

МІНІСТЕРСТВО ОСВІТИ І НАУКИ
ДЕРЖАВНИЙ УНІВЕРСИТЕТ
«ЖИТОМИРСЬКА ПОЛІТЕХНІКА»

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ACQUAINTANCE WITH OUR PLANET

Навчальний посібник з англійської мови для
студентів спеціальності 103
«Управління земельними і водними ресурсами»

ЖИТОМИР
ВИДАВНИЦТВО ДЕРЖАВНОГО УНІВЕРСИТЕТУ
«ЖИТОМИРСЬКА ПОЛІТЕХНІКА»
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Мета посібника – забезпечити розвиток навичок роботи з фаховою літературою та навичок усного мовлення на теми, передбачені програмою з іноземних мов для вищих навчальних закладів.

Навчальний посібник складається з двох частин. Перша частина містить матеріал для проведення практичних занять з іноземної мови. В другій частині представлений довідник найчастіше вживаних слів та словосполучень за фаховою тематикою.

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**IMPORTANT ENVIRONMENTAL ISSUES AND
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NOTES

INTRODUCTION



The Earth: Fast Facts

Our planet Earth is a world unlike any other. The Earth is the only place in the universe that hosts life.

The Earth is the only planet in the solar system not named after a mythological being. Its name is derived from the Old English word "ertha" and the Anglo-Saxon word "erda". These two words mean ground or soil.

The gravity between the Earth and the Moon is the cause of tides on Earth.

The rotation of the Earth is gradually slowing down. The deceleration of the Earth's rotation is very slow, approximately 17 milliseconds per hundred years. Eventually, this will prolong days but it will take around 140 million years before our day will have increased from 24 to 25 hours.

The length of a year on the Earth is 365 days, 6 hours, and 16 minutes.

The length of a day on the Earth is 23 hours and 56 minutes.

The Earth is composed of several layers. A rocky layer called the Earth's crust is on the outside. Below one can find the mantle followed by the outer core and the inner core.

Planet Earth is made up of a number of elements.
The Earth is Mostly Iron, Oxygen and Silicon.

If you could separate the Earth into piles of material, you'd get 32.1 % iron, 30.1% oxygen, 15.1% silicon, and 13.9% magnesium. Of course, the core of the Earth consists mostly of this iron. If you could act down and sample the core, it would be 88% iron. And if you sampled the Earth's crust, you'd find that 47% of it is oxygen.

The Earth has a powerful magnetic field.

This field protects the Earth from the effects of solar wind.

The Earth has a radius of 3,959 miles. It is the fifth-largest planet in our solar system. It is the only planet known to have liquid water on its surface.

Oceans at least 4 kilometers deep cover about 70 percent of the Earth's surface.

The minimum weather temperature on the Earth is -87.8 degrees Celsius and the maximum weather temperature on the Earth is 57.8 degrees Celsius.

Freshwater exists in the liquid phase only within a narrow temperature range between 0 and 100 degrees Celsius.

The Earth's weather depends greatly on the presence and distribution of water vapor in the atmosphere.

UNIT 1.

Exercise 1. Read and translate the text. Learn unknown words.



Geography

Geography is a study of the planet Earth. 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 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. To improve the accuracy of their descriptions, they scratched crude on rocks or pieces of cloth or leather.

As you already know, geography is the study of the relationship between people and their physical surroundings or environments. This science grew directly out of early explorers' attempts 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 Earth is only one of nine planets in our solar system that revolves around the sun (a minor star in the universe). The Earth is the third planet in distance from the sun, which is 150 million kilometers away. Even though the sun is considered to be one of the smaller stars in the universe, it is huge when compared to the Earth.

The sun's heat and light provide most of the energy that makes life on the Earth possible.

Exercise 2. Give equivalents for:

Планета Земля, physical surroundings, взаємодіяти, analyze the physical characteristics, розрізняти, to improve the accuracy of the descriptions, сонячна система, early explorers, карти та описи, to revolve around the sun, забезпечувати, the sun's heat and light.

Exercise 3. Find a synonym or meaning for the following words.

to become aware	to mark the surface of something with a sharp or pointed object
to distinguish	an effort to achieve or complete a difficult task or action
to scratch	to make or become better
to improve	to apprehend
an attempt	importance
significance	recognize or treat (someone or something) as different

Exercise 4. Develop your reading skills. Read the following text and do the comprehension tasks.

1. Geographers deal with the cultural properties of the Earth. **TRUE / FALSE**
2. Geography is a study of economic relations between nations. **TRUE / FALSE**
3. The first maps appeared on the walls of the houses people lived in. **TRUE / FALSE**
4. The Earth is much bigger than the Sun. **TRUE / FALSE**
5. Geography as a science appeared because of people's desire to invent something new. **TRUE / FALSE**
6. The Earth is the closest planet to the Sun. **TRUE / FALSE**
7. The Sun is the biggest star in the universe. **TRUE / FALSE**
8. All living organisms can exist thanks to the energy from the Sun. **TRUE / FALSE**

Exercise 5. Answer the questions:

1. What is the task of geographers?
2. When did the first maps appear?
3. For what purposes were they used initially?
4. What is the characteristic feature of the Earth?
5. What is the distance between our planet and the sun?
6. What makes life on the Earth possible?

Exercise 6. Complete the sentences:

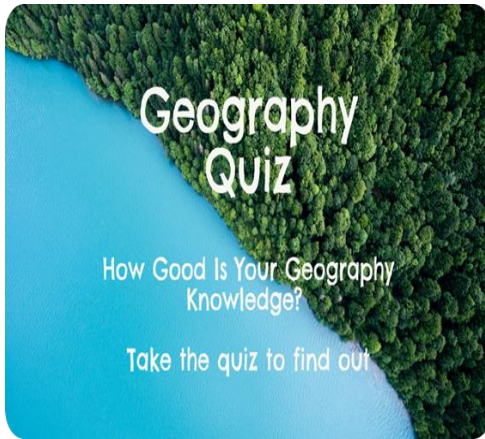
1. Most of the energy is provided by
2. Earth is planet in distance from the sun.
3. Geography is the study of the relationship between people and their
4. Many of the early travelers formed of the places they had visited.
5. The Earth is only one of nine planets in our ... that revolves around the sun.

Exercise 7. Read the sentences and look at the highlighted prepositions. Choose the word that is followed by each preposition and fits the content.

1. Geography is a science *devoted / familiar / interested* **to** the study of land, its properties as well as relationships between people and their environments.
2. To understand the present, people require knowledge of the past. That is why a great deal of emphasis is *put / taken / shown* **on** historical geography.
3. Digital revolution has greatly changed the practice and study of geography. Modern geographers are *studied / endangered / equipped* with sophisticated programs that help them in their work.
4. Students can study how humans can *exhibit / eliminate / interact* **with** their environments.

5. To gather and analyse topics geographers use GIS (Geographic Information Systems). I haven't *noticed / recognized / heard / realized* of them before.
6. A wide variety of graphics is used by *specialists in regard / in order / in memory* to present the information they have gathered.

Exercise 8. You are a participant of the students' conference and preparing a short report about geography.



Geography is an interesting subject that covers a lot of areas. You can find many facts about our planet Earth, get acquainted with new lands and their inhabitants, study nature and environment. Take a short quiz to find out if you know our planet well.

1. What is the largest country in the world?
2. What is the most densely populated country in the world?
3. How many oceans are there in the world? Name them.
4. What is the biggest ocean on the Earth?
5. What are the largest in the area and the smallest continents?
6. Which planet is nearest to the Earth?
7. In which country would you find the Leaning Tower of Pisa?
8. How many states do the United States consist of?
9. How many regions does our country consist of?
10. What is the largest waterfall in the world?
11. What is the biggest desert in the world?
12. What is the hottest continent on the Earth?
13. What is the highest mountain in the world?

14. What is the coldest place on the Earth?
15. What continent is Britain part of?
16. Which rivers flow through the territory of Ukraine?
17. What is the longest river in Ukraine?
18. What do you call land with water on 3 sides?
19. Where are the Andes mountains located?
20. What are horizontal and vertical imaginary lines around the earth called?

UNIT 2.


Exercise 1. Read and translate the text. Learn unknown words.

Physical and Cultural Geography

Two Types of Geography

- Physical Geography
 - Location, Landforms

- Cultural Geography
 - Human Characteristics, Regions, Movement



Most geographers focus on one of the two major branches of geography, *physical geography, and cultural geography.*

Physical geography is the branch of natural science which deals with the processes in the natural environment such as the atmosphere, hydrosphere, biosphere, and geosphere.

Physical geography studies our planet as a whole and its systems in particular. The aim of scientists engaged in this branch is to examine landscapes, surface processes, and climate of the earth. All these issues are of great importance as their smallest changes affect people now and can alter their future.

The study of Earth is huge, that is why numerous sub-branches of physical geography specialize in different areas. Have you heard anything about geomorphology, hydrology or pomology? They are important for studying our planet because all natural processes of Earth affect the distribution of resources and conditions of the human settlement.

Cultural geography

Cultural geography is one of the two major branches of geography. It is often called human geography. Cultural geography is the study of many cultural aspects one can find throughout the world. In contrast to physical geography, cultural geography focuses on the impact of human ideas and actions on the earth.

Language, religion, different economic and governmental structures, art, music, as well as other cultural aspects are those phenomena that are objects of cultural geography.

Each group of people has a strong effect on its human habitat or the place where that group lives. This imprint is defined 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.

Another aspect that is thoroughly studied by geographers is the process of cultural diffusion. In other words, it is spreading 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 can be viewed as an example of cultural diffusion. The spread of the alphabet is another example. Initially originated in the Middle East about 2000 B. C., it 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.

Exercise 2. Give equivalents for:

To focus on, поширення алфавіту, to spread, змінювати навколишнє середовище, cultural landscapes, сільськогосподарські культури, cultural diffusion, розводити тварин, to change the habitat, набувати (здобувати), the earth's surface, вплив людської діяльності, major branches of geography.

Exercise 3. Insert the prepositions if necessary:

The process ... cultural diffusion; the spread ... culture ... one area ... to another; ... contrast ... physical geography; two major branches ... geography; to leave a distinct imprint ... the human habitat; to use various forms ... the alphabet; changes ... the earth's surface.

Exercise 4. Answer the questions:

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. What are the subjects of physical geography?
5. What aspects is cultural geography concentrated on?
6. Give the definition of the term "cultural landscape".
7. Give examples of cultural diffusion today.

Exercise 5. Look at these words and write their synonyms, a definition or your own sentence to show that you understand their meaning.

to focus on, to offer, to occur, evident, remote, imprint



Example: If something is evident, it is obvious and easy for understanding.

Exercise 6. Match the following terms with their definitions.

1	Geomorphology	f	the study of glaciers and ice sheets, including their formation, cycles, and effect on the Earth's climate.
2	Hydrology	b	the study of soil, including formation, different types as well as their distribution over the Earth
3	Glaciology	c	the study of the Earth surface and its processes. The objects of study are various processes such as soil erosion, landslides, volcanic activity, earthquakes, floods etc.
4	Pedology	d	the study of the water cycle, water distribution across the planet as well as water quality

Exercise 7. Look at the picture. Prepare a short report about the areas each branch of Geography studies. Search for some new information about any subdivision of geography. Be ready to present it to your group mates.

Physical v. Cultural Geography

Physical Geography	Cultural Geography
Rocks/Minerals	Population/Settlements/Urbanization
Landforms	Economic and Political Systems
Animal and Plant Life	Transportation
Soils	Human Migration
Atmosphere/Climate/Weather	Social Systems
Environment	Recreation
Rivers/Oceans/Other bodies of Water	Religion/Belief System



Physical Geography is the study of the *Natural Landscape* of the Earth while Cultural Geography is the study of the *Human Landscape* of the Earth.

Exercise 8. Read the information about famous people who studied geography. Open the brackets and write the necessary tense form of the verb. Find more information about famous geographers and present it in the classroom.

1. Prince William (the Duke of Cambridge) studied geography at the University of St. Andrews in Scotland. He (to receive) his Master's degree in 2005. He (to apply) his navigation skills during the service in the Royal Air Force as a helicopter pilot.

2. A well-known basketball player Michael Jordan (to graduate) with a degree in geography in 1986. He (to take) several courses in the regional geography of the Americas.

3. Ellen Churchill Semple (to be born) on January 8th, 1863 in Kentucky. She (to study) history but (to become) interested in geography when she (to visit) England. She (to become) the first woman to hold the position of the president of the Association of American Geographers.

4. Claudius Ptolemy (to be) a famous geographer of the ancient Roman Empire. He (to live) from the years 100 to 170 AD. In his famous work "Geography" he (to speak) about difficulties of mapping.

UNIT 3.

Exercise 1. Read and translate the text. Learn unknown words.

Geographers use a wide range of tools which help them perform their work. Globes and maps are those things that most people are familiar with. Other advanced tools represented by different computer programs, aerial photographs and satellite images are of

great help and importance to modern geographers. All these tools help scientists to analyze the interactions between people and their environments.

Globes and maps represent useful models of the earth. However, they are not able to provide perfect representations of the earth. Both of them have specific advantages as well as disadvantages.

Globes.

A globe is a spherical model of the Earth. It does not distort the surface it portrays. It is the most accurate representation of the shape of the Earth. The landmasses and bodies of water on the globe have the same shapes as on the Earth's surface.

Besides, a globe accurately represents the earth's grid of parallels and meridians, as well as direction and distance from one place to another. The most important advantages of globes are apparently connected with their shape.

Unfortunately, globes are not practical to use. They are too big and bulky to carry around. Moreover, people can view only one half of a globe at a time.



Another disadvantage of globes concerns the problem of detail. Because globes represent the entire earth, the individual areas are relatively small. It is impossible to show details of small geological features or manmade features like small cities.

It becomes obvious that globes are not able to show the detailed features of an area.

Exercise 2. Give equivalents for:

useful models of the earth, переваги та недоліки, the most accurate representation, поверхня, the earth's grid of parallels and meridians, напрям та відстань між містами, too big and bulky,

протилежна сторона глобуса, the detailed features of an area, стосуватися, to use different tools, взаємодія між людьми та навколишнім середовищем, to carry out the work.

Exercise 3. Find a synonym or meaning for the following words.

tool	correct, exact, and without any mistakes
accurate	whole
concern	taking up much space; large and unwieldy
entire	something that helps you to do a particular activity:
bulky	change
variety	relate to; be about

Exercise 4. Answer the questions:

1. What tools do geographers use?
2. What are the oldest tools?
3. What are the advantages of spherical models of the Earth?
4. Name major disadvantages of globes.

Exercise 5. Rearrange the letters in the anagrams to form equivalents for the Ukrainian words.

різномаїття - tyrieva	Земля - Eraht
перевага - aantadvge	характерна риса - fateur
забезпечувати - pdroevi	струмки - esmatsr
поверхня - eaurscf	порівнювати - oacpmre
масштаб - lcsae	інструменти - olsot

Exercise 6. Complete the facts. Use:

discovered, produced, peaked, survives, antiquity, tools, places

1. People have used globes to model the world around them since
2. The earliest globe that today was made in 1492 by Martin Behaim, a German navigator and geographer.
3. Not only the lands by explorers were shown on it.

