и городов приводило к глубокому преобразованию природных ландшафтов Земли. Особенно большие изменения произошли и происходят в последние десятилетия. К наиболее существенным, общепланетарным изменениям следует отнести:

- трансформацию ландшафтов Земли;
- изменения глобальных биогеохимических циклов веществ;
- изменения режима биосферы, гидросферы и атмосферы;
- сокращение биологического разнообразия.

Эти изменения столь значительны, что для их обозначения в научной и политической литературе на английском языке возник и стал общепринятым и общепонятным специальный термин «Global Change», что может быть переведено как «глобальные изменения».

## 6. Speaking

### 6.1. Retell the following text in English.

#### CORAL REEFS

Corals are formed by an accumulation of coral animals. More than 100 countries — many of them small islands — rely on coral reefs for essential goods and services. Reefs shelter coastlines from storm damage, erosion, and flooding, providing protection and other benefits for an estimated half-billion people. They are also important feeding and breeding grounds for commercial fisheries. Reefs also generate significant tourism revenue. Recently reef-derived molecules have been used to develop medicines from antibiotics to HIV (human immunodeficiency virus) drugs.

Coral reefs are found only in the tropics, for reef-building corals can survive only within a narrow range of temperature from 26 °C to 27 °C and they cannot survive for long in cool waters. Corals grow near land in shallow water, because they require great amounts of light and specific salinity conditions. For this reason they thrive (flourish) only in shallow, clear, sunlit tropical seas, extending to about 30° north and south of the equator. They can live longer than 300 years and grow between one half and ten centimetres per year.

Coral reefs cover less than 0.2 per cent of ocean area, but are among Earth's most complex and productive ecosystems. Many animals such as fish, sea urchins, starfishes and numerous species of mollusks feed on algae. Hiding in the numerous caves and crevices of a reef are predatory animals including sharks. The numerous microhabitats and the productivity of the reefs support a great diversity of marine life.

Coral reefs are ecosystems with well-defined structure that involves both producers and consumers. The outer layer of a reef consists of living polyps of coral. Within the coral animals live single-celled photosynthetic plants — algae, which give corals their colour. These algae and corals live in a symbiotic partnership. The corals utilize food and oxygen produced by the algae and both partners benefit from the efficient internal cycling of nutrients between plant and animal.

An estimated 11 per cent of the world's coral reefs have been lost as a result of direct human pressures. These include fishing and coral mining, coastal development, waste dumping, vessel collisions, and inland deforestation and farming, which can cause runoff of harmful nutrients and sediments. Such activities now threaten nearly 60 per cent of all reefs. The booming demand for reef species for food and for aquariums has depopulated many coral ecosystems and high-value species are now missing from areas where they were once abundant.



When the corals are affected by the factors such as low or high temperatures, changes in light level or other unfavourable conditions, they lose colour due to the expulsion of the symbiotic algae. This phenomenon is referred to as "bleaching" (discoloration). The most severe and damaging bleaching occurred over the three-year period from 1986 to 1988. Recent research indicates that pollution, global warming, and ultraviolet radiation can be suggested as possible causes of this widespread bleaching incident. Bleached corals may regain their algae and return to health (normally a reef will take years to recover), or subsequent bleaching incidents may make it impossible. Without their symbiotic algae, corals are unable to live. If the adverse conditions, which created the bleaching last too long, the corals cannot accept the algae back and eventually die.

6.2. Split into two teams. List as many ecological problems, as you can. Choose one and debate on its origin and possible solutions.

## 7. Summarizing the Unit

Make a summary of the Unit and render its content in a 4—6 min talk.

# UNIT 17

## CLIMATE CHANGE

### 1. Reading and learning

Scan each text and formulate the main ideas. Make up 5 questions. Read the text again carefully and memorize it, then retell the text close to the original using the main ideas as a plan.

#### 1.1. WEATHER-RELATED DISASTERS

Climate change, sometimes called "global warming", is the most serious and most complex environmental issue ever to confront the international community. The Earth's climate is changing and extreme weather events — droughts, floods, and storms — are becoming more frequent. The climate has changed before, but gradually, long enough for most plants and animals to adjust through evolution or migration. Yet there is still much debate about the issues of the climate change and the threat it poses to the world.

Scientists believe that higher global temperatures will lead to a greater number of extreme weather events. In 2002, the summer monsoon hit eastern India, Nepal, and Bangladesh with rain and floods, while other parts of India suffered the worst drought in years, as an unprecedented heat wave caused the highest one-week death toll in the nation's history.

All over the world the year 2002 set numerous local and regional records for windstorms, rain intensities, floods, droughts, and temperatures. Economic losses from weather disasters worldwide increased. Weather disasters also took a significant human toll. Nearly 8,000 people died in storms, floods, droughts, heat waves, or extreme cold. Many who survived faced the threat of diseases, including cholera, dysentery, malaria, and yellow fever.

The most costly event of 2002 was the flooding of the Danube and Elbe Rivers in August, the worst since the millennium flood in 1342. In less than two days, Germany received as much rain as it normally gets in a year.

Southwest Asia suffered from temperatures as high as 50°C; more than 1,200 people died in India, the highest one-week death toll on record for heat waves there. In late July, torrential rains, mudslides, and floods killed nearly 300 Indians and affected more than 10 million. Yet at the same time, expected monsoon rains neglected much of the country, causing the first all-India drought in 15 years.

The frequency of severe weather events is clearly on the rise. Worldwide, the number of big weather catastrophes has quadrupled since the 1960s. Environmental disasters — including severe weather — are to blame for millions of environmental refugees all over the world.

These economic and human costs have multiplied over the years due to not only the surge in extreme weather events but also rising global population and increasing concentrations of people and wealth in vulnerable regions. Human activities such as clear-cutting of upstream slopes have increased the impacts as well. In many cases, efforts to prevent or lessen disaster, such as construction of dikes, dams, and avalanche barriers, have drawn people to coastal areas, riversides, and hillside locations, giving them a false sense of safety.

Scientists believe that rising global temperatures may increase the intensity and frequency of extreme weather events even more. Even slight temperature increases can shift low-pressure systems from their usual paths, causing sudden and significant increases in the frequency of heavy rainfall in a particular area. Small increases in event severity can lead to multiple increases in damage and costs — for example, a 10-percent increase in wind speed can increase damage by 150 per cent. Thus climate change is expected to aggravate the upward trends of economic and human costs.

While the burden of climate-related disasters falls most heavily on developing nations least able to adapt, the burden of responsibility lies

with the industrial nations that have contributed the bulk of carbon emissions through fossil fuel burning.

The United States is the single largest consumer of oil, coal, and natural gas and is accordingly the largest contributor to climate change, producing 24 per cent of the world's carbon emissions from fossil fuel burning.

Two powerful global forces — growing environmental degradation and high levels of poverty make poor people living in precarious conditions the most vulnerable to storms and floods. The situation is made worse by deforestation, soil erosion, and climate change.

## 1.2. SMALL ISLANDS THREATENED BY SEA LEVEL RISE

Sea level, like the weather, varies considerably from year to year for island nations. A combination of many factors, including wind, ocean currents, ocean temperature, and periodic oceanic oscillations like El Niño, bring about this annual variation.

Long-term trends make it clear that for most islands, as for the world in general, the sea is rising. In the 20th century, global sea level rose 10—20 cm, averaging 1—2 mm per year. The sea level rises from melting continental ice masses and from the expansion of the oceans due to climate change.

Over the next century, global sea level rise is expected to accelerate and reach a mid-estimate rise of 50 cm, or 5 mm per year — two to four times faster than during the 20th century.

In terms of vulnerability the small-island states are the most at risk. Accelerated sea level rise brings up the possibility that, an entire sovereign country could be lost due to environmental change. The height of low-lying atolls, like those in the Pacific and Indian Oceans, rarely exceeds 2 m, with maximum heights 3—4 m. New Zealand has drawn up a plan to accept immigrants from the tiny Pacific island country of Tuvalu, where residents fear losing their homes to future sea level rise. And the Indian Ocean nation of the Maldives — 65 per cent of which is less than 1 meter above sea level — has evacuated residents from four of the lowest lying islands to larger ones over the past few years.

The impact of sea level rise on the Marshall Islands, Tuvalu, and Kiribati can lead to their disappearance in the worst scenario; the impact on the Federated States of Micronesia, Nauru, and Tonga can result in major population displacement. Indeed, in 1999, Kiribati lost two uninhabited islets to the sea.

Sea-level-rise scenarios have been compiled for a few small-island states, with most focusing on the impact of a one-meter rise — the “worst-case scenario” for the next 100 years. Such a rise would inundate or erode the lands in Antigua, Mauritius, Tonga and Cuba.

While the long-term threat to these islands is inundation, the more immediate and pressing problems are those associated with storm

surges, flooding, coastal erosion, salt water intrusion into freshwater supplies, coral bleaching, and economic losses.

Storm patterns are heavily connected to local weather patterns, most notably El Niño, strongly affecting islands in the Caribbean and the Pacific. The warm episodes of El Niño, which affect rainfall and periods of drought for small-island states, have been more frequent, persistent and intense since the mid-1970s. Cyclones cause storm surges, which can reach up to 6 m in height. With elevated sea levels, these surges are predicted to be more destructive, and even more so if cyclone intensity increases due to climate change.

Accelerated coastal erosion has caused some beaches in Trinidad, where sea level has risen four to eight times faster than the global average, to retreat by as much as 2 m a year during the past 15 years. In Fiji, where sea level has risen at the average global rate, beaches have retreated by about 75 cm per year. Coral reefs, which provide sand and a buffer for the beach, suffer severe deterioration or death with ocean temperatures of about 1 degree Celsius higher than the summer maximum.

Tourism is one of the most important economic sectors for island states. For a number of these countries, such as Antigua and Barbuda, the Bahamas, Barbados, Cyprus, Grenada, Jamaica, the Maldives, Malta, Samoa, and the Seychelles, tourist revenue makes up more than 20 per cent of the GDP. In addition to the degradation of natural resources, equatorial islands worry that global warming will lead to milder winters in industrial countries in northern latitudes, decreasing the incentive to travel for a large number of tourists.

Another economic concern for islands is the reduction of their exclusive economic zones (EEZ), which provide sovereign development rights over 370 km (200 nautical miles) of ocean area surrounding the islands. These nations typically include tens to thousands of islets; for some mid-Pacific states, the EEZs are a thousand times larger than the land areas. Even if they are uninhabited, disappearing fringe atolls could lead to a reduction of the EEZ and, therefore, a reduction in fishing license revenues for the government.

## 1.3. ICE COVER MELTING WORLDWIDE

From the polar regions to high mountain glaciers, Earth's ice cover is melting at an astonishing rate. Global ice melt accelerated rapidly during the 1990s — the warmest decade on record. Scientists suspect that the enhanced melting is related to the unprecedented release of greenhouse gases by humans during the past century.

The Polar ice cap reflects sunlight energy back into space, rather than absorbing the heat. As it melts, the albedo is reduced and more heat is retained. The ice-covered polar regions are warming faster than the planet as a whole, and melting rapidly. The Arctic sea ice, covering an area



roughly the size of the United States, has lost an average of an area larger than the Netherlands each year since 1978. But the ice has thinned even faster than it has shrunk. In the last decades, the average thickness dropped from 3.1 meters to 1.8 meters, a decline of some 40 per cent.

The massive Antarctic ice cover, which averages 2.3 km in thickness and represents 91 per cent of Earth's ice, is also melting — although there is disagreement over how quickly. The scientists point to fast-moving ice streams within the Western Antarctic Ice Sheet that could speed ice melt, as evidence of potential instability. The sheet may break more abruptly if melting accelerates.

For now, most Antarctic melting has occurred on the continent's edges, on the ice shelves that form when the land-based ice sheets flow into the ocean and float. Within the past decade, three ice shelves crumbled. Two more are in full retreat and expected to break up soon. Icebergs also break off Antarctica, posing threats to open-water shipping.

Outside the poles, most ice melt has occurred in mountain and sub-polar glaciers, which respond much more rapidly to temperature changes. As a whole, the world's glaciers are now shrinking faster than they are growing according to the World Glacier Monitoring Service. Scientists predict that up to a quarter of global mountain glacier mass could disappear by 2050, and up to half by 2100 — leaving large patches only in Alaska, Patagonia, and the Himalayas. Within the next 35 years, the Himalayan glacial area alone is expected to shrink by one fifth.

The disappearance of Earth's ice cover would significantly alter the global climate — though the net effect remains unknown. Ice reflects large amounts of solar energy back into space and helps cool the planet. When ice melts, however, this exposes land and water surfaces that retain heat — leading to even more melt that accelerates the overall warming. But excessive ice melt in the Arctic could also cause cooling in parts of Europe and the eastern United States, as the influx of fresh water into the North Atlantic may disrupt the northward flow of the warming Gulf Stream.

As mountain glaciers shrink, large regions that rely on glacial runoff for water supply could experience severe shortages. For example, the Quelccaya Glacier, the traditional water source for Lima, Peru, is now retreating by some 30 meters a year posing a threat to the city's 10 million residents.

Rapid glacial melting can cause serious flood damage in heavily populated regions such as the Himalayas. The glacier-fed Indus and Ganges rivers are expected to initially swell and then fall to dangerously low levels, affecting the crops and drinking water of the estimated 500 million people who live along their tributaries in northern India. In Nepal, a glacial lake burst in 1985, sending a wall of water rushing 90 km down the mountains, drowning people and destroying houses.

Large-scale ice melt would also raise sea levels and flood coastal areas, currently home to half the world's people. Over the past century,

melting in ice caps and glaciers has contributed on average about a fifth of the estimated 10—25 centimeter global sea level rise. But ice melt's share in sea level rise is increasing, and will accelerate if the larger ice sheets crumble. Antarctica alone is home to 70 per cent of the planet's fresh water, and collapse of the West Antarctic Ice Sheet, an ice mass the size of Mexico, would raise sea levels by an estimated 6 meters — while melting of both Antarctic sheets would raise them nearly 70 meters. Loss of the Arctic sea ice or of the floating Antarctic ice shelves would have no effect on sea level because these already displace water.

Wildlife is already suffering as a result of global ice melt — particularly at the poles, where polar bears, penguins, seals, and other creatures depend on food found at the ice edge. Krill populations, which feed on algae that initially grow in the ice, are in danger of crashing. As krill are the basis of almost the entire Antarctic food web, seal, whale, and penguin populations could follow.

## 2. Lexical and grammatical exercises

2.1. Rearrange the letters in the anagrams to form equivalents for the Russian words.

|                        |                          |
|------------------------|--------------------------|
| принимать — ccaetp     | лавина — aaanlvceh       |
| возлагать вину — bmlae | наводнение — ooldf       |
| окружать — rrsuodun    | засуха — hdotrug         |
| муссон — ooomnns       | бедствие — iaedrsst      |
| житель — sidntree      | беженец — eeeufgr        |
| потери; жертвы — ltlo  | бремя — duenbr           |
| бедность — pteryov     | суровый — vrsee          |
| дамба, плотина — amd   | приблизительно — lyugroh |

2.2. Match the words in A with the words in B to form word combinations. Give Russian equivalents.

- A. greenhouse; torrential; precarious; avalanche; environmental; burden of; death; long-term  
B. responsibility; barrier; trend; rain; disaster; conditions; gases; toll

2.3. Complete the words using their definitions.

- r \_ sh: to flow somewhere very quickly  
m \_ lt \_ pl \_ : to increase by a large amount  
pr \_ d \_ ct: to say what you think will happen in the future  
\_ sl \_ t: a small island  
d \_ sr \_ pt: to interrupt the normal course of a process or activity  
fr \_ q \_ \_ nc \_ : the number of times that sth happens during a period of time

s \_ sp \_ ct: to believe that something is true, esp. something bad  
 \_ nh \_ nc \_ : to improve or add to the strength, worth, or other quality of sth  
 \_ v \_ d \_ nc \_ : facts or physical signs that help to prove something  
 p \_ tch: an area that is different from what surrounds it  
 \_ v \_ nt: sth that happens, esp. when it is unusual or important  
 s \_ rr \_ \_ nd \_ ng: near or all around a place  
 r \_ v \_ n \_ \_ : income from business activities or taxes

#### 2.4. Fill in the missing forms of the words.

| Noun      | Verb       | Noun      | Adjective    |
|-----------|------------|-----------|--------------|
| expansion |            |           | vulnerable   |
|           | lose       | frequency |              |
| fear      |            |           | safe         |
|           | impoverish | severity  |              |
| reduction |            | variation |              |
|           | die        |           | catastrophic |
| food      |            | excess    |              |

#### 2.5. Match the words close in meaning in A and B.

- A. enhance; retain; stop; adjust; bring about; face; crumble; neglect; astonish; flood; draw

B. keep; boost; confront; adapt; pass by; cause; pull; inundate; break up; prevent; surprise
- A. deterioration; tendency; issue; refuge; burden; resident; concern; fringe; surge; catastrophe

B. problem; load; worry; (sudden) increase; disaster; edge; shelter; inhabitant; trend; degradation

#### 2.6. Choose a word from the list below to fit the word combinations in each line. For example: *suffer* fits line 1.

*suffer; share; vary; cause; trend; rainfall; agreement; refuge; threat; record; confront; reflect*

- ~ a drought; ~ a loss; ~ from an illness; ~ the consequences
- a ~ to sth; to face a ~; to pose a ~; to be under ~
- a political ~; to seek ~; to find ~; to take ~ from a storm
- dis~; reach ~; come to an ~; work out an ~
- ~ an issue; ~ the crisis; ~ a problem; to be ~ed with
- set ~; hold ~; beat ~; on ~
- heavy ~; annual ~; average ~; to measure ~
- ~ a damage; ~ a drought; ~ a death toll; ~ trouble
- the ~ of birds; a higher ~; to ~ the planet; ~d border

- upward ~; current ~; general ~; long-term ~
- ~ from ... to; ~ in size; ~ considerably; tend to ~ widely
- ~ sunlight; to be ~ed in; ~ a change; ~ population growth

#### 2.7. Match the words in A with their opposites in B.

- suffer; remain; accelerate; particular; abrupt; frequent; revenue; poverty; lead; retain; reduce; drought; expose; destructive; severe; disrupt; resident; considerable
- rare; insignificant; enjoy; follow; change; gradual; slow; general; wealth; guest; loss; release; cover; boost; flood; harmless; mild; generate

#### 2.8. Choose the correct word.

- In Fiji beaches have retreated by about 75 cm (**in a / per**) year.
- Developing nations are least able to (**adopt / adapt**).
- Plants and animals adjust (**through / to**) evolution or migration.
- The climate change (**faces / poses**) the threat to the world.
- The impact can (**result / lead**) in major population displacement.
- The enhanced melting is related (**with / to**) the release of greenhouse gases.
- These nations include (**tens / ten**) to (**thousand / thousands**) of islets.
- 1,200 people is the highest one-week death toll (**in / on**) record there.
- The fast-moving ice stream is (**— / an**) evidence of potential instability.
- Severe weather is (**blaming / to blame**) for millions of refugees.
- The number of (**weather / whether**) catastrophes has quadrupled.

### 3. Translation into Russian

#### MELTING HIMALAYAN GLACIERS MAY DESTROY TOWNS

It's hardly news that the world's glaciers are melting — a phenomenon widely attributed to gradually rising global temperatures. In the next half a decade or so, the Himalayas could experience intense flooding as mountain lakes overflow with water from melting glaciers and snowfields. The lives of tens of thousands of people who live high in the mountains and in downstream communities could be at severe risk as the mud walls of the lakes collapse under the pressure of the extra water. Major loss of land and other property would aggravate poverty and hardship in the region.

The scientists assessed the conditions of glaciers and glacial lakes in Nepal and Bhutan. Their findings indicate that 44 glacial lakes in these land-locked countries have become potentially dangerous as a result of climate change.



The largest part of the Himalayas lies within India, although almost nothing is known about glacial lake outburst floods from India. Studies done by the Geological Survey of India have revealed that, on average, glaciers in India have been receding at the rate of about 15 m a year.

Glacial melting associated with the temperature warming has expanded the size of many lakes in the region. The UNEP study found, that from 1986 to 1996, the Raphstreng Tsho glacial lake in Bhutan swelled from 1.6 kilometers to 1.94 km in length, from 0.96 km to 1.13 km in width, and from 80 meters to 107 meters in depth.

Another lake deemed at critical risk of bursting is Tsho Rolpa in Nepal. Half a century ago the lake extended 0.23 sq. km. Today its expanse is 1.4 square kilometers. Efforts are now under way to reduce the lake's water level by 30 meters. At stake are 10,000 human lives, as well as livestock, land, bridges, and other infrastructure, located 108 kilometers downstream.

UNEP is planning to implement programs to mitigate the potential disaster. One project is to install warning systems to alert people in the region about impending glacial flooding. A communication network of sensors and sirens now links Tsho Rolpa in Nepal with villages at risk from floodwaters.

## 4. Complementary activities

Develop your skills: identifying cause and effect.

Identifying cause-and-effect relationships is very important for understanding. A *cause* is an event, person, or condition that makes something happen. An *effect* is the result or outcome of a cause. For example, the statements below show:

1) the cause-and-effect relationship between absolute location and climate in the Caribbean:

*Islands located between 10° and 27° N <=> Warm climate all year;*

2) the cause-and-effect relationship between resources and population that exists in the Caribbean region:

*Too many people and too few resources <=> Overpopulation.*

Remember that an effect may have several causes. And a cause may have several effects. You should be able to identify the main geographic cause or main geographic effect in a situation.

To identify cause-and-effect relationships, follow these guidelines:

**1. Look for the clues.** Writers often give clues that make it easy to uncover cause-and-effect relationships. Cause clues include *led to*, *brought about*, *produced*, *because*, and *the reason why*. Effect clues include *as a consequence*, *dependent on*, *give rise to*, and *outcome*.

Sometimes you will have to "read between the lines" to identify the cause-and-effect relationship.

**2. Check for complex connections.** Remember that there may be many causes or effects in a situation. After identifying the main ones, look for other links between happenings.

Climate is one of the most important geographic factors in the physical setting of the Caribbean Islands. In studying the region's climate, you will note several cause-and-effect relationships.

Study the excerpt below. Identify the cause and effect.

Because the northeast trade winds sweep the islands, rain falls mostly on the northeastern sides of the islands.

Your completed diagram should resemble the following one:

*Northeast trade winds <=> Rain falls mostly on northeastern sides of islands.*

In this case, the word *because* is the clue that the sentence contains a cause-and-effect relationship.

## 5. Writing

Render the following text in English.

### КЛИМАТИЧЕСКИЕ СДВИГИ

Сотрудники Гамбургского института метеорологии считают, что при сохранении нынешних темпов потепления в ближайшее десятилетие засухи в Германии станут продолжительнее на 10 — 20 дней, а на юге Европы ни капли дождя не будет выпадать в течение 50 дней подряд.

Повышение температуры приведет к катастрофическому наступлению пустынь, росту числа ураганов и наводнений, отступлению на север вечной мерзлоты, таянию ледников и значительному подъему уровня Мирового океана. По мнению экспертов, при повышении средней глобальной температуры воздуха на 4 °C тают почти все ледники. В результате многие страны останутся без пресной воды, поскольку в ледниках хранится около 70 % ее мировых запасов.

Геофизические спутники обнаружили, что площадь и толщина льдов в Арктике стремительно уменьшаются. Средняя толщина так называемого пакового льда в 1990 г. составляла 3 метра, но за 13 лет сократилась на 40 %. Если тенденция не изменится, то, по оценкам экспертов, через 100 лет в Арктике не останется льда, а

уровень Мирового океана повысится настолько, что существование десятков прибрежных государств будет под угрозой.

Первым делом вымрут такие виды животных, как полярный медведь и северный тюлень. Из-за бурного таяния арктических льдов огромная масса холодной воды «сдвинет» Гольфстрим, обогревающий Западную и Северную Европу. И тогда на фоне глобального потепления там значительно похолодает.

## 6. Speaking

### 6.1. Retell the following text in English.

#### MOUNTING MENACE

Glaciers are formed by hundreds of years of accumulating snow. It is this snow which has drawn hordes of tourists to Switzerland for winter skiing. With prestigious resorts such as Zermatt, St Moritz and Davos, the country boasts nearly 2,000 ski installations. But these are threatened by the big thaw, especially the ski centres at lower altitudes.

At St Moritz, the last decade has seen insufficient snow levels to sustain a skiing industry, which makes up more than 70 per cent of the regional tourist economy. Technical innovations such as artificial snow have helped make up the shortfall. Yet artificial snow production is so expensive that it isn't possible to construct an artificial winter.

As temperatures surge because of steadily rising global temperatures, mighty glaciers are melting at a rapid rate, with potentially catastrophic consequences for the communities lying below. More than half the ice in Alpine glaciers has melted since 1850, and 100 glaciers have already disappeared altogether. If current trends continue, Austria will have no glaciers left at all. And the consequences — both for people living in the mountain regions, and for those depending on the mighty European rivers that start there — are likely to be catastrophic.