4. It represented details about overseas commodities, market and local trading protocols.
5. Pocket globes were first in England by Joseph Moxon in 1673. The diameter of pocket globes was around three inches.
6. These globes had several functions. Gentlemen could use these miniature instruments as status symbols. They were also educational for children.
7. Although the popularity of pocket globes in the first half of the 18th century, makers continued to produce them in the 19th century.

Exercise 7. Fill in the missing forms of the words. Choose any 6 and write your own sentences with them.

Noun	Verb	Noun	Adjective
description		difference	
	compare		evident
	interact	distinction	
attempt			various
	distort		important
analysis			practical
	develop	science	
	discover	significance	

Exercise 8. Read the text about maps and do the tasks suggested below.

A. Fill in the necessary prepositions: *in, into, of, by, at, on.*

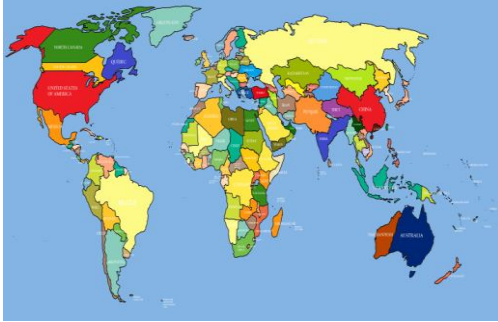
Maps

Maps are flat representations ... the Earth. Maps vary ... size. There are tiny maps one can put ... the pocket as well as huge wall maps used during the classes. The purpose of maps can also vary.

Speaking about maps it is worthwhile mentioning their convenience to use. It is one of the most obvious advantages of maps over globes. If there arise a necessity, they can be easily

rolled, folded and carried around. Another advantage of maps is that they can show the earth's entire surface ... one time, or can show specific details. Maps can also present information concerning various topics related ... physical and cultural features of the earth. The regions ... heavy rainfalls or floods, deposits ... mineral resources, different religions can be illustrated ... maps by means of different colors and symbols.

On the other hand, it is impossible to show accurately 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 distortions remain the essential disadvantage of maps.

B. Find synonyms to the underlined words among the suggested ones.

- | | |
|-------------|-----------------|
| obvious | deformations |
| features | stay |
| reason | aim |
| distortions | evident |
| remain | characteristics |
| purpose | cause |
| vary | appear |
| arise | change |

C. Choose the odd word out.

- | | | | |
|------------|------------|---------------|-----------------|
| 1 vary | exist | change | alter |
| 2 purpose | aim | objective | reason |
| 3 features | advantages | peculiarities | characteristics |
| 4 arise | appear | emerge | disappear |
| 5 evident | disputable | obvious | manifest |

Exercise 9. Look through the text above and complete the table with your own ideas.

ADVANTAGES	DISADVANTAGES
<i>Paper maps are tangible. They can be seen and touched.</i>	<i>Paper maps are printed on paper that can easily be damaged as a result of unfavourable weather conditions.</i>
<i>Paper maps don't need battery power and are of great help in the most remote areas.</i> <i>They do not require internet connections every time to access.</i>	<i>All maps have distortions because it is impossible to represent accurately a three-dimensional objects on flat maps.</i>
<i>Maps can show the Earth's entire surface or just a small part of it.</i>	<i>Paper maps are an old way of representing an area and may be difficult to understand because of symbols used on them.</i>
.....
.....

UNIT 4.

Exercise 1. Read and translate the text. Learn unknown words.

Different Types of Maps

In order to study thoroughly the features of the earth the science of geography relies on many different types of maps. Some maps are so common to us that even a pupil would recognize them. We refer to them during our trips, in school classrooms and in daily lives for information. Other maps are used only by professionals in specialized fields.

What Is a Map?

A map is a visual representation of the whole area or a part of it. It's not only a representation of the Earth's surface. Maps represent various things such as national boundaries, physical features, climates, population, the locations of cities, economic activity and so on. For this very reason we can mention different types of maps.

Thematic Maps

- A thematic map is one that focuses on a particular main idea (or theme).
- These might include:
 - Climate
 - Vegetation
 - Economy
 - Population
 - Language



Thematic maps display specific data which can include, for instance, the average rainfall distribution for a certain area or the distribution of a particular disease throughout a country.

With the increased use of Geographic Information Systems (GIS), thematic maps are growing in importance and becoming more readily available. Furthermore,

the digital revolution of the 21st century has contributed much to the shift from paper maps to electronic ones.

Below you can find a list of the most common types of maps used by geographers.

Political Maps

A political map does not show topographic features like mountains. It is a type of the map that represents political divisions, or human-created boundaries of the world, continents and major geographic areas.



Political maps can vary in size and content. Some political maps cover entire continents, while others may include the locations of cities, depending on the detail of the map. Each political map can also focus on different types of political features.

A common type of political map would be one showing the regions of our country and their borders along with the Ukraine's international borders.

Physical Maps



Physical maps are used demonstrate the physical features of an area, such as mountains, rivers and lakes. Blue colour is usually used to indicate rivers, lakes, seas and oceans. Light blue color is used for the shallowest areas and darkening for areas of deeper water. Glaciers and ice caps are shown in white colors. Brown colour indicates

mountains and plateaus, different shades of green are used to represent elevations.

Topographic Maps

A topographic map is similar to a physical map as it shows different physical landscape features. These features include:

cultural: roads, buildings, railways, airports, administrative boundaries, state and international borders;

hydrography: lakes, rivers, streams, swamps;

relief: mountains, valleys, cliffs;

vegetation: wooded and cleared areas, vineyards and orchards.

Changes in the landscape are shown by means of contour lines. These lines normally spaced at regular intervals to show elevation changes and when lines are close together the terrain is steep.

Climate Maps

A climate map shows information about the territorial distribution of climatic conditions based on the results of long-term observations. Climatic maps are compiled for individual climatic features (temperature, precipitation, humidity) and for combinations of them at the earth's surface.



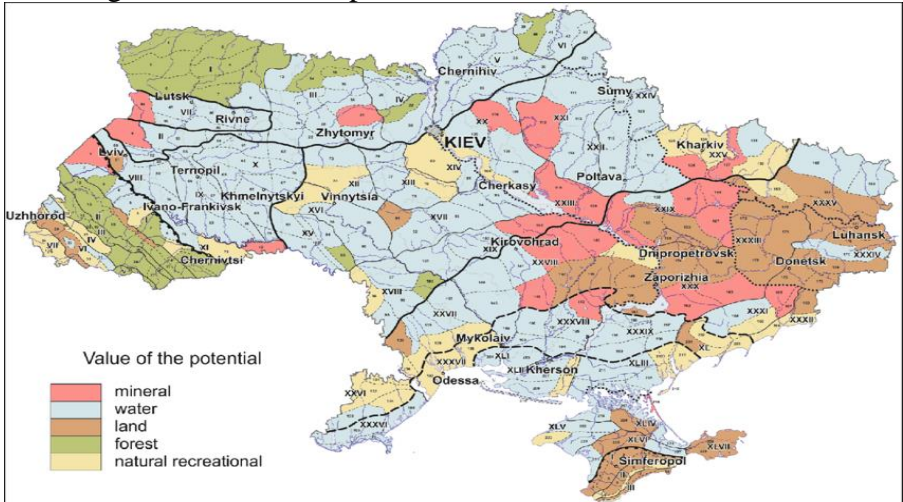
Tropical	Dry	Moderate	Continental	Polar	Highland
Tropical wet	Semi-arid	Mediterranean	Humid continental	Tundra	Highland
Tropical wet and dry	Arid	Humid subtropical	Subarctic	Ice cap	
		Marine west coast			

features (temperature, precipitation, humidity) and for combinations of them at the earth's surface.

They can show the amount of snow or rain an area receives or the average number of cloudy or sunny days. These maps normally use colors to show different climatic areas.

Economic or Resource Maps

An economic or resource map display information based on specific types of economic activity or natural resources available in an area. The knowledge about the type of resources available will help to determine which types of industries will be able to thrive in that area. Different symbols or colors are used depending on what is being shown on the map.



For example, this map shows the availability of water, mineral, land resources as well as forest and natural recreational zones found in particular regions of our country.



Road Maps

A road map is one of the most widely used map types. These maps display roads and transport links, major and minor highways as well as things like airports, city

locations and places of interest such as parks, campgrounds, and monuments. Major highways on a road map are generally shown in red and larger than other roads, while minor roads are a lighter color and a narrower line.

Exercise 2. Give equivalents for:

економічна діяльність, бути схожим до фізичної карти, використовувати контурні лінії, показувати зміни в ландшафті, головні автошляхи, кордони країни, специфічні кліматичні зони, кількість снігу, види сільськогосподарських культур, цифрова революція, опис, поверхня землі.

Exercise 3. Answer the questions:

1. What is a map? What types of maps do you know?
2. What does the political map show?
3. What information can one get from the thematic map?
4. How are the road maps used?
5. How are maps useful to us?

Exercise 4. Form nouns derived from the words in bold.

Translate the information below and get ready to speak about various symbols used in different types of maps.

We use **-ance** (appear – appearance), **-ery/-ry** (slave – slavery), **-ion/-ation** (admire – admiration), **-ment** (move – movement) to form nouns.

Scale of a Map

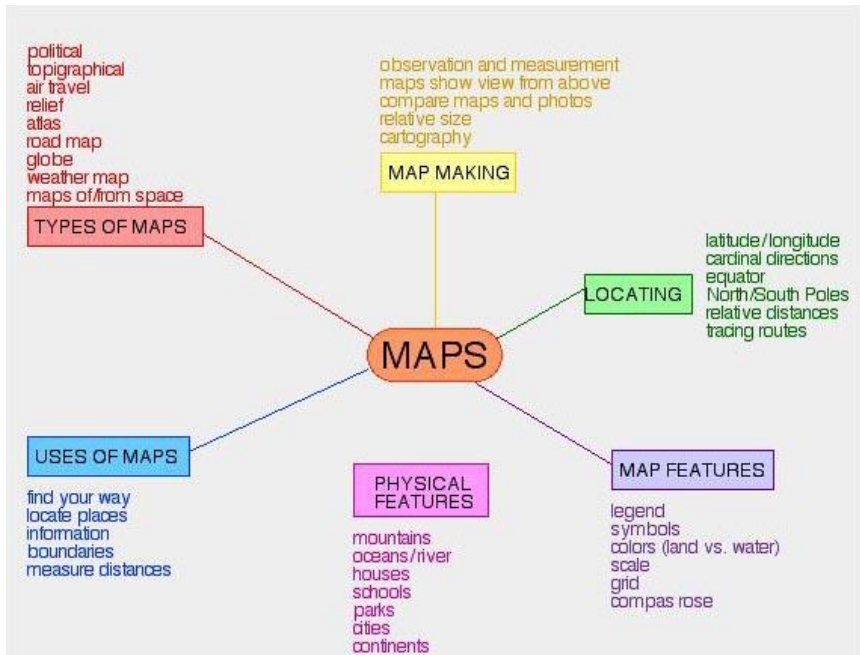
1. All maps are viewed as model of the real world, that is why the features are reduced in size. (**REPRESENT**)
2. In other words, the scale of a map is the between distance on a map and the corresponding distance on the ground (**RELATE**). For example, on a 1:100000 scale map, 1cm on the map equals 1km on the ground.
3. So, you will get a of the distance between two places by means of a scale. (**MEASURE**)

Symbols

Symbols are small pictures that stand for different features on a map. A symbol is usually similar to what it represents.

1. For example, a triangular shape is often used for of a mountain. (**DENOTE**)
2. Black dots are of cities, circled stars represent capitals. (**REPRESENT**) Different types of lines represent roads, highways and railways.
3. All the symbols for a map are often grouped together in a **MAP KEY** for (**REFER**).
4. **MAP KEY** is an of symbols in a box (**ARRANGE**). Their purpose is to make it easier for us to study and understand the map.

Exercise 5. Speak about the role and uses of maps in today's society. The picture below will help you to reveal the topic.





1. The map that shows the weather of a specific area is called a

- A. weather map
- B. road map
- C. population map
- D. political map

**2. Weather maps show average elevations in a specific area. True
False**

3. The purpose of the road map is

- A. to show the history of an area.
- B. to It use boundary lines.
- C. to show elevations.
- D. to show the types of roads in an area.

4. A shows the elevation, vegetation, or some other physical features of the land.

- A. population map
- B. physical map
- C. time-zone map

5. The areas in which people live are depicted on a

- A. population map
- B. physical map
- C. political map

6. A person needs afor reading and understanding a map.

- A. map key
- B. scale
- C. title

D. all of the above

7. A round view of the world is represented by means of a (an)

.....

A. globe

B. sketch

C. road map

D. none of the above

8. How does a map scale help you to read a map?

A. it helps to show what things stand for

B. it is a tool used for measuring distance

C. it tells what mountains and plains are on the map

D. it tells how heavy something is on the map

9. The maps that can show types of things that are grown, raised or mined in a certain place are called

A. population maps

B. physical maps

C. product maps

10. This map uses boundary lines to show the history of an area.

It is a

A. historical map

B. road map

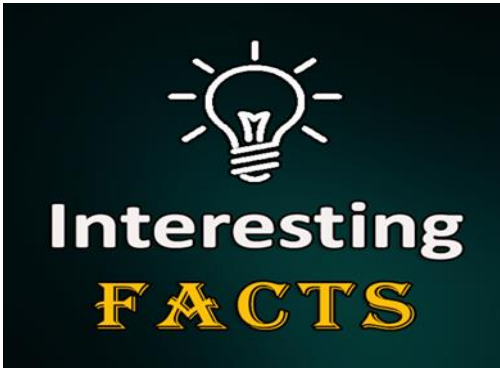
C. political map

11. The natural landscape features of Earth is shown on

A. physical maps

B. road maps

C. resource maps



Mapping

In spite the fact people use various types of maps, all of them have similar components. These common parts include a title, a legend or key, a direction indicator and a scale.

The title of a map. The title is important because it describes the theme or subject of a map, what it is about. Sometimes the title of the map may include a date. Dates are usually used to show features that have undergone changes over a period of time. A map with the title “Distribution of Population in Ukraine: 1917”, for example, should not be used when looking for figures on the present population of Ukraine.

A legend. A legend or a key is a list of symbols that appear on the map. It explains the meaning of colors and symbols the map uses. If the user knows the meaning of colours on the map, what the green, red, and blue, for instance, represent, then the map won't be misunderstood and will be read properly. The stars used on the map stand for capital cities, so the legend also explains the meaning of symbols used on a map.

A direction indicator. Every map should have a direction indicator. A directional indicator lets the map user know which side of the map corresponds to north.

In some cases, the direction indicator on a map might be used only as a design element and doesn't perform any specific functional, because many maps are not intended to be used for actual navigation, but to provide a schematic of a place. A subway system map, for example, gives a general sense of which stations are near each other.

Map scales and projections.

Scale and projections are among essential features of maps. Scale refers to how map units relate to real-world units. The scale of the map indicates how much our planet has been reduced to be reproduced on this map.

In other words, scale is the relationship between the actual distance and the distance shown on the map.

Projections deal with the methods around turning a three-dimensional earth into a two-dimensional map.

It is impossible to show the earth's curved surface on a map without distortions. They are inevitable in the process of illustrating the earth's spherical surface on a flat map. Map projections introduce distortions in distance, angles, and areas.

Remote sensing

Rapid developments in technology have contributed much to the appearance of new tools. The aim of these tools is to provide a certain amount of valuable information about the earth's surface. Remote sensing ranks first among the most important new methods. It is defined as the gathering and recording of information by means of aerial photographs and satellite images.

Aerial photographs. Aerial photographs are the pictures taken from above the earth. They are of great help to examine relationships between people and places that cannot be easily seen from the ground level. To plan new highways, the aerial photographs of traffic patterns can be used. The aerial photographs are also of great help to foresters because they are able to spot diseased or insect-infested trees in some remote areas which are difficult to reach on foot. Even the features of the ocean floor can be observed using aerial photographs.

Aerial photographs are considered to be a reliable source of information, because it is accurate and detailed.

Most aerial photographs used for making maps are taken by

cameras in high-altitude airplanes.

Satellite images

Many of the satellites circling the earth have special sensors called multispectral scanners.

These scanners make records of observations electronically and



send them to the ground stations.

Computers then translate the data into electronic images.

Despite the fact the pictures are taken from the far space, they are so accurate and detailed to such an extent that they can show houses or even sailboats on a lake.

Landsats is group of earth satellites. These satellites revolve around the earth 14 times every 24 hours. During this time, they scan, collect and send back a greater view of the entire world than any human being could ever see.

Besides various types of maps and remotely sensed images, geographers also use tables, charts and diagrams to help them in their work.

UNIT 5.

Exercise 1. Read and translate the text. Learn unknown words.

The Atmosphere Makes Life on Earth Possible

The Earth is a unique planet in the universe. The presence of a stable atmosphere is an exceptional peculiarity of the Earth. The atmosphere is made up of various gases that surround our planet. So, the atmosphere of the Earth defines the weather, climate, and vegetation patterns and makes our life possible. The changes occurring daily are possible due to the presence of air. If there was no air on the Earth, there would be no oxygen and no carbon dioxide to support human and plant life.

Components of the atmosphere. A vast amount of various gases surrounding the earth forms the earth's atmosphere. More than 98 per cent of these gases 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 mixture of gases that has no color, odor and taste. 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.

Apart from gases, air is always composed of small amounts of water vapor, dust, soot, pollen, and other particles. These particles get into the air naturally through winds, forest fires and volcanic eruptions. Other particles are released from chimneys, automobiles, and other polluters. Together they are the cause of air pollution, the example of which can be haze and smog that hangs over many cities today.

Weather is the condition of the atmosphere for a short period at a specific location. The average weather in a given area over a longer period of time is defined as climate. While the weather can change in just a few hours, climate takes hundreds, thousands, even millions of years to change.

Exercise 2. Give equivalents for:

the universe, оточувати планету, various gases, впливати, particles, виверження вулкану, haze and smog, лісові пожежі,

tasteless mixture of gases, невелика кількість води, carbon dioxide, забрудники, the earth's surface, рослинність, to thin out gradually, надзвичайно спекотно, охуген.

Exercise 3. Answer the questions:

1. What are the components of the atmosphere?
2. Name the characteristic feature of the Earth that makes it exceptional among other planets.
3. Why are some scientists concerned about the atmosphere's levels of carbon and ozone?
4. What is the role of oxygen in our life?
5. What is the atmosphere? Where is it found?
6. What does the air contain?
7. Give the definitions of weather and climate.

Exercise 4. Insert the prepositions if necessary:

smog ... cities, the condition ... the atmosphere, small amounts ... dust, to influence ... the distribution ... climates, the planets ... the solar system, very cold ... night, thousands ... miles, tasteless mixture ... gases.

Exercise 5. Rearrange the letters in the anagrams to form equivalents for the Ukrainian words.

asruец - поверхня

seapicltr - частинки

osrelutlp - забрудники

nyemcih - димохід, комин

titedalu - широта

egevnotati - рослинність

gyxoen - кисень

turexim - суміш

Exercise 6. Choose the correct words to complete the sentences. Translate them into your native tongue. Say whether you agree or disagree with the following statements.

1. The atmosphere is of gases.
consists of *made up* *comprise*
2. Two of them that modern scientists are carbon dioxide

and ozone.

look forward

keep up

concern about

3. Temperature, wind, moisture and atmospheric pressure are those conditions that the creation of weather.

generates

insist on

promote to

4. Changing atmospheric conditions can create weather.

vivid

violent

virtual

5. Such as thunderstorms, typhoons, tornadoes and hurricanes can be very dangerous and destructive for everything on their way.

natural disasters

natural habitat

natural reserves

6. Tornadoes are rotating flows of air. Winds of a tornado can reach the speed of up to 480 km per hour.

speed

length

hight

Exercise 7. How much do you really know about the atmosphere surrounding you? Read the information below to find some interesting facts about Earth's atmosphere.

Fill in: stroke, greenhouse gases, altitude, speed, are formed, seen, mix, undergone, to destroy, thicker,

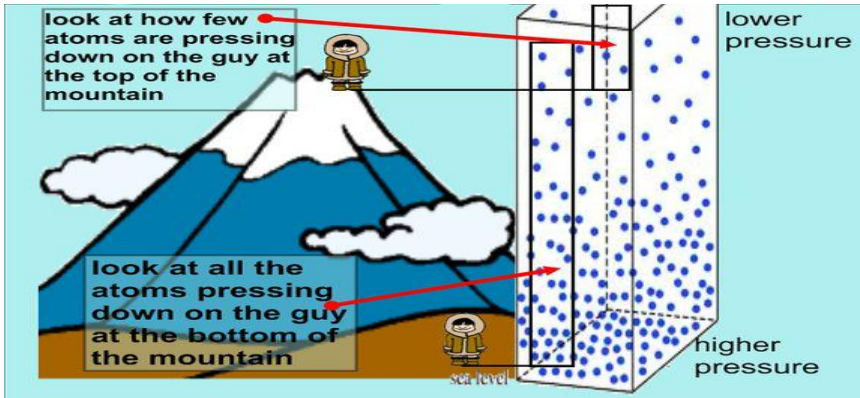
1. The Earth's Atmosphere is a of gases and is 480 km thick. Some of them are Nitrogen, Oxygen, Argon, Carbon dioxide, Neon and many others.



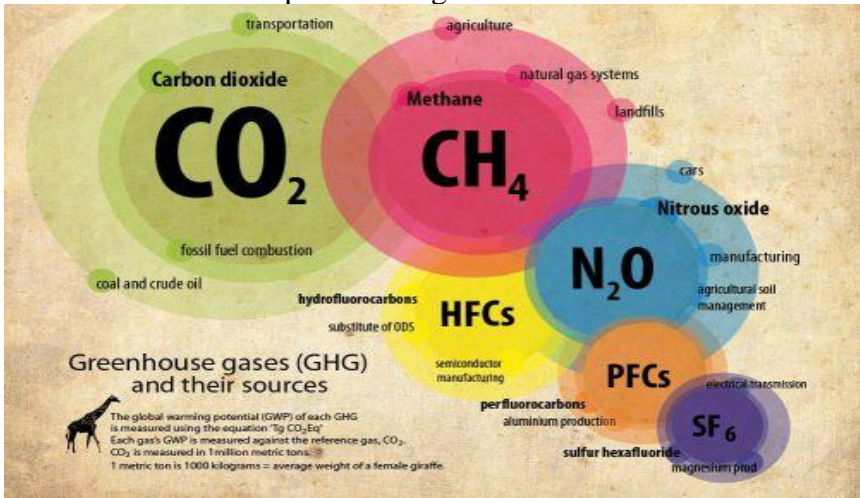
2. Have you ever seen jets leaving white trails? They are usually formed as a result of mixture of the cold atmospheric air and the hot humid exhaust. The more humid the atmosphere, the the contrails.

3. Polar light, also known as Auroras, can be in regions of high latitude. It is the shimmering light seen at night. Auroras are formed due to charged particles from the Sun striking the upper atmosphere above the poles.

4. With the increase of the atmosphere becomes thinner. The air pressure in the highest layer is extremely low due to its high altitude and the distance between the molecules it has.

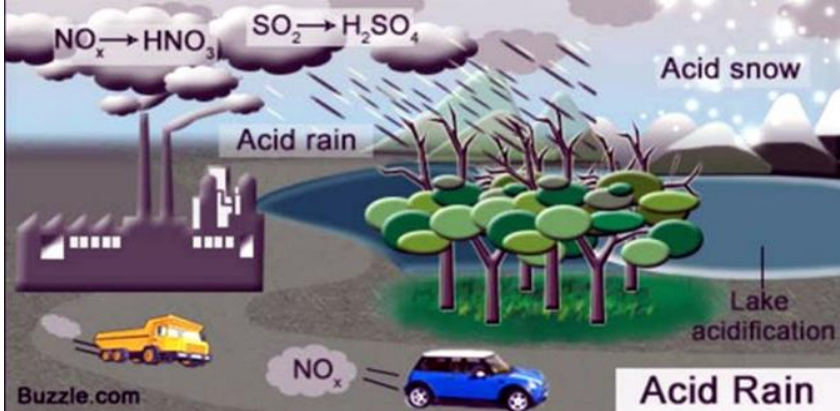


5. The global climate has changes throughout history. Nowadays human activity results in an increased level of that causes unusual rapid warming.



6. Acid rains as a result of a chemical reaction between sulfur dioxide and nitrogen oxides with water vapors.

7. Acidic rains are able animal and plant life and even kill organisms living in oceans.



8. A single of a lightning can heat the surrounding air to 27,000 degrees Celsius. Since the lightning travels at extremely fast



..... (299,792,458 m/s), the heated air has no time to expand. This rapid heating causes an explosive expansion of the nearby air, which forms a shock wave of compressed particles in all directions. Similar to an explosion, the rapid expanding waves produce a very loud, booming burst of sound.

Exercise 8. Find out more interesting information and get ready to share your findings with groupmates.

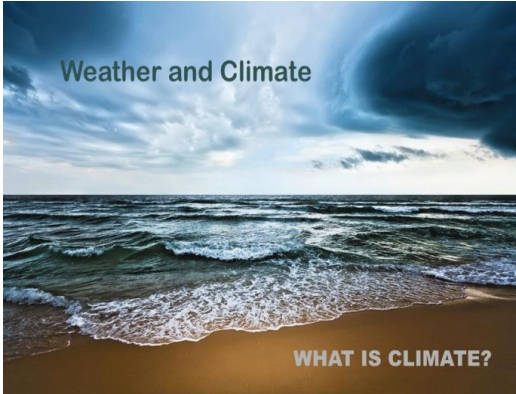
UNIT 6.

Exercise 1. Read and translate the text. Learn unknown words.

Climate's Role in the Environment

Climate is related all other parts of the earth. It is closely connected with its atmosphere, land and water. These relationships work in two ways.

Land, water, and the changes that take place in the air play a



significant role in shaping climate. At the same time, climate is essential in shaping landforms and soils. Climate is of great assistance in keeping the water cycle working. It also helps to determine what changes take place in the air

from month to month and from year to year.

The relationships between land, water, air, and climate have a direct influence on the plant and animal species living on a particular territory. Climate is also vital for making decisions and choices concerning the use the land, water and life forms found in a region.

Today scientists are aware of some climate changes in the past.

The cooler periods were characterized by the formation of ice on the earth. Huge glaciers covered large parts of the Earth's land surface. But the glacial periods were always followed by warmer periods. These cycles characterized by consecutive warming, cooling, and warming again repeated several times in the past. The last glacial period was followed by a warming period about 11 000 years ago.

The present day climates emerged after the last continental glaciers had moved back to the territories around the poles.

Nowadays, hot climates are observed around the equator, cold climates can be felt around the poles, and climates with warm and cold seasons are the characteristic feature of middle latitudes.

On the areas characterized by hot and warm temperatures as well as heavy or moderate precipitation, forests cover the land. Tall grasses can be found in areas where temperatures are warm enough but precipitation falls only in one season. Very hot but dry places are the habitat for special species of plants which can store water in their stems or take moisture from the air. In very cold places, tiny mosses manage to survive.

Every climate region gives a shelter to special forms of animal life. Animals climbing up and down the trees cannot be found in grasslands. In very dry regions animals are adapted to live without water for long periods of time. Moreover, every climate region has its own communities of insects and birds.

Exercise 2. Give equivalents for:

great continental glaciers, ховатися поміж трав, certain climate regions, комахи та птахи, tree trunks, зберігати (утримувати) воду, to take moisture from the air, виживати, tiny mosses, середні широти, the glacial periods, to have a direct influence, визначати, scientists, to survive.

Exercise 3. Develop your reading skills. Read the following text and do the comprehension tasks.

1. Climate has no impact on atmosphere. *True / False*
2. In dry areas of the world different species of plants use their stems to store water. *True / False*
3. Every climate region has its own flora and fauna. *True / False*
4. Climate started influence the environment only several decades ago. *True / False*
5. The present day climates appeared after the last warming. *True / False*
6. Scientists don't know anything about climate changes in the past. *True / False*

7. The plant and animal species living on a particular territory greatly depend on the direction of winds on that territory.
True / False
8. Dry places are the habitat for lush greenery and variety of birds. *True / False*
9. Huge glaciers covered only Polar regions of the Earth's land surface. *True / False*

Exercise 4. Insert the prepositions if necessary:

parts ... the earth, to have a direct influence ... the kinds ... plants and animals, the cycle ... warming and cooling, special forms ... animal life, to live ... forests, to survive ... grasslands, ... very dry regions, to go without water ... long periods ... time, to live ... very cold regions, communities ... insects and birds.

Exercise 5. Use the appropriate English equivalents:

1. Climate has (взаємозв'язки) to all other parts of the earth.
2. After the last great continental glaciers (відступив) to the lands around the poles, the climates we know today emerged.
3. Special forms of animal life, too, live in (певних кліматичних регіонах).
4. Where temperatures are hot to warm and where (опадів) is heavy to moderate, (земля вкрита лісами).
5. Today (вчені) know some things about climate changes in the past.
6. The relationships between land, water, air, and climate (мають прямий вплив на) the plant and animal species living on a particular territory.

Exercise 6. Look at WEATHER COLLOCATIONS.

A) Choose the odd word out.

B) Use the collocations in sentences of your own.

cold – thick – fresh – freezing **air**

low – high – freezing – good **temperatures**

strong – heavy – dense – thick **fog**

lovely – bad – strong – dry **weather**

strong – foggy – chilly- rough **wind**
heavy – light – torrential – wet **rain**

Exercise 7. Read short texts about weather and climate and decide which answer (A, B, C or D) best fits each gap. There is an example at the beginning (0).

What exactly is weather?

Weather is the (0) B of events that happen each day in our atmosphere. Even though there's only one (1) _____ on Earth, the weather isn't the same all around the world. Weather is different in different parts of the world and (2) _____ over minutes, hours, days, and weeks.

Most weather happens in the part of Earth's atmosphere that is closest to the ground — (3) _____ the troposphere. And, there are many different factors that can change the atmosphere in a certain area like air pressure, temperature, (4) _____, wind speed and direction, and lots of other things. Together, they determine what the weather is like at a given time and location.