In Switzerland, one of the most startling examples of glacial retreat is found near St Moritz. When the small railway station was built 150 years ago, the tongue of the glacier was only 200 metres away. Victorian tourists would stroll up to the edge of the ice in ten minutes. Now the glacial tongue is nearly 3 km away. It is nicknamed the "climate trail", because as you walk through the shimmering heat haze, signposts mark off the decades. Stand next to the sign saying "1960" and there are young pine trees already colonizing the new ground.

At the edge of the ice itself, the sheer speed of the meltdown is apparent. Water is flowing everywhere, and frequent rock falls tumble down from the moraines left high up the valley sides. In some places boulders the size of houses teeter on the brink of ice ridges, waiting for the ice to melt and pitch them onto the valley floor below.

In some places steep mountain slopes are held together by permafrost, which acts like an icy glue to prevent rock falls. But the slopes are beginning to thaw, causing landslides. Work is about to start on a giant 15-metre earth barrier above the town Pontresina near St Moritz to catch falling debris.

The summit cable car station at Pic Corvatsch is built on an outcrop of frozen rock, under which scientists have drilled boreholes to test the stability of the slope. They concluded that at  $-5^{\circ}\text{C}$  the station's rocky foundations are stable. But once the temperature rises to  $-2^{\circ}\text{C}$ , there will be an imminent risk of collapse.

Reports reconstructing Switzerland's climate record as far back as the Middle Ages show that although the country's temperature is now, on average,  $1.2^{\circ}\text{C}$  higher than before the Industrial Revolution, extremely warm climate events have happened before. The end of December 1758 was so warm that people went barefoot as if it were spring; in 1540 children were still playing in the Rhine at Christmas. What is definitely unprecedented, however, is the almost complete absence of winter snow in the Swiss lowlands since the 1980s.

The major problem with climate change is not so much the amplitude of warming — it's the speed of the change which is taking place. Most of the major changes in the past have taken place over several millennia, and we're talking about the same kinds of changes in climate over the next 50 or 100 years.

### 6.2. Find more material about one of the following selected examples of ice melt around the world and give a talk.

- Arctic Sea Ice has shrunk by 6 per cent since 1978, with a 14-percent loss of thicker, year-round ice, and has lost 40 per cent of its thickness in less than 30 years.
- Greenland Ice Sheet has thinned by more than a meter a year on its southern and eastern edges since 1993.
- Columbia Glacier (United States) has retreated nearly 13 km since 1982. In 1999, retreat rate increased from 25 m per day to 35 m per day.
- Wilkins Ice Shelf (Antarctica) lost nearly 1,100 sq. km in area in early March 1999. Ice front is back 35 kilometers from previous extent.
- Tasman Glacier (New Zealand) has thinned by more than 100 m in the past century. Overall, New Zealand glaciers shrank some 26 per cent between 1890 and 1998.
- Gangotri Glacier (India) — average rate of retreat is now 30 m a year, compared with 18 m a year between 1935 and 1990 and 7 m a year between 1842 and 1935.
- The Caucasus Glacier volume has declined 50 per cent in the past century.
- Tien Shan Mountains — 22 per cent of glacial ice volume has disappeared in the past 40 years.



- Mt. Kenya — largest glacier has lost 92 per cent of its total mass since the late 1800s. Some 40 per cent of this decline has occurred since the 1960s.

- The Alps — overall glacial extent has declined 30—40 per cent since 1850. Ice has lost 50 per cent of its mass in the past century.

- Glacier National Park (United States) — since 1850, the number of glaciers has dropped from 150 to fewer than 50. The remaining glaciers could disappear completely in 30 years.

- Upsala glacier (Argentina) has retreated 60 meters per year over the last 60 years, and rate is accelerating.

6.3. Talk about the causes and consequences of climate change.

## 7. Summarizing the Unit

Make a summary of the Unit and render its content in a 4—6 min talk.

# UNIT 18

## BIODIVERSITY AND HABITAT LOSS

### 1. Reading and learning

Scan each text and formulate the main ideas. Make up 5 questions. Read the text again carefully and memorize it, then retell the text close to the original using the main ideas as a plan.

#### 1.1. BIRDS IN DECLINE

Around the world, ornithologists are alarmed at bird population declines and are concerned about what they mean for the world's ecosystems and our own future. According to estimates about 12 per cent of the world's 9,800 bird species are threatened with extinction and in the near future more species may become threatened.

It is not just the loss of birds that worry scientists, but what their loss could mean for the ecosystems that depend on the many services birds provide: dispersing seeds, pollinating flowers, controlling insect and rodent populations, and eating dead animals. As a result of the bird declines plant species become extinct.

Of course, birds' colorful plumage, songs, and varied behaviors also capture people's attention. To many, the world would seem incomplete without ostriches, eagles, flamingos, parrots, and hummingbirds.

Many declining bird species serve as indicators of growing environmental problems. Aquatic songbirds called dippers, for example, disappear from stream waters acidified by pine plantations and acid rain. Dying North American crows, hawks, and owls mark the rapid spread of the West Nile virus that has been introduced to the region.

Numerous causes lie behind the decline of the world's birds, and in most cases no single threat is to blame, but rather a combination of factors. For nearly all threatened birds, the impact of humans is evident — scientists estimate that 99 per cent of threatened birds are at risk because of human activities such as agriculture, logging, hunting, and trapping.

Habitat loss and degradation is the leading danger. Most threatened species depend on one type of habitat, and many of them are forest-dependent. Yet forests are being lost around the world at a rapid rate — especially in tropical regions that are particularly rich in bird diversity. Grasslands, shrub-lands, savannas, and wetlands also provide important bird habitat. Unfortunately, these systems are being lost or degraded.

Many bird populations shrink after invasions by introduced, or exotic, species. Rats, cats, mongooses, and other exotic predators kill birds and their young; introduced birds compete with native species. Introduced insect pests destroy birds' forest habitats. Worldwide, exotic plants also alter local flora, denying birds their food supplies and habitat.

Hunting for food or collection for the pet trade is yet another threat to birds which are an important food source for subsistence communities. Birds are also trapped for the pet trade. The colorful and talkative parrots and cockatoos are particularly threatened by capture for the cage-bird trade. Unfortunately, the more rare and endangered a species becomes, the more valuable it is. Another form of wildlife exploitation — long-line fishing — unintentionally kills hundreds of thousands of seabirds, which are hooked on baited lines and then drowned.

Pollution threatens birds in the oceans, near industrial sites, and in the countryside. Large and small oil spills kill many birds, including penguins and gannets. In addition to increased tanker traffic, aging vessels make the business of transporting oil even more hazardous. On land, oil and natural gas exploration, extraction, and pipelines threaten some of the world's most bird-rich habitats in Peru, Ecuador, and elsewhere. Agricultural pesticides kill millions of birds, weaken others, and deplete birds' food supplies of insects and wild plants.

Skyscrapers, wind farm networks, communications towers, and power lines can kill millions of migrating birds, which collide with the structures.

To these threats due to human activities must now be added another one: climate change. Earlier bird breeding, migration arrivals, and some bird species' northward range expansions seem to indicate the early effects of this. Also, some long-distance migrants now return to nesting grounds too late to exploit increased peaks in insect food supplies. Climate change will likely alter many bird habitats causing the extinction of isolated species.

## 1.2. MAMMALS: A DARKER PICTURE

Mammals are substantially more threatened than birds. Out of almost 4,400 mammal species, about 11 per cent are critically endangered. Another 14 per cent remain vulnerable to extinction, including the Siberian musk deer, whose populations in Russia have fallen 70 per cent during this decade due to increased hunting to feed the booming trade in musk, used in perfumes and traditional Asian medicine. Some threatened species tend to have larger population sizes or be relatively widespread, but nonetheless face pressures.

Among major mammalian groups, primates (lemurs, monkeys, and apes) occupy the most unfortunate position, with nearly half of all primate species threatened with extinction. Rodents are the least threatened mammalian group, but also the most diverse.

The biggest cause of the loss of mammalian diversity is the same as that for birds — habitat loss and degradation. As humankind converts forests, grasslands, wetlands, and deserts for intensive agriculture, tree plantations, industrial development, and transportation networks, many mammals are forced to exist in fragmented, remnant habitat patches of their former habitats.

Habitat loss is a principal factor in the decline of at least three quarters of all mammal species. The major reason primates are endangered is their close relationship with tropical forests, a habitat threatened around the globe. In regions where forest degradation has been most intense, such as South and East Asia, Madagascar, and the Atlantic forest of eastern Brazil, on average 70 per cent of the endemic primate species face extinction.

The loss of habitat also affects marine mammals, though it usually proceeds as gradual decline in habitat quality rather than complete destruction of aquatic ecosystems. Marine mammals, particularly those that inhabit densely populated coastal areas, now face with polluted water and food, physical hazards from fishing gear, heavy competition from humans for the fish stocks on which they feed, and hazardous, noisy boat traffic.

Along the coastline of Western Europe, bottlenose dolphins and harbor porpoises that regularly use near-shore European waters seem to be steadily declining. Seal populations in the Baltic Sea carry very high chemical pollutant loads in their tissues that appear to decrease their reproductive success.

In addition to habitat loss, at least one in five threatened mammals faces direct overexploitation — excessive hunting for meat, hides, tusks, and medicinal products, and persecution as predators of and competitors with fish and livestock. Overexploitation tends to affect larger mammals disproportionately over smaller ones, and when strong market demand exists for a mammal's meat, hide, horns, tusks, or bones, species can decline on catastrophic scales.

Only the most remote or best-protected forests throughout Latin America have avoided significant loss of large mammals that face heavy hunting pressure from rural residents. Much of this hunting is for home subsistence — wild game meat is an important source of protein in the diets of rural residents, particularly for indigenous people. Yet the real problem occurs when hunting is done to supply markets rather than just for home consumption.

Throughout South and East Asia, a major factor fueling excessive wildlife exploitation is the demand for animal parts in traditional medicine. Tigers — the largest of all cats — once ranged from Turkey to Bali and the Russian Far East and have been the subject of organized conservation projects for more than two decades. At first these projects appeared to be having some success — until the mid 1980s brought a demand in East Asia for tiger parts as arousing and medicinal products. With the body parts of a single tiger potentially worth as much as \$5 million, illegal hunting skyrocketed. Wild tigers now total barely 3,000 — 5,000 individuals, many in small isolated populations.

The loss of a region's top predators or dominant herbivores is particularly damaging because it can trigger disruptions in the ecological relationship among species that maintain an ecosystem's diversity and function. Large mammals exert influence within their ecological communities by consuming and dispersing seeds, creating unique microhabitats, and regulating populations of prey species. In Ghana, Liberia, and Uganda, certain trees — including valuable timber species — have shown reduced regeneration after the decrease of elephant populations. Similarly, decades of excessive whaling reduced the number of whales that die natural deaths in the open oceans. This may have affected deep-sea communities that decompose the remains of dead whales after they have sunk to the ocean floor.

Taken together, the problems faced by mammals — habitat loss, over-hunting, invasive species — are not more intensive than those faced by birds. But birds cope better with the pressures placed on them by humankind. They are more mobile and wide-ranging; they may be able to find food and shelter more easily in the fragmented landscapes produced by human disturbance. Birds are also smaller on average than mammals, so they require smaller ranges and fewer resources for survival — advantages when habitat and food supply become restricted.

## 1.3. REPTILES AND AMPHIBIANS: THE HIDDEN FAUNA

In 1987, the Golden Toad failed to appear at its usual breeding sites in the Monteverde Cloud Forest Preserve in Costa Rica; it has not been seen since. The Golden Toad is the most celebrated example of an amphibian species apparently becoming extinct over the last 20 years, but it is only one of many.



The sudden declines among amphibians are not confined to Central America. Similar events are reported from South America and eastern Australia. In many instances, amphibians are disappearing from nature reserves, national parks and other areas set up to protect biodiversity.

The declining amphibian phenomenon casts serious doubt on the assumption, that animals can be protected by setting up reserves and suggests, that amphibians are subject to some adverse environmental process that affects them on a global scale.

Among reptiles, species are declining for reasons similar to those affecting birds and mammals. Habitat loss is again the leading factor. Much of this is due to the drainage and contamination of wetland habitats. In island regions, habitat degradation together with the introduction of exotic species has contributed to the decline of many unique reptiles. In Ecuador's famed Galapagos archipelago, the largest native herbivores are reptiles — long-isolated giant tortoises and land and marine iguanas found nowhere else in the world. Introduced goats are winning out over the native reptiles. In addition, the spread of road networks and road traffic leads to increased amphibian mortality.

In 1991 the Declining Amphibian Populations Task Force was set up. Its task is to find out which amphibians are declining and where, as well as to determine potential causes of their declines, such as chemical contaminants, climatic and atmospheric change, and disease.

It is apparent that many declines are explicable in terms of habitat change resulting from human activities such as deforestation, draining of wetlands, and changes in agricultural land use. In Europe, for example, most population declines are explicable in terms of loss of suitable habitat, both aquatic and terrestrial.

Most likely it is not a single factor but rather a combination of factors that best explains the declines. Frogs lack any kind of protection from the environment, such as a shell or a dry skin and the presence of industrial pollutants may stress and weaken frogs, making them more susceptible to infectious diseases.

Because of their great sensitivity to changes in both aquatic and terrestrial habitats, they may, like the coal miner's canary, be giving us early warning of the gradual but global decline of our planet's environmental health. The factors that have been shown to affect amphibians, threaten all forms of life, including humans.

The sea turtles have been studied since at least the 1960s, and all species are judged as endangered. Illegal poaching of turtles for meat and eggs remains a widespread problem. Where beaches are lit at night with artificial lights, as at tourist resorts, hatchling turtles become disoriented and crawl toward the land rather than the sea. Sea turtles get entangled in fishing nets.

Certain species of crocodilians still suffer from over-hunting (such as black caimans in the Amazon Basin) and from pollution (such as the Chinese alligator). Since 1971, seven alligator and crocodile species

have been taken off Red Data list, including Africa's Nile crocodile and Australia's huge estuarine crocodile. In part, these recoveries are due to the development of crocodile ranching operations, which harvest the animals for their meat and hides; when combined with effective wildlife protection efforts, this can take hunting pressure off wild populations. In Zimbabwe, crocodile ranches have been so successful that domestic crocodiles now outnumber the country's 50,000 wild crocs by three to one.

For amphibians, direct exploitation is less of a problem. With the exception of larger frogs favored for their tasty legs, few amphibians face any substantial hunting pressure.

## 2. Lexical and grammatical exercises

### 2.1. Rearrange the letters in the anagrams to form equivalents for the Russian words.

|                           |                                       |
|---------------------------|---------------------------------------|
| хищник — atpdorre         | предположение — onumpassti            |
| добыча — pyre             | преимущество — aaadvgent              |
| вид — pieccss             | вредитель, паразит — etsp             |
| грызун — odretn           | предостережение — rnnngwai            |
| дичь — mgea               | истощать; исчерпывать — tpldeee       |
| ткань (анат.) — ssutie    | отказывать (в чем-л., кому-л.) — ndey |
| кислота — adci            | аборигенный, местный — iigennosdu     |
| опылять — pllinateoe      | (человекообразная) обезьяна — pae     |
| запутывать — enngleta     | сомнение — ubotd                      |
| браконьерствовать — pacoh | древесина — mtbeir                    |

### 2.2. Match the words in A with the words in B to form word combinations. Give Russian equivalents.

- A. endangered; illegal; habitat; subsistence; oil; fishing; agricultural; acid  
 B. gear; loss; community; rain; poaching; pesticide; spill; species

### 2.3. Fill in the letters to complete the words.

- wa \_ n: to make someone conscious of a possible problem or danger  
 e \_ tin \_ t: having no members of the species or family in existence  
 pe \_ ti \_ ide: a chemical used for killing insects, esp. those that damage crops  
 tr \_ gg \_ r: to make something happen  
 \_ om \_ ete: to try to win  
 e \_ da \_ ge \_ : to expose somebody or something to danger  
 su \_ cep \_ i \_ le: easily influenced or affected by something  
 \_ olli \_ e: crash into something

s \_ i \_ l: an amount of liquid that has accidentally fallen out of its container

\_ u \_ al: relating to the countryside

ca \_ tu \_ e: to catch and then lock up a person or an animal

d \_ o \_ n: to sink under water and die

\_ ar \_ es \_ : to collect plants, animals, or other things that can be eaten or used

\_ ie \_ e \_ ind: to be the real reason for a decision or action

c \_ p \_ (wi \_ h): to deal successfully with a difficult situation

#### 2.4. Fill in the missing forms of the words.

| Noun     | Adjective   | Verb    | Adjective   |
|----------|-------------|---------|-------------|
| hazard   |             | acidify |             |
|          | extinct     |         | explicable  |
| loss     |             | succeed |             |
|          | invasive    |         | intentional |
| evidence |             | value   |             |
|          | competitive | exclude |             |

#### 2.5. Match the words close in meaning in A and B.

- 1) A. restrict; disperse; maintain; introduce; avoid; assume; deplete; cast; capture  
B. keep; escape; impoverish; trap; limit; throw; bring in; spread (out); suggest
- 2) A. vessel; subsistence; contamination; intention; hazard; patch; alarm; hide  
B. plan; pollution; skin; warning; piece; maintenance; danger; craft
- 3) A. extinct; catastrophic; indigenous; adverse; evident; exclusive; invasive; former  
B. disastrous; unfavorable; previous; native; apparent; aggressive; dead; restricted

#### 2.6. Choose a word from the list below to fit the word combinations in each line.

For example: *term* fits line 1.

*term; estimate; introduce; doubt; avoid; regular; cope; warn; concern; set; alter; indicator; depend*

1. to define a ~; the ~ implies; long-- trend; in ~s of sth
2. an important ~; economic ~; an ~ of success; an ~ of a problem
3. a ~ of standards; to ~ up a fund; to ~ a record; to ~ the stage for
4. economic ~; major ~; growing ~; to be ~ed about
5. to cast ~ on sth; there is no ~; to have little ~; to be in ~ about sth

6. to give a ~ing; storm ~ing; to ~ of danger; to ~ against a fault
7. ~ remarkably well; ~ better; ~ with stress; ~ with a problem
8. ~ a term; ~ a bill; ~ a virus; an ~d species
9. accurate ~; rough ~; reliable ~; the cost was ~ed at
10. ~ on conditions; ~ entirely on; forest--ent; inter~ent
11. to manage to ~; ~ loss; ~ mistakes; ~ misunderstanding
12. at ~ intervals; a ~ customer; to use ~ly; ir~ verbs
13. ~ climate; ~ flora; major ~ations; to make ~ations

#### 2.7. Match the words in A with their opposites in B.

- A. hazardous; crawl; endanger; evident; indigenous; unintentionally; entangle; former; predator
- B. on purpose; current; introduced; preserve; safe; prey; doubtful; rush; release

#### 2.8. Choose the correct word.

1. Another 14 per cent remain vulnerable (**for / to**) extinction.
2. Birds are (**at / in**) risk because of human activities.
3. In the (**nearest / near**) future more species may become threatened.
4. Tropical regions are particularly rich (**of / in**) bird diversity.
5. Ornithologists are alarmed (**at / for**) bird population declines.
6. Introduced birds compete (**for / with**) native species.
7. The remains of dead whales (**drown / sink**) to the ocean floor.
8. The species is declining for reasons similar (**with / to**) those affecting mammals.
9. Frogs give us warning (**of / against**) the decline of our planet's health.
10. The body parts of a single tiger (**— / are**) potentially worth \$5 million.
11. Hunting (**— / for**) food is yet another threat to birds.
12. Sea turtles (**get / have**) entangled in fishing nets.

### 3. Translation into Russian

#### WETLANDS DECLINE

From coastal swamps to inland floodplains, Earth has lost over half its wetlands in the last 100 years. Much of the disappearance and degradation during the first half of the 20th century occurred in the northern hemisphere, but pressure on wetlands in the South has increased since the 1950s, and these fragile ecosystems continue to lose ground throughout the world.

Wetlands are areas where inundation or saturation with water is frequent but does not exceed 6 m depth at low tide. Natural freshwater wetlands, including marshes, bogs, swamps, and peatlands, occupy the most area,



followed by rice paddies and saltwater wetland areas that include mangroves and coral reefs. Left intact, wetlands regulate water flow, recharge groundwater supplies, and provide flood control. In addition to hosting diverse biological communities, they retain essential sediments and nutrients while effectively buffering ecosystems against contamination by removing toxins from effluents and reducing the concentration of excess nitrogen and phosphorus from crop field drainage.

A principal cause of wetland loss is the draining or filling for human settlements and agriculture. In Europe, conversion to agriculture alone has reduced wetlands by some 60 per cent. In Asia, where some 85 per cent of the wetlands of international importance are threatened, rice cultivation has claimed 40 million hectares in the central plains of India and significant portions of natural wetland areas in Thailand, Viet Nam, and China.

In the United States, wetlands have been lost due to urban and rural development, agriculture, and forest plantations. In Oceania, where most people live in the coastal zone, the coastal lake areas and the biologically rich coral reefs and mangroves have been seriously degraded by altered hydrological regimes, land reclamation, and pollution.

Competition is high for the use of Africa's wetlands. These areas, some of the world's most productive ecosystems, are often the exclusive source of natural resources on which growing economies depend. In the Inner Delta of the Niger River, over a half-million people with 1 million sheep and 1 million goats depend on floodplains as dry-season grazing land. Unfortunately, population growth, excessive exploitation, and misguided development projects threaten wetlands throughout the continent.

In Central America, where wetlands have been highly modified, deforestation of coastal hills and mountains causes increased runoff during storms, depositing heavy sediment loads into low-lying wetlands. A number of water diversion and dam projects endanger wetland ecosystems worldwide. In South America, the proposed Hidrovía waterway on the Paraná River threatens to destroy the world's largest continuous wetland, the Patanal, which covers western Brazil and parts of Bolivia and Paraguay.

The impact of human change on wetland functioning is not confined to the site of damage. Wetland draining and filling or the diversion and damming of rivers can alter the frequency of water flow, thereby harming downstream wetlands, deltas, and coastal ecosystems. Additionally, draining can cause water tables to fall and increase the potential for the salinization of soils. Such disruptions of hydrological regimes are predicted to increase the severity of water shortages in at least 60 countries and to elevate the incidence of flood-related disasters within 50 years.

The draining of the wetland areas in South Africa for agriculture, coupled with increased runoff from overgrazed grasslands in the upper watersheds of the Limpopo River, causes extreme flooding in Mozambique, killing and displacing people.

Attempts have been made in various nations to restore or recreate degraded wetlands, yet the complexity of their functioning makes restoration difficult.

## 4. Complementary activities

### Develop your skills: identifying topic sentence.

As the name suggests, a topic sentence states the topic, or main idea, of a paragraph. Usually the first sentence in a paragraph is the topic sentence. In some cases, however, the first sentence of a paragraph does not state the main idea, and the second or third sentence may be the topic sentence. The other sentences in a paragraph supply details that support the main idea. They are called supporting sentences.

Some topic sentences try to cover more than can be developed in one paragraph. They try to tell everything in one sentence. A good topic sentence states a subject or idea that can be properly developed in one paragraph.

In the passage below, the paragraphs have been run together purposely. Read the passage and decide where you would divide it to make three paragraphs.

### THE VOLGA

The Volga River rises in the Valdai Hills, to the northwest of Moscow, and after a course of 3,700 km it enters the land-locked Caspian Sea. It is a wide, slow-flowing river, and from the earliest times it has been used for navigation. A thousand years ago it carried the trade between the peoples around the Baltic Sea and China and India. Small boats were carried downstream by wind and current, and on the return voyage they were rowed. Today things have greatly changed. A series of dams have been built, and the great river has been transformed into a succession of lakes that drop like gigantic steps from the Valdai Hills to the Caspian. No longer does one hear the melancholy song of the rowers; it is the shrill whistle of a ship's siren and the beat of stern paddle and screw. The Volga is busier than ever before. It carries much of the internal trade of Russia: coal and oil, lumber, and cement and building materials. It is also joined by canals with other rivers. But some of the problems that confront the modern riverboats and their tows are the same as those faced on the Volga in the past. During the long Russian winter, the river is frozen, and shipping comes to a halt. In the spring the snows melt, and the current is swift. Still the Volga continues its long tradition of serving as an important trade route.

To practice the skill write the title of the passage on a sheet of paper. Then write the topic sentence of each paragraph. Does each of the sentences you chose

state the main idea of the paragraph? Copy the entire passage as three separate paragraphs on your paper. After you have copied the passage in paragraphs, answer the following questions.

1. What are some of the details given in the supporting sentences of the first paragraph? Write two words from the first paragraph that describe the Volga River.
2. What does the second paragraph describe?
3. How many supporting sentences are there in the third paragraph? What kinds of details do they give?

## 5. Writing

Render the following text in English.

### ЛЯГУШКА-ГОЛИАФ ПОД УГРОЗОЙ ВЫМИРАНИЯ

Лягушка-голиаф живет по берегам рек в тропических лесах Камеруна и Экваториальной Гвинеи. Но эти леса быстро исчезают, угрожая существованию самой большой лягушки на Земле. Из-за своего размера голиафы около десяти лет назад стали объектом внимания частных коллекционеров и зоопарков. Их ловили и выставляли на «соревнования» по прыжкам, а также пытались разводить в неволе.