0	A	measure	B	mix	C	moor	D	means
1	A	climate	B	atmosphere	C	temperature	D	island
2	A	alters	B	starts	C	covers	D	over
3	A	used	B	left	C	found	D	called
4	A	honesty	B	humidity	C	hoover	D	hey

What is climate?

Whereas weather (5) _____ to short-term changes in the atmosphere, climate describes what the weather is like over a long period of time in a (6) _____ area. Different regions can have different climates. To describe the climate of a place, we might say what the temperatures are like during different seasons, how windy it usually is, or how much rain or snow typically (7) _____.

When scientists talk about climate, they're often looking at averages of (8) _____, temperature, humidity, sunshine, wind, and other measures of weather that occur over a long period in a

particular place. In some instances, they might look at these averages over 30 years.

5	A	insists	B	follows	C	refers	D	goes
6	A	specific	B	spontaneous	C	strategic	D	spare
7	A	feels	B	fault	C	foul	D	falls
8	A	precaution	B	precipitation	C	pollution	D	portion

Why do we study climate?

Climate, climate change, and their impacts on weather events (9) _____ people all around the world. Rising global temperatures are expected to further (10) _____ sea levels and change precipitation patterns and other local climate (11) _____. Changing regional climates could alter forests, (12) _____ yields, and water supplies. They could also affect human health, animals, and many types of ecosystems. Deserts may (13) _____ into existing rangelands, and features of some of our National Parks and National Forests may be permanently altered.

9	A	affect	B	effect	C	afford	D	adore
10	A	raid	B	rode	C	eraser	D	raise
11	A	regulations	B	conditions	C	rules	D	caves
12	A	creek	B	mint	C	crop	D	mite
13	A	extreme	B	expand	C	exclude		engrave

Exercise 8. Be ready to speak about the *Climate's Role in the Environment and Climate of Ukraine.*



1. What is the name of the science that studies the atmosphere, monitors and predicts the weather and climate?

Hydrology
Meteorology
Demography

2. The term used to define the average weather conditions in a particular area is

weather *climate* *temperature* *humidity*

3. The term is used to describe the movement of air from a high pressure to a low pressure zone.

whirl *wind* *wave* *glacier*

4. Climate and weather usually describe the same natural phenomena. *True* *False*

5. Ice sheets melting leads to

rise in the sea level *diminishing in the sea level*

6. The average global temperature has increased since the 18 century. *True* *False*

7. What factor is considered to be the most important to influence climate?

Air masses *Latitude* *Ocean currents* *Moisture*

8. Snow is an example of the key weather element known as _____.

atmosphere *portion* *precipitation* *moisture*

9. _____ refers to the atmospheric conditions of a specific place over a considerable period of time usually up to 30-35 years.

Weather *Climate* *Temperature*

10. The amount of water vapor in the air is _____.

humidity *precipitation* *gravity* *water drops*

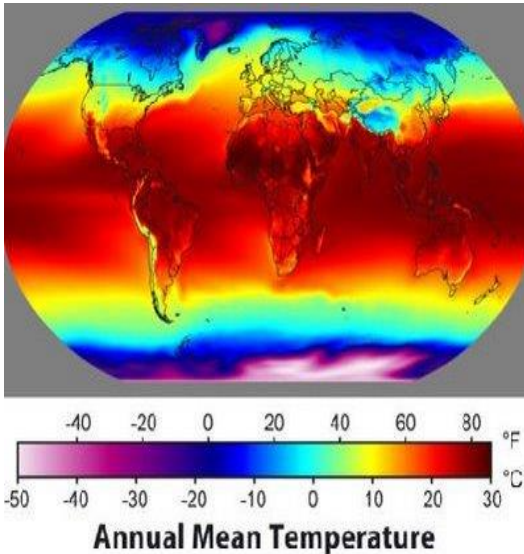
UNIT 7.

Exercise 1. Read and translate the text. Learn unknown words.

Conditions Causing Weather: Temperature and Moisture

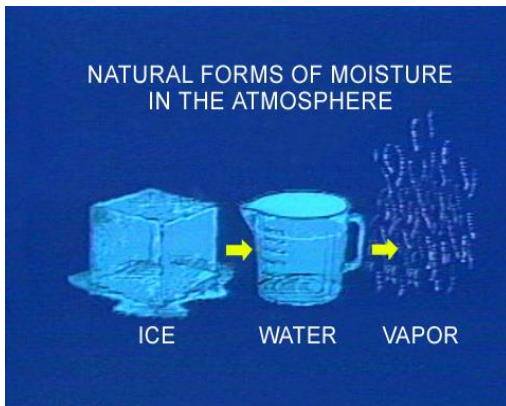
You have probably heard a saying: “If you don’t like the weather, wait an hour.” It proves that weather conditions can change very quickly. By its nature, weather changes constantly. The term “weather” describes the condition of the atmosphere for a short period of time in a specific area. As the atmosphere changes constantly, the weather, consequently, changes constantly as well. An area’s weather is affected by 4 variable conditions in the atmosphere: 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. Moisture in the atmosphere exists in several forms, for example water vapor, liquid water and ice, and it controls most aspects of our weather and climate. However, air higher than 6.4 km above the earth's surface rarely

contains moisture. On average, water vapor makes about 4% of the molecules in the air. The amount of moisture in the air is called **humidity**.

Usually scientists use two terms: **absolute humidity and relative humidity**. **The absolute humidity** is the actual amount of water vapor per unit volume of gas at given temperature and pressure, and is expressed in g/m³. **The relative humidity**, on the other hand, is the ratio of the amount of water vapor present in the air to the amount present at a given temperature, and is expressed as a percentage.

Exercise 2. Give equivalents for:

weather conditions, постійно змінюватися, to affect an area's weather, випаровування води, to receive warmth from sunlight, волога, to reach the earth's surface, відносна вологість, to contain some amount of moisture, співвідношення, actual amount of water, містити вологу, absorb the sunlight, існувати в різних формах, water vapor.

Exercise 3. Answer the questions:

1. Name four factors that affect the weather.
2. Where does the Earth receive its warmth from?
3. What is insolation?
4. Give the definition of humidity. How is it measured?

5. Describe the process of forming precipitation.
6. What types of precipitation do you know?
7. What type of precipitation is common to your country?

Exercise 4. Guessing the meaning of unknown words.

A. Match the words with their meanings.

- | | | | |
|---|---------------|---|--|
| 1 | moisture | a | the amount of energy from the sun that reaches the earth |
| 2 | humidity | b | the conditions in the air above the earth such as wind, rain, or temperature, especially at a particular time over a particular area |
| 3 | insolation | c | water that falls from the clouds towards the ground, especially as rain or snow |
| 4 | weather | d | a liquid such as water in the form of very small drops, either in the air, in a substance, or on a surface |
| 5 | precipitation | e | a measurement of how much water there is in the air |

B. Choose the right word to complete the sentence.

1. The animal's thick fur provides very good *insolation* / *insulation* against the arctic cold.
2. *Insolation* / *insulation* is a measure of the solar energy that is incident on a specified area over a set period of time.
3. Not all of the solar energy that *reaches* / *riches* the Earth actually *reaches* / *riches* the surface of the Earth.
4. It doesn't matter *whether* / *weather* you're invited to the party or not. I won't allow you to go until you finish your homework.
5. I checked the *whether* / *weather* for this week because I want to start my work in the garden.
6. The island of Newfoundland is commonly known for its wet and cold *whether* / *weather*.
7. Children didn't know *whether* / *weather* the ice on the pond was thick or not.

8. According to the weather forecast some kind of frozen *participation / precipitation* is expected tomorrow.
9. The sun dries the *moisture / humidity* on the ground.
10. Plants use their roots to absorb *moisture / humidity* from the soil.
11. Last summer was characterized by murderous heat and *moisture / humidity*.
12. There is heavy *precipitation / moisture* in some parts of the country.
13. The weather forecast promises dry weather with no *precipitation / moisture*.



Collocations are phrases used commonly in speech. They will help you understand others and sound more natural.

Weather Collocations

Weather the storm (to be strong and face something difficult)

This old wrinkled man sitting on the bench weathered lots of storms in his lifetime.

Good/bad weather

*We had good weather during our last journey.
It's going to be bad weather this week.*

Weather permitting

They will be having the match outdoors, weather permitting.

When **weather** is used as a verb, it can mean to change the appearance or structure of something that is exposed to the outdoors for a period of time.

When things are left outside for a long period of time, wind, rain and sun can destroy or change them. This is **weathering**.

*The sun **weathered** and faded the cushions that were left outside on the Granny's favourite arm-chair under the old linden.*

Exercise 5. Find and cross the odd word in each line. Find the heading for it from the suggested below.

forests	grasses	trunk	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

1. Particles contained in the air.
2. Polluters (contaminants).
3. Degree of precipitation (rainfall or snowfall).
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.

Exercise 6. Choose the right word to fill in the gaps:

1. If you don't like the weather, wait an ... (age, second, hour, minute).
2. When the ... (flows, tons, cups, drops) of water condensing in cooling air become large enough, they form (waves, precipitation, oxygen, humidity).

3. (Weather, Forecast, Climate, State) describes the condition of the atmosphere for a short period of time in a specific area.
4. The amount of moisture in the air is called (precipitation, humidity, rainfall, moisture).
5. Hail is formed when condensation takes place (above 0°C, below 1°C, below 0°C).
6. The weather of a particular area is affected by (three, four, five, six) variable conditions in the atmosphere.

Exercise 7. Read the weather conversation and decide which answer (A, B, C or D) best fits each gap.



Ted and Jane are going camping and deciding what to take.

Ted: Have you heard the weather forecast? What kind of weather are we going to have?

Jane: (1) _____ said that it would be hot and dry.

- A. the map on television
- B. the meteorologist on television
- C. the precipitation on television
- D. all the neighbours
- E. the prediction of tourists

Ted: Yes, (2) _____.

- A. it should be lovely weather
- B. it should be terrible weather

- C. it must be heavy storm
- D. it will be very cold
- E. it must be windy

Jane: But the weather forecast is normally wrong, so (3)_____.

- A. we should have good weather
- B. we should go outside and check
- C. we should stay at home
- D. we should call our friends
- E. we should expect rain and fog

Ted: I also think it might be quite cold at night. We might even get frost in the mornings.

Jane: We should take (4)_____.

- A. some sunglasses then
- B. some fizzy drinks
- C. some warm clothes then
- D. some extra food then
- E. some fireworks then

Ted: And (5)_____ rains.

- A. some umbrellas for if it
- B. some shorts for if it
- C. some swimming costumes for when it
- D. some extra hamlets for if it
- E. some fishing rods for if it

Jane: I don't normally go camping early in the spring because the weather is so changeable. We can't rely on the weather forecast.

Ted: Yes, I understand you. I agree that it is rather difficult to pack necessary things.

Jane: I'm sure we'll have a good time.no matter how good or bad the weather is.

Ted: Sure, we will.

Exercise 8. Prepare a short report about the influence of temperature or moisture on weather.

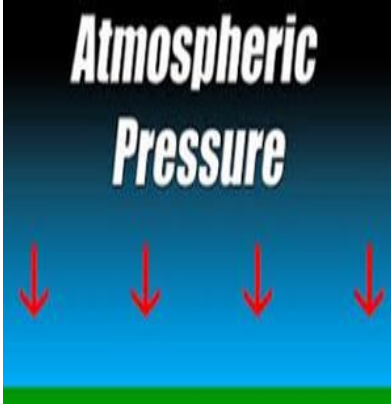
UNIT 8.

Exercise 1. Read and translate the text. Learn unknown words.

Four Conditions Causing Weather:

Atmospheric Pressure and Wind

Another two atmospheric variable conditions affecting the area's weather are atmospheric pressure and wind.



Atmospheric pressure. The air around us has weight, and it presses against everything it touches. That pressure is called atmospheric pressure, or air pressure. It is the force exerted on a surface by the air above it as gravity pulls it to Earth. The standard pressure exerted by the atmosphere at sea level is 760 millibars.

The atmospheric pressure is greatly affected by the distance above the Earth's surface, in other words by altitude. (At high altitudes pressure is lower.) It is also affected by temperature. 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 forms a high-pressure area. Low-pressure areas are characterized by unstable weather with clouds, rain and storms. High-pressure areas usually have clear and calm weather.



Wind. The wind is caused by differences in atmospheric pressure. When this difference exists, air moves from the higher to the lower pressure area, resulting in winds of various speeds. And the bigger the difference between the pressures,

the faster the air will move from the high to the low pressure.

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.

Exercise 2. Guessing the meaning of unknown words.

A. Find the words 1-6 in the text and guess their meanings.

1 adjacent

2 reverse

3 affect

4 continually

5 prevailing

6 variable

A. Now match the words 1-6 with their meaning a-f.

a alter, change

b regularly

c existing, prevalent

d act on, influence

e shifting, fluctuating

f close to

Exercise 3. Give equivalents for:

unequal heating of land and sea, пасати, the global circulation of the atmosphere, західні вітри, low-pressure areas, спричиняти сезонні вітри, complicated, мусони (дощовий сезон), due to the influence of various factors, атмосферний тиск, altitude, важити менше.

Exercise 4. Answer the questions:

1. Is atmospheric pressure a stable factor affecting the weather?
2. What is the atmospheric pressure?
3. What is it influenced by?
4. What are the peculiarities of low-pressure areas?
5. When do winds occur? How are they formed?
6. How important are weather and climate to the agriculture and industry of your region?

Exercise 5. Insert the prepositions if necessary:

... example, affect ... an area's weather, the weight ... the air, ... sea level, a major effect ... atmospheric pressure, the circulation

... the atmosphere, the influence ... various factors, many types ... local winds.

Exercise 6. Read short texts about wind and decide which answer (A, B, C or D) best fits each gap. There is an example at the beginning (0).

There are many names (0) B the wind, from a breeze to a gust. But all winds (1) _____ in a similar way.

What is Wind?

In a hurricane, it can reach (3) _____ of more than 130 miles per hour. In a tornado, it can swirl at more than 200 miles per hour. Do you know what it is? It is the wind! This natural phenomenon is defined as the movement of air caused by differences in air pressure.

Meteorologists use an anemometer to (4) _____ wind speed. It (5) _____ a pole with a few cups on top.

When the wind blows, it goes into the cups, making them (6) _____ on the pole. A specialist then can count how many times the cups spin over a set period of time to figure out how fast the wind is blowing.

The speed of the wind can vary significantly from gentle to hard. When it is strong enough it can even knock down a building. But (6) _____ the wind's speed, wind wouldn't be possible without the sun.

0	A	to see	B	to describe	C	to derive	D	to speak
1	A	creates	B	are created	C	created	D	is create
2	A	center	B	slope	C	speeds	D	squirrel
3	A	measure	B	movement	C	maintain	D	medieval
4	A	looks around	B	looks about	C	looks like	D	looks for
5	A	spin	B	to spin	C	spinning	D	spam
6	A	regarding to	B	regardless of	C	paying attention	D	without



Interesting FACTS

Violent weather

Thunderstorms, tornadoes, hurricanes, and typhoons can be rather dangerous. They occur as a result from certain combinations of temperature, moisture, atmospheric pressure and wind.

A thunderstorm is characterized by the presence of lightning and its acoustic effect on the Earth's atmosphere, known as thunder. 16 million thunderstorms occur worldwide each year. About 10% of them reach severe levels.

Tornadoes and hurricanes are not the same things. They differ in size and their duration. Hurricanes are generally hundreds of miles in diameter. They are characterized by high winds and heavy rains over the entire region. They occur throughout the world and the speed of the wind varies in the range between 480 and 800 km per hour. They rank first among the most violent of nature's storms.

The largest hurricane ever to hit the United States was Sandy in 2012. It was 1,000 miles wide and caused more than 175 deaths and the damage in the amount of more than \$70 billion.

Hurricanes can last for days or even weeks. Tornadoes usually last no more than a few minutes. A hurricane typically starts in the regions over the tropical oceans. It is characterized by a wave of low pressure air in the warm, and rich in moisture atmosphere.

These large low-pressure areas with strong winds can create violent storms over tropical ocean areas usually in the late summer and early autumn. The storms formed over the Atlantic Ocean and the Gulf of Mexico are called hurricanes. Similar storms formed over the Pacific Ocean are called typhoons. The route of hurricanes and typhoons is unpredictable. They reach coastlines with high winds, high waves, and heavy rains. and can cause tremendous damage to coastal areas.

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

Desert Landscapes

If you hear a word “desert”, the first thing that springs in your imagination is a barren space with no people around. But this description could be equally used for polar or mountain regions as well. What is then a distinctive feature of a desert?

Geographic definitions. When geographers use the word desert, they imply something special. A geographer’s desert may be crowded with people. For example, Egyptian cities Cairo and Alexandria are both in a desert, but they are crowded with millions of people. So “place without people” really do not provide a useful geographic definition of desert.

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

Unreliable precipitation.

People describe deserts as hot, dry and empty areas which receive no more than 25 centimetres of precipitation every year. Very often the amount of evaporation greatly exceeds the annual rainfall. This is true to some extent. Some deserts are very hot and the daytime temperature can increase up to 55°C, other deserts have cold winters or are cold year-round. Despite these characteristics deserts are a habitat for a great variety of plants, animals and other living organisms. And though there is little water available for plants and other organisms, they have adapted for such heavy conditions during the thousands of years.

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.

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.

UNIT 9.

Exercise 1. Read and translate the text. Learn unknown words.

Vegetation and Soils

NATURAL VEGETATION



Natural vegetation regions. Vegetation is plant life. The kind of natural vegetation 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 generally need more moisture than grasses. For areas with a heavy and well-distributed rainfall and at least one month per year with average temperatures above 10°C the natural vegetation is forest where the trees are 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.

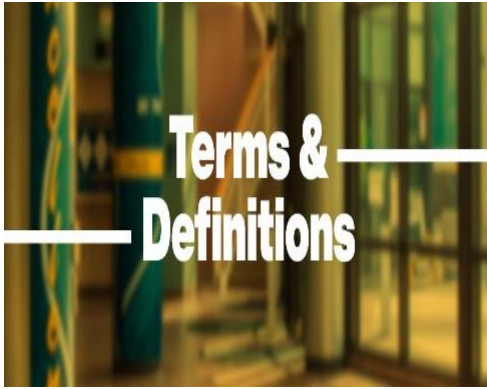
For example, the tropical rain forests of the Amazon basin are very different from the coniferous (needle leaf) forests of the interior of northern Canada and Russia or scrub forests typical for Mediterranean climate region. Similarly, the savanna grasslands of East Africa are very different from the temperate grasslands of the steppes of Ukraine.

Exercise 2. Give equivalents for:

Рослинне життя, dominant plants, пасовища, to thaw, тропічні ліси, to depend upon several factors, рельєф, moderate rainfall, різна кількість вологи, average temperatures, принаймні, very dry or very cold conditions, пристосовуватися, during the short period, пустеля, coniferous (needle leaf) forests.

Exercise 3. Answer the questions:

1. What is the definition of the term ‘vegetation’?
2. What factors does vegetation depend on?
3. How is vegetation connected to climatic conditions? Are they interdependent?
4. Where are forests and grasslands usually found? What are the different types of forests and grasslands?
5. How does the vegetation differ with the distribution of moisture?
6. Give examples of dominant plants in steppes, deserts, grasslands?



Exercise 4. Learn the following definitions.

VEGETATION (n)

1. the process of growth in plants; type of development, growing, growth, maturation.

2. all the plant life in a particular region or period.

Synonyms: botany, flora

Exercise 5. Choose a suitable word for each sentence. Translate the sentences into your native tongue and write down your own sentences with the underlined words:

1. Vegetation climatic conditions and plant-growth patterns.

differs from *found in* *depends on*

2. Global vegetation regions forest-lands, grasslands, vegetation in dry and cold regions, and mountain vegetation.

divide *include* *survive*

3. One can distinguish between different types of forests all over the world. You can admire the beauty of tropical near the Equator or investigate boreal forests close to the Arctic Circle.

deserts *rainforests* *coniferous forests*

4. Grasslands can be found on every continent except Antarctica. The type of vegetation here is grasses.

extraordinary *rare* *dominant*

5. Arctic tundra has a landscape and is frozen for much of the year.

rich *bare* *vivid*

6. the barren look of hot deserts, they are full of animal life.

In spite *Deprived* *Despite*

7. Most desert animals, for instance, lizards or snakes, are It means they are active at night.

nordic

nocturnal

nonverbal

Exercise 6. Scan the text and get ready to speak about the role of soil plant vegetation.

UNIT 10.

Exercise 1. Read and translate the text. Learn unknown words.

Vegetation Regions

All plant life which covers the ground in a particular area is called **vegetation**. Based on the type of climate, soil, elevation (the height above sea level), and the soil's ability to hold water, we can distinguish between many vegetation regions. These regions are areas with distinct plant types. Among them, the five which spread across the largest land areas on Earth are **forests, grasslands, tundra, deserts, and ice sheets**.

Forests

Forests are vegetation regions dominated by trees and bushes.



Numerous different types of forests such as tropical rain forests, cool climate forests, and temperate forests, are found all over the world, even close to the Arctic Circle (the area around the North Pole).

Trees and their leaves can be viewed as

one factor used for distinguishing between different types of forests. For example, deciduous (losing its leaves every year) forests' trees have green leaves which change their color in the fall, become red or yellow, and then fall to the ground when the winter starts.

The evergreen forests, on the other hand, have trees with leaves that stay green all the time. Evergreen rainforests are especially rich in wildlife, they provide a perfect habitat for thousands of animal and plant species.



Grassland vegetation regions are dominated by grass. These large, flat, open areas are found on every continent other than Antarctica. The type of grass depends on the climate of the area.

Grasslands are divided into two major types: tropical grasslands and temperate grasslands. Tropical grasslands are also called savannas, and they are usually found in Africa, where it is warm and dry all year.

Temperate grasslands are more common in the Americas. Grasslands support many plant-eating animal species. The reason why grasslands can survive all the grazing is because the grass grows from the bottom, not the tips, so, in fact, it grows more when it is eaten.

Tundra

The vegetation region called tundra is found in cold places where it is very difficult for trees to grow. For this reason, the vegetation in the tundra typically includes shrubs (bushes), grass, and mosses (small green plants without flowers).

Because the ground is often too cold for plants to be able to develop their roots, few species live in the tundra. Plants such as wildflowers only appear in the summer.



There are two distinct types of tundra: alpine (of the mountains) and arctic (of the North Pole). In the alpine tundra, weather conditions are very harsh, with cold winds and snow. One example of such a vegetation region is the mountain range of the Himalayas in Tibet.

Arctic tundra dominates the far north of our planet, especially the north of Russia and Canada. The soil stays frozen for most of the year or even permanently (this is called permafrost).

Exercise 2. Develop your reading skills. Read the following text and do the comprehension tasks. Decide whether the following statements are true or false.

1. Different types of forests are found across the planet.
2. The main representatives of forests are bushes and mosses.
3. Coniferous trees always change their color in autumn.
4. Rainforests give shelter to sea turtles.
5. Scientists distinguish between seven vegetation regions.
6. Temperate grasslands are vast mountainous areas found in Africa.
7. Savannas are also called tropical grasslands and are found close to tropical rainforests.
8. All forest trees have green leaves all year-round.
9. Few species can survive in the arctic tundra.
10. The ice sheet supports many plant species.
11. Grasslands are great habitats for plant-eating animals.

12. Snakes and lizards, are only active at night when the temperatures reach their maximum level.
13. Because it is difficult for low-to-ground vegetation to survive in harsh tundra conditions, the dominant plants there are high trees able to adapt and withstand tundra conditions.

Exercise 3. Use various sources to search the information and get ready to answer the following questions.

1. What are the tundra's distinct seasons?
2. What is the maximum summer temperature there?
3. What is permafrost?
4. Why do the plants grow in groups in the tundra?
5. What are the major world's grasslands?
6. What types are temperate grasslands presented by?
7. What makes a forest a rainforest?
8. What are the three major areas of tropical rainforests?
9. What are the rainforest layers? Describe them.
10. What leads to disappearance of rainforests?

Exercise 4. Read short texts about the next two vegetation regions and decide which answer (A, B, C or D) best fits each gap. There is an example at the beginning (0).



Deserts are a (0) B habitat for most animals and plants. This vegetation region is very dry, receiving less than 10 cm of rain a year. Some deserts like the Atacama in Chile never get any rain. The temperatures go from very hot during the day to much colder at night. Because the area is so dry,

the soil is often very (1) _____ or rocky. Desert plants, such as (2)

_____, for example, have very deep and widespread roots, so they can reach any water (3) _____ underground. They store water in their small leaves and use their (4) _____ (thin, sharp points) to protect themselves from being eaten.

Surprisingly, many animal (5) _____ have made deserts their home. Most of them, like snakes and lizards, are *only active at night* when the temperatures cool down.

0	A	hail	B	harsh	C	harvest	D	heaven
1	A	sandy	B	stunning	C	slippery	D	sunny
2	A	peacock	B	cackles	C	cactusess	D	cacti
3	A	sustainable	B	adoptable	C	available	D	suitable
4	A	pickles	B	prickles	C	beetles	D	beeds
5	A	species	B	spices	C	spies	D	spoons

Ice Sheets



(6) _____ it is defined as a separate vegetation region, the ice sheet has almost no vegetation at all. As its name suggests, the ice sheet is a large area of ice. It (7) _____ over 20,000 square miles (50,000 square kilometers).

All this ice was formed as (8) _____ of snow did not entirely melt but piled up and grew thicker.

This vegetation region is (9) _____ in Greenland (the largest island in the world, located close to the North Pole) and Antarctica. These two ice sheets alone contain some 99 percent of all freshwater ice on Earth.

The ice sheet is very important because, thanks to these layers of ice, scientists are able to monitor the levels of pollution and volcanic

gases in the atmosphere. The ice layers can also tell us much about our planet's climate history.

6	A	Thought	B	Although	C	Otherwise	D	Through
7	A	expands	B	extrails	C	exaggerates	D	exhausts
8	A	lovers	B	lawns	C	lawyers	D	layers
9	A	fund	B	founded	C	fond	D	found

Exercise 4. Scan the text and choose the correct answer to the following questions.

- Vegetation provides _____ to animals and provides us with timber and many other forest produce.**
 - roof
 - climate change
 - shelter
 - species
- The verb "graze" means**
 - to treat someone badly
 - to feed on grass
 - to look at someone for a long time
 - to do something on purpose
- Bamboo is the fastest-growing _____ plant in the world.**
 - paper
 - woody
 - glass
 - oxygen
- What does the word "store" mean?**
 - to save for later
 - to sell with a discount
 - to buy something new
 - to hide something in a secret place
- The term "habitat" means**
 - a house built by yourself or construction company
 - the natural environment of an animal

- C. the time mammals spend sleeping
- D. the amount of food consumed daily

6. What does "distinguish" mean?

- A. to treat everyone with candies
- B. to understand several languages
- C. to see differences between two or more things
- D. to reduce the amount of something

7. Scientists distinguish _____ several vegetation regions.

- A. between
- B. of
- C. from
- D. among

8. Cacti _____ water in their leaves.

- A. lag behind
- B. store
- C. deposit
- D. withdraw

9. Deserts have almost no _____ or rainfall.

- A. repetition
- B. precipitation
- C. reproduction
- D. prohibition

10. Scientists carefully monitor the _____ of pollution.

- A. levels
- B. volumes
- C. degrees
- D. sizes

11. _____ forests have trees with cones and needles instead of leaves.

- A. Boreal
- B. Rain
- C. Coniferous
- D. Old

12. During the 1600s, tulips were so valuable in Holland that their _____ were worth more than gold.

- A. lamps

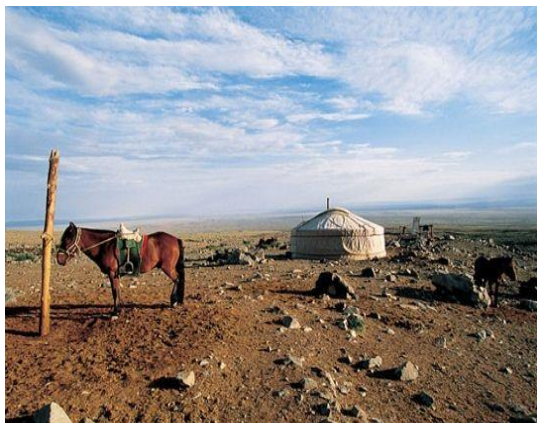
- B. loops
- C. bulbs
- D. buds

Exercise 5. Answer the questions.

1. Which vegetation region receives very little rain?
2. When do wildflowers appear in the tundra?
3. What characteristics of soil depend on vegetation?
4. Where is nearly all freshwater ice on Earth found?
5. How do cacti protect themselves from being eaten?

Exercise 6. Choose the most appropriate word from the box and use the verb in the necessary tense form.

<i>representatives</i>	<i>stretch</i>	<i>unlike</i>	<i>conserve</i>
<i>nomads</i>	<i>receive</i>	<i>habitat</i>	<i>desert</i>
<i>contrast</i>	<i>cover</i>	<i>conditions</i>	<i>cattle</i>



The Gobi is the fifth largest in the world. It across Central Asia over large parts of China and Mongolia. In to the Sahara, the Gobi is a cold desert. Ice and snow its large territory in the winter. It can be

explained by the fact that the Gobi is approximately 1500 m above the sea level.

The Gobi can be considered one of the driest places on our planet. It less than 200 mm of rainfall per year.

..... the Sahara, the Gobi is mostly bare rock. It is the for many unusual animal species including the mountain sheep, snow leopard, lynx and a small population of Gobi bears.

The of flora are wild onions, shrubs, grasses and the Saxaul Tree. The tree is often bent in gnarly shapes by the wind. The leaves of the tree are small. It helps to water which is very sparse in this region.

The population density is small (one person per square km). Most of the people living in the Gobi Desert are Mongolian. They are They usually move from one place to another to find better living The main occupation of the inhabitants is nomadic raising.



What is a collocation?

A collocation is two or more words that often go together. These combinations just sound "right" to native English speakers, who use them all the time. On the other hand, other combinations may be unnatural and just sound "wrong".