В наши дни лесозаготовки уничтожают места обитания голиафов. Около половины их естественной среды обитания потеряно или находится в серьезной опасности. Агрохимикаты, используемые для браконьерской добычи рыбы, отравляют реки. Для голиафа — животного, зависящего от состояния рек и откладывающего икру в водоемах, — это экологическая катастрофа.

Вслед за лесозаготовками глубже в чащу леса продвигаются охотники и отлавливают лягушек для продажи на местных продуктовых рынках. Эти животные ассоциируются с чистой водой, их считают «чистыми тварями» и хорошей пищей для беременных женщин.

Всемирный фонд дикой природы вместе с министерством природы и заповедников Камеруна пытаются сохранить ареал голиафов, сокращающийся каждый год более чем на 80 тыс га. Уже созданы три заказника, на очереди — проект экологического контроля над бассейнами ряда рек. Если природоохранное законодательство будет претворено в жизнь, это сможет изменить ситуацию. А пока основной угрозой для популяции лягушек являются коммерческие лесозаготовки, а их не так-то легко ограничить.

## 6. Speaking

6.1. Retell the following text in English.

### BIO-INVASION

Bio-invasion is the influx of alien invasive species. Alien species are considered invasive when they become established in natural habitats, are agents of change, and threaten native biological diversity. Alien invasive species include bacteria, viruses, fungi, insects, molluscs, plants, fish, mammals and birds.

Species that become invasive can be introduced either intentionally or unintentionally through pathways. These include transportation (by water, land and air; in the goods themselves, packing materials or containers, in or on ships, planes, trains, trucks or cars); agriculture; horticulture; aquaculture industry; ornamental pond, water garden and the aquarium pet trade.

Where there are no natural predators, they can come to dominate ecosystems, and can alter the composition and structure of food webs, nutrient cycles, fire cycles, threatening agricultural productivity and other industries dependent on living resources.

As an example, purple loosestrife, which was introduced from Europe in the mid-1800s as a garden ornamental, has been spreading in North America, invading wetland habitats where it dominates native plants and deprives waterfowl and other species of food sources. When such non-indigenous aquatic weeds replace native species, they establish dense colonies that can impair navigation, water-based recreation and flood control; degrade water quality and wildlife habitat; accelerate the filling of lakes and reservoirs.

New Zealand has the Earth's richest and most threatened reservoirs of plant and animal life. According to evolutionary biologists, there are two reasons why New Zealand became a display of peculiarity. It is the largest oceanic archipelago on the planet and the most distant from any major landmass. Isolation made New Zealand a laboratory where life experimented with what was possible.

There are gigantic snails, caving spiders, and flightless flies. Among the more than 150 species of native earthworms is one which is luminous. Then there are primitive earless frogs that lack webbing between their toes and can't croak and the legendary 20-kilo moa.

The only newcomers were those that could fly or float their way across the oceanic barrier. Other than bats, no mammals succeeded in doing that. Over the centuries many of these new arrivals, encountering no mammalian predators to hunt them, went to ground. By the time humans arrived, a third of New Zealand's birds were flightless. Many species — vertebrate and invertebrate — became giants of their kind.



Bigger is better for many reasons, e.g., large herbivores process food more efficiently than small ones.

It was too good to last. Humans brought predators — rats, dogs, cats, ferrets as well as spears and fire. The impact was immediate and catastrophic. The moas were gone. “Lost as the moa is lost”, says a Maori lament. Several other flightless birds joined moas on the extinction list.

**6.2. Find material about other examples of introduction of alien species and give a talk.**

## **7. Summarizing the Unit**

**Make a summary of the Unit and render its content in a 4—6 min talk.**

# **UNIT 19 ECOTOURISM**

## **1. Reading and learning**

**Scan each text and formulate the main ideas. Make up 5 questions. Read the text again carefully and memorize it, then retell the text close to the original using the main ideas as a plan.**

### **1.1. ENVIRONMENTAL IMPACTS OF TOURISM**

As soaring air travel brings many of Earth’s most ecologically fragile destinations within easy reach, concern about tourism’s environmental impacts is rising. Travelers from industrial countries often try to replicate their own high consumption lifestyles, increasing the pressures on ecosystems and resources. Yet few developing-country governments have the capacity to protect their attractions.

Tourism’s environmental impacts can begin even before arrival. Increasingly, the passenger jet is overtaking the automobile as the primary means of tourist transport: an estimated 43 per cent of international tourists now fly to their destinations. Air travel has been particularly important in the developing world, where in some countries at least 90 per cent of tourists arrive by plane.

Unfortunately, air transport is one of the world’s fastest growing sources of emissions of carbon dioxide and other greenhouse gases, responsible for global climate change. Tourists currently account for

about 57 per cent of all international air passengers. But they may be responsible for a much higher share of jet fuel use because they tend to travel longer distances.

Once tourists arrive at their destinations, their choices of where to sleep, eat, shop, and be entertained come at the expense of the environment. Natural and rural landscapes are rapidly being converted to roads, airports, hotels, gift shops, parking lots, and other facilities, leading to deterioration of the scenery, wildlife habitats, and other sites. The number of hotel rooms worldwide has increased and the trend is toward larger hotels, particularly in the newer destinations. At the world-famous Victoria Falls, shared by Zambia and Zimbabwe, a new multimillion-dollar hotel was recently built only a few meters from the water. The Zambezi River there is already polluted with detergents, uncollected garbage, and human waste.

At coastal destinations in the Caribbean and elsewhere, construction methods have destroyed dunes and wetlands. In Cancun, Mexico, large expanses of mangrove forests, salt marshes, and other wetland areas that harbor wildlife and protect reefs have been cleared and filled to make room for resorts and piers. These areas are often shored up with topsoil scraped from inland wetland savanna areas, resulting in the disruption of two valuable ecosystems.

The world’s hotels use massive quantities of resources, including energy for heating and cooling rooms, and cooking meals, as well as water for washing laundry, filling swimming pools, and watering golf courses. This resource use damages the environment. Tourist facilities are contributing to the drying up of Israel’s famed Dead Sea: in the last 50 years, water levels have dropped by an estimated 40 meters, leaving barren, salty mudflats that are hostile to native plants and birds. Environmentalists predict that the Dead Sea could disappear completely by 2050.

At destinations where fresh water is scarce, over-consumption by tourists and tourism facilities can divert supplies from local residents or farmers. In the Philippines, the diversion of water to tourist lodges threatens to destroy paddy irrigation at the 3,000-year-old rice terraces, an important cultural heritage site.

In addition, tourism creates large quantities of waste. Hotels, swimming pools, golf courses, and other facilities also generate a wide variety of harmful residues. Improperly disposed of, this waste can damage nearby ecosystems, contaminating water sources and harming wildlife.

Many tourist facilities in the developing world possess limited or no sewage treatment facilities, in part because of weak environmental legislation or a lack of money, monitoring equipment, and trained staff. Hotels release their sewage without adequate treatment in coastal waters, on beaches, and around coral reefs and mangroves. Cruise ships also generate enormous amounts of sewage and garbage.

These problems will likely worsen as shipbuilders rush to meet the rising demand for cruise vacations. Many newer ships resemble "floating cities," boasting up to 1,000 crew members. To accommodate these larger vessels, countries often dredge deep-water harbors or modify their coastlines, destroying coastal ecosystems. When ships dock, their massive anchors and chains can break coral heads and devastate underwater habitats. In the Cayman Islands, more than 120 hectares of reefs have been lost as a result of cruise ships anchoring in George Town harbor.

Busloads of cruise passengers, day-trippers, and other visitors are overwhelming fragile cultural and natural sites that are ill-equipped to manage rising tourist numbers. Visits to Cambodia's Angkor temples have increased following the government's decision to open the nearby town to international flights — intensifying pressures on the already fragile stone structures.

The presence of tourists in natural areas can affect wildlife behavior and populations. Around the world, whale-watching boats relentlessly pursue whales and dolphins and even encourage petting, influencing the animals' feeding and social activity. Similarly, tourist vehicles that approach cheetahs, lions, and other animals in Africa's safari parks can distract these creatures from breeding or stalking their prey. Safari tourists are also the market for illegal elephant ivory.

At particularly fragile destinations, such as small islands, it can take relatively few visitors to leave a mark. Tourists can unintentionally trample vegetation or disturb nesting seabirds, breeding seals, or other animals, and they can bring invasive plants and animals in with their equipment or luggage. The introduction of these "exotic" species threatens to destroy the unique flora and fauna of Ecuador's Galapagos Islands.

In mountain areas, resorts and related infrastructure can disrupt animal migration, create waste that is difficult to dispose of at high altitudes, and deforest hillsides, triggering landslides. In Nepal virgin rhododendron forests are being cut down for firewood to support the booming trekking industry, causing the erosion of soil. In Tanzania, the number of trekkers on the trails of Mount Kilimanjaro has risen so dramatically that the government had to double the daily climbing fee to \$100 per person to slow serious erosion and other environmental harm.

In coastal areas, popular recreational activities such as scuba diving and snorkeling are damaging coral reefs and other marine resources. With their fins and hands, divers and snorkelers break coral colonies at popular Red Sea reefs off Egypt and Israel. Heavy diving at many sites has changed the composition of reefs. Souvenir shops and restaurants also contribute to the destruction, looting reefs for shells, coral, and seafood.

The environmental damage caused by tourism can ultimately hurt the industry by destroying the very reefs, beaches, forests, and other attractions that attract visitors. Already, global warming caused in part by

rising aircraft emissions is raising sea levels and damaging coral reefs worldwide, threatening low-lying tropical countries like the Maldives. Germany's Black Forest and Italy's Adriatic coast lose visitors due to environmental deterioration. Cairo's urban sprawl and pollution in Bangkok and Beijing alienate visitors.

Tourists must be made aware that just as they take souvenirs home with them, so they leave souvenirs behind. Every trip leaves a trace.

## 1.2. ECOTOURISM — FRIEND OR FOE?

The International Ecotourism Society defines ecotourism as "responsible travel to natural areas that conserves the environment and sustains the well-being of local people." The United Nations has demonstrated its support for the concept by declaring 2002 the International Year of Ecotourism.

Many governments, industry groups, and others are promoting "ecotourism" — responsible travel that generates money and jobs while also protecting local environments and cultures. Ecotourism can suffer from the same environmental pitfalls as conventional tourism, including using resources irresponsibly, creating waste, and endangering ecosystems.

In some cases, it is little more than a "green" marketing tool for enterprises hoping to promote an environmentally conscious image. Growing numbers of hotels and tour operators now label themselves as ecotourism organizations, whether they are environmentally responsible or not. One operator in Cusco, Peru, estimates that less than 10 per cent of the local trekking companies really fit the "eco" bill. And many tourists now call any travel that occurs in natural settings ecotourism.

Ecotourism is one of the fastest growing segments of the tourism industry. Tourists travel to enjoy nature and to observe wildlife, such as birds and whales. Popular activities include safaris in Africa, trekking in the Himalayas, hiking in the rainforests of Central and South America, and scuba diving and snorkeling in Southeast Asia and the Caribbean. WTO (World Tourism Organization) predicts that the most popular destinations of the future will be the tops of the highest mountains, the depths of the oceans, and the Earth's poles.

Rising interest in ecotourism has had positive benefits. Governments are setting aside valuable natural areas as national parks or protected areas, sparing them from more environmentally destructive activities like agriculture, logging, or mining. The greatest increase in ecotourism has occurred in places with the highest numbers of protected areas, an important factor in choosing a destination.

Some eco-resorts carefully monitor visitor impacts as well as their own ecological footprints. The most lodges are fueled by propane, solar, or wind energy rather than electricity or firewood, have no indoor



bathrooms, generate minimal waste, use aerial bridges instead of roads or walkways, and ask guests to reuse sheets and towels.

Many early ecotourists were motivated by a keen environmental interest and awareness; they took local transport, stayed in locally run accommodations, and ate locally. But today's ecotourists are less intellectually curious, socially responsible, environmentally concerned than in the past. They demand higher-end facilities, consume more resources, and produce mounting levels of waste. And because their trips are often only a week or even a day long, they do not always feel the need to follow rules.

There are efforts to promote a more "genuine" form of ecotourism that requires fewer resources, generates less waste and pollution, and brings benefits to both local communities and the environment. Initiatives that are managed by local communities can range from low-impact efforts like offering an extra room or meal, renting out a small cabana, or showing traditional dances, to larger-scale investments like ecolodges or canopy walkways.

A high level of participation is desirable because it can reduce revenue leakage and heighten local appreciation for wildlife and other natural resources. One Ugandan farmer, talking about the recent boost in gorilla-related tourism at the nearby Budongo Forest Reserve, remarked of the benefits, "We never thought these monkeys could become a source of money... now they pay for our schools." When local communities see direct benefits from tourism, they are more likely to slow resource use and to actively protect natural areas. Local people recognize they can earn more from offering wildlife viewing, sustainable safari hunting on their land than from resource intensive cattle ranching. Many former poachers, hunters, and fishers now guide tourists through jungles or reefs.

When tourism initiatives exclude local people from participating in the management and use of natural areas where they grow food, raise livestock, and gather fuel, they are more likely to resent these efforts. Areas that exclude local participation have seen increase of poaching, vandalism, and even armed conflict. One Galapagos fisher said of government efforts to limit local use of the park's resources: "If the government does not lift the fishing ban we will burn all the natural areas to finish this tourism craziness."

With support from the World Wide Fund for Nature Nepal launched a successful ecotourism project which has trained local residents in such skills as food preparation, safety and security for trekkers, and carpet weaving, allowing them to integrate tourism with their own farming activities and handicrafts. Setting up micro hydroelectricity plants on streams, installing solar water heaters in the lodges, and organizing latrines and garbage pits has helped conserve forests and other resources. Yet ecotourism should be viewed as just one possible solution in a range of strategies for more sustainable tourism development.

### 1.3. TOWARD A SUSTAINABLE TOURISM INDUSTRY

According to the WTO, sustainable tourism should lead to the "management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support systems."

Perhaps more than any other industry, tourism depends on a clean environment. Helping to make destinations more attractive and supporting more environmentally sensitive practices can boost the profits of tourism businesses.

Many of the world's larger tourism companies, from hotels to tour operators, are taking formal steps to restructure their operations along environmental lines — including reducing consumption of water, energy, and other resources and improving the disposal of waste. Changes in the hotel industry can be particularly fruitful, not only because these facilities consume large quantities of resources but also because they can have enormous influence over the broader habits and practices of their guests, employees, and suppliers. A simple step such as outfitting rooms with cards that encourage guests to reuse linens and towels when they are staying more than one night can conserve on average 114 liters of water per room each day.

The cruise industry, too, is making an effort to integrate environmental practices into its activities such as recycling plastic ware and using recyclable and reusable containers, outfitting newer vessels with on-board water treatment plants. The International Council of Cruise Lines, adopted new rules for the disposal of wastewater, used batteries, and photo processing and dry cleaning chemicals.

Antarctica's main tour operators now belong to the International Association of Antarctic Tour Operators that enforces a strict code of conduct for tour operators and their clients. But despite regulations that include landing no more than 100 people per site at a time and making sure visitors do not disturb wildlife, tourists still pick up penguins, approach seals, and drive birds from their nests. Tour operators came up with a voluntary 5-metre limit of approaching penguins in groups of no more than 15 people.

Governments can help redirect tourism by developing policies and regulations. In Denmark, Egypt, France, and Spain, laws forbid developers from building within a defined distance from the coast in order to prevent beach erosion.

Elsewhere, governments are mitigating tourism's impacts by restricting the actual number of visitors allowed at a natural area or cultural site. The Peruvian government recently decreed that up to 500 people a day can hike to Machu Picchu (down from as many as 1,000). In addition the fee more than tripled and tourists were required to trek with a registered company. On a larger scale, the Himalayan kingdom of

Bhutan practices an official policy of "high-value, low-volume" tourism and accepted only 7,500 visitors in 2000, at a cost of \$250 each per day.

Sustainable tourism means traveling with an awareness of our larger impact on Earth. This is something that everyone will need to remember — from governments promoting tourism, to tourism businesses and tourists themselves. Together, these groups will need to balance the ultimate goal of satisfying tourist demand with key environmental and social objectives, such as reducing resource consumption, eliminating poverty, and preserving cultural and biological diversity.

## 2. Lexical and grammatical exercises

2.1. Rearrange the letters in the anagrams to form equivalents for the Russian words.

хрупкий — **fglirae**  
строгий — **iscctr**  
городской — **bnura**  
надлежащий — **opprre**  
курорт — **orrets**  
стирка — **ldrauny**  
якорь — **anorch**  
ремесло — **hcranditaf**  
гавань; порт — **hboarr**  
цель — **ivobtejec**  
средство — **anmes**

наследие — **hitaeegr**  
транспортное средство — **hlicvee**  
моющее средство — **deeerntt**  
сточные воды — **sgeewa**  
развлечение, отдых — **rreecatnio**  
расползание (города) — **srlawp**  
оснащать; оборудовать — **quiep**  
позволять — **owall**  
ликвидировать — **teeimnal**  
преследовать — **puuers**  
признавать — **cozreegni**

2.2. Match the words in A with the words in B to form word combinations. Give Russian equivalents.

- 1) A. urban; cattle; rural; popular; monitoring; swimming; cultural; trained; adequate; ultimate  
B. staff; heritage; goal; equipment; destination; sprawl; ranching; treatment; landscape; pool
- 2) A. consumption; golf; tourist; sewage; jet; paddy; crew; elephant; canopy; resource  
B. member; fuel; lifestyle; ivory; walkway; course; irrigation; treatment; attraction; consumption

2.3. Add vowels to form the words which fit the definitions.

**pchr:** someone who illegally catches or kills animals, birds, or fish  
**dsps:** to throw away or get rid of something  
**pvrt:** the state of not having enough money to pay for basic needs  
**ccmmdt:** to provide enough space for something or someone

**pprch:** to move closer to someone or something  
**hkng:** the activity of walking for long distances in the countryside  
**lnch:** to begin a carefully planned activity  
**bst:** to possess with pride  
**prmt:** to help something to develop  
**bst:** to increase, raise, improve  
**spr:** to keep from using, spending  
**dtrrt:** to become worse  
**frbd:** to state that sth is not allowed, according to a rule, law, or custom  
**cent fr:** to be the cause or origin of

2.4. Fill in the missing forms of the words.

| Noun      | Verb    | Noun     | Verb    |
|-----------|---------|----------|---------|
| diversion |         |          | consume |
|           | dispose |          | expand  |
| force     |         | tendency |         |
|           | disturb |          | solve   |
| choice    |         | arrival  |         |
|           | harm    | lack     |         |

2.5. Match the words close in meaning in A and B.

- 1) A. replicate; outfit; devastate; soar; resemble; pursue; divert; recognize; estimate; trigger; dredge  
B. fly; destroy; follow; cause; equip; become aware; copy; calculate; dig; redirect; be similar
- 2) A. capacity; impact; means; leakage; room (for); jet; objective; residue; trail; benefit; fee; pitfall  
B. ability; aircraft; influence; loss; space; remainder; path; way; price; trap; purpose; advantage
- 3) A. hostile; proper; conscious; nearby; fragile; ultimate; recreational; primary  
B. main; surrounding; entertaining; final; aware; breakable; adverse; adequate

2.6. Choose a word from the list below to fit the word combinations in each line. For example: *ban* fits line 1.

*ban; sustain; meet; destination; boost; consume; fee; launch; encourage; aware; primary; essential*

1. to ~ sth; a ~ on fishing; to lift a ~; to be ~ned
2. keenly ~; ~ of existence; public ~ness; to make smb ~
3. ~ nutrients; ~ processes; ~ feature; to be ~ly the same



- |                  |                     |               |                        |
|------------------|---------------------|---------------|------------------------|
| 4. ~ producers;  | a ~ objective;      | of ~ concern; | a ~ means of transport |
| 5. the daily ~;  | to charge a ~;      | for a ~;      | the ~ tripled          |
| 6. ~ resources;  | ~ less electricity; | ~d power;     | a ~r choice            |
| 7. actively ~;   | ~ing results;       | ~ recycling;  | ~ participation        |
| 8. ~ a ship;     | ~ a satellite;      | ~ a project;  | ~ a campaign           |
| 9. ~ needs;      | ~ demands;          | ~ standards;  | ~ requirements         |
| 10. to ~ prices; | ~ in tourism;       | recent ~;     | initial ~              |
| 11. fragile ~;   | holiday ~;          | reach the ~;  | arrive at the ~        |
| 12. ~ life;      | ~ research;         | ~ economic    | ~able yield            |
|                  |                     | growth;       |                        |

### 2.7. Match the words in A with their opposites in B.

- A. barren; friend; rural; conventional; ban; encourage; lack; scarce; exclude; eliminate; contaminate; spare
- B. allow; prevent; expose; abundant; fertile; foe; exotic; include; create; clean; excess; urban

### 2.8. Choose the correct word.

1. Tourist vehicles distracted lions (**from / in**) stalking their prey.
2. Water levels have dropped (**on / by**) an estimated 40 meters.
3. It is difficult to dispose (**— / of**) the waste at high altitudes.
4. Large (**expanses / expenses**) of mangrove forests have been cleared.
5. Entertainment comes at the (**expanse / expense**) of the environment.
6. The presence of tourists can (**affect / effect**) wildlife populations.
7. Global warming is (**rising / raising**) sea levels.
8. Natural landscapes are rapidly being converted (**from / into**) tourist facilities.

## 3. Translation into Russian

### REDIRECTING INTERNATIONAL TOURISM

Tourism is one of the world's least regulated industries, which has serious implications for ecosystems, communities and cultures. Hotels, tourist transport, and related activities consume huge amounts of energy, water, and other resources and generate pollution and wastes, often in destinations that are unprepared to deal with these impacts. And many communities face cultural disruption and other unwelcome changes that accompany higher visitor numbers.

Until recently, Kovalam, a small fishing village in India's Kerala state, could not keep up with its rising popularity. Attracted by palm-lined beaches, friendly people, and a relaxed lifestyle, visitors flooded the region in the mid-1960s. Over the next two decades, investors rushed

in to meet the demand, building row upon row of new hotels, restaurants, and shops. But in the 1990s, the tourist stream began to slow.

Tourism experts ruled out economic factors and shifting tourist tastes, and finally attributed the decline to the community's waste management problems. Like many booming destinations in the developing world, Kovalam has no formal plan to deal with the mounting levels of trash generated by tourists. Hotels and other facilities collect recyclable items, such as glass, paper, and metal scraps, for reuse by local industries whenever possible. The less desirable refuse — including human waste, plastic bottles, and other non-biodegradables — piles up in towering mounds or is dumped into nearby streams, increasing risks of diseases.

These concerns are not unique to Kovalam. Increasingly, developing countries are turning to tourism as a way to diversify their economies, stimulate investments, and generate foreign-exchange earnings. Tourism can be a lucrative and less resource intensive alternative to growing a single cash crop or to traditional industries like mining, oil development, and manufacturing.

Yet many holiday destinations are reaching saturation point. Once this point is overtaken, the host environment and culture may suffer permanent damage from tourist pressure: three quarters of sand dunes on the coast between Spain and Sicily have disappeared, mainly as a result of urbanization linked to tourism development; the massive anchors and chains of cruise ships have ripped huge holes in the Caribbean's ocean floor. As tourism's impacts, both good and bad, continue to spread, it is increasingly important to redirect activities onto a more sustainable path.

## 4. Complementary activities

### Develop your skills: reading for understanding.

To learn from reading, you must make the ideas in a book or article memorable to you. The information needs to take orderly form in your mind if you are to remember and use it. As you read, whether during leisure time or for an assignment, your mind must sort out the important points and identify the details offered to support, prove, or add interest to these points.

To recognize main ideas, follow these guidelines:

1. **Use the features of the text.** Introductions, summaries, and headings outline the main ideas. Other helps also are supplied to guide your reading.

2. **Find the topic sentence.** A writer organizes information for you by separating topics into paragraphs. Each paragraph, unless it is meant to illustrate an idea further, has a separate point to make. Often that point

is summarized in a topic sentence, which usually appears as the opening or closing sentence of the paragraph. Sometimes the main idea or topic is only implied and the reader must identify the topic sentence from the information given.

**3. Identify supporting details.** Note illustrations and examples that support the main point.

To apply this skill read the following excerpt about conservation on Cape Hatteras, a barrier island. Then identify the main idea and the supporting details.

"The Park Service is now firmly opposed to promoting boom development of Hatteras. North of the National Seashore, a thickly developed stretch already runs up Nags Head, Kill Devil Hills and Kitty Hawk to the mainland bridge, with jumbles of expensive homes and clusters of prefab sun shanties near where the Wright brothers first took to the air."

The topic sentence, *The Park Service is now firmly opposed to promoting boom development of Hatteras*, is the paragraph's opening sentence. The author describes "the thickly developed stretch" from Nags Head to the mainland bridge and the "jumbles of expensive homes and prefab sun shanties." These are details that identify why the Park Service opposes development on Hatteras.

To practice this skill reread the text below. Then answer the following questions: What is the main idea of each paragraph? What is the topic sentence? What are the points that support the topic sentences?