NATURAL ENGLISH

the fast train
fast food

a quick shower
a quick meal

UNNATURAL ENGLISH

the ~~quick~~ train
~~quick~~ food

a ~~fast~~ shower
a ~~fast~~ meal

Vegetation Collocations

- growing close together in large amounts: **dense, lush, thick** *The land in this region is very fertile, with dense vegetation.*

2. **green** *The island has a warm tropical climate with a rich landscape covered in lush green vegetation.*
3. **natural, semi-natural** *Great care has been taken to preserve the natural vegetation in the area.*

Exercise 7. Using the collocations describe the vegetation of the area you live in.

UNIT 11.

Exercise 1. Read and translate the text. Learn unknown words.

Soil composition

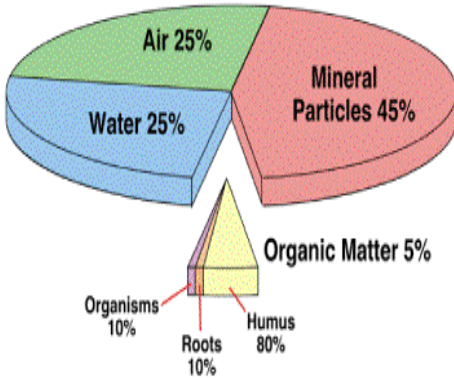
Climate, vegetation and soil are closely related components of nature and their global distributions over the earth's surface are very similar.

Soils are a mixture of mineral and organic matter in which plants grow. The concept of soil as a medium of plant growth was born in antiquity and remains as one of the most important concepts of soil today.

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 soil can be viewed as a mixture of mineral and organic particles of varying size and composition in regard to plant growth. The particles occupy about 50 percent of the soil's volume. The remaining soil volume,

about 50 percent, is pore space, composed of pores of varying shapes and sizes. The pore spaces contain air and water and serve as channels for the movement of air and water.

Roots anchored in soil support plants and roots absorb water and nutrients. The three essential things that plants absorb from the soil and use are:

(1) *water* that is mainly evaporated from plant leaves, (2) *nutrients* for nutrition, and (3) *oxygen* for root respiration.

One of the most obvious functions of soil is to provide support for plants. Roots anchored in soil enable growing plants to remain upright.

Exercise 2. Give equivalents for:

closely related components, забезпечувати підтримку рослин, to be of great importance to smb., коріння рослин, the total volume, давати змогу, particles of varying size, поживні речовини, to ossuru, дихання, anchored in soil, поглинати з ґрунту, to ossuru, відмерлі органічні рештки, the movement of air and water.

Exercise 3. Insert the prepositions if necessary:

components ... nature, a mixture ... mineral and organic matter, a medium ... plant growth, the total volume ... the earth, formed ...

the breakdown ... rocks, a result ... precipitation, ... regard ...
plant growth, channels ... the movement ... air and water.

Exercise 4. Guessing the meaning of unknown words.

A. Match the words with their meanings.

B.

- | | | | | |
|---|-----------|---------|---|---|
| 1 | soil | organic | a | thickness of material, typically one of several, covering a surface or body |
| 2 | nutrients | | b | bear all or part of the weight of; hold up. |
| 3 | support | | c | substances that provide nourishment essential for the maintenance of life and for growth |
| 4 | absorb | | d | the fraction of the soil that consists of plant or animal tissue in various stages of breakdown (decomposition) |
| 5 | layer | | e | take in or soak up (energy or a liquid or other substance) by chemical or physical action |

C. Open the brackets and write the correct tense form of the verb. Look at the following examples and make up your own sentences with the underlined words.

1. Fish is a source of many important nutrients, (to include) protein, vitamins, and minerals.
2. The dome (to support) by a hundred white columns.
3. All houses in the town (to cover) with a layer of ash after the volcano eruption.
4. The dark material (to absorb) a lot of heat during the day.
5. Layers of leaves or other organic matter sometimes (to add) to speed decomposition.

C. Choose the right word to complete the sentence.

1. The experts have found poisonous organic matter in water *samples* / *sands* / *additives* they studied.

2. Vegetarians need to get enough protein, iron and vitamin B12, **nuts / nutrients / nutritious** usually found in meat.
3. Do not overmix the **layers / lawyers / levels**, this can bury organic matter too deeply.
4. Manure is used by many farmers for soil fertilization because it is relatively cheap and replenishes **nutritious / nutrition / nutrients** and organic matter.
5. This cream is **absorb / abandon / absorbed** directly into your skin to keep it from becoming dry.

Exercise 5. Choose the right word to fill in the gaps:

1. The soil can be viewed as a (суміш мінеральних та органічних часток різного розміру) and composition in regard to plant growth.
2. Roots anchored in soil (підтримують) plants and roots (поглинають) water and nutrients, (чи не так)?
3. One of the most obvious functions of soil is to (забезпечувати) support for plants.
4. Plants absorb from the soil water, (поживні речовини для живлення), and oxygen for (дихання коріння).
5. The productive topsoil can be (знищений) within a very short time if it is misused by people.



Exercise 6. Using the collocations describe the types of soil of the area you live in.

Verb + soil

cultivate, turn, till, fertilize, dig

If you cultivate the soil too deeply, the surface will only dry out faster.

Adjectives + soil
dry, wet, fertile, rich, poor, barren

Strawberry grows well on this sandy soil.

Soil + noun
fertility, samples, erosion, types, survey,

Soil fertility can be enhanced through organic and inorganic fertilizers.

Exercise 7. Read the text and give the definition of the term “soil”.

Essential Nutrient Elements

Plants need certain essential nutrient elements to complete their life cycle. At least 16 elements are currently considered essential for the growth of most vascular plants. Carbon, hydrogen, and oxygen are combined in photosynthetic reactions and are obtained from air and water. These three elements compose 90 percent or more of the dry matter of plants. The remaining 13 elements are obtained largely from the soil.

Nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), and sulfur (S) are required in relatively large amounts and are referred to as macronutrients.

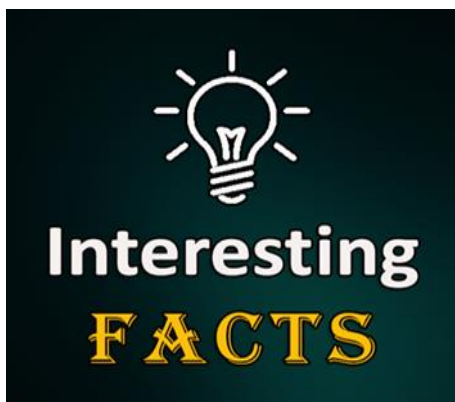
Elements required in considerably smaller amounts are called micronutrients. They include boron (B), chlorine (Cl), copper (Cu), iron (Fe), manganese (Mn), molybdenum (Mo), and zinc (Zn).

Most of the nutrients in soils exist in minerals and organic matter. Minerals are inorganic substances occurring naturally in the earth. The organic matter in soils consists of the recent remains of plants, microbes, and animals and the resistant organic compounds resulting from the rotting or decomposition processes.

Exercise 8. Answer the questions:

1. What is the soil? What is its role in the life of plants?
2. Does it take much time to form a fertile layer of soil?
3. What main parts does the soil consist of?
4. What function do plant roots perform?
5. What things do plants absorb from the soil?
6. What type of soil does Ukrainian Polissia have?

7. What types of soils are favourable for cultivation of wheat (strawberry, grapes)?
8. How can the quality of soil affect the growth of plants?
9. Why is humus important?
10. Why is soil considered to be a non-renewable resource?
11. Is it possible for people to protect the soil?



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.



SOIL SMARTS QUIZ



1. Microorganisms in the soil generally harm plants.
A. *True* B. *False*

2. In order the soil to be healthy, it should be allowed to rest from time to time. No plants should be grown on it.
A. *True* B. *False*

3. Sand is soil with tiny pieces of rock visible to your eyes.
A. *True* B. *False*

4. The part of the earth's surface consisting of disintegrated rock and humus is called _____.

- A. *sand* B. *clay* C. *soil* D. *layer*

5. Where is humus found? In _____.

- A. *top soil* B. *mines* C. *core* D. *rocks*

6. What soil is made of broken down pieces of dead plants and animals?

- A. *clay* B. *minerals* C. *sand* D. *humus*

7. Which three layers form the soil profile?

- A. *Air, water and soil.*
B. *Minerals, organic matter and living organisms.*
C. *Clay, silt and sand.*
D. *The topsoil, subsoil and parent material.*

8. Sandy soil is _____.

- A. *Sticky* B. *Gritty* C. *Smooth* D. *Fluffy*

9. Why is organic matter an important part of soil?

A. *It helps to improve water filtration.*

B. *It can break down organic pollutants.*

C. *It converts nitrogen in the air into nitrates used by plants.*

D. *It is rich in nutrients important for fertility.*

10. Which of the following is NOT a threat to the soil?

A. *Soil erosion*

B. *Percolation*

C. *Deforestation*

D. *Climate change*

11. What is soil erosion?

A. *It is the process by which soil is formed.*

B. *A harmful process that involves the removal and transport of soil by wind and water.*

C. *A natural method of filtering harmful pollutants.*

D. *A process often referred to as the 'greenhouse' effect.*

12. Cultivating different crops each year is called

A. *windbreakers*

B. *soil tillage*

C. *crop rotation*

D. *perennials*

13. Soils that develop on steep slopes are subject to greater erosion than soils developed on gentler slopes.

True

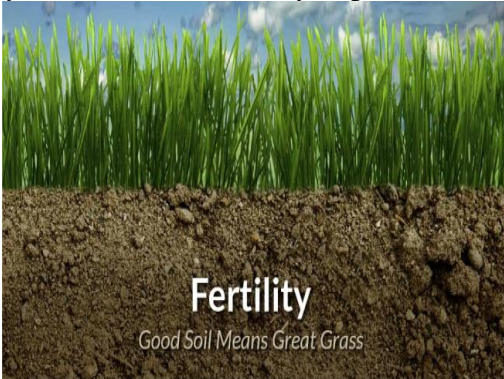
False

UNIT 12.

Exercise 1. Read and translate the text. Learn unknown words.

Soil Fertility and Soil Productivity

An important property of soil is its fertility. Fertility is the ability of soil to provide the plants with such conditions during their vegetative period that will ensure their growth, development and yields. The soil fertility depends on both the properties of the soil



itself (natural fertility) and the activity of man in cultivating the soil (artificial fertility).

Soil fertility is also defined as the ability of soil to supply essential elements for plant growth without a toxic concentration of any element.

An assessment of soil fertility can be made with a series of chemical tests.

Soil productivity is the soil's capacity to produce a certain yield of crops or other plants with optimum management.

The protection and improvement of soil are among the essential problems involving the protection of the environment. Healthy soil is the basis of large-scale agricultural production. Agricultural and forest soils are threatened to a great extent by degradation and reduction of nutrients.

Exercise 2. Give English equivalents:

головна проблема; здатність забезпечувати; вегетативний період; родючість ґрунту; залежати від; оцінка родючості; захист ґрунтів; навколишнє середовище; урожай; сільськогосподарське виробництво.

Exercise 3. Fill in the spaces with the appropriate words:

1. An important property of soil is its ...
2. Fertility is the ability of soil to ... the plants with necessary for vegetative period conditions.
3. Fertility depends on ... of soil and the activity of man in cultivating the soil.
4. Agricultural and forest soils are ... by degradation and reduction of nutrients.
5. A number of chemical tests is required in order to

Exercise 4. Answer the following questions:

1. What is soil?
2. What property does it possess?
3. How can you define the notion of “soil fertility”?
4. What does soil fertility depend on?
5. Describe the difference between the natural and artificial fertility.
6. What steps should be taken to assess soil fertility?
7. What is soil productivity?
8. What threatens agricultural and forest soils?

Exercise 5. Read a short text and decide which answer (A, B, C or D) best fits each gap.

Vegetable growers should (1) _____ good soil fertility to attain good yield. Good soil is not only rich in the basic (2) _____; it is also physically well-structured and biologically active. When plants get minerals, they become (3) _____ and grow well. Ideally, organic matter should (4) _____ and returned to the soil. The amount of humus in the soil decreases through mineralization; thus, resupplying lost humus every year is a must for maintaining soil fertility and good (5) _____. (6) _____ 37 tons (metric tons) of humus per hectare are necessary for this purpose. Organic matter can be added to the soil using liquid manure, mulching, farmyard manure, green manure.

1	A	mainstream	B	maintain	C	endure	D	endorse
2	A	nourishment	B	notorious	C	novelty	D	nutrients
3	A	robust	B	relevant	C	heavy	D	leather
4	A	add	B	be added	C	to be added	D	added
5	A	equilibrium	B	equality	C	quantity	D	quality
6	A	Evidently	B	Approximately	C	Suitably	D	Lately

Exercise 6. Translate into English:

- Грунт – це верхній родючий пласт земної кори.
- Родючість ґрунту залежить від його природної родючості та діяльності людини при його обробітку.
- «Здоровий» ґрунт є основою широкомасштабного с/г виробництва .
- Що загрожує с/г та лісовим ґрунтам? Їм загрожує виродження та зменшення поживних речовин.
- Ґрунт є обмеженим природним ресурсом, який легко розрушити .
- Які методи ви застосовуєте, щоб захистити якість ґрунту?
- Який урожай картоплі ви зібрали минулого року?
- Чи може агроном дати оцінку родючості ґрунту?
- Поліпшення родючості ґрунту – це одна з основних проблем сільського господарства.
- Ріст рослин залежить від родючості ґрунту, чи не так?

Exercise 7. Read the abstract. How do you understand “intelligent intervention”? Suggest other ways to improve soil fertility.

Soil fertility experts know that most soils today need their health and vitality rebuilt. Many years ago nature built healthy, vital soils. During the centuries the soils have been undergone the influence of human activity and now they need to be rebuilt. Unfortunately, we do not have much time for this process, so the intelligent intervention is needed. There exist a number of methods and

approaches that are considered to be beneficial in establishing self-regenerative and fertile soils. Proper cultivation, grazing, composting, soil conservation, green manuring play a great role in achieving the aim of recovering the soils.

UNIT 13.

Exercise 1. Read and translate the text. Learn unknown words.

farming – сільське господарство

loamy soils – суглинки

to till – обробляти ґрунт

tillage – обробіток ґрунту (за допомогою с/г знарядь)

to lack – відчувати нестачу

germination – проростання

to supply (with) – постачати

consume – споживати

consumer – споживач

lime – вапно

poor / rich soils – бідні / багаті ґрунти

rate – норма, ступінь, темп

treatment – обробіток



Soil and its Management

Good farming means proper use of many factors such as natural conditions, land, crops, livestock, machinery, fertilizers and some others. The combination of all these factors promotes to the

successful work of the farming system.

One of the most important points to be taken into consideration in farming is the soil. *Soil* is a natural resource that supports plant life, it is a mixture of particles of rock, organic materials, living forms, air and water.

During his entire existence upon the Earth man has depended upon the soil either directly or indirectly. Grain, fruits and vegetables are food products obtained by man directly from the soil. Domestic animals consume grain and forage produced by the soil and in turn supply people with meat, milk, eggs and other products used for human food. These are the products obtained from the soil indirectly.

Some good clay and loamy soils are naturally poor. Various factors that make up soil fertility are moisture conditions, plant food, and soil structure. All these components may be regulated by proper management of the soil.

Soil management is the science of tillage operations, cropping practices, using fertilizers, lime and other treatments conducted on, or applied to, a soil for the production of crops.

Plant growth and yields can be increased by applying certain recommended soil management practices. Liming, fertilization and irrigation immediate yield increases. Good soil management results in better yields and lower cost per unit of production. Fertile soils produce plants that are less affected by diseases and less likely to be attacked by insects. In this case small losses of crops result.

Some time ago attention was centered on such macroelements as phosphorus, nitrogen and potassium. Now, it is well known that in addition to primary plant food elements mentioned, so-called secondary elements (calcium, magnesium, and sulphur) as well as microelements or trace elements (boron, copper, manganese, zinc, and molybdenum) may be highly important for crop yields, for livestock and human health.

That is why all farmers should make soil tests in order to determine whether any essential elements are lacking in the soil and to determine the rate of fertilizers to be applied.

Exercise 2. Answer the questions:

1. What is the soil?
2. Give the examples of products people obtain from the soil directly or indirectly.
3. Which soils are considered to be poor? Are soils in your area rich or poor?
4. What factors influence soil fertility?
5. What does good soil management mean?
6. What should people do to get good soil?
7. Is it possible to increase crop yields? How can this goal be reached?
8. What micro and macroelements are vital for successful plant growing?
9. Why should farmers make soil tests?

Exercise 3. Give equivalents:

Entire, loam, clay loam, forage, treatment, to conduct, to germinate, lack, fertile, soil management, use of fertilizers, disease, to result in, essential, tillage operations, to consume, obtained from the soil, naturally poor, yields, to be affected by, treatment, liming, to determine, livestock .

Exercise 4. Match the words with close meaning.

- | | | | |
|---|-----------|---|-------------|
| 1 | important | a | living |
| 2 | mixture | b | cultivation |
| 3 | existence | c | combination |
| 4 | poor | d | use |
| 5 | tillage | e | significant |
| 6 | apply | f | harvest |
| 7 | yield | g | exhausted |

Exercise 5. Define the part of speech of the following words. Use five of them to make collocations and write your own sentences.

Loamy, management, liming, various, growth, consume, fertilizers, essential, secondary, lower, indirectly, obtained, structure.

Exercise 5. Match the words with their definitions:

1	A mixture of organic matter and the soil that is subjected to biological decomposition.	a	<i>seedbed</i>
2	. Making the soil more productive for growing plants.	b	<i>plant nutrient</i>
3	The protection of natural resources according to principles that will assure their highest economic or social efficiency.	c	<i>compost</i>
4	A chemical used to kill insects.	d	<i>soil improvement</i>
5	All the external conditions that may act upon an organism to influence its development or existence.	e	<i>drainage</i>
6	The soil prepared for sowing seed.	f	<i>insecticide</i>
7	A chemical required for plant growth and development.	g	<i>dryland farming</i>
8	The removal of excess water from land.	h	<i>environment</i>
9	The practice of crop production in low rainfall areas without irrigation.	i	<i>conservation</i>

Exercise 6. Put special questions to the following sentences:

1. Successful farming means proper use of natural conditions.
2. Moisture, plant nutrients and soil structure are the main components of fertile soil.
3. Fertilizers are added to the soil to meet the plant food needs.
4. Cotton requires higher temperature for its growth than wheat.
5. Farmers can increase the yields provided they apply proper soil management practices.
6. Grain is obtained by man directly from the soil.
7. Soil tests are required to determine what elements are deficient.
8. Proper temperature is also essential for successful plant growth.
9. Crops vary in their climatic requirements.
10. Crop yields are affected by soil and climatic conditions.

Exercise 7. Are the following sentences true or false?

1. Dairy and meat products are obtained directly from the soil.
2. Loamy and sandy soils are more fertile than black soils.
3. Tillage operations include ploughing and harrowing.
4. Liming is harmful for the soil and does not produce any yield increases.
5. Irrigation is usually applied to watery soils.
6. Calcium and Sulphur are primary plant food elements.
7. Soil tests are aimed at determining the number of insects and worms in the soil.
8. Every day the probes of air, water and soil are tested to ensure high yields.

Exercise 8. Read a short text and decide which answer (A, B, C or D) best fits each gap.

Crops (1) _____ nutrients just like people do. A fertile soil will (2) _____ all the major nutrients for basic plant nutrition (e.g., nitrogen, phosphorus, and potassium), as well as other nutrients needed in smaller quantities (e.g., calcium, magnesium, sulfur, iron, zinc, copper, molybdenum, nickel).

Soil Fertility

• **Soil Fertility** is the ability of the soil to provide essential **plant nutrients and water** to the plants in adequate amount for proper plant growth and reproduction



SOIL FERTILITY

Fertile soil usually also has some organic matter that improves soil structure, soil moisture (3) _____, and also nutrient retention, and a pH between 6 and 7. Unfortunately, many soils do not have adequate levels of all the necessary plant nutrients, or conditions in the soil

are (4) _____ for plant uptake of certain nutrients.

Soil scientists that focus on soil fertility (5) _____ in managing nutrients to improve crop production. They concentrate on using commercial fertilizers, manures, waste products, and composts to add nutrients and organic matter to the soil. Sometime they also add chemicals that change the pH to a more optimum level. Soil fertility experts must also be careful to (6) _____ that practices are environmentally sustainable. Inappropriate management of nutrients can lead to (7) the _____ of lakes, rivers, streams, and groundwater. Moreover, adding amendments to the soil is expensive and can lead to a reduction in the profitability of farming operations. In addition, the toxic levels of nutrients are considered to be (8) _____ than too little nutrients for the plants.

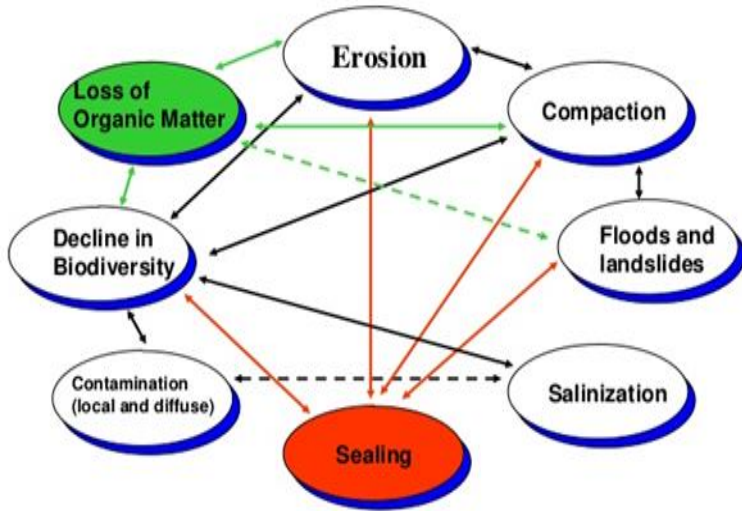
1	A	build	B	observe	C	need	D	buy
2	A	contrast	B	cooperate	C	contain	D	coexist
3	A	rehabilitation	B	revolution	C	retention	D	reduction
4	A	unfavorable	B	appropriate	C	super	D	suitable
5	A	are interesting	B	are interested	C	interested	D	interest
6	A	improve	B	increase	C	engage	D	ensure
7	A	contribution	B	contaminati on	C	conglome ration	D	conversati on
8	A	gooder	B	worse	C	the best	D	the worst

Exercise 9. Write a short summary of the text ‘Soil and its management’.

UNIT 14.

Exercise 1. Read and translate the text. Learn unknown words.

THE 8 THREATS TO SOIL AND THEIR FUNCTIONAL INTERDEPENDENCIES



Threats to Land

Arable land is currently under threat of many different sources. People construct buildings and roads on millions of hectares of good land. The use of intensive methods of farming leads to loss of organic matter in the topsoil and the buildup of both toxic chemicals and salts in the soil.

The problem is aggravated by the fact that so much natural organic fertilizer (dung, crop residues, peat) instead of being returned to the soil where it is badly needed, has to be burnt for fuel.

Desertification is one of the major problems. Desertification is not produced by the climatic change but by overcropping, overgrazing, and salinization. It can also be produced by deforestation, which exposes soil to wind and rain.

Exercise 2. Give equivalents for:

different sources, intensive methods of farming, topsoil, buildup of toxic chemicals, aggravate, deforestation, to be exposed to wind and sun, dung, fertilizer;

бути під загрозою, будувати, призводити до, втрата органічних речовин, виснаження землі, торф, пальне.

Exercise 3. Answer the questions:

1. Why do different toxic chemicals and salts accumulate in the topsoil?
2. What is the impact of intensive farming methods on lands?
3. What types of fertilizers do you know? Name the organic fertilizers.
4. With what purpose do people use organic fertilizers?
5. What is desertification? What are its causes?

Exercise 4. Choose the suitable word for each sentence. From the context guess about the meaning of the bold words:

1. *Congratulation* / *recognition* / *cooperation* of specialists in different spheres is required for solving this complex problem.
2. Natural resources are not *desirable* / *unlimited* / *important*.
3. The programme on rational *utilization* / *demonstration* / *urbanization* and reproduction of natural resources is of great importance for nature conservation.
4. The employees must *fulfill* / *feel* / *fuel* the work in time.
5. There is a plant in the town where fruit and vegetables are *exposed* / *processed* / *prepared*.
6. *Wrist* / *Waste* / *Weird* products of chemical enterprises are harmful for environment.
7. Natural balance must not be *rebuild* / *loss* / *destroyed*.

Exercise 5. Translate the sentences into English using the construction "there is" or "there are".

1. Неподалік від ферми буде збудовано новий хімічний завод.

2. Чи може бути в цьому журналі якась нова інформація про меліорацію?
3. Існує багато нових сортів цієї овочевої культури.
4. Чи було забруднене повітря в 1000 році нашої ери?
5. Чи були в тому році великі вчені?
6. Існує багато способів підвищити родючість ґрунту.

Exercise 6. Scan the text and do the tasks below.

A. Look at the underlined words and write their synonyms, definitions and your own sentences to show that you understand their meaning.

Soil pollution is a major concern for both industrial and developing countries. Pollutants such as metals and pesticides seep into the earth's soil and contaminate the food supply.



Soil pollution causes major health risks to entire ecosystems. This type of pollution reduces the amount of land suitable for agricultural production and contributes to global food shortages. Dumping of industrial and domestic waste products produces much of the world's soil pollution. Natural disasters can also add to the problem. In wealthy countries such as the US, protection agencies monitor the food supply. The public is generally warned before major disease outbreaks occur. Developing countries do not have this luxury. Farmers in poor nations grow food in contaminated soil both to earn a living and to avoid starvation.

A. Choose the right answer.

1. Which is NOT a source of soil pollution?

hazardous wastes

use of harmful pesticides

smoke from factories

2. Soil pollution is an urgent problem in _____ countries.

industrial *developing* *industrial and developing*

3. Industrial metals and pesticides permeate into the soil and contaminate our _____.

food supply *food shortage* *waste products*

4. _____ can face the health risks caused by soil pollution.

poor regions *the whole universe* *entire ecosystems*

5. Soil pollution decreases the area of _____.

production facilities *arable lands* *agricultural production*

6. Soil pollution can result in _____

global food shortages *health benefits* *additional facilities*

7. The problem of soil pollution is also aggravated because of _____.

spreading of infectious diseases *catastrophes*
decreasing precipitations

8. In developing countries farmers are forced to cultivate contaminated soil in order to _____.

escape weeding *improve yields* *escape hunger*

9. In developed countries special bodies such as protection agencies control the _____.

prices for fuel *food supply* *arable lands*

Exercise 7. Read the abstract and find the answer to the question “What is the desertification caused by?” Find the information about other threats to land and present it in the classroom.

Desertification is one of the major problems. The data provided by the European Commission World Atlas of Desertification state

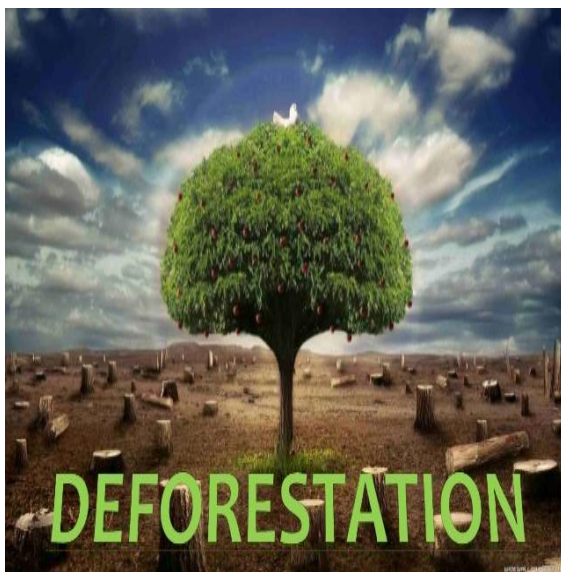
that more than 75% of the Earth's land has been already degraded. More than 90% could become degraded by 2050.

Desertification is not only the result of the climatic change. It is caused by human activities such as overcropping, overgrazing, and salinization. When land becomes desert, its ability to support surrounding populations of people and animals declines sharply.

UNIT 15.

Exercise 1. Read and translate the text. Learn unknown words.

Trees are vitally important to the world health on all levels. Globally, forests are essential to the health of ecosystems and their functions, biodiversity and economics. Trees cleanse the air and provide oxygen, help soil retain water, provide habitat for animals and plants. Moreover, they give people special beauty



throughout each year!

People cut down trees, so forests disappear. Huge hillsides are stripped of their forests, become naked, unprotected from heavy rains. Deforestation and degradation of forests create ecological problems in every part of the world.

What Is Deforestation?

Deforestation refers to the decrease in forest areas across the world that are lost for other uses such as agricultural croplands, urbanization, or mining activities. Deforestation has been negatively affecting natural ecosystems, biodiversity, and the climate as a result of accelerated human activity since 1960. The UN's Food and Agriculture Organization estimates the annual rate of deforestation to be around 1.3 million km² per decade.

The Causes of Deforestation

There exist various factors causing deforestation. They can be of human or natural origin. Natural factors include natural forest fires or parasite-caused diseases. Human activities rank first among the main causes of global deforestation.

The data provided by Food and Agriculture Organization show that the expansion of agriculture caused nearly 80% of global deforestation. The construction of infrastructures such as roads or dams, together with mining activities and urbanization, make up the remaining causes of deforestation.

1. Number 1 Cause of Deforestation (~80%) - Agriculture

How does agriculture cause so much deforestation? Subsistence agriculture the example of which is local peasant agriculture in developing countries comprises 33% of agriculture-caused deforestation.

Commercial or industrial agriculture aimed at cultivating field crops and raising livestock cause approximately 40% of forest loss in the search for area to grow food, fibers or biofuel.

2. Deforestation Caused by New Constructions (~15%)

The construction of human infrastructures has also been driving deforestation. 10% of deforestation can be attributed to new infrastructures that meet people's needs in transportation, transformation and energy generation.

3. Urbanization as a Cause of Deforestation (~5%)

The data provided by FAO confirm that movement from rural to urban areas is also contributing to deforestation. By the year 2050 68% of the world's population is expected to live in cities. This urban growth will lead to a considerable increase in housing sites and consequently to deforestation.