## WATER RIGHTS

Cities, towns, and private users of water from rivers and lakes do not have the right to use all the water they want. Other cities and towns and other private users also draw water from these sources. In every case where rivers, lakes, or underground sources are shared by more than one city or town, state or country, agreements need to be worked out. These agreements determine how much water each user may draw from the source so the source does not dry up or become used up.

The Great Lakes is one area where water use is carefully regulated. Cities in both the United States and Canada draw water from the lakes. Should too much water be drawn off, the level of the lakes could drop. This would affect shipping. It would also affect the rivers that empty into them and all people living along their tributaries. The area drained by the Colorado River is another one that is carefully regulated. There are demands for irrigation water, demands for water to supply cities, demands for water to generate electric power. Finally, there are demands to guard the area's scenic beauty. Not all of these demands can be met to each user's satisfaction, but some of them can be met through cooperation and compromise.

## 5. Writing

Render the following text in English.

Экологический туризм — особый сектор туристической отрасли, который подразумевает общение с природой, познание природных объектов и явлений, активный отдых на природе. Традиционные развлечения, бытовой комфорт отходят на второй план. По некоторым оценкам, экологический туризм охватывает уже более 10 % туристического рынка, а темпы его роста превышают соответствующие темпы во всей индустрии туризма.

Появление экотуризма и его развитие объясняется стремлением свести к минимуму изменения окружающей среды. Экотуризм — это способ решения проблемы взаимодействия человека с окружающей природной средой. Из-за меньшего объема необходимой туристической инфраструктуры экотуризм характеризуется меньшей ресурсоемкостью.

География экологического туризма своеобразна. Экотуристы направляются главным образом из развитых стран в развивающиеся, находящиеся преимущественно в тропиках, природа которых экзотична и притягательна для жителей умеренных широт. Среди лидеров — Кения, Танзания, Эквадор, Коста-Рика, Непал, а также Австралия, Новая Зеландия и ЮАР. В развитых государствах Европы и Америки экотуристы очень часто путешествуют и по своим странам. Экотуристы стремятся в места с нетронутой природой, но таковых на нашей планете остается все меньше. Очень часто хрупкое экологическое равновесие на «диких» территориях не выдерживает возрастающих нагрузок. Возникает необходимость в освоении новых рекреационных территорий.

В литературе встречается несколько терминов, относящихся к сфере экотуризма. Объектами собственно экотуризма могут быть как природные, так и культурные достопримечательности, природные и природно-антропогенные ландшафты, где традиционная культура составляет единое целое с окружающей средой.

В природный туризм вовлекается как живая, так и неживая природа (пещеры, горы, водоемы). Природный туризм включает в себя биотуризм, объектами которого являются любые проявления живой природы, отдельные виды животных или растений или целые экосистемы.

Всемирная туристская организация использует термин приключенческий туризм в качестве более широкого понятия, включающего в себя экотуризм. Однако экотуризм, хотя и обладает приключенческим элементом, не всегда подразумевает приключение в чистом виде.

Все большее распространение получает агротуризм, сельский туризм или «отпуск на крестьянском дворе». Это отдых на фермах



и хуторах, где туристы ведут сельский образ жизни, участвуя в сельскохозяйственных работах: собирают урожай, косят сено, ухаживают за скотиной. Развитие такого вида туризма наиболее актуально для стран Западной Европы с небольшим процентом естественных ландшафтов и высоким уровнем сельскохозяйственной освоенности территории.

По цели путешествия можно выделить научный, познавательный и рекреационный виды экотуризма. Многие с удовольствием совмещают отдых на природе с экзотическими занятиями, например, сбор яиц редких видов черепах в Коста-Рике или учет численности копытных в заповеднике. Объектами экотуризма могут стать экзотические растительные сообщества — тропические леса, цветущая летняя тундра, весенняя пустыня.

Популярными видами деятельности экотуристов являются пешие походы, наблюдение за птицами или экзотическими бабочками, кино- и фотосъемка, экосафари, проживание в палаточных городках, альпинизм, рыбалка, сплав на плотах по порогам, археологический туризм, спелеотуризм.

Экотуризм содействует охране природы и традиционных культур, способствует созданию новых охраняемых природных территорий. Для жителей деревень это дополнительный заработок, спасение умирающих деревень, для регионов — приток средств и развитие инфраструктуры, для страны — возможность развития туризма за пределами городов, где полностью отсутствуют гостиницы, а для туристов — возможность недорого отдохнуть в экологически чистой среде.

На многих территориях экологический туризм может представлять конкурентоспособную альтернативу разрушающей природу хозяйственной деятельности. Россия обладает обширными территориями с нетронутой природой. К сожалению, до последнего времени развитие экотуризма в России шло преимущественно на самодеятельном уровне. Сейчас мы наблюдаем развитие этого сектора.

## 6. Speaking

### 6.1. Retell the following text in English.

#### A GLOBAL INDUSTRY

As the planet becomes increasingly explored and there are fewer new destinations left for tourists to discover, the WTO predicts new trends in tourism, like mountain trekking and touring in deep oceans. Antarctica is also becoming fashionable: Australia is considering turning two of three Antarctica research centres into summer bases for adventure tourists.

The number of people who take a cruise is expected to increase with enormous consequences for the Caribbean. It is estimated that cruise ships produce more than 70,000 tons of waste annually. Ecotourism, cultural tourism and theme park attractions are also becoming good cash earners.

Rising disposable incomes, along with the emergence of wide-bodied commercial jets, cheap oil, and low promotional airfares after World War II, have accelerated tourism's growth. And new information technologies like global distribution systems, computer reservation systems, and the Internet enable travel agents as well as individual travelers to check flight availabilities, issue tickets, and make reservations rapidly.

Nearly two thirds of international tourists travel for vacation, leisure, and recreation. But tourist tastes are gradually changing. Growing displeasure with heavily commercialized and polluted destinations is spurring a shift from the highly packaged and standardized mass to more flexible and independent personalized experiences like culture or nature tourism.

Although Europe and the Americas continue to attract the most international tourists, the traditional dominance of these destinations is declining. Meanwhile, tourism to Asia, the Middle East, Africa, and the Pacific, is growing rapidly. China is expected to overtake France as the world's most visited country, and also to become the fourth largest source of tourists worldwide — behind Germany, Japan, and the United States. Russia and several former Eastern bloc countries also rank among the top destinations of the future. Rapidly growing destinations include Cambodia, Egypt, Thailand, Turkey, and Viet Nam.

The World Trade Organization reports that tourism is the only economic area where developing countries consistently run a trade surplus. Yet in developing countries that attract growing numbers of tourists, the benefits are not always as significant as the statistics suggest. WTO estimates that as much as 50 per cent of the tourism revenue that enters the developing world ultimately "leaks" back out in the form of profits earned by foreign-owned businesses, or payments for imported goods and labor.

Leakage is particularly high in the Caribbean, where 50—70 per cent of tourism earnings go toward acquiring imports — from skilled staff to food and consumer goods. Many hotels and other tourism businesses in the developing world rely heavily on foreign inputs. This is either because the host country lacks the goods and services or because the tourism sector is poorly linked with other sectors like fishing, agriculture, manufacturing, and transport and it is difficult to obtain local supplies.

Foreign operators dominate the tourism industries of many countries, including Kenya, Tanzania, and Zimbabwe. These businesses typically send their profits back home, leaving little revenue at the destination. The bulk of a tourist's spending, including airline tickets, tour packages, and rental cars, never reaches the destination. Cruises and other all-inclusive tour packages cover airfare, lodging, entertainment, and meals funnel away tourism revenues.

Tourism can also divert people from traditional jobs in agriculture and fishing. In Grenada, the government is replacing small-scale, organic agricultural plots with large tourism resorts in a push to secure foreign investment, squeezing out local farmers. But if economies become too narrowly dependent on tourism, they are more vulnerable to a collapse resulting from changing tourist tastes or other factors, such as fear of international terrorism.

Tourism also has impacts on local cultures. On the one hand, it can heighten respect for minority groups, helping to revive languages and religious traditions. Tourist demand for dancing and other arts has reportedly fostered an artistic revival in Bali, Indonesia, while in Peru rising tourist interest in traditional healing has stimulated a revival of shamanism. In the Himalayas rising tourist interest in Buddhist festivals has led monks to shorten elaborate rituals to satisfy tourist attention. Meanwhile, local involvement in the events has dropped off.

Tourism can accelerate the inflow of western values and material goods into indigenous areas, provoking changes in eating, dress, and other daily activities. Forest tribes in Peru, for example, can now earn more selling traditional cloaks to tourists than trading them for axes or machetes — a shift that has altered the economic relations of villages. Increased contact with mainstream culture can lead to replacement of a native tongue.

In extreme cases, native communities have been forcefully removed from their homelands to make room for tourists. In the 1950s, Kenya's colonial government drove the nomadic Masai from their traditional grazing lands to accommodate safari lodges and visitors to the newly created national parks and wildlife sanctuaries. The Masai have since won greater involvement in the management and use of their resources and have been able to meet community needs with money earned leasing their land. Yet they still face the social and cultural repercussions of tourism, including misrepresentation of their crafts and rituals and growing prostitution, alcoholism, and drug use.

Despite the potential negative impacts, many communities still favor increased tourism because they see greater economic and cultural opportunities. Some indigenous groups, such as Panama's Kuna people, hope to maximize the benefits of tourism while fighting some of the unwelcome changes. In 1996, the Kuna ratified a Statute on Tourism that limits the number of hotels yet ensures the collection of tax revenue and the redistribution of benefits among community members.

**6.2. Split into three groups to discuss the priorities in tourism for governments, tourist industry, and tourists. Present your statements.**

## 7. Summarizing the Unit

Make a summary of the Unit and render its content in a 4—6 min talk.

## UNIT 20

### CONSERVATION OF NATURE AND CULTURE

#### 1. Reading and learning

Scan each text and formulate the main ideas. Make up 5 questions. Read the text again carefully and memorize it, then retell the text close to the original using the main ideas as a plan.

##### 1.1. CONSERVATION OF NATURAL AREAS: TRANSBOUNDARY PARKS

The idea of conservation is probably as old as the human species. Over the years the word “conservation” has acquired many connotations: to some it has meant the protection of wild nature, to others the sustained production of useful materials from the resources of the Earth.

The most widely accepted definition of the term, presented in 1980 by the International Union for Conservation of Nature and Natural Resources, is that of “the management of human use of the biosphere so that it may yield the greatest sustainable benefit while maintaining its potential to meet the needs and aspirations of future generations.” The document defines the objectives of the conservation of living resources as: maintenance of essential ecological processes and life-support systems, preservation of genetic diversity, and guarantee of the sustainable use of species and ecosystems.

More generally, conservation involves practices that preserve the resources of the Earth on which human beings depend and that maintain the diversity of living organisms that share the planet. This includes such activities as the protection and restoration of endangered species, the careful use or recycling of scarce mineral resources, the rational use of energy resources, and the sustainable use of soils and living resources.

Conservation is necessarily based on the knowledge of ecology, the science concerned with the relationship between life and the environment, but ecology itself is based on a wide variety of disciplines, and conservation involves human feelings, beliefs, and attitudes as well as science and technology.

Preserving the planet's remaining natural areas is one of our most urgent responsibilities. There is no substitute for a stable hydrological cycle, healthy pollinator populations, or the general ecological stability that only natural areas can confer. Ecological health and cultural health are related. Environmental and cultural degradation are entangled in



many places: the destruction of the forests and indigenous forest cultures in Indonesia, Canada, or Brazil; the ecological and social collapse of the Aral Sea basin; the flattening of North American life and landscapes into homogenous shopping malls. Thus the struggle to save wild places is also an act of economic and cultural self-preservation.

In recent years, apart from national parks, "transboundary parks" have become an important tool for conserving the planet's biodiversity and promoting regional stability. These parks are formed when neighboring countries agree to link and jointly manage national parks, wildlife reserves, or other protected areas that are adjacent but lie on opposite sides of a shared border.

The earliest effort to unify two adjoining parks dates to after World War I, when the 1925 Cracow Protocol called for the creation of twin national parks along the then-disputed Czech-Polish border. Today, transboundary parks — also known as peace parks — are found on six continents, from South America to Asia.

In some cases, the level of cooperation between neighbors is highly formal: in 1932, when the United States and Canada created North America's first transboundary park, the Waterton-Glacier International Peace Park, they signed an international treaty. Poland and Belarus, in contrast, have yet to establish diplomatic ties between their neighboring parks — Bialowieza and Belovezhskaya Pushcha — although they cooperate scientifically by exchanging plants and wildlife. And India and Bhutan coordinate only anti-poaching efforts in their adjacent Manas parks.

Opportunities for cross-border conservation are growing as countries designate new protected areas along their boundaries. In 1988, in only 59 sites worldwide adjoining protected areas lay on opposite sides of a national border. By 2001, the figure had nearly tripled, to 169 sites. Some degree of transboundary cooperation already occurs at many of these locations, though typically at the lowest levels.

The sites are found in 113 countries. The majority of them span just two countries, but as many as 31, cover three nations. Most are located in Europe. Altogether, these transboundary areas account for more than 10 per cent of the currently protected land area worldwide.

In addition to the 169 sites, there are at least as many border locations where adjoining protected areas do not yet exist but could be established — creating hundreds of opportunities for future cross-border conservation. These include places where a park or reserve is found on only one side of the border, or on neither side, but where protection is still viable.

By establishing transboundary parks, conservationists hope to reconnect single ecosystems that have been artificially cut off by political boundaries. By one estimate, more than half of all international borders were drawn up arbitrarily by just six colonial powers, typically as an outcome of war or political compromise. Many of these borders

bisect continuous deserts, forests, and watersheds, greatly increasing the political challenge of managing these areas. (The habitat of Africa's endangered mountain gorilla, for instance, is in a war-torn region shared by Rwanda, Uganda, and the Democratic Republic of Congo.)

Because of their large size, transboundary parks may be more effective than national parks at stemming species extinctions and protecting valuable ecological processes. For instance, they may be better able to support a more diverse gene pool for an animal or plant population, or to encompass the range required for large mammals like elephant or buffalo. Transboundary parks can also serve as important wildlife corridors, allowing movement from one natural area to another, thus recreating ancient migration paths on land or water.

There are administrative benefits as well. Often, park officials do not communicate or coordinate activities with their cross-border counterparts, though they may face similar challenges. By collaborating, parks can maximize efficiencies of scale and avoid duplication — sharing the costs for research, education, training, or equipment, for instance, or jointly combating illegal logging or wildfires.

By collaborating through "peace parks," governments can foster dialogue among long-distrustful neighbors and build understanding among communities and institutions. Already, provisions for peace parks have been incorporated into the treaty resolving the 1998 territorial dispute between Peru and Ecuador, and are also being used in negotiations between Israel and its neighbors.

But transboundary conservation still faces many obstacles. Neighboring countries may share similar ecosystems, yet they often have quite different cultural and political values, forms of governance, and levels of stability. Their adjacent parks may vary in infrastructure and in some more localized problems. And the cost of unifying parks can be high: funds may be needed for land purchase, removal of fencing, staff, counter poaching, wildlife reintroductions, or community development projects. In most cases, however, the benefits of transboundary parks to nature and society will outweigh these costs.

## 1.2. WORLD HERITAGE SITES RISING STEADILY

The idea of protecting the world's shared heritage emerged after World War II in response to growing concern about threats to important cultural and natural landmarks. UNESCO launched the first global campaign to save cultural heritage in 1960, when 50 countries raised money to rescue the ancient Egyptian temples of Abu Simbel from flooding due to construction of the Aswan High Dam. Other early campaigns focused on conserving Venice in Italy and the Buddhist temples in Indonesia.

In 1972 UNESCO established The World Heritage List by adopting a treaty known as the World Heritage Convention. To date 172 of the

world's 192 nations have signed the treaty to collectively protect natural and cultural areas of "outstanding universal value" that transcend national boundaries and belong to all of humanity.

Nominations can come from any nation that has signed the World Heritage treaty. Member countries must individually nominate sites for inclusion on the list. Submissions must include a plan for managing and protecting the site. After receiving independent evaluations, the World Heritage Committee at its annual meeting chooses worthy sites.

Once a site is approved, governments are encouraged to report on the progress of conservation and to raise public awareness about the property. But not all nominees succeed: many countries face instability or lack financial or other support, which prevents them from meeting the strict listing requirements.

Nations lobby hard to get their glorious buildings, wilderness, and historic ruins on the list, a stamp of approval that brings prestige, tourist income, public awareness, and a commitment to save the irreplaceable. World Heritage status commits the home nation to protect the designated location. And if a site — through natural disaster, war, pollution or lack of funds — begins to lose its value, nations that have signed the treaty must assist in emergency aid campaigns.

The World Heritage Program has scored high-profile successes. It exerted pressure to halt a highway near Egypt's Giza Pyramids, block a salt mine at a gray whale nursery in Mexico, and cancel a dam proposal above Africa's Victoria Falls. Its funds, provided by dues from the treaty's signers, have hired park rangers, bought parkland, built visitor centers, and restored temples. It relies on persuasive powers more than legal threats.

Between 1978 and 2002, the number of World Heritage Sites worldwide increased from 12 to 730. UNESCO confers World Heritage status on cultural or natural sites considered to be of outstanding value to humanity. Sixteen of the world's 25 so-called biodiversity hotspots are also designated as World Heritage Sites.

The sites are located in 125 countries on six continents. Europe, with its heavy concentration of monuments and religious architecture, is home to 323 sites, while Asia has 163 sites. Spain and Italy contain the most individual sites, with at least 35 each, followed by China, France, and Germany. UNESCO aims to increase the number and diversity of sites, particularly in Africa.

Some existing sites already risk deterioration or disappearance. UNESCO's List of World Heritage in Danger now includes 33 properties, most of which are in Africa. They face a wide range of threats — from armed conflict to abandonment, rampant urban or tourist development, and changes in land use or ownership.

Many sites also face environmental dangers, including pollution, poaching, flooding, and natural disasters like earthquakes, landslides, and volcanic eruptions. Mali's great mosques of Timbuktu are

increasingly at risk of encroachment by desert sands, while mining operations threaten both Yellowstone National Park in the United States and the Mount Nimba Strict Nature Reserve stretching across Guinea and Côte d'Ivoire.

UNESCO-sponsored campaigns raise money for site preservation and provide emergency assistance to endangered sites.

### 1.3. WORLD HERITAGE SITES: CATEGORIES AND THE GLOBAL A-LIST

The current list includes 563 cultural sites (buildings, monuments, and properties with aesthetic, anthropological, archaeological, ethnological, historical, or scientific value) with 15 among them in danger. Masterpiece buildings, such as the Versailles palace and the Taj Mahal, and monuments from past civilizations, the Great Wall and Stonehenge, headline the cultural list. Selections also commemorate historic events with sites like the Hiroshima Peace Memorial.

There are 144 natural sites (areas with scientific, conservation, or aesthetic value; outstanding physical, biological, and geological formations; or habitats of threatened plant or animal species) with 18 in danger. Swiss Alps, Mount Kilimanjaro, and the Great Barrier Reef — they qualify for sheer beauty. Natural sites also recognize geographic history — the Grand Canyon is an example — and habitats that protect species and conserve biodiversity, such as Africa's Serengeti Plain.

There are 23 mixed sites. Mixed sites combine exceptional natural and cultural values. Tikal National Park in Guatemala, for example, shelters Maya ruins as well as part of Central America's most extensive rain forest. Sacred mountains in China, Australia, and New Zealand also make the list.

When natural disasters such as earthquakes or human actions such as war or pollution threaten a listed site, this category is applied, not as a sanction but as red flag. The goal is to provide assistance and restore a site as soon as possible.

**Europe.** Cathedrals, castles, Roman and Greek ruins, and historic city centers account for Europe's density of cultural sites. Recent selections recognize modern sites like the Essen coal region in Germany and cultural landscapes such as the Douro wine country of Portugal.

**Africa.** It accounts for nearly a fourth of World Heritage natural sites. It also contains the highest number of locations in danger. Warfare in the Democratic Republic of Congo has put in danger conservation efforts in five parks, home to endangered gorillas, elephants, and rhinoceroses.

**North America.** Spectacular parks in Canada and the United States, with glaciers, dinosaur fossils, and geysers, dominate the continent's natural listings. Mexico claims most of the cultural spots with its wealth of pre-Columbian ruins.



**South America.** Strong in archaeological sites, South America's list is still short on rain forest reserves. Brasil's Iguacu National Park was recently taken off the danger list after the closing of an illegal road.

**Australia.** It has come to beefed-up protection of its sites, and has pioneered the nomination that links areas under one concept, such as Queensland's Wet Tropics.

**Asia.** China leads Asian nations with 28 sites, the most for any country outside Europe. In Southeast Asia, Lorentz National Park in Indonesia and Kinabalu Park in Malaysia add vast rain forest reserves.

A natural choice for World Heritage recognition, Komodo National Park in the Lesser Sunda Islands provides the last sanctuary for the endemic Komodo dragon. Largest of lizards, it can reach a fearsome ten feet in length. A surge in tourism and predation by feral dogs has overwhelmed staff and endangered the dragons. This listing brought vital funding, with groups such as the UN Foundation and the Nature Conservancy helping the cash-strapped park. Donor money has stabilized the dragons' situation.

## 2. Lexical and grammatical exercises

2.1. Rearrange the letters in the anagrams to form equivalents for the Russian words.

|                           |                              |
|---------------------------|------------------------------|
| соглашение — yreatt       | непредвиденный случай —      |
| ограждение — ncfee        | ееесumrgn                    |
| храм — mpltee             | позиция; отношение — ttiaued |
| мечеть — qmeosu           | обязательство — coittmmnen   |
| применять — yppla         | собственность — pprtrtoey    |
| приобретать — cauiqre     | генофонд — eegn oopl         |
| основывать — tabesslih    | подтекст — nncoooattin       |
| восстанавливать — estorre | убедительный — rssuaipee     |
| перевешивать — oeigutwh   | вооруженный — medar          |
| священный — sedacr        | неотложный — gnetur          |

2.2. Match the words in A with the words in B to form word combinations. Give Russian equivalents.

- A. armed; persuasive; gene; designated; annual; transboundary; emergency; genetic  
B. diversity; location; meeting; pool; park; assistance; power; conflict

2.3. Match each of the following words with the correct definition.

*exert; rescue; persuade; adjacent; counterpart; approve; confer; homogenous; current; submission; designate*

1. next to or near something else
2. to save someone or something from a dangerous or harmful situation
3. to use influence, authority, or power in order to affect or achieve sth
4. to give something such as a title, honor, or favor to somebody
5. happening or existing now
6. somebody or something corresponding to another
7. to make somebody perform a particular action, esp. by reasoning
8. the process of giving a document to be considered
9. to give official agreement or acceptance to something
10. to give someone or something a particular name, title, or description
11. having the same kind of constituent elements, or being similar in nature

2.4. Fill in the missing forms of the words.

| Noun        | Verb     | Noun      | Verb             |
|-------------|----------|-----------|------------------|
|             | conserve | provision |                  |
| yield       |          |           | substitute (for) |
|             | maintain | danger    |                  |
| recognition |          |           | include          |
|             | remove   | flat      |                  |
| pollen      |          |           | approve (of)     |
|             | nurse    | nominee   |                  |

2.5. Match the words close in meaning in A and B.

- 1) A. establish; counter; emerge; rescue; shelter; acquire; encompass; evaluate; aim; span; exert (influence); confer; foster; halt  
B. stretch (over); arise; promote; set up; oppose; grant; save; obtain; surround; estimate; lobby; accommodate; stop; intend
- 2) A. research; nominee; revenue; tie; ownership; encroachment; obstacle; aid; stamp; outcome; dues  
B. assistance; (membership) fee; link; sign; property; candidate; study; income; invasion; barrier; result
- 3) A. endemic; current; urgent; continuous; adjacent  
B. adjoining; present; vital; indigenous; unbroken

2.6. Choose a word from the list below to fit the word combinations in each line. For example: *endanger* fits line 1.

*endanger; evaluate; viable; accept; maintain; define; manage; resolve; challenge; yield; approval; approach*

- |                |                |                |                         |
|----------------|----------------|----------------|-------------------------|
| 1. ~ed species | critically ~ed | to ~ a species | to ~ ecosystem          |
| 2. to ~ lions  | to ~ an issue  | a flexible ~   | diverse ~es             |
| 3. complete ~  | to grant ~     | a stamp of ~   | dis~                    |
| 4. ~ results   | ~ benefits     | ~ a crop       | ~ a profit              |
| 5. to meet a ~ | a political ~  | to face a ~    | a ~ing job              |
| 6. ~ a dispute | ~ a problem    | ~ a crisis     | to be ~d by negotiation |
| 7. ~ a problem | ~ a situation  | ~ resources    | ~ a site                |
| 8. ~ a process | ~ a potential  | ~ stability    | ~ links                 |
| 9. ~ a word    | ~ a term       | ~ objectives   | ~ a boundary            |
| 10. ~ visitors | ~ a definition | ~ an offer     | widely ~ed              |
| 11. a ~ scheme | a ~ economy    | financially ~  | to prove ~              |
| 12. ~ new data | ~ a situation  | ~ a product    | ~ rates                 |

### 2.7. Match the words in A with their opposites in B.

- A. homogenous; restoration; confer; joint; foster; deny; adjoining  
 B. discourage; far-away; shared; diverse; destruction; take away; recognize

### 2.8. Choose the correct word.

1. Neighboring countries (**accept / agree**) to jointly manage national parks.
2. There is no substitute (**to / for**) a stable hydrological cycle.
3. The (**cost / price**) of unifying parks can be high.
4. Poland and Belarus have (**still / yet**) to establish diplomatic ties.
5. Tourists account (**about / for**) 57 per cent of all international air passengers.
6. These nations must assist in emergency aid (**companies / campaigns**).
7. Instability prevents countries (**to meet / from meeting**) all the requirements.
8. Warfare has put in danger conservation (**efforts / affects**) in five parks.
9. Some protected areas (**lie / lay**) on opposite sides of a shared border.

## 3. Translation into Russian

### PROTECTION OF LAKE VOSTOK

Of all the great lakes of the world, just one remains untouched by humanity. The very existence of Lake Vostok, buried as it is beneath some four kilometers of ice in one of the most remote parts of Antarctica, was unknown when Soviet explorers occasionally built a base directly above it in 1957. Not until 1994 — by which time Russian

glaciologists had drilled three quarters of the way down to the lake in order to read 400,000 years of climate history recorded in the ice — did satellite and seismographic measurements reveal Vostok's impressive size: 300 km long, 80 km wide and 1,000 m deep. Cut off from direct contact with the sun, wind and life of the surface world for as long as 14 million years, Lake Vostok seems to scientists to be a unique time capsule that, once opened, could help solve old and difficult puzzles. Some technologists consider it the best place on Earth to test probes that are designed to bore through the icy shell of Europa, a moon of Jupiter suspected of harboring a watery ocean and possibly life.

But many environmental activists disagree, and recently scientists and technologists have been stepping back from proposals they started making in 1996 to send robotic probes into the lake to analyze the water, look for microorganisms and return sediment samples. Now researchers concede it may well be a decade before instruments are lowered into the lake.

Growing uncertainties of three kinds have forced this retreat. One question is whether and how a probe could be lowered into a subglacial lake without contaminating it with microbes from the surface or the ice pack. The general idea is to drill down 3.5 km or so with hot water and then deploy a cryobot. Until tests in less pristine settings, such as ice-covered volcanic lakes in Iceland, prove that a cryobot can enter the water without dragging along foreign life-forms, it is likely that conservationists will continue to oppose plans to penetrate Lake Vostok. "We firmly believe that a comprehensive environmental evaluation (required by the Antarctic Treaty) would not permit this to go forward with current technology," says Beth Clark, the director of the Antarctica Project, speaking for a coalition of more than 200 environmental groups. The World Conservation Union has adopted a resolution urging treaty members to "defer for the foreseeable future" drilling into the lake and to designate Vostok a "specially protected" area.

Perhaps the greatest uncertainty is whether Vostok is the only lake that can answer the important questions scientists are asking of it. Analyses of ice-penetrating radar soundings have turned up at least 70 lakes beneath the Antarctic ice sheet. But Vostok is probably unique in a number of ways: in its sediments, in its depth, in its age, in its sloped ceiling (which may cause its waters to circulate) and in its possible geological origin as a rift in Earth's crust.

But preliminary results from new radar, magnetic and seismic data taken in January reveal just how little scientists truly know about Vostok. The lake contains "islands" where land meets ice and pockets where water rises to different levels. Another surprising observation is a big magnetic anomaly near one shoreline, and that in places the water is 1,000 m deep — almost twice what was previously thought. Vostok is larger by far than any of the other subglacial lakes.



The Scientific Committee on Antarctic Research issued a statement that urged the investigation of smaller lakes first but maintained that Lake Vostok "must be the ultimate target of a subglacial lake exploration program. The goal should be to solve scientific problems, not just to explore."

#### 4. Complementary activities

**Develop your skills: writing synopsis, paraphrasing.**

**Synopsis** is a short, condensed account of something longer, especially of a text, book, play or film. As an example see the text below, which is supplied with a short synopsis.

#### MOHANDAS GANDHI: GREAT TEACHER

Some say that the difference between a good teacher and a great teacher is that a great teacher teaches how to live and lives a life worth teaching about. Mohandas Gandhi was such a teacher. His life changed the lives of others. His teachings brought about India's independence. He had such influence that people began to call him Mahatma, a title that means "great soul".

Mr Gandhi was born in 1869, when India was still a British colony. He was a Hindu, the child of a middle-caste family. He spoke English as well as Hindi. When he was a young man, Mr Gandhi went to London, England, and became a lawyer. Gandhi devoted his life to fighting injustice. Gandhi's methods of fighting did not involve violence. He felt that violence was a sign of weakness.

By refusing to take up weapons, Gandhi's followers kept their pride. They convinced the world that it was the British who were in the wrong. Mr Gandhi lived to see India become an independent nation in 1947. When he died in 1948, he was revered as a great teacher by people throughout the world.

**Synopsis.** Mohandas Gandhi was a great thinker and a great teacher. He led the successful movement for Indian independence from Great Britain. Gandhi's teachings spread far beyond India. Among the people he influenced there were many famous politicians.

**Paraphrase** of something written or said is the same thing expressed in a different way, especially in the words which are easier to understand. Thus, for example, the passages below are taken from Gandhi's journals and letters. Each quotation is followed by a statement which is correct paraphrase of Gandhi's words. The paraphrase states the idea in different words that shows an understanding of what was read.

For example, Gandhi wrote, "Nonviolence is the first article of my faith". If you were making a report about Gandhi, you might say, "Gandhi did not believe in violence".

**Compare the pairs of the phrases given below:**

- |  |  |
|--|--|
| 1. "We want freedom for our country, but not at the expense or exploitation of others, not so as to degrade other countries."  | 1. <i>We do not want to hurt others in our search for freedom.</i>                             |
| 2. "If there were no greed, there would be no occasion for armaments."   | 2. <i>Greed has resulted in warfare.</i>   |
| 3. "What appears to be truth to the one may appear to be error to the other."  | 3. <i>There is a right and a wrong in every situation.</i>                                     |
| 4. "India has to flourish in her own climate and scenery and her own literature, even though all three may be inferior to the English climate, scenery, and literature. We and our children must build on our own heritage. If we borrow another, we impoverish our own."  | 4. <i>Each country should appreciate and develop its own climate, scenery, and literature.</i> |
| 5. "I believe in the fundamental truth of all great religions of the world. And I believe that, if only we could all of us read the scriptures of the different faiths from the standpoint of the followers of those faiths, we should find that they were at the bottom all one and were all helpful to one another." | 5. <i>Study of other religions would lead one to appreciate them.</i>                          |
| 6. "No matter how insignificant the thing you have to do, do it as well as you can, give it as much of your care and attention as you would give to the thing you regard as most important. For it will be by those small things that you shall be judged."  | 6. <i>You should try to do your best in everything that you do.</i>                            |

**Use paraphrasing while writing summaries and preparing oral presentations in English.**

#### 5. Writing

**Render the following text in English.**

#### ГАЛАПАГОССКИЕ ОСТРОВА

Галапагосские острова расположены в Тихом океане на самом экваторе, в тысяче километров от побережья Южной Америки. Они образовались 4—5 млн. лет назад в результате извержений огромных подводных вулканов, изливавших жидкую базальтовую лаву. При относительно небольшой высоте вулканы занимают

очень внушительную площадь: гора, возвышающаяся над уровнем моря не более чем на километр, может иметь 20-километровый диаметр. Последние извержения вулканов произошли совсем недавно — в 1995 и 1998 годах.

Природа Галапагосов уникальна, поскольку острова никогда не были связаны с материком. Все местные обитатели добрались сюда из Южной Америки по воздуху или по морю и приспособились к условиям существования на островах. В результате многие из обитающих здесь животных и растений больше нигде не встречаются. Из 800 видов растений галапагосской флоры около 300 можно найти только здесь, из 58 обитающих тут птиц уникальны 28, а из двух десятков видов пресмыкающихся — почти все. На островах практически нет наземных хищников, поэтому местные животные вообще не боятся человека.

Еще одной уникальной особенностью Галапагосов является то, что здесь сливаются холодное течение Гумбольдта и теплое экваториальное течение, что обеспечивает высокую биологическую продуктивность океана. Поэтому здесь обитают как тропические, так и холодолюбивые виды животных. На Земле нет больше мест, где рядом плавают пингвины и тропические коралловые рыбы. А еще на этих островах есть уникальные ящерицы — морские игуаны, питающиеся водорослями.

На большей части Галапагосских островов засушливый тропический климат. Только юго-восточные склоны самых высоких гор перехватывают облака, и образующиеся в результате дожди и туманы превращают узкую полосу предгорий во влажные тропики. Значительные площади островов покрыты сухолюбивой растительностью, среди которой много кактусов. Свежие лавовые поля, занимающие значительную территорию, обычно не заселены растениями.

Общая площадь Галапагосов составляет 7882 км<sup>2</sup>. Они состоят из большого острова Исабела протяженностью 130 км, 4 островов поменьше и еще 14 средних и малых островов. Здесь также множество островков, отдельных скал и рифов. Высшая точка Галапагосов — вулкан Вольф на острове Исабела высотой 1707 м над уровнем моря. Острова были открыты в 1535 году «по ошибке» — сюда отнесло корабль епископа Панамы, плывшего в Перу. Моряки встретили здесь гигантских черепах (галапаго), отсюда и пошло их название. В XVI—XVIII веках Галапагосские острова открывали заново мореплаватели различных стран, поэтому многие из них имеют по два названия (испанское и английское).

Галапагосы принадлежат Эквадору. Постоянного населения на островах немного; большая часть их территории необитаема и является национальным парком с очень строгим природоохранным режимом. Туристов пускают только в сопровождении лицензированного гида. В пределах парка выделено около трех десятков

мест, где только в дневное время разрешается высаживаться на берег и откуда начинаются проложенные специально для туристов тропы. Открытые для посетителей участки представляют все биологическое разнообразие островов. Бродить без троп запрещено, к тому же леса местами непроходимы и пресной воды на островах почти нет.

У богатой, практически нетронутой природы Галапагосов есть свои проблемы. Основные из них — промысловый лов рыбы и завезенные человеком животные и растения. Сейчас администрация национального парка проводит кампанию по истреблению одичавших домашних животных, особенно коз, и старается не допустить переноса чуждых видов с острова на остров.

## 6. Speaking

### 6.1. Retell the following text in English.

#### WILLEM BARENTS PARK IN THE RUSSIAN ARCTIC

Mankind has long recognized the necessity to protect the territories of natural, historical, cultural and recreational value at high latitudes. This explains the large number of national parks, nature reserves, game sanctuaries and other protected areas set up in all eight Arctic countries, of which Russia has the largest Arctic sector.

The first protected Arctic area was established in North America in the Yukon Delta in 1909. In Scandinavia, the first national park in Sweden was also established as early as 1909. The first protected area in the Russian Arctic, Lapland Nature Reserve on the Kola Peninsula, was set up in 1930.

Today the total area of protected natural territories in the Arctic is growing. This tendency reflects the universal recognition of the high prevalence of intact natural features in this region and their huge value as part of the world's natural heritage. No wonder, that UNESCO has included a number of large protected territories in the Arctic and Subarctic in its prestigious World Heritage List; "Virgin Komi Forests" in Komi Republic of Russia is one of them.

A rapid growth of protected territories has recently taken place in the Russian Arctic. They have different status, mainly nature reserves, sanctuaries (zakazniks) and natural monuments. Unlike other Arctic states, Russia has not so far had an Arctic territory in which protection of natural resources is rationally combined with the ecologically sound exploitation of its resources, e.g. tourism. Today, there is a good opportunity to create the first strictly protected multifunctional territory for the combined conservation of natural, historical and



cultural heritage. This area occupies the northern part of Novaya Zemlya and is characterized by unique combination of scenic beauty and historical and cultural monuments. Certain sites in Novaya Zemlya are of special value as they are associated with the voyages of Willem Barents, a famous Dutch navigator, to the Russian Arctic at the end of the 16th century.

The year 1997 was marked with the 400th anniversary of the death of Barents off the coast of Novaya Zemlya after the unprecedented wintering of his expedition at the northern extreme of the archipelago. The contribution of Willem Barents to the development of contacts between Western Europe and Russia is universally recognized. Barents and his fellow travellers were the first to describe the northern territories of Russia and the Pomors and Nenets living there, as well as the large archipelago Novaya Zemlya. Thanks to Barents the name of the archipelago sounds similar to its Russian name in all the languages of the world.

Historically the discoveries of Barents had broader implications than serving the immediate interests of the Netherlands and Russia. For several centuries now his name has justly belonged to the entire European civilization and to the rest of the world as a symbol of the glorious time of great geographic discoveries. Therefore it is proposed to designate the whole region as the memorial Willem Barents Park, to protect its natural scenery and historical monuments. This proposal reflects a novel approach to the conservation and management of natural and cultural heritage in the Russian Far North.

The territory of Willem Barents Park lies in the northernmost part of the archipelago (north of 76°N), behind the nuclear test site. It is here that Willem Barents spent the last year of his life and started his last voyage in an attempt to escape after successful wintering in the Arctic. It is here that the outstanding navigator was buried.

The popular story of Barents' expedition makes the northern part of Novaya Zemlya highly attractive for the tourists from the Netherlands, where Barents is respected as a most prominent figure in the national history, as well as for the tourists from other countries, where his name is also well-known. The northern part of Novaya Zemlya with its scenic landscapes is equally attractive for sightseeing. For this reason the area should be designed as a national park to achieve effective integration of environmental protection and recreational development.

**6.2. Find material about conservation policy and protected areas in different countries; give a talk.**

## 7. Summarizing the Unit

Make a summary of the Unit and render its content in a 4—6 min talk.

## UNIT 21

### HUMAN IMPACT AND ECOLOGICAL DISASTERS

#### 1. Reading and learning

Scan each text and formulate the main ideas. Make up 5 questions. Read the text again carefully and memorize it, then retell the text close to the original using the main ideas as a plan.

##### 1.1. FRESHWATER PROBLEM

In 2000, the World Health Organization estimated that 1.1 billion people were not able to meet their needs for safe water. These people can be thought of as hydrologically impoverished. Although moderate gains have been made in various regions, one fifth of humanity has no access to a safe water supply, and two fifths has inadequate sanitation.

Twenty-nine per cent of people living in rural areas around the world lack the most basic water supply — they cannot get water from a household connection, public standpipe, borehole, protected dug well, protected spring, or rainwater collection. Over 62 per cent of the world's rural population lacks improved sanitation, meaning a household connection to a public sewer, septic system, pour-flush toilet, or simple pit latrine. In cities, the equivalent figure is 14 per cent.

Hydrological poverty strikes at a variety of levels beyond lack of access to water supplies. At the most fundamental level is water scarcity, where drought and water diversions for agriculture and industry limit the amount of water available to meet people's basic needs. Currently, more than 2 billion people live in water-stressed countries. By 2025, the number of people residing in areas of water scarcity is predicted to reach 3.4 billion. And these estimates are based on national-level predictions; they understate the current severity of the problem in many local areas.

In some areas, water may be plentiful but is available intermittently, or it cannot be collected for later use since there are no adequate water storage facilities. In India, for instance, precipitation is concentrated in the four months of the monsoon season, during which only a few hours of rain provide over half the year's rainfall. In drought-prone northwestern China, 60 per cent of the limited annual precipitation occurs between July and September, which unfortunately is not when the water is most needed by crops.

An alternative to depending on precipitation is to turn to water from the ground. More than a quarter of the world's population relies on

groundwater for drinking supplies, yet aquifers are being depleted worldwide because natural recharge rates cannot keep pace with increased use. In many areas, including parts of China, the Indian subcontinent, Mexico, and Yemen, water tables are falling by as much as a meter each year.

Where water is not necessarily scarce, it may be of poor quality, contaminated by pollutants or salt. Globally, less than 10 per cent of total waste, including farm runoff, industrial pollution, and human waste, is treated before it enters rivers that are used for drinking, sanitation, irrigation, or industry. On each continent, groundwater is threatened by contamination from nitrates, pesticides, petrochemicals, arsenic, chlorinated solvents, radioactive wastes, fluoride, or saltwater intrusion, or by a combination of these.

Even in places where fresh water may be plentiful, poverty often precludes access to it. It is hardly a coincidence that the 1.1 billion who are without access to water supplies correspond closely to the 1.2 billion in extreme poverty who live on less than \$1 a day. The poor who are cut off from municipal services are forced to collect water from unsafe sources, such as unprotected wells, springs, and drainage ditches, or to purchase water from independent vendors. Such supplies are exempt from quality controls and of indeterminate origin, oftentimes coming from local polluted rivers, yet their price is high.

Where connection to a water supply is provided, water service may be confined to specific times of the day, depending on supply. In many countries, the poor in outlying urban areas suffer from frequent service disruptions, as 30—50 per cent of water supplies is lost to leaking pipes, overflowing service reservoirs, faulty equipment, or poorly maintained distribution systems.

In order to increase water availability and provide improved service around the world, the World Water Council, an international water policy research group, estimates that total global investment in water services must more than double.

Unfortunately, as water stress becomes increasingly common, fast-growing populations hungry for food and eager for development will elevate demands on water, both for basic needs and for agriculture and industry. Competition between urban and rural dwellers is likely to increase as cities grow in size and density, worsening hydrological poverty in the countryside. These pressures will make it even more difficult for the marginalized poor to pay higher prices for access to this scarce and vital resource.

## 1.2. OIL SPILLS DECLINE

Oil pollutes water. Some of it comes from accidents, some from deliberate washing of tanks at sea and some from industrial effluents. Oil coats the feathers of sea birds and the scales of fish. It kills tiny plants

and animals in the deeper layers of the ocean. Oil also has a less visible toxic effect: it reduces the level of oxygen dissolved in the water. Without dissolved oxygen, the sea cannot support life.

The amount of oil spilled accidentally in 2000 from tankers, pipelines, wells, storage facilities, and other sources was estimated at 48,600 tons worldwide. This was the lowest recorded since 1968. The largest amount, some 1.5 million tons, was spilled in 1979. Since 1990, there has been an almost continuous reduction in the quantity of oil spilled.

These figures do not include spills that are the result of warfare or sabotage, however. Historically, three of the top five spill incidents are the result of acts of war. In 1991, Iraqi troops deliberately released some 840,000 tons of oil from Kuwaiti facilities into the Persian Gulf, causing the largest marine oil spill in history. And in 2000, reports of sabotage by Chechen rebels indicated that 2 million tons of oil had leaked from wells and refineries near Grozny. If confirmed, this would be the largest spill ever.

Oil tankers, barges, and other vessels account for about half the total amount of oil spilled. But greater use of double-hulled tankers and other safety measures have significantly reduced both the number of tanker accidents and the quantity of oil spilled.

Collisions and groundings are relatively rare, but can result in large, sometimes massive, spills. The infamous 1989 *Exxon Valdez* incident in Alaska ranks only as the forty-second worst tanker accident in terms of quantity of oil released, although it occurred in a particularly clean and ecologically vulnerable location.

Almost half of all pipeline spills are the result of aging equipment. Some pipelines are 30—50 years old; others are even older. Niger delta communities in Nigeria have suffered heavily from spills caused by corrosion of antiquated pipelines and by vandalism. Pipeline bursts have killed hundreds of people in recent years.

Sabotage is another cause of pipeline spills. In the last few years rebel groups have attacked pipelines in Algeria, Assam (India), Colombia, Ecuador, Sudan, Turkey, and Yemen.

Some well blowouts are among the biggest spills ever. For example, the Ixtoc exploratory well in the Gulf of Mexico spewed some 476,000 tons of oil, the largest non-war oil spill ever.

The quantity of oil spilled does not necessarily indicate the severity of the impact on the environment. Important factors include the type of oil spilled, weather and climate conditions, the extent to which the oil is recovered or at least contained, how quickly the oil biodegrades and how much of it evaporates, and the proximity to wildlife habitats or environmentally sensitive areas.

Even though much of the oil released by the *Exxon Valdez* in 1989 evaporated or dispersed, for instance, the accident had disastrous results. It killed an estimated 3,500—5,500 sea otters (10—15 per cent of the



region's total population) and some 300,000—675,000 seabirds. Most wildlife species still have not recovered.

In sensitive near-shore environments, the effects of an oil spill can be seen even decades later. Significant oil residues remain in local sediments can have a long-term impact on a coastal environment. Even after many years, concentrations of some compounds are similar to those observed immediately after the spill, and reflect the persistent nature of oil in coastal sediments, heavily contaminated by the brown, viscous oil. Fish, worms, crabs, mollusks, and other animals perish in great numbers, along with oil-smothered marsh grasses.

It is usually assumed that oil will be naturally dispersed within a few months or years. However, surveys detect oil in sediments providing strong evidence that this isn't always the case. An oil slick might disappear as far as visual sighting on the surface of the water, but petroleum hydrocarbons could still persist in sediments. Oil degraded very little over time. Bacteria and Mother Nature do not significantly weather oil and oil can last for a long time.

The reason for the oil's persistence in marsh sediments can be due to the lack of oxygen, which many oil-decomposing bacteria need to survive in these sensitive habitats. The findings confirm that deeply penetrated oil in oxygen depleted marsh soil persists for long times.

### 1.3. TOXIC WASTE

Some 300—500 million tons of hazardous waste is generated worldwide each year. This amounts to roughly 50—83 kilograms per person a year — and hazardous waste generation continues with no signs of slowing. Wastes are classified as hazardous if they exhibit one or more hazardous characteristics and appear on a list of waste streams or if they contain specified hazardous constituents, such as asbestos, heavy metals, and several other chemicals. Many industries create hazardous waste, including medical care, mining, petrochemicals, and pesticides and plastics manufacturing.

Today, about 10 per cent of all hazardous waste is moved across an international border, mostly among industrial nations. They create more than 80 per cent of the world's hazardous waste, including heavy metals, solvents, and toxic sludge. The primary exporters are Australia, Germany, the Netherlands, the United Kingdom, and the United States. Canada has recently become a dumping ground for toxic waste in North America, owing to its less restrictive regulations. Canada accepts much more hazardous waste from the United States than Mexico.

The governments want to reduce cross-border movements of hazardous wastes while minimizing their generation, to promote disposal close to site of origin, and to prohibit trade with countries that lack the capacity to manage wastes in an environmentally sound

manner. Waste shipments between developing countries are a growing concern. Illegal trade is also ongoing and difficult to stop.

In addition to the global ban on exports, many countries have passed national laws and joined to regional agreements to prohibit imports of hazardous wastes. Regional bans in Africa and Latin America, for example, now forbid importing asbestos, unregistered pesticides, and other hazardous products. As a result of these legal agreements, actual and attempted waste transfers between industrial and developing countries have declined significantly in recent years.

In 1998, an estimated 11 per cent of exported wastes was burned, landfilled, or otherwise disposed of — while the other 89 per cent was recycled. While this sounds like a preferable environmental option, many recycling and recovery operations are seen as a pretext for sending hazardous materials to countries for use in energy production, road building, construction, fertilizer manufacturing, and substandard and hazardous recycling operations. Such uses expose greater numbers of people to health risks and spread the contamination.

Another form of toxic transfer is the relocation of industries and technologies that generate hazardous materials from industrial to developing countries. For example, the global shipbreaking industry has recently shifted its focus from industrial countries to Asia. Shipbreaking involves dismantling vessels contaminated with explosive gases, asbestos, and other toxins. Most of the world's shipbreaking is now done by migrant workers in Asia, with little or no health protections.

People who live near toxic waste dumps have reported increased vulnerability to certain cancers, birth defects, and low birth weight. Babies whose mothers lived within three kilometers of a landfill were found to have a higher risk of birth defects than babies living three to seven kilometers away. One study concluded that living near a hazardous landfill poses the same risk of having a baby with low birth weight as smoking during pregnancy.

However, new hazardous waste continues to be produced at the rate of about a million tons per day and is transferred in many forms, largely unmonitored. Only by incorporating cleaner technologies and safer products can societies prevent the creation and use of hazardous materials and the growing waste crisis.

## 2. Lexical and grammatical exercises

2.1. Rearrange the letters in the anagrams to form equivalents for the Russian words.

нефтепровод — ppiineel  
скважина, колодец — llew  
беременность — cypgreann

водоносный горизонт — uiferaq  
бедственный, пагубный —  
ditroussas

житель, обитатель — **drllwee** катастрофа; авария — **idenacct**  
 перо — **rfathee** выпадение осадков — **tatppreonciiii**  
 источник — **psgrin** растворитель — **vesolnt**  
 войска — **sootrp** (жизненно) важный — **valit**  
 (нефтяная) пленка — **ksiel** болото, топь — **msarh**  
 обзор; исследование — **rvesuy** продолжаться, длиться — **aslt**  
 проникать внутрь — **npeeettra** отходы — **tewsa**

2.2. Match the words in A with the words in B to form word combinations. Give Russian equivalents.

- A. faulty; medical; leaking; hazardous; explosive; indeterminate; inadequate; dissolved  
 B. oxygen; pipe; sanitation; origin; waste; care; gas; equipment

2.3. Complete the words using their definitions.

**f \_ r \_ ili \_ e \_**: a substance added to soil in order to help plants grow  
**di \_ p \_ rse**: to (make things) spread in different directions over a wide area  
**d \_ m \_**: to dispose of something that you no longer want or need  
**in \_ er \_ itten \_**: happening sometimes but not regularly or often  
**di \_ er \_ ion**: a change in the use or purpose of something  
**c \_ nfi \_ m**: to prove that something is true  
**l \_ a \_**: to let liquid or gas come out through a hole or crack accidentally  
**p \_ o \_ imi \_ y**: how near sth is to another thing, esp. in distance or time  
**p \_ rs \_ st**: to continue to exist  
**s \_ rv \_ y**: an examination of something to see how good its condition is  
**l \_ n \_ f \_ ll**: a site where waste material has been buried  
**re \_ ov \_ r**: to stop being affected by an unpleasant experience  
**\_ oncl \_ de**: to decide that sth is true after looking at all the evidence you have  
**so \_ n \_**: safe or in good condition

2.4. Fill in the missing forms of the words.

| Noun        | Verb        | Noun        | Adjective |
|-------------|-------------|-------------|-----------|
|             | recover     | disaster    |           |
| resident    |             | severity    |           |
|             | marginalize |             | scarce    |
| assumption  |             | exploration |           |
|             | refine      |             | available |
| persistence |             | restriction |           |
|             | collide     |             | poor      |
| record      |             | explosion   |           |

2.5. Match the words close in meaning in A and B.

- 1) A. elevate; purchase; confine; coat; host; vend; perish; promote; assume; prohibit  
 B. restrict; sell; raise; buy; encourage; die; cover; accommodate; forbid; suppose  
 2) A. manner; dweller; extent; option; scarcity; landfill; effluent; burst; alternative; incident  
 B. size; dumping ground; way; choice; explosion; substitute; event; resident; lack; sewage  
 3) A. plentiful; inadequate; vital; outlying; intermittent; disastrous; impoverished; eager; deliberate  
 B. tragic; occasional; remote; scarce; intentional; poor; abundant; keen; essential

2.6. Choose a word from the list below to fit the word combinations in each line. For example: *deplete* fits line 1.

*deplete; confine; prone; alternative; promote; extent; current; predict; treaty; need; access*

1. ~ supplies; ~ aquifers; ~ the ozone layer; oxygen ~d soil  
 2. ~ faultlessly; ~ the future; ~ phenomena; ~ water scarcity  
 3. (un)limited ~; without ~; direct ~; ~ to water supply  
 4. to meet the ~; the ~ for; basic ~s; increasing ~  
 5. ~ events; ~ severity; ~ly; ~ development  
 6. a cleaner ~; an ~ to sth; suggest an ~; ~ sources of energy  
 7. drought ~; injury ~; error ~; ~ to earthquakes  
 8. virtually ~ed; ~ed mostly to; ~ to the USA; ~ to specific time  
 9. to a certain ~; to some ~; to a less ~; to a great ~  
 10. ~ development; ~ awareness; ~ actively; deliberately ~d  
 11. international ~; to sign a ~; to adopt a ~; ~ resolving a dispute

2.7. Match the words in A with their opposites in B.

- A. confirm; intermittent; deliberate; proximity; faulty; plentiful; exhibit; deplete; perish; moderate  
 B. perfect; remoteness; deny; sparse; persistent; enrich; survive; excessive; accidental; hide

2.8. Choose the correct word.

1. Water is not (**necessarily** / **necessary**) scarce.  
 2. Less than 10 per cent of total waste (**are** / **is**) treated before it enters rivers.  
 3. 99 per cent of threatened birds (**are** / **is**) at risk.  
 4. Much of the oil is (**disposed** / **dispersed**) or evaporated.  
 5. The (**poor** / **poors**) are cut off from municipal services.



6. Societies can prevent the growing waste (**crisis / crises**).
7. The deltas host dozens of biologically (**reach / rich**) marshes and wetlands.
8. Countries didn't manage wastes in an environmentally (**noise / sound**) manner.

### 3. Translation into Russian

#### THE ARAL SEA: A HUMAN-INDUCED ENVIRONMENTAL AND HUMANITARIAN DISASTER

The destruction of the Aral Sea ecosystem has been sudden and severe. Beginning in the 1960s, agricultural demands deprived this large Central Asian salt lake of enough water to sustain itself, and it has shrunk rapidly. Uzbekistan, Kazakhstan, and other Central Asian states used this water to grow cotton and other export crops, in the face of widespread environmental consequences, including fisheries loss, water and soil contamination, and dangerous levels of polluted airborne sediments.

The Aral Sea is one of the greatest environmental catastrophes ever recorded. Humans have made use of the waters of the Aral basin for thousands of years, borrowing from its two major rivers: the Amu Darya, which flows into the Aral Sea from the south; and the Syr Darya, which reaches the sea at its north end. The Kara Kum Canal opened in 1956, diverting large amounts of water from the Amu Darya into the desert of Turkmenistan, and millions of hectares of land came under irrigation after 1960. While the sea had been receiving about 50 km<sup>3</sup> of water per year in 1965, by the early 1980s this had fallen to zero. As the Aral shrank, its salinity increased, and by the early 1980s commercially useful fish had been eliminated, shutting down an industry that had employed 60,000.

The declining sea level lowered the water table in the region, destroying many oases near its shores. Over-irrigation caused salinization in many agricultural areas. By the beginning of the 1990s, the surface area of the Aral had shrunk by nearly half, and its volume was down by 75 per cent. Winds picked up sediments laced with salts and pesticides, with devastating health consequences for surrounding regions.

The destruction of the Aral Sea is now a well-known example of unsustainable development. Atlases used to describe the sea as the world's fourth largest lake, with an area of 66,000 km<sup>2</sup> and a volume of more than 1,000 km<sup>3</sup>. Its waters supplied local fisheries with annual catches of 40,000 tons, while the deltas of its tributaries hosted dozens of smaller lakes and biologically rich marshes and wetlands.

In the 1960s, planners in the former Soviet Union assigned Central Asia the role of supplier of raw cotton. Irrigation was imperative, and the Aral Sea and its tributaries seemed a limitless source of water. Irrigated

land was expanded from about 4.5 million ha in 1960 to almost 7 million ha in 1980. The local population also grew rapidly, from 14 million to about 27 million in the same period, while total water withdrawal almost doubled to an annual 120 km<sup>3</sup>, more than 90 per cent of it for agriculture. The result was the collapse of the prevailing water balance in the basin.

Waterlogging and salinization eventually affected about 40 per cent of irrigated land. Overuse of pesticides and fertilizer polluted surface water and groundwater, and the delta ecosystems simply perished: by 1990, more than 95 per cent of the marshes and wetlands had given way to sand deserts, and more than 50 delta lakes had dried up.

The surface of the Aral Sea shrank by one-half and its volume by three-quarters. The mineral content of the water has increased fourfold, preventing the survival of most of the sea's fish and wildlife. Commercial fishing ended in 1982. Former seashore villages and towns are now 70 km from the present shoreline.

Communities face appalling health problems. In Karakalpakstan, Uzbekistan, drinking water is saline and polluted, with a high content of metals that causes a range of diseases. Over the past 15 years, there has been a 3,000 per cent increase in chronic bronchitis and in kidney and liver diseases, especially cancer, while arthritic diseases have increased 6,000 per cent. The infant mortality rate is one of the world's highest.

Five newly independent Central Asian states have now established a joint commission for water coordination. Several international organizations and bilateral agencies are providing assistance, and an International Fund for the Aral Sea and the Interstate Council for the Aral Sea Problem have been set up to coordinate initiatives.

The Central Asian republics have decided to focus on demand management, aiming to reduce water withdrawal by raising irrigation efficiency. The primary objective is to satisfy crop water requirements. Total water withdrawal in the basin has now stabilized at 110–120 km<sup>3</sup> a year but environmental degradation continues.

### 4. Complementary activities

#### Develop your skills: summarizing information.

As you read, it is not important to remember every word: your mind identifies the main ideas. It then notes the supporting details. In short, your mind summarizes the information presented. You should follow the same steps in writing a summary. A summary highlights the main points about a certain topic. Minor points are usually excluded because the purpose of a summary is to bring out main points.

Follow these guidelines in writing summaries:

1. **Identify main ideas.** As you read material to be summarized, note the main ideas. Also note all important supporting evidence.

2. **Use your own words.** Restate the main ideas in your own words. Using your own words helps you understand the main ideas. (If you have trouble stating the ideas in your own words, reread the material until you feel you understand and can restate it.)

3. **Recognize relationships.** Think in broad terms. Write a list of the main ideas. Look for main ideas that are related and state that relationship as a broad topic. Link all the main ideas to broader topics. Identify a general idea that links all the main ideas and use this idea as your first sentence.

In the following text key sentences have been underlined. Read the extract as a whole. Then reread only the underlined sentences.

Before the development of farming many early people were nomads always on the move hunting game and gathering food that grew wild. These hunters and gatherers were at the mercy of nature. If their numbers became too large, or if the animals that they hunted and the wild foods that they gathered were in short supply, some starved. Once the food supply in one place was used up, the group had to move on or go hungry.

About 10,000 years ago, in the Middle East, India, Southeast Asia, and China, people discovered that they could raise their own food by planting and cultivating the foods that they had previously gathered. As their knowledge of agriculture — the art and science of farming — increased, people found that they could grow enough food to meet their needs. No longer were they forced to search for food. This meant that they could build permanent settlements. Over hundreds of years these settlements developed into cities.

Read the following paragraph. It is a summary of the extract. In it the underlined sentences have been restated.

Before the development of farming early people constantly had to search for food. They moved whenever food sources got too low. About 10,000 years ago people discovered that they could control their food supplies by planting and cultivating plants. Because they no longer had to move in search of food, they could build permanent settlements.

## 5. Writing

Render the following texts in English.

### ЭКОЛОГИ ПРОТИВ КОМПЬЮТЕРОВ

Экологи из Университета ООН убеждены, что мировому сообществу следует немедленно предпринять экстренные меры по предотвращению вредного воздействия производства компьюте-

ров на окружающую среду. По их данным, производство одного компьютера в среднем требует в 10 раз больше материалов и топлива для получения энергии, чем весит он сам. Так, чтобы произвести 24-килограммовый компьютер с монитором, необходимо 240 кг топлива и около 22 кг химикатов. К этому следует прибавить 1,5 т воды, используемой в производственном процессе.

При этом, как утверждают экологи, многие из используемых химикатов крайне токсичны. Кроме того, при производстве компьютеров образуется много отходов. По данным экологов, токсичные отходы чаще всего попросту закапывают на свалках или, в крайнем случае, перерабатывают на плохо оборудованных предприятиях в развивающихся странах. По мнению ученых, необходимо разработать меры, которые вынудили бы компании модернизировать процесс производства компьютеров и улучшить технологии переработки отходов.

### ЭНЕРГИЯ ИЗ МУСОРА

Специалисты Тайваня разработали экологически чистый и даже прибыльный способ утилизации бытовых отходов. Там введена в эксплуатацию первая электростанция, работающая на газе, который выделяется при гниении отходов на мусорных свалках. Этот проект поможет густонаселенному острову решить одним махом две проблемы: ликвидировать дефицит электроэнергии и избавиться от избытка мусора. Эта уникальная электростанция сможет работать на отведенном ей мусорном котловане около 10 лет, снабжая электроэнергией семь тысяч домов.

### ПРОБЛЕМА АРАЛЬСКОГО МОРЯ

Избыток воды может превратиться в серьезную проблему. В засушливых районах СССР — прежде всего в Средней Азии — начиная с 30-х годов велись ирригационные работы невиданного масштаба. Длина построенного в 1950—70-х годах Каракумского канала — около 1100 км, а общая сеть каналов в одной только Марыйской области Туркменистана превышала 6 тыс км.

Цифры поражали воображение, но при этом на поля Средней Азии выливали столько воды, что в конце концов большие реки региона — Сырдарья и Амударья — перестали достигать Аральского моря. И оно умерло. В открытых оросительных каналах огромное количество влаги испарялось, а растворенные в ней минеральные соли оставались в почве. Так же бесхозяйственно использовались и артезианские ресурсы: засоление наступало даже быстрее, так как в подземных водах содержание минеральных веществ обычно выше.



Орошаемые земли превращались в мертвые солончаки, на которых уже ничего не росло. Засоленные почвы бросали, переходя на новые, а когда порча земель приняла угрожающие размеры, был придуман проект «поворота» сибирских рек в Азию... К счастью, он не осуществился. Все это только оттягивало окончательный крах региона и одновременно увеличивало масштабы будущей катастрофы.

Между тем, примерно в те же годы создавалось сельское хозяйство Израиля. Водные ресурсы этой пустынной страны чрезвычайно ограничены. Но там разработали свою систему поливного земледелия: малые объемы, никаких открытых каналов, строго дозированный адресный полив. Вода идет не потоком на поле, а каплями — под корни каждого растения. И подача ее дозируется компьютером. Израильтяне создали высокоурожайное земледелие — образец для засушливых районов всего мира.

## 6. Speaking

### 6.1. Retell the following text in English.

#### BIRDS TRYING TO FLY SOUTH FACE MANY ROADBLOCKS

One of the oldest examples of globalization does not involve airplanes, the Internet, or trade agreements. Every year, shorebirds of the Asia-Pacific traverse the eastern hemisphere in a long odyssey that lands them in regions as far as Australia and Siberia. They take flight when winter arrives in their northern nesting grounds in search of the worms and warmth of the south, and return during the brief summer season to raise their young.

However, modern globalization — specifically the spread of human populations and industry — is clashing with the more ancient version, putting this miraculous journey in jeopardy. Many of the estuaries, tidal mudflats, and swamps where the birds stop to refuel along their way have been reclaimed for human use. Without these stopping grounds many of the birds lack the strength to complete their journey or to reproduce if they manage to arrive at their nesting grounds. Environmentalists are pressuring governments to protect these areas, but fear that such efforts may be too little, too late, for the shorebirds.

Each year, more than two million migratory shorebirds fly to Australia and New Zealand to escape the winter that turns their breeding grounds in the northern hemisphere into a frozen wasteland. They spend their time in the South Pacific feeding on shellfish and worms along the seacoasts and wetlands and then return to the northern nesting grounds

to rear the young when insects become abundant during the short summer season.

The shorebirds travel along flight paths that ornithologists call the East Asian-Australasian Flyway. They use routes similar to those of passenger and freight jets but, of course, fly much slower than jets and at lower altitudes of between 3,000 and 8,000 meters. The flyway covers 20 countries in East Asia and the Pacific, extending from northern China, Mongolia, Siberia, and Alaska, where the birds nest, to Australia, New Zealand, and their offshore islands. Scientists estimate that the zone encompassed by this flyway supports over seven million shorebirds, of which some five million are migratory.

Yet just as modern jetliners depend on well-equipped airports to refuel and replenish, birds, too, need landing areas where they can feed and recover before continuing their journey. The birds use their stored fat as fuel. They renew their fat layer by feeding for two or three weeks. Indeed, officials and experts in the Asia-Pacific region say that the single greatest threat to the shorebirds is the loss or damage of these sites.

Reclamation of wetlands disrupts bird life patterns along East Asian-Australasian Flyway. East Asia contains nearly half the world's population and many of its fastest growing economies. Amidst this rapid development, a lot of the estuaries, tidal mudflats, foreshores, and mangrove swamps used by itinerant shorebirds are being reclaimed for human use, mainly for homes, industry, agriculture and aquaculture. For example, although Singapore nearly a decade ago preserved 87 hectares of mangrove swamps for migrating shorebirds at the Sungei Buloh Wetlands Reserve, the government's Urban Redevelopment earlier this year gave notice that two nearby swamps used by the birds were to be redeveloped, probably as reservoirs. Economic globalization is taking its toll on birdlife.

The Yellow Sea, bordered by China and Korea, is a particularly vital staging area for shorebirds. Although there are seemingly countless shorebirds in the Yellow Sea, their habitat is under serious threat. Unfortunately for the shorebirds, the wetlands they use around the Yellow Sea are very much reduced in area and are continuing to be significantly threatened by ongoing reclamation, pollution, human disturbance and the insidious effects of reduced river flows. East Asia as a whole, over half the significant wetlands are under serious threat of development, researchers say.

In 1971 the international Convention on Wetlands was signed to protect freshwater ecosystems and coastal and marine wetlands. Wetlands are crucial not just for birdlife but for flood control, water purification and food supply. Yet half the world's wetlands have been drained, filled and converted to other uses.

At least 128 bird species have vanished over the past 500 years, due mainly to habitat loss as human population mushroomed and industries, cities and international commerce ate into wilderness areas. Migratory

shorebirds face many natural perils, among them storms, predators and food shortages. Habitat loss heightens such dangers and causes new ones. For example, tagging by scientists in Australia has indicated that in some conditions, including poor food supply, shorebirds heading north to breed turn back and instead return to their wintering grounds, missing a nesting cycle. Birds that do reach their breeding grounds in the northern hemisphere must be well-fed and in good condition to breed successfully.

6.2. Find material and give a talk about concrete examples of human impact on the environment and ecological disasters.

## 7. Summarizing the Unit

Make a summary of the Unit and render its content in a 4—6 min talk.

# UNIT 22

## HUMAN-ENVIRONMENTAL INTERACTION

### 1. Reading and learning

Scan each text and formulate the main ideas. Make up 5 questions. Read the text again carefully and memorize it, then retell the text close to the original using the main ideas as a plan.

#### 1.1. RENEWABLE ENERGY

The world's most important energy sources are fossil fuels — coal, oil, and natural gas. These energy sources are non-renewable: oil, coal, natural gas — all have limits. But some renewable energy sources are well-known and already in wide use. The World Energy Council has identified six sources of energy to pursue as alternatives to non-renewable fossil fuels: solar (energy from the sun's rays), wind (energy from moving air), geothermal (energy from heat inside the earth), modern biomass (energy from plant and animal residue), ocean (energy from seawater movement and temperature changes), small hydroelectric (energy from small dams, such as those filled by melting snow).

It is worth pointing out why large hydroelectric (large dams that block rivers) and traditional biomass (firewood and charcoal) were excluded from the Council's focus. These two renewable sources of

energy often caused environmental problems and other adverse effects. Large hydroelectric projects usually require long planning and construction which delays their benefit, and sometimes results in social problems, such as displacement of people living near rivers that are dammed. Traditional biomass (burning trees) results in air pollution and deforestation. A combination of these six other alternative sources of energy is our best hope as supplies of fossil fuels gradually diminish.

**Solar.** Almost all energy comes from the sun. The energy stored in coal, oil, and natural gas is the result of photosynthesis carried out by plants that lived hundreds of millions of years ago. Wind energy is actually the movement of the atmosphere driven by the heat from the sun. Currently solar energy is used in two ways: for heating and generating electricity. Solar rays can be directly thermal in two ways: actively as can be seen in the thousands of rooftop water heaters throughout Italy and Greece, and passively with proper design of homes and buildings. For all its advantages, however, solar power remains the least used of the main alternative energy sources. A serious limitation for widespread use is that solar energy is an intermittent energy source — it goes away at night and is blocked on cloudy days.

**Modern biomass.** It simply means fuel produced from organic sources. Traditional biomass includes wood, charcoal, and other plant matter. Modern biomass, however, includes other types of fuel derived from plants, such as the residues of existing agricultural, livestock, and lumber industries, from forests planted and harvested renewably, and from farms dedicated to this purpose.

Biomass needs to be produced on a sustainable basis, whether on deforested lands or on excess agricultural land, and never from virgin forests. Some of the most suitable locations are areas where widespread deforestation has already occurred, but there are still other possible sources of biomass. For example, residues from the processing of pulpwood, cereals, and logging operations can be processed into gas or burned in power plants to generate electricity. Methane from urban landfills and from animal and human wastes is another potential type of fuel derived from biomass.

As an alternative to non-renewable energy sources, modern biomass may have the greatest potential for growth, especially in transportation and powering vehicles. For example, Brazil has been a leading nation in the use of ethanol (alcohol-based fuel) for automobiles. It is derived from sugar cane and grains grown specifically to produce ethanol.

**Ocean.** The sea could provide an abundant supply of renewable energy, but the large engineering challenges and negative effects on the ecology of coastal areas have limited its use. Thermal gradients, or currents caused by varying temperatures in the water, have the greatest potential as a source of renewable energy, especially in tropical areas. Large heat exchangers are required to capture the energy of thermal gradients. Tidal energy has the widest present application, because it



uses dams and turbines similar to those now in use for hydroelectric power plants. The constant movement of the waves is the third possible form of energy from the ocean. Ocean energy has vast promise for but will need much effort to overcome the negative environmental impact on bays, marshes, beaches, and marine animals.

**Wind power.** Its rapid growth continues, encouraged by falling costs and concern about climate change, wind remains the fastest-growing energy source. Today, wind provides enough electricity to meet the residential electricity needs of 35 million people worldwide.

Europe has nearly 73 per cent of global wind capacity — thanks to strong policies driving demand for renewable energy, particularly in Germany, Spain and Denmark. 38 per cent of the world's wind capacity is found in Germany. The government plans to reduce greenhouse emissions 40 per cent by 2020.

Spain ranks the second, and Denmark, a nation of just 5 million people, the third. Its wind capacity is enough to generate 21 per cent of the country's electricity. Much of this new capacity is operating offshore. Denmark has installed the world's largest offshore wind farm.

The United Kingdom, the fourth, despite having the best wind resources in Europe, continues to experience slow growth. Then come Italy, The Netherlands and three new markets — Norway, Poland, and Latvia.

Beyond Europe and the United States, the most significant growth was in Asia with India ranking the fifth in the world. Future growth in Japan and China is expected to be rapid, as even offshore wind is now cost-competitive with many conventional energy options.

## 1.2. TRAFFIC AND POLLUTION

Advances in transportation technology have brought benefits, but growing vehicle fleets and increasing fuel use have also created problems. Local problems include noise, accidents, smog, traffic congestion, urban sprawl, loss of forests and farms, and loss of wildlife habitat; globally, the transportation sector is the fastest-growing source of the carbon emissions.

But governments could choose to go in a different direction, to create transportation systems that give people more choice with less damage to the environment. This would require an effort to build and revitalize railway and transit systems and to steer new development to locations easily reached by a variety of transportation means — not only car, but also bicycle, bus, and rail. Yet cars, trucks, and planes are moving more people and goods, while rails, bicycles, and other less environmentally damaging transport modes are declining. Increasing incomes, sprawling cities, and globalizing companies, among other factors, are sustaining these shifts.

Many factors are contributing to the growth in road and air travel. As people get richer, they often buy motor vehicles. Rising incomes have also supported air travel. Bikes are much cheaper than motor vehicles and are well-suited to short trips, but pollution, unsafe roads, and a lack of safe bike parking often keep cyclists off the road.

Motor vehicles also contribute to local and regional air pollution. Toxic ingredients in motorcycle and car fumes include carbon monoxide, sulfur dioxide, nitrogen oxides, fine particles, and sometimes lead. Nitrogen and sulfur that travel beyond urban areas acidify lakes, forests, and farms. Emissions from many vehicles are harder to reduce than emissions from relatively few stationary sources. As a result, acid rain eats away at forests.

Roads also cause profound changes in ecosystems. A great deal of land is lost to roads. Plants and animals are killed during road construction, as well as by vehicles. And roads promote the dispersal of species that are not native to a given area, alter the physical and chemical environment, block wildlife corridors, and divide populations of various species into smaller, less stable subpopulations. Noise is perceived by many urban residents as one of the greatest problems associated with road traffic. It contributes to stress disturbances, cardiovascular disease, and hearing loss.

The single largest contributor to the costs of transportation born by society in many countries is illnesses and deaths from air pollution. One challenge, therefore, is to tackle immediate health threats from the most polluting vehicles. Cleaner fuels and engines can reduce local air pollution.

Whereas some technical solutions allow the combustion engine to release less pollution when it burns petroleum or diesel fuel, another set of solutions replaces the fuel or the engine with a cleaner alternative. London has begun converting taxis from diesel fuel to cleaner liquefied petroleum gas. Toyota and Honda offer vehicles with very low emissions powered by a small internal combustion engine combined with an electric motor. DaimlerChrysler, Toyota, Honda, and General Motors are planning to make fuel-cell public buses.

To meet the target of environmentally and socially "sustainable" transportation system, societies will have to not only shift to cleaner motor vehicles but also work to diversify transportation choices. With a diversity of transportation alternatives at varying speeds and volumes, people could choose the best option for a given purpose.

Today transportation planners increasingly recognize that building more roads does not necessarily solve traffic problems. Adding highway capacity to solve traffic congestion is like buying larger pants to deal with your weight problem: new roads attract more cars. Measures to diversify transportation options include regulations to limit car traffic; price incentives to reduce motor vehicle use and boost alternatives; changes in urban design that enhance cycling, walking, and public transit.

Some European cities explicitly ban private cars from central areas. Munich, Vienna, and Copenhagen, for instance, boast popular commercial centers that restrict motor vehicle traffic to ambulances, delivery trucks, and cars owned by local residents.

For a car ban to work, however, there must be other effective means of transportation, such as public transit or cycling networks. A well-known example of a policy failure is Mexico City's anti-pollution scheme where cars with odd-numbered license plates were allowed in on some days and even-numbered on others. Without viable transportation choices, many residents just bought an extra car — often an old, cheap, and highly polluting one. Thus a policy aimed at reducing pollution ended up worsening the problem. To avoid a similar result, the mayor of Bogota is proposing a long-term program that would develop the city's bus service and build a subway and bicycle paths so that people could realistically restrict their private car use for three hours in the morning and three hours in the afternoon.

### 1.3. ECOLABELING GAINS GROUND

As the demand for environmentally friendly products grows, manufacturers, governments, and nongovernmental groups have expressed rising interest in "ecolabeling." Ecolabels are seals or logos used to indicate that a product has met a specified set of environmental or social standards.

Although ecolabeling schemes vary widely, they typically reward a product for its environmental soundness during one or more stages of its life cycle, including production, packaging, use, or disposal. Some programs focus on a single product: the Mexico-based Forest Stewardship Council, for instance, grants its seal to wood products that have met certain social and environmental standards during harvesting, manufacturing, and distribution. In contrast, the U.S.-based Green Seal program evaluates and certifies a wide range of products, including paints, engine oil, and air conditioners. Worldwide, ecolabels can now be found on everything from organic foods to tourism destinations.

The first national scheme, Germany's Blue Angel, was launched in 1978 and now awards its seal to some 3,900 products and services — from batteries to car washes. Currently, at least 24 countries have national ecolabeling program. The Nordic Swan certifies more than 3,000 different products in Europe's Nordic countries, and the European Union's Flower Eco-label has been applied to 400 products.

Ecolabeling schemes serve a dual purpose. They can help encourage the design, production, marketing, and use of more environmentally sound products and services. But they also provide consumers with valuable information about the range of preferable products, helping

them to make more informed purchasing choices. Now more often consumers prefer products because they are environmentally safe or biodegradable.

For many product areas, however, several competing ecolabels now exist, creating the potential for consumer confusion. For instance, more than 100 schemes reward environmentally or socially responsible tourism. One way to resolve this problem is to develop a universal labeling standard for a specific industry or product, though this is generally a challenge.

Ecolabeling faces economic challenges as well. Many certification schemes charge a fee for evaluation, which may be too high for smaller companies or producers and can limit expansion of the market. Companies may also pass the costs of certification on to consumers, boosting the prices of ecolabeled products. And there is concern that programs that rely on self-certifying may simply allow companies to "buy" their way to a green label.

Consumers also need to distinguish genuine ecolabels from more general claims manufacturers make about the environmental soundness of their products. Many of these claims — such as "dolphin-safe", "antibioticfree", "biodegradable", or "elemental chlorinefree" — may be accurate, but they are not always independently verified. At times, the labels can be highly ambiguous and may only confuse consumers, as with products that claim to be "environmentally friendly" or "Earth smart".

Moreover, just because a product carries an ecolabel does not mean it is necessarily the most environmentally sound option. In some cases, reusing or doing without may be environmentally preferable to buying a labeled product — reusing a cloth towel instead of buying recycled paper towels, for instance. Ecolabels can also be relatively narrow in scope, focusing only on one specific attribute: a label may reward a product for its energy efficiency, but hide the fact that it also contains toxic materials.

Ultimately, the success of ecolabeling will depend on whether trusted, reliable standards can be set and on the degree to which the industry and consumers embrace it worldwide.

## 2. Lexical and grammatical exercises

2.1. Rearrange the letters in the anagrams to form equivalents for the Russian words.

|                            |                                   |
|----------------------------|-----------------------------------|
| явный — <b>xcpliite</b>    | нечетный; странный — <b>dod</b>   |
| доставка — <b>ydeerliv</b> | четный; ровный — <b>veen</b>      |
| печать — <b>esal</b>       | зерновые культуры — <b>rceaal</b> |
| тростник — <b>anec</b>     | воспринимать — <b>prceeevi</b>    |



обещание — **spmiro** (воз)награждать — **ewarrd**  
 двигатель — **gienne** заявление, утверждение — **aiclm**  
 зерно — **naigr** назначать, запрашивать цену — **crgeha**  
 свинец — **adle** “скорая помощь” — **mncbulaae**  
 дым; газ — **umfe** возобновляемый — **nrleeewab**  
 мэр — **arymo** подлинный; неподдельный — **geinnue**  
 доверять — **ustrt** неоднозначный; двусмысленный — **aiguumbos**

2.2. Match the words in A with the words in B to form word combinations. Give Russian equivalents.

- A. adverse; traffic; liquefied; health; virgin; combustion; thermal; unsafe  
 B. road; gradient; forest; engine; gas; effect; congestion; threat

2.3. Match each of the following words with the correct definition:

*advantage; claim; vehicle; steer; confuse; capacity; tackle; verify; fleet; carry out; sprawl*

- the maximum amount that can be held or taken in
- a means of land transport
- to try to cope with something that requires effort
- to check or prove that something is true or correct
- to make someone feel that they do not understand something
- to say that something is true, even though there is no definite proof
- to do a particular piece of work, research, etc.
- sth that makes a person or thing more likely to succeed than others
- to extend in a disordered, awkward, or ugly way
- to control the direction in which a vehicle moves
- a number of road vehicles, boats, or aircraft as a unit

2.4. Fill in the missing forms of the words.

| Noun        | Verb     | Noun      | Verb     |
|-------------|----------|-----------|----------|
| sprawl      |          |           | fail     |
|             | perceive | liquid    |          |
|             | dissolve |           | disperse |
| certificate |          | diversity |          |
|             | apply    |           | deliver  |

2.5. Match the words close in meaning in A and B.

- 1) A. derive; point out; pursue; diminish; steer; trust; grant; perceive  
 B. decrease; aim for; understand; direct; rely; indicate; award; come from

- 2) A. residue; target; scope; option; capacity; confusion; congestion; seal; lumber (AmE)  
 B. stamp; jam; choice; mistake; objective; volume; range; timber; remains  
 3) A. conventional; immediate; explicit; sound; genuine; adverse  
 B. harmful; direct; clear; safe; real; traditional

2.6. Choose a word from the list below to fit the word combinations in each line. For example: *harvest* fits line 1.

*harvest; scope; express; capacity; gain; vast; decline; tackle; growth; drive; purpose; emission; overcome; capture; apply*

- to ~ crops; to ~ timber; the potato ~; a rich / poor ~
- ~ for a job; ~ properly; ~ to all members; ~ theory to practice
- at full ~; wind ~; highway ~; ~ of 25,000 litres
- ~ explicitly; ~ an opinion; ~ oneself; ~ increasing interest
- carbon ~; greenhouse ~; aircraft ~; low ~
- dual ~; to achieve a ~; for practical ~s; on ~
- ~ a problem; ~ a threat; ~ crucial issues; ~ successfully
- ~ steadily; ~ sharply; ~ dramatically; ~ in value
- ~ quantity; ~ expanse; in ~ numbers; ~ promise
- ~ a difficulty; ~ an obstacle; ~ a problem; ~ fears
- significant ~; population ~; rapid ~; ~ rate
- ~ ground; an immediate ~; ~ of 3.6 billion; a ~ in productivity
- ~ birds; ~ an area; ~ energy; ~ people's attention
- within the ~; narrow in ~; to be limited in ~; beyond the ~ of sth
- a ~ing force; a ~ing demand; be ~n by ~ birds from their necessity; nests

2.7. Match the words in A with their opposites in B.

- A. delay; incentive; odd; ambiguous; single; conventional; profound; genuine; ill; narrow; tackle; verify; enhance; disperse  
 B. false; healthy; wide; accelerate; confine; discouragement; damage; even; explicit; deny; various; avoid; exotic; slight

2.8. Choose the correct word.

- Biomass is produced on (**excess** / **access**) agricultural land.
- Noise is (**received** / **perceived**) as one of the greatest problems.
- It contributes (**to** / **in**) stress disturbances.
- It is worth (**pointing** / **to point**) out why.
- This eco-label has been applied (**for** / **to**) 400 products.
- Roads divide populations (**in** / **into**) smaller, less stable subpopulations.
- Reusing may be preferable (**from** / **to**) buying a labeled product.

8. Commercial centers restrict motor vehicle traffic (to / with) ambulances and delivery trucks.
9. The demand (in / for) environmentally friendly products is growing.
10. The policy aimed (on / at) reducing pollution ended up worsening the problem.

### 3. Translation into Russian

#### BETTER TRANSPORTATION CHOICES

Privately run car-sharing or car-pooling networks, taking off rapidly in industrial nations, give people easy access to a car without the high costs of owning or renting. Members are more likely to use a car only for the trips where it has a significant advantage over other modes. In addition, they have access to a wide range of vehicles, so they can choose the best one for a given trip: a small car for city use, a larger car for a family vacation, or a truck for moving furniture.

In most car-sharing organizations, participants have access to a fleet of cars parked at designated spots around town, often in a subscriber's neighborhood or at a major transit hub. In Switzerland, two thirds of members have a car within a 10-minute walk of their home. Car sharers typically pay a refundable deposit, and sometimes a yearly membership fee. They are also charged by the hour and by the kilometer for usage; these charges typically cover gas, insurance, and maintenance.

Car-sharing experiments started in Switzerland, and then in Germany. These two nations now account for roughly 80 per cent of the world's subscribers. Yet car-sharing is too expensive to use as a sole means of transport. Still car-sharing is growing rapidly.

Car-sharing operates on the assumption that other transport needs — from daily commuting to trips to the corner market — are best met by other modes, such as mass transit, cycling, or walking. By using a mix of transportation, car sharers tap the automobile's assets while minimizing the expense, inconvenience, and extensive environmental toll of private ownership.

Owners of private cars have a strong economic incentive to drive rather than bus, cycle, or walk because of the heavy investment already made in their automobile and because the cost per trip of driving is relatively low. But when car-sharing replaces private ownership, this incentive disappears, and people pay more attention to their cost per trip. Ironically, people who become car sharers often use the shared cars less and less over time.

Car-sharing is a good example of using services, rather than goods, to meet people's economic needs. This trend toward services reduces environmental impact by making the economy less materials-intensive.

Indeed, each shared car is estimated to eliminate four cars — and all the rubber, metal, and glass that these represent — from the road.

Because car sharers drive less than most car owners do, this practice brings real social and environmental benefits to cities. People who give up their car when they join a car-sharing organization reduce car use by more than 70 per cent a year, easing congestion and pollution and using less fuel. And because shared cars are used more intensively than privately owned vehicles (which typically sit idle most of the time), sharing reduces the need for parking spaces.

Some European car-sharing agencies have begun to link car-sharing with other transportation options. Swiss Federal Railways and Mobility Car Sharing Switzerland introduced a combined season pass that allowed access to shared cars and to trains throughout the country. The future of car-sharing appears to be bright.

### 4. Complementary activities

#### Develop your skills: debating.

The most natural and effective way to practise talking freely in English is by thinking out some problem or situation together through verbal interchange of idea; or in simpler terms, to discuss. Debating is an important way of learning how to participate constructively and cooperatively in a discussion. Debating skills include listening to others, and speaking relevantly and clearly. You need to practise thinking up well-grounded points, giving original examples and generalizing from them, drawing analogies, judging priorities, inferring causes, bringing fresh evidence.

The issue of quarrying is about the conflict between jobs for local people and conservation.

Work out and note down all possible arguments in favour and against the proposal to extract limestone in the territory of the National Park quarrying. Include defences against points that might be brought up.

#### LIMESTONE QUARRYING: CONSERVATION OR JOBS?

Limestone is a valuable mineral. It is so valuable that it is quarried in some of the most beautiful landscapes in England which are supposedly protected as National Parks. There are eight limestone quarries in the Yorkshire Dales National Park and they are controversial. They destroy the landscape, are an eyesore (something ugly to look at), and generate a lot of noise, dust and lorry traffic. However, quarrying is often supported by local people because it creates much-needed jobs.

Briefly state your opinion and then explain why you hold it.



## 5. Writing

Render the following text in English.

### ПОНЯТИЕ УСТОЙЧИВОГО РАЗВИТИЯ

Английскому слову "sustainable" в выражении "sustainable development" («устойчивое развитие») нет точного эквивалента в русском языке. Программа ООН по окружающей среде (ЮНЕП) дает следующее определение: «Устойчивое развитие — это такое улучшение качества жизни людей, которое сохраняет потенциальную емкость экологических систем, обеспечивающих жизнь».

В соответствии с этим документом принципы устойчивого развития заключаются в следующем:

1. Воздействие человека на экосферу не должно превышать ее потенциальную емкость.

2. Сохранение возобновимых ресурсов включает в себя: а) сохранение основных процессов экосферы (гидрологического цикла, климатической системы, процессов почвообразования и др.); б) сохранение биологического разнообразия; в) использование возобновимых ресурсов в пределах их прироста.

3. Расходование невозобновимых ресурсов, не превышающее скорость создания их заменителей, с последующим прекращением использования невозобновимых ресурсов.

4. Внедрение более эффективных технологий в промышленности, сельском хозяйстве, энергетике и пр.

5. Совершенствование управления природопользованием включает в себя: а) развитие соответствующей системы законодательства; б) следование принципу «предвидеть и предотвращать», а не «реагировать и исправлять»; в) введение государственной экологической экспертизы, включающей оценку воздействия проектов на окружающую среду.

6. Развитие морально-этических факторов и принципов включает в себя: а) формирование этики устойчивого развития; б) совершенствование экологического образования.

Очевидно, что стратегия устойчивого развития несовершенна, но в то же время это наиболее реалистичное из того, чем располагает мир, и потому может рассматриваться на этом этапе как основа стратегии выживания.

Стратегии достижения экологической устойчивости должны быть различными для разных стран из-за разной приоритетности правил. Например, некоторые страны должны уделить больше внимания снижению численности населения (значительная часть развивающихся стран), для других стран важен баланс между величиной собираемого прироста возобновимых ресурсов и регенеративной способностью экосистем (страны-экспортеры леса,

рыбы, тропических сельскохозяйственных культур и пр.). Некоторые страны должны отдать приоритет борьбе с загрязнением среды (страны Центральной Европы и бывшего СССР), а богатые страны должны уделять основное внимание потреблению как ресурсов, так и систем жизнеобеспечения.

## 6. Speaking

6.1. Retell the following text in English.

### DANISH ENVIRONMENTAL AWARENESS

"Green City Denmark" is a national network of environmentally conscious public and private institutions and companies that join their resources and skills to find solutions to a wide range of environmental problems. Green City Denmark's network covers such areas as energy supply, waste management, green manufacturing, water, transport and agriculture. Throughout the year study groups from various industrial sectors and countries visit Green City Denmark, and delegates are sent all over the world to hold seminars and training programs. Conferences are organized and seminars in green management are arranged, all of which bring Denmark into focus as a leader in the field of environmental technology.

The bicycle has in some way become a status symbol, a statement of certain values and responsibilities. You can find top politicians and company directors cycling to work in their suits, battling against the cold eastern winds. And you can be sure that this will improve their image tremendously — far more than arriving in a newly polished BMW with an uncrumpled jacket lying neatly on the back seat. The strong cycling culture in Denmark is not just a result of flat land, short distances, nor of government efforts to fight pollution; the popularity of the bicycle is just the Danes' respect for the planet on which they live.

Another example of the Danes' dedication to a better environment can be seen in the design of the domestic terminal at Copenhagen Airport. From the landside, the domestic terminal has a length of 376 m and a height of 11 m, and its body acts as an effective buffer between the noise of the airport and the surrounding residential areas. These environmentally-friendly measures have favorable effects and have been greatly appreciated by people living near the airport.

Measures taken by the Danish government to protect the environment are greeted all over the world, though they are sometimes cursed by the Danes because of the taxes. It may be no wonder that cycling has become popular in a country that imposes a 150% tax on cars. However, even a brief comparison of people able to afford these prices shows that there is still a significantly lower level of car ownership

in Denmark. This environmental feeling is a great source of national pride. The Danes are proud that the European Environment Agency was chosen to locate anywhere but Denmark.

6.2. Talk about other environmentally friendly means of transport.

6.3. Organize a publicity campaign "A Healthy City".

## 7. Summarizing the Unit

Make a summary of the Unit and render its content in a 4—6 min talk.

## COUNTRIES

### EUROPE

1. Portugal
2. Spain
3. France
4. Switzerland
5. Italy
6. Slovenia
7. Croatia
8. Bosnia and Herzegovina
9. Serbia and Montenegro
10. FYRO Macedonia
11. Albania
12. Greece
13. Bulgaria
14. Romania
15. Moldova
16. Hungary
17. Austria
18. Czech Republic
19. Germany
20. Belgium
21. Netherlands
22. Great Britain
23. Ireland
24. Iceland
25. Norway
26. Denmark
27. Sweden
28. Finland
29. Estonia
30. Latvia
31. Lithuania
32. Poland
33. Belarus
34. Ukraine
35. Russia
36. Slovakia

### ASIA

1. Lebanon
2. Israel
3. Jordan
4. Syria

5. Kuwait
6. Iran
7. Saudi Arabia
8. Yemen
9. Oman
10. United Arab Emirates
11. Iran
12. Azerbaijan
13. Armenia
14. Turkey
15. Georgia
16. Russia
17. Kazakhstan
18. Turkmenistan
19. Uzbekistan
20. Kyrgyzstan
21. Tajikistan
22. Afghanistan
23. Pakistan
24. India
25. Sri Lanka
26. Nepal
27. Bhutan
28. Bangladesh
29. Burma
30. Thailand
31. Cambodia
32. Vietnam
33. Laos
34. China
35. Mongolia
36. North Korea
37. South Korea
38. Japan
39. Taiwan
40. Philippines
41. Indonesia
42. Malaysia
43. Indonesia
44. Brunei
45. Singapore

### NORTH AMERICA

1. Greenland (Denmark)

2. Canada
3. United States
4. Mexico
5. Guatemala
6. Belize
7. Honduras
8. El Salvador
9. Nicaragua
10. Costa Rica
11. Panama
12. Cuba
13. Jamaica
14. Haiti
15. Dominican Republic
16. Bahamas

### SOUTH AMERICA

1. Colombia
2. Venezuela
3. Guyana
4. Suriname
5. French Guiana
6. Brazil
7. Uruguay
8. Paraguay
9. Argentina
10. Chile
11. Bolivia
12. Peru
13. Ecuador

### AFRICA

1. Morocco
2. Western Sahara
3. Mauritania
4. Senegal
5. The Gambia
6. Guinea
7. Sierra Leone
8. Liberia
9. Côte d'Ivoire
10. Ghana
11. Togo



12. Benin  
13. Nigeria  
14. Burkina Faso  
15. Mali  
16. Niger  
17. Algeria  
18. Tunisia  
19. Libya  
20. Egypt  
21. Chad  
22. Cameroon  
23. Equatorial Guinea  
24. Gabon  
25. Congo

26. Central African  
Republic  
27. Sudan  
28. Uganda  
29. Rwanda  
30. Burundi  
31. Zaire  
32. Angola  
33. Namibia  
34. South Africa  
35. Lesotho  
36. Swaziland  
37. Botswana  
38. Zimbabwe

39. Zambia  
40. Malawi  
41. Mozambique  
42. Madagascar  
43. Comoros  
44. Tanzania  
45. Kenya  
46. Ethiopia  
47. Somalia  
48. Djibouti  
49. Eritrea

AUSTRALIA and  
OCEANIA

ANTARCTICA

# VOCABULARY

## A

ability .....  
abiotic .....  
able ..... 28  
abroad ..... 8  
absence .....  
absolute .....  
absorb ..... 7  
abundant ..... 10  
abundance .....  
abyssal .....  
accelerate ..... 15  
accept ..... 5  
accepted ..... 6  
access ..... 11  
accessible .....  
accessibility .....  
accident ..... 11  
accommodate .....  
accommodation ..... 6  
accompany .....  
according ..... 13  
accordingly .....  
account ..... 11  
accumulate .....  
accumulation .....  
accuracy ..... 5  
accurate ..... 9  
accurately .....  
achieve .....  
achievement .....  
acid ..... 6  
acquire ..... 6  
act ..... 9  
action ..... 11  
active ..... 9  
activity .....  
activities ..... 62  
actual .....  
actually ..... 10  
adapt .....  
add ..... 17  
addition ..... 31  
additional .....

additive ..... 10  
adequate ..... 7  
adjacent .....  
adjoining .....  
adopt ..... 11  
adult ..... 12  
advance ..... 10  
advanced ..... 5  
advantage ..... 31  
aerial ..... 16  
aesthetic .....  
affect ..... 47  
affluent .....  
afford ..... 5  
age ..... 7  
aging .....  
agency ..... 16  
agent ..... 7  
agree ..... 6  
agreement ..... 11  
agribusiness .....  
agriculture ..... 57  
agricultural ..... 25  
agrochemicals .....  
aid ..... 9  
aim ..... 7  
aimed .....  
air ..... 89  
airline ..... 5  
airplane ..... 6  
airport ..... 11  
airspace ..... 12  
albedo .....  
algae ..... 9  
alien .....  
alive .....  
allow ..... 23  
alter ..... 11  
alteration .....  
alternate .....  
alternative ..... 11  
altitude ..... 9  
amount ..... 40  
amphibian ..... 13  
amplitude .....

analysis .....  
analyze ..... 5  
ancestor .....  
ancient ..... 15  
animal ..... 99  
annual ..... 13  
apparent ..... 5  
appear ..... 20  
appearance .....  
apply ..... 11  
application .....  
approach ..... 11  
appropriate ..... 5  
approximately ..... 5  
aquaculture ..... 5  
aquatic ..... 8  
aqueducts .....  
aquifer .....  
arable ..... 5  
archipelago ..... 8  
area ..... 251  
argue ..... 5  
argument .....  
arid .....  
arise .....  
arose .....  
arrange .....  
rearrange .....  
arrive ..... 10  
arrival .....  
art ..... 9  
artificial ..... 8  
artificially .....  
ash ..... 13  
aspect ..... 9  
assemble .....  
assembly ..... 16  
assist .....  
assistance .....  
associated ..... 8  
association ..... 6  
assumed .....  
assumption .....  
astronomy .....  
atlas .....

|                    |    |                    |    |                   |    |                      |     |                     |    |
|--------------------|----|--------------------|----|-------------------|----|----------------------|-----|---------------------|----|
| atmosphere .....   | 34 | began .....        | 44 | brief .....       | 6  | city .....           | 191 | commercial .....    | 19 |
| atmospheric .....  | 12 | beginning .....    | 9  | briefly .....     |    | civil .....          |     | commercially .....  |    |
| atoll .....        |    | behave .....       |    | bright .....      |    | civilisation .....   | 6   | commission .....    |    |
| atomic .....       |    | behaviour .....    | 8  | bring .....       | 18 | claim .....          | 16  | commodity .....     |    |
| attach .....       |    | believe .....      | 26 | brought .....     | 13 | claimed .....        |     | common .....        | 21 |
| attack .....       |    | belief .....       |    | broad .....       |    | classify .....       | 13  | communication ..... | 15 |
| attempt .....      | 14 | belong .....       | 16 | broadest .....    |    | classification ..... |     | community .....     | 29 |
| attempted .....    |    | belt .....         |    | brown .....       | 8  | clay .....           |     | commuter .....      |    |
| attention .....    | 5  | bend .....         |    | brush .....       |    | clean .....          | 7   | commuting .....     |    |
| attitude .....     |    | benefit .....      | 14 | buffer .....      |    | cleaner .....        | 5   | compact .....       | 7  |
| attract .....      | 19 | benefits .....     | 20 | build .....       | 28 | cleaning .....       |     | company .....       | 52 |
| attractive .....   | 11 | beneficial .....   |    | built .....       | 27 | clear .....          | 10  | compare .....       | 13 |
| attraction .....   | 7  | bicycle .....      | 23 | building .....    | 43 | cleared .....        |     | compete .....       |    |
| automobile .....   | 11 | big .....          | 9  | bulk .....        | 6  | clearing .....       |     | competition .....   |    |
| availability ..... | 9  | bigger .....       |    | bulky .....       | 7  | clearly .....        | 5   | competitive .....   |    |
| available .....    | 13 | biggest .....      |    | burn .....        | 7  | cliff .....          |     | competitor .....    |    |
| avalanche .....    |    | bike .....         | 6  | burned .....      |    | climate .....        | 118 | complete .....      | 9  |
| average .....      | 31 | bilateral .....    |    | burnt .....       |    | climatic .....       | 7   | completed .....     |    |
| avoid .....        | 7  | biodiversity ..... | 6  | burrow .....      |    | climatology .....    |     | completely .....    | 8  |
| aware .....        |    | biological .....   | 13 | burrowing .....   |    | climb .....          |     | complex .....       | 9  |
| awareness .....    | 6  | biologist .....    |    | burst .....       | 6  | climbing .....       |     | component .....     | 19 |
|                    |    | biomass .....      | 12 | bury .....        |    | clock .....          |     | composition .....   | 5  |
| <b>B</b>           |    | biosphere .....    |    | buried .....      |    | clockwise .....      |     | compound .....      |    |
| back .....         | 29 | bird .....         | 65 | bus .....         | 6  | close .....          | 36  | computer .....      | 17 |
| bacteria .....     | 8  | birth .....        | 14 | bush .....        |    | closed .....         | 5   | concentrate .....   |    |
| bad .....          | 8  | blast .....        | 7  | business .....    | 41 | closely .....        | 6   | concentration ..... | 9  |
| worse .....        |    | bleach .....       | 7  | buy .....         | 26 | cloth .....          | 5   | concept .....       | 8  |
| worst .....        | 6  | block .....        | 13 | bought .....      |    | clothes .....        |     | concern .....       | 18 |
| balance .....      | 9  | blocked .....      |    |                   |    | clothing .....       | 5   | concerned .....     | 18 |
| balanced .....     |    | blow .....         | 6  |                   |    | cloud .....          | 13  | conclude .....      | 6  |
| ban .....          | 7  | blew .....         |    | <b>C</b>          |    | cloudy .....         |     | condense .....      |    |
| banned .....       |    | blown .....        |    | calculated .....  |    | coal .....           | 17  | condensation .....  |    |
| band .....         | 8  | board .....        | 10 | calculation ..... |    | coalfield .....      |     | condition .....     | 42 |
| bank .....         | 15 | boat .....         | 11 | call .....        | 76 | coalition .....      |     | conduct .....       |    |
| bare .....         |    | body .....         | 40 | call .....        |    | coast .....          | 34  | cone .....          |    |
| barely .....       |    | bog .....          |    | calm .....        |    | coastal .....        | 31  | conference .....    |    |
| barren .....       |    | boom .....         | 7  | camp .....        |    | coastline .....      | 10  | confine .....       | 5  |
| barrier .....      | 8  | boost .....        | 5  | campaign .....    | 6  | coffee .....         | 5   | confirm .....       |    |
| barter .....       |    | border .....       | 25 | canal .....       | 17 | cold .....           | 24  | confirmation .....  |    |
| base .....         | 6  | bordered .....     |    | cancel .....      |    | colder .....         | 6   | conflict .....      | 5  |
| based .....        | 26 | bore .....         |    | cancer .....      |    | collapse .....       | 13  | confront .....      |    |
| basic .....        | 10 | borehole .....     |    | cane .....        | 6  | collect .....        | 13  | confrontation ..... |    |
| basically .....    |    | born .....         | 6  | canopy .....      | 6  | collection .....     | 7   | confuse .....       |    |
| basin .....        | 13 | bottom .....       |    | canyon .....      | 11 | collide .....        |     | confusing .....     |    |
| basis .....        | 7  | boulder .....      |    | cap .....         | 8  | collision .....      |     | confusion .....     |    |
| bay .....          | 6  | boundary .....     | 21 | capable .....     |    | colony .....         | 10  | congestion .....    | 9  |
| beach .....        | 20 | boy .....          | 10 | capacity .....    | 9  | colonized .....      |     | coniferous .....    |    |
| beam .....         |    | branch .....       | 5  | capital .....     | 19 | colonial .....       |     | connect .....       | 10 |
| beauty .....       | 6  | break .....        | 15 | car .....         | 85 | colour .....         | 14  | connection .....    |    |
| beautiful .....    | 7  | broke .....        |    | carbon .....      | 20 | coloured .....       |     | consequence .....   | 10 |
| become .....       | 78 | broken .....       | 8  | care .....        | 11 | colourful .....      |     | consequently .....  |    |
| became .....       | 26 | breed .....        |    | carefully .....   | 28 | combination .....    | 15  | conservation .....  | 34 |
| bed .....          | 5  | breeding .....     | 9  | cargo .....       |    | combine .....        | 11  | conserve .....      | 10 |
| bedrock .....      |    | breeze .....       | 5  | carnivore .....   |    | come .....           | 48  | consider .....      | 13 |
| begin .....        | 18 | bridge .....       | 5  | carry .....       | 40 | came .....           | 10  | considerable .....  |    |
|                    |    | bridging .....     |    | cartography ..... |    | commerce .....       |     | considerably .....  |    |



|                     |    |                        |     |                       |    |                     |     |                      |    |                    |     |
|---------------------|----|------------------------|-----|-----------------------|----|---------------------|-----|----------------------|----|--------------------|-----|
| consist .....       | 8  | counterclockwise ..... |     | data .....            | 6  | design .....        | 17  | dispose .....        | 5  | driven .....       |     |
| constant .....      | 5  | country .....          | 343 | date .....            | 7  | designate .....     | 10  | disposal .....       | 9  | drop .....         | 17  |
| constantly .....    | 11 | countryside .....      | 6   | day .....             | 50 | destination .....   | 27  | dispute .....        | 7  | dropped .....      | 5   |
| constitute .....    |    | course .....           | 16  | deal .....            | 20 | destroy .....       | 24  | disputed .....       |    | drought .....      | 14  |
| construct .....     |    | cover .....            | 25  | dealt .....           |    | destruction .....   | 10  | disrupt .....        |    | drug .....         |     |
| construction .....  | 12 | covered .....          | 16  | debris .....          |    | destructive .....   | 5   | disruption .....     | 7  | dry .....          | 24  |
| consume .....       | 10 | craft .....            |     | decade .....          | 20 | detail .....        | 5   | dissolve .....       | 9  | dried .....        | 2   |
| consumer .....      | 19 | craggy .....           |     | decay .....           |    | detailed .....      | 5   | dissolved .....      | 9  | due .....          | 25  |
| consumption .....   | 6  | crash .....            |     | decayed .....         |    | detect .....        |     | distance .....       | 28 | dump .....         |     |
| contact .....       | 10 | crater .....           |     | decide .....          |    | detergent .....     |     | distant .....        |    | dumped .....       |     |
| contain .....       | 33 | create .....           | 42  | decision .....        |    | deteriorate .....   |     | distinct .....       |    | dumping .....      | 5   |
| container .....     | 7  | creature .....         | 5   | deciduous .....       |    | deterioration ..... | 7   | distinctive .....    | 7  | dune .....         |     |
| contaminate .....   | 6  | crescent .....         |     | declare .....         |    | determine .....     | 18  | distinguish .....    |    | dust .....         |     |
| contamination ..... | 6  | crest .....            |     | decline .....         | 26 | devastate .....     | 6   | distort .....        |    | dweller .....      |     |
| contaminant .....   |    | crevice .....          |     | declined .....        | 8  | develop .....       | 24  | distortion .....     | 6  | dwelling .....     |     |
| content .....       | 28 | crisis .....           |     | declining .....       | 11 | developed .....     | 43  | distribute .....     | 9  |                    |     |
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|                       |    |                    |    |                   |    |
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|                |    |                |    |                   |    |
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|             |    |             |    |               |    |
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| adopt       | 11 | retreat     | 11 | generation    | 10 |
| agreement   | 11 | revenue     | 11 | gradually     | 10 |
| airport     | 11 | revolution  | 11 | hemisphere    | 10 |
| alter       | 11 | scenery     | 11 | hurricane     | 10 |
| alternative | 11 | separate    | 11 | illustrate    | 10 |
| apply       | 11 | shallow     | 11 | impose        | 10 |
| approach    | 11 | sheet       | 11 | light         | 10 |
| attractive  | 11 | shop        | 11 | liquid        | 10 |
| automobile  | 11 | solve       | 11 | livestock     | 10 |
| boat        | 11 | station     | 11 | mapmaker      | 10 |



|                     |    |                      |   |                     |   |                      |   |                       |   |                     |   |
|---------------------|----|----------------------|---|---------------------|---|----------------------|---|-----------------------|---|---------------------|---|
| meridian .....      | 10 | congestion .....     | 9 | productive .....    | 9 | correct .....        | 8 | strike .....          | 8 | effective .....     | 7 |
| neighbor .....      | 10 | cooler .....         | 9 | profit .....        | 9 | cotton .....         | 8 | swamp .....           | 8 | entertainment ..... | 7 |
| occupy .....        | 10 | disposal .....       | 9 | projection .....    | 9 | crocodile .....      | 8 | tropic .....          | 8 | exploitation .....  | 7 |
| ore .....           | 10 | dissolve .....       | 9 | regulation .....    | 9 | declined .....       | 8 | typhoon .....         | 8 | exploration .....   | 7 |
| paper .....         | 10 | dissolved .....      | 9 | represent .....     | 9 | domestic .....       | 8 | understand .....      | 8 | fairly .....        | 7 |
| particular .....    | 10 | distribute .....     | 9 | right .....         | 9 | drift .....          | 8 | usual .....           | 8 | famous .....        | 7 |
| plane .....         | 10 | efficient .....      | 9 | run .....           | 9 | drill .....          | 8 | vegetable .....       | 8 | fault .....         | 7 |
| practice .....      | 10 | engine .....         | 9 | rush .....          | 9 | entirely .....       | 8 | visited .....         | 8 | fear .....          | 7 |
| projects .....      | 10 | extent .....         | 9 | sail .....          | 9 | erode .....          | 8 | vulnerable .....      | 8 | flat .....          | 7 |
| rail .....          | 10 | eye .....            | 9 | school .....        | 9 | except .....         | 8 | wash .....            | 8 | fund .....          | 7 |
| recycling .....     | 10 | faced .....          | 9 | seafloor .....      | 9 | fast .....           | 8 | wheat .....           | 8 | geological .....    | 7 |
| refer .....         | 10 | farmland .....       | 9 | seem .....          | 9 | fleet .....          | 8 | widely .....          | 8 | globalisation ..... | 7 |
| rely .....          | 10 | feel .....           | 9 | shelf .....         | 9 | formation .....      | 8 | yield .....           | 8 | grew .....          | 7 |
| remains .....       | 10 | finish .....         | 9 | sound .....         | 9 | went .....           | 8 | absorb .....          | 7 | heated .....        | 7 |
| remove .....        | 10 | firm .....           | 9 | stable .....        | 9 | harbour .....        | 8 | adequate .....        | 7 | highway .....       | 7 |
| resulted .....      | 10 | fishery .....        | 9 | stabilize .....     | 9 | housing .....        | 8 | age .....             | 7 | hydrological .....  | 7 |
| sand .....          | 10 | float .....          | 9 | style .....         | 9 | impossible .....     | 8 | agent .....           | 7 | incentive .....     | 7 |
| seal .....          | 10 | flooding .....       | 9 | success .....       | 9 | improvement .....    | 8 | aim .....             | 7 | individual .....    | 7 |
| seashore .....      | 10 | fragile .....        | 9 | successful .....    | 9 | integrate .....      | 8 | attraction .....      | 7 | inhabitant .....    | 7 |
| shelves .....       | 10 | fragmented .....     | 9 | task .....          | 9 | item .....           | 8 | avoid .....           | 7 | input .....         | 7 |
| shortage .....      | 10 | frequent .....       | 9 | technological ..... | 9 | longitude .....      | 8 | ban .....             | 7 | jet .....           | 7 |
| skill .....         | 10 | go .....             | 9 | tell .....          | 9 | lose .....           | 8 | basis .....           | 7 | kingdom .....       | 7 |
| soviet .....        | 10 | govern .....         | 9 | tornado .....       | 9 | lowered .....        | 8 | beautiful .....       | 7 | landmass .....      | 7 |
| spectacular .....   | 10 | happen .....         | 9 | trading .....       | 9 | marsh .....          | 8 | blast .....           | 7 | load .....          | 7 |
| stability .....     | 10 | holy .....           | 9 | transfer .....      | 9 | military .....       | 8 | bleach .....          | 7 | lock .....          | 7 |
| steep .....         | 10 | indicate .....       | 9 | true .....          | 9 | moon .....           | 8 | boom .....            | 7 | logo .....          | 7 |
| suggest .....       | 10 | influenced .....     | 9 | urbanization .....  | 9 | opened .....         | 8 | bulky .....           | 7 | massive .....       | 7 |
| table .....         | 10 | inland .....         | 9 | village .....       | 9 | package .....        | 8 | burn .....            | 7 | metal .....         | 7 |
| took .....          | 10 | intensity .....      | 9 | violent .....       | 9 | path .....           | 8 | cheap .....           | 7 | mixed .....         | 7 |
| travelling .....    | 10 | interdependent ..... | 9 | vital .....         | 9 | paid .....           | 8 | clean .....           | 7 | monitor .....       | 7 |
| typically .....     | 10 | interior .....       | 9 | walk .....          | 9 | peak .....           | 8 | climatic .....        | 7 | mouth .....         | 7 |
| unfortunately ..... | 10 | join .....           | 9 | week .....          | 9 | pesticide .....      | 8 | collection .....      | 7 | muslim .....        | 7 |
| vessel .....        | 10 | label .....          | 9 | worm .....          | 9 | picture .....        | 8 | compact .....         | 7 | necessary .....     | 7 |
| visit .....         | 10 | late .....           | 9 | abroad .....        | 8 | planned .....        | 8 | container .....       | 7 | necessarily .....   | 7 |
| accurate .....      | 9  | later .....          | 9 | aquatic .....       | 8 | pole .....           | 8 | continuous .....      | 7 | nesting .....       | 7 |
| act .....           | 9  | leaves .....         | 9 | archipelago .....   | 8 | pollute .....        | 8 | crowded .....         | 7 | nomadic .....       | 7 |
| active .....        | 9  | mangrove .....       | 9 | artificial .....    | 8 | predator .....       | 8 | daily .....           | 7 | oceanic .....       | 7 |
| aid .....           | 9  | meat .....           | 9 | associated .....    | 8 | project .....        | 8 | damaging .....        | 7 | option .....        | 7 |
| algae .....         | 9  | migration .....      | 9 | bacteria .....      | 8 | proportion .....     | 8 | date .....            | 7 | organise .....      | 7 |
| altitude .....      | 9  | minute .....         | 9 | bad .....           | 8 | red .....            | 8 | degree .....          | 7 | passage .....       | 7 |
| art .....           | 9  | model .....          | 9 | band .....          | 8 | release .....        | 8 | delta .....           | 7 | per capita .....    | 7 |
| aspect .....        | 9  | month .....          | 9 | barrier .....       | 8 | residue .....        | 8 | dense .....           | 7 | polar .....         | 7 |
| availability .....  | 9  | mount .....          | 9 | behaviour .....     | 8 | responsibility ..... | 8 | density .....         | 7 | pollutant .....     | 7 |
| balance .....       | 9  | narrow .....         | 9 | broken .....        | 8 | restore .....        | 8 | desertification ..... | 7 | pour .....          | 7 |
| beginning .....     | 9  | negative .....       | 9 | brown .....         | 8 | round .....          | 8 | deterioration .....   | 7 | predictable .....   | 7 |
| big .....           | 9  | operator .....       | 9 | cap .....           | 8 | saltwater .....      | 8 | dispute .....         | 7 | presence .....      | 7 |
| breeding .....      | 9  | organism .....       | 9 | catch .....         | 8 | search .....         | 8 | disruption .....      | 7 | prevailing .....    | 7 |
| capacity .....      | 9  | oriented .....       | 9 | charge .....        | 8 | seek .....           | 8 | distinctive .....     | 7 | primary .....       | 7 |
| cast .....          | 9  | outside .....        | 9 | cheaper .....       | 8 | simple .....         | 8 | diverse .....         | 7 | producer .....      | 7 |
| centimetre .....    | 9  | particle .....       | 9 | completely .....    | 8 | southeast .....      | 8 | double .....          | 7 | progress .....      | 7 |
| circulation .....   | 9  | payment .....        | 9 | concept .....       | 8 | specialized .....    | 8 | drainage .....        | 7 | projected .....     | 7 |
| complete .....      | 9  | permanent .....      | 9 | consist .....       | 8 | spend .....          | 8 | drawn .....           | 7 | pull .....          | 7 |
| complex .....       | 9  | poverty .....        | 9 | contrast .....      | 8 | stand .....          | 8 | drinking .....        | 7 | ranks .....         | 7 |
| concentration ..... | 9  | powerful .....       | 9 | convert .....       | 8 | steam .....          | 8 | ecolabeling .....     | 7 | recreation .....    | 7 |

|                  |   |               |   |                   |   |               |   |              |   |                  |   |
|------------------|---|---------------|---|-------------------|---|---------------|---|--------------|---|------------------|---|
| remote           | 7 | burst         | 6 | groundwater       | 6 | shrunk        | 6 | clothing     | 5 | feeding          | 5 |
| report           | 7 | bus           | 6 | hardly            | 6 | significance  | 6 | coffee       | 5 | filled           | 5 |
| reserve          | 7 | campaign      | 6 | harmful           | 6 | significantly | 6 | composition  | 5 | floodplain       | 5 |
| rest             | 7 | cane          | 6 | hide              | 6 | smoke         | 6 | confine      | 5 | fold             | 5 |
| room             | 7 | canopy        | 6 | hydroelectric     | 6 | spreading     | 6 | conflict     | 5 | found            | 5 |
| route            | 7 | cartographer  | 6 | illegal           | 6 | star          | 6 | constant     | 5 | freeze           | 5 |
| science          | 7 | cave          | 6 | indigenous        | 6 | store         | 6 | contribution | 5 | full             | 5 |
| seed             | 7 | certify       | 6 | industrialisation | 6 | stretch       | 6 | convention   | 5 | geopolitics      | 5 |
| sold             | 7 | channel       | 6 | inner             | 6 | subject       | 6 | cooling      | 5 | glass            | 5 |
| sewage           | 7 | cheaply       | 6 | intense           | 6 | succeed       | 6 | creature     | 5 | globally         | 5 |
| shorten          | 7 | church        | 6 | introduction      | 6 | suddenly      | 6 | critical     | 5 | hard             | 5 |
| shown            | 7 | civilisation  | 6 | invasive          | 6 | surround      | 6 | crowd        | 5 | headquarters     | 5 |
| sight            | 7 | closely       | 6 | issue             | 6 | sustain       | 6 | customs      | 5 | healthy          | 5 |
| signed           | 7 | colder        | 6 | key               | 6 | sweep         | 6 | decompose    | 5 | held             | 5 |
| situation        | 7 | conclude      | 6 | knowledge         | 6 | tanker        | 6 | decomposer   | 5 | household        | 5 |
| spilled          | 7 | consumption   | 6 | launch            | 6 | tariff        | 6 | decrease     | 5 | humidity         | 5 |
| spot             | 7 | contaminate   | 6 | leader            | 6 | taste         | 6 | democratic   | 5 | hydroelectricity | 5 |
| spring           | 7 | contamination | 6 | learn             | 6 | thick         | 6 | destructive  | 5 | iceberg          | 5 |
| start            | 7 | continued     | 6 | logging           | 6 | toll          | 6 | detail       | 5 | immediate        | 5 |
| step             | 7 | countryside   | 6 | modify            | 6 | tower         | 6 | detailed     | 5 | indicator        | 5 |
| surge            | 7 | data          | 6 | monument          | 6 | trained       | 6 | diffusion    | 5 | interval         | 5 |
| symbol           | 7 | definition    | 6 | nitrogen          | 6 | tremendous    | 6 | dug          | 5 | invest           | 5 |
| tectonics        | 7 | degrade       | 6 | officials         | 6 | truck         | 6 | dimensional  | 5 | irrigate         | 5 |
| temple           | 7 | demands       | 6 | overall           | 6 | turbine       | 6 | disperse     | 5 | isolated         | 5 |
| test             | 7 | deplete       | 6 | overcome          | 6 | turned        | 6 | dispose      | 5 | lava             | 5 |
| tradition        | 7 | derive        | 6 | paint             | 6 | variation     | 6 | division     | 5 | leisure          | 5 |
| transcontinental | 7 | devastate     | 6 | penetrate         | 6 | virus         | 6 | diving       | 5 | lightning        | 5 |
| transnational    | 7 | diamond       | 6 | penguin           | 6 | accept        | 5 | downward(s)  | 5 | linked           | 5 |
| treat            | 7 | discovery     | 6 | permit            | 6 | accuracy      | 5 | draining     | 5 | listing          | 5 |
| tribe            | 7 | display       | 6 | piece             | 6 | advanced      | 5 | dramatic     | 5 | lowest           | 5 |
| unlike           | 7 | distortion    | 6 | plankton          | 6 | afford        | 5 | dress        | 5 | machinery        | 5 |
| weak             | 7 | dramatically  | 6 | poaching          | 6 | airline       | 5 | drink        | 5 | maritime         | 5 |
| weight           | 7 | earn          | 6 | prefer            | 6 | analyze       | 5 | dropped      | 5 | mark             | 5 |
| widespread       | 7 | element       | 6 | previously        | 6 | apparent      | 5 | dumping      | 5 | marked           | 5 |
| wilderness       | 7 | exact         | 6 | profile           | 6 | appropriate   | 5 | easier       | 5 | medicine         | 5 |
| wood             | 7 | exceed        | 6 | railroad          | 6 | approximately | 5 | ecolabel     | 5 | meeting          | 5 |
| yellow           | 7 | explore       | 6 | recycled          | 6 | aquaculture   | 5 | education    | 5 | migrate          | 5 |
| accepted         | 6 | extra         | 6 | refinery          | 6 | arable        | 5 | efficiently  | 5 | millennium       | 5 |
| accommodation    | 6 | fastest       | 6 | relation          | 6 | argue         | 5 | electronics  | 5 | mosque           | 5 |
| acid             | 6 | favourable    | 6 | released          | 6 | attention     | 5 | electronic   | 5 | multinational    | 5 |
| acquire          | 6 | fertile       | 6 | reported          | 6 | bed           | 5 | elephant     | 5 | newly            | 5 |
| agree            | 6 | fight         | 6 | resistant         | 6 | boost         | 5 | empire       | 5 | noise            | 5 |
| airplane         | 6 | firewood      | 6 | retain            | 6 | branch        | 5 | engineering  | 5 | object           | 5 |
| association      | 6 | forced        | 6 | rice              | 6 | breeze        | 5 | estuary      | 5 | observe          | 5 |
| awareness        | 6 | frozen        | 6 | rite              | 6 | bridge        | 5 | evaporate    | 5 | obvious          | 5 |
| worst            | 6 | friendly      | 6 | running           | 6 | cash          | 5 | evolution    | 5 | opposite         | 5 |
| base             | 6 | geothermal    | 6 | satisfy           | 6 | cataract      | 5 | excessive    | 5 | originate        | 5 |
| bay              | 6 | giant         | 6 | save              | 6 | catastrophic  | 5 | exert        | 5 | output           | 5 |
| beauty           | 6 | gorge         | 6 | scarce            | 6 | ceremony      | 5 | exotic       | 5 | outstanding      | 5 |
| bike             | 6 | grain         | 6 | section           | 6 | circulate     | 5 | experiment   | 5 | overtake         | 5 |
| biodiversity     | 6 | grant         | 6 | seismologist      | 6 | cleaner       | 5 | exported     | 5 | parking          | 5 |
| blow             | 6 | grasses       | 6 | sensitive         | 6 | clearly       | 5 | exposed      | 5 | pilgrim          | 5 |
| born             | 6 | graze         | 6 | shell             | 6 | closed        | 5 | faithful     | 5 | pond             | 5 |
| bulk             | 6 | grid          | 6 | shelter           | 6 | cloth         | 5 | favour       | 5 | poorest          | 5 |



|                 |   |                    |   |                     |   |
|-----------------|---|--------------------|---|---------------------|---|
| practiced ..... | 5 | salty .....        | 5 | terrain.....        | 5 |
| practices ..... | 5 | sanitation .....   | 5 | terrestrial .....   | 5 |
| pump .....      | 5 | savannah .....     | 5 | thunderstorm .....  | 5 |
| rare .....      | 5 | scholar .....      | 5 | tiger .....         | 5 |
| real .....      | 5 | seasonal .....     | 5 | tonne .....         | 5 |
| really .....    | 5 | security .....     | 5 | trace .....         | 5 |
| rear .....      | 5 | sense .....        | 5 | train .....         | 5 |
| recorded .....  | 5 | series .....       | 5 | trekking .....      | 5 |
| regard .....    | 5 | shipping .....     | 5 | tributary .....     | 5 |
| regulate .....  | 5 | shock .....        | 5 | understanding ..... | 5 |
| reliable .....  | 5 | shopping .....     | 5 | uneven .....        | 5 |
| reptile .....   | 5 | sit .....          | 5 | vacation .....      | 5 |
| restrict .....  | 5 | skilled .....      | 5 | virgin .....        | 5 |
| reward .....    | 5 | staff .....        | 5 | virtually .....     | 5 |
| ridge .....     | 5 | status .....       | 5 | visible .....       | 5 |
| risen .....     | 5 | stored .....       | 5 | waterway .....      | 5 |
| roof .....      | 5 | strict .....       | 5 | wear .....          | 5 |
| root .....      | 5 | successfully ..... | 5 | web .....           | 5 |
| runoff .....    | 5 | sudden .....       | 5 | windmill .....      | 5 |
| safari .....    | 5 | surplus .....      | 5 | enterprise .....    | 4 |
| sale .....      | 5 | tank .....         | 5 | dried .....         | 2 |
|                 |   |                    |   | felt .....          | 2 |

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