Exercise 2. Give equivalents for:

vitaly important, health, to retain water, forest cover, croplands; очищувати повітря, housing and consumption sites, забезпечувати киснем, urban growth, середовище проживання, to be greatly accelerated by, приблизно, a consequence, відновлювати, local peasant agriculture, потреба, to meet people's needs, місцеві селянські господарства, raising livestock, спричиняти (бути причиною), fibers or biofuel, гірничодобувна діяльність, approximately, виробник.

Exercise 3. Tick the correct answer.

The text is about:

- solutions to deforestation;
- the causes and effects of deforestation;
- the acceleration of human activities;
- a scientific substantiation of the term "deforestation".

Exercise 4. Insert the necessary prepositions if necessary. Translate the sentences.

1. Commercial agriculture is aimed cultivating field crops and raising livestock.
2. Movement rural urban areas is contributing deforestation.
3. Forests are essential to the health ecosystems and their functions.
4. Because of deforestation the land becomes unprotected heavy rains.
5. You can use the data provided Food and Agriculture Organization.

6. Declines productivity may be the result climate change and deforestation.
7. Forests are disappearing an alarming rate.
8. Deforestation is caused a combination of human and natural factors like wildfires and overcropping.
9. Rainforests influence regional and even global water cycles.
10. The threats nature vary from region to region.

Exercise 4. Correct the following false statements. Give precise details.

1. Deforestation takes place in developed countries.
2. It is expected that more than a half of the world's population will live in cities.
3. The population shift means the movement of people from urban to rural areas to develop agriculture of the country.
4. Trees only provide habitat for endangered species of animals and plants.
5. The construction of human infrastructures is among the most important reason that leads to deforestation.

Exercise 5. Answer the questions:

1. What are the major functions of forests?
2. What other functions and uses of trees can you add?
3. What human activities lead to deforestation and big loss in the tree cover of our planet?
4. How does agriculture cause deforestation?

Exercise 6. Think about the consequences of the following human activity and complete the table, suggest your own ideas.

Event	Result
The cutting of trees

The burning of trees

Exercise 7. Fill in the blanks in the text with the correct words from the table below. There are five extra words.

<i>fewer</i>	<i>providing</i>	<i>related to</i>	<i>environment</i>
<i>mining</i>	<i>eating</i>	<i>deforestation</i>	<i>reason</i>
<i>infrastructure</i>	<i>raising</i>	<i>recycling</i>	<i>destruction</i>
<i>habitat</i>	<i>digging</i>	<i>habits</i>	<i>dams</i>
<i>ago</i>	<i>housing</i>	<i>cattle</i>	<i>rate</i>

Rainforest Deforestation

Rainforests are an essential part of our planet, (1) _____ oxygen, absorbing carbon dioxide and (2) _____ 50% of the animal and plant species of the planet. The medicines and cures that are made using plants only found in a rainforest (3) _____.

Deforestation is the name given to the (4) _____ of the rainforests by burning them, chopping down the trees, or in some cases, flooding the areas. This is happening so fast that an area the size of twenty football pitches is being destroyed every minute! If the current (5) _____ of deforestation continues, it will take less than a hundred years to destroy all the rainforests on Earth.

Why are they being destroyed?

The biggest (6) _____ rainforests are cleared is to make space for food, including (7) _____ to be farmed for cheap beef and also growing large crops, such as soya beans and palm oil. In addition, other causes of deforestation, which are also (8) _____ making money include: chopping down and using the wood from the forest, building roads for mining metals, gold or diamonds, flooding areas to make (9) _____ to generate electricity and also (10) _____ for oil.

How can they be saved?

There are plenty of charities fighting against deforestation and people can always help by (11) _____ money for those charities. Also, think about the reasons that the forests are being destroyed and how some little changes in your everyday (12) _____ could help. For example, the cheap beef farmed in the areas that used to be rainforest land is often used in fast food chains. Could you avoid (13) _____ fast food from these outlets? You could also check on your supermarket food labels for the country of origin of any meat you buy. Was it farmed in an area where (14) _____ is taking place? You could also use rainforest-friendly wood so you know it is not a by-product of deforestation. Finally remember, paper comes from trees, so any paper saving you can do, as well as (15) _____ will help the environment.

Exercise 8. Read the arguments for and against deforestation and complete the table. Add your own arguments.

- ✓ Many people often use wood for building things.
- ✓ Poorer countries depend on the money made by the logging industry.
- ✓ Loose soil is being washed into rivers and polluting them with silt when there are no trees to anchor it down.
- ✓ Bananas, coffee, rice, and potatoes are food obtained by people from the rainforest.
- ✓ There are protected areas of the rainforest where cutting down trees is not permitted.
- ✓ The trees help to control the climate and water cycle.
- ✓ The machinery used in deforestation adds to carbon emissions.
- ✓ Such industries as farming or logging can provide work for people.
- ✓ Even if trees are replanted, they take years to grow back, especially hardwoods.

Deforestation: For and Against

FOR	AGAINST
Cutting down the rainforest provides fuel, wood, paper and land for farming, mining and cattle ranching.	Deforestation destroys the habitats of many animals.
.....
.....

Exercise 9. Watch the video and be ready to speak about the problem of deforestation in Ukraine.

<https://www.youtube.com/watch?v=5TlzPoOxW40>

UNIT 16.



Exercise 1. Read and translate the text. Learn unknown words.

Erosion is the process by which the surface of the Earth, such as soil or rocks, get worn away and are transported to another location by water or wind. Erosion is a natural process, but can be greatly accelerated by human activity.

What causes erosion?

Erosion starts with weathering. It is when the soil is broken down into smaller pieces and they become loose in the earth's surface.

Wind and water will transport these smaller pieces of soil to another place causing erosion.

However, the most potent tool for erosion is water. Rainfall and streams wash away the topsoil causing the soil to be infertile. Rivers can create a significant amount of erosion over time.

A glacier that flows down a slope is a powerful erosive agent as well. It helps change the shape of the land. It erodes rocks and sediment, moves it to another place, and leaves it there.

Overgrazing, overcropping, and deforestation are some of the human activities that can cause erosion.

Effects of erosion

Soil erosion has a significant effect on the agriculture. When the topsoil is washed away from an area, it loses the most nutrient-rich layer which leads to the reduction of the soil quality. In their turn poor soil can cause limited crop yields. In this case farmers are forced to use fertilizers and pesticides.

An excessive use of chemicals in farming is the cause of water pollution. When the contaminated soil is washed away, it enters rivers and streams and pollutes drinking water.

How to control erosion?

Soil is one of the most important assets in agricultural operation. In order not to lose it as a result of erosion, farmers use various ways to control this harmful process. Here are some of them:

Contour Plowing is of great assistance in slowing down the flow of water and the soil that it carries. Because the erosion usually takes place on a slope, farmers follow the contours of the land instead of planting the crops up and down the slope.

Crop Rotation is used to maintain the good quality of the soil and prevent pests from destroying the plants. It presupposes planting crops in a different spot each year.

Mulch Cropping is the application of straw, compost, pine needles as mulch. It is spread over the surface of the soil to reduce the impact of raindrops striking the soil and to cover it from the wind.

Natural Vegetation, for instance, trees, shrubs and grasses grow naturally. Their roots help to hold the soil together and make it more stable. It is considered to be the simplest and most effective way to avoid erosion.

Exercise 2. Study the following words and translate them into Ukrainian:

To be accelerated, солома, pine needles, вплив, to spread, гірські схили, to reduce, коріння рослин, surface of the soil, уникнути ерозії, to destroy the plants, поширюватися, straw, використовувати добрива та пестициди, to reduce the impact, спричинити повені, contaminate drinking water.

Exercise 3. Find a synonym or meaning for the following words.

to reduce	the process of wearing or being worn by long exposure to the atmosphere
plants	support
weathering	constructive, fruitful
maintain	verdure
effective	a marked effect or influence
impact	make smaller or less in amount, degree, or size

Exercise 4. Insert prepositions if necessary (at, with, of, from, on). Translate the sentences into your native tongue.

1. When things erode, they wear away due to some force acting ... them.
2. If you look ... any coastline, you will notice how the constant pounding force from wind and waves causes erosion ... the rocky structures.
3. Soil can erode due to the effects ... forces, such as water, wind and farming practices.
4. Soil is naturally created when small pieces of weathered rocks and minerals mix ... organic materials ... decaying plants and animals.
5. Soil creation is a slow process, taking ... many years.

6. Soil erosion is defined as the wearing away of topsoil. Topsoil is the top layer... soil and is the most fertile because it contains the most organic, nutrient-rich materials.
7. This is the layer that farmers want to protect ... growing their crops on.

Exercise 5. Read and translate the abstract, be ready to answer the questions after it.



Soil is the top layer of the Earth's crust which is a medium of support and nourishment of cultivated and self-sown plants. It is necessary for the circle of

life on the Earth as it contributes to the growth of plants.

Only 10% of the soil is arable and its key role for the food chain is undisputable. So, it is important not only to study the natural and anthropogenic causes which lead to its degradation but to give solutions that can lead to a reduction of this phenomenon and even to enrichment of the soil fertility. Soil is the cornerstone of food security and agricultural development, thus its restoration and conservation should become a major global priority.

QUESTIONS

- Do you know of any soils in your area that are degraded?
- What are the causes and consequences of soil degradation for people and biodiversity?
- Explain the importance of arable lands.
- How important do you think is the quality of the food we eat for our health?

Exercise 6. Watch a video on soil degradation (<https://www.youtube.com/watch?v=403sT9CGRI0>) and write answers to the following questions:

1. Why is productive land becoming scarce?
2. What are the consequences of overusing land and cultivating unsuitable land?
3. What are the reasons for soil degradation?
4. How fast is topsoil created?
5. What are the consequences of soil degradation?
6. How can the problem be prevented?

Exercise 7. Erosion is a natural process, but it doesn't happen on its own. Enumerate and write what you can do to stop the causes of erosion.



SOIL EROSION QUIZ

1. When something erodes, it ____.

- A. wears away
- B. builds up
- C. enlarges
- D. accumulates

2. What is soil erosion?

- A. It is the process by which soil is formed.
- B. It is a harmful process that involves the removal and transport of soil by wind and water.

- C. It is a natural process of filtering harmful pollutants.
- D. It is a process that scientists often refer to as the 'greenhouse' effect.

3. Soil erosion is troubling to farmers because it strips away the _____ that plants need for growth.

- A. deep layers of minerals
- B. topsoil
- C. particles of rocks and mud
- D. water

4. What can occur on the area experiencing soil erosion?

- A. Vegetation is able to grow easily.
- B. Water pollution is observed.
- C. Farmers can boast of the increased crop yields.
- D. The soil quality is reduced.

5. Which of the following is NOT an effect of soil erosion?

- A. Reduced soil quality.
- B. Water pollution.
- C. Decreased crop yields.
- D. Improved water quality.

5. What is a soil horizon?

- A. A factor affecting soil fertility.
- B. A layer of soil.
- C. An organism found in the soil.
- D. A technique used to till soils.

6. Why is organic matter (humus) an important part of soil?

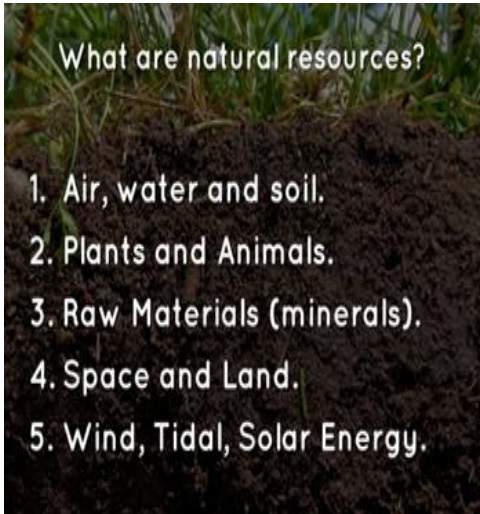
- A. It helps to improve water infiltration.
- B. It can break down organic pollutants.
- C. It converts nitrogen in the air into nitrates used by plants.
- D. It is rich in nutrients, which is important for fertility.

UNIT 17.

Exercise 1. Read and translate the text. Learn unknown words.

The Use of Resources

Natural Resources. Resources help people satisfy their needs and wants. Natural resources are naturally occurring material that can be used to produce goods and services.



Our planet is 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.

As people use natural resources, they change the natural landscape. It can be illustrated by alterations in the landscape brought about by mining and farming. 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. 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 influences the way people value and use natural resources. Before tractors and trucks, farmers considered mules to be a highly valued resource because mules pulled plows and carried crops to market. Today as they are substituted by tractors and trucks, their value is reduced.

Technological changes brought new applications for previously unvalued natural materials. Until 1700s uranium ores were not used and valued as natural resources. They gained value only after modern advances made them useful as a resource for nuclear energy.

Exercise 2. Give equivalents for:

осур, створювати, the environment, впливати, to be conserved or recycled, зони відпочинку, to be rich in the materials, з цієї причини, to include, постачатися природою, tools and foods, цінні ресурси, pulled plows, природний ландшафт, carried crops to market, наявний (доступний), technological change, майбутні покоління, a highly valued resource.

Exercise 3. Match the terms with their meanings.

natural resource	a solid object found in nature that has never been alive;
fossil fuel	a resource that can be replaced in a human lifetime;
mineral	anything from the environment that can be used
renewable resource	a resource that can be used again and again;

nonrenewable resource	a resource that comes from the remains of living things that lived long ago;
reusable resource	a resource that when it is used up, will not exist again in a human lifetime.

Exercise 4. Answer the questions:

1. Give the definition of natural resources.
2. Why are natural resources important?
3. What do natural resources include?
4. What human activities lead to the change of natural landscape?
5. What factors affect the use and value of natural resources?

Exercise 5. Complete the sentences:

1. Resources help people
2. Natural resources are
3. Resources include
4. People convert the things that nature provides into
5. Campers may see the forest as
6. Loggers may see the forest as
7. Factors that affect the use of natural resources include

Exercise 6. Choose the right preposition for each phrase and use them in your own sentences:

to be conserved ... use ... future generations	for	to carry water ... many parts of the country
to speed the movement ... valuable resources	by	to be rich ... mineral resources
energy ... the sun and wind	of	an important part ... the environment
to use natural resources ... the same way	in	a resource ... nuclear energy
something supplied ... nature	to	changes ... the landscape

Exercise 7. Read a short text and decide which answer (A, B, C or D) best fits each gap.

Natural resources are all those things that come directly from the environment and (1) _____ to make the things that people need for food, (2) _____, and energy. Natural resources _____ include things (3) _____ plants, soil, sunshine, water, fossil fuels, wildlife, metals, and minerals. Ukraine has an (4) _____ of natural resources: forests in the north, fossil fuels and minerals, wildlife and fish in both the interior and in the seas. Every day, people (5) _____ natural resources. Where natural resources are exported, they are an important part of the cash economy. When turned into fuel — whether from fossil, wind, or solar sources — they power homes and vehicles. Natural resources also provide us (6) _____ the food and minerals to nourish our bodies.

1	A	are use	B	are used	C	use	D	uses
2	A	grain	B	fur	C	shelter	D	seafood
3	A	love	B	like	C	deserve	D	hate
4	A	abundanc e	B	abandoned	C	abdominal	D	abyss
5	A	derive from	B	depend on	C	deduct from	D	deliver to
6	A	toward	B	by	C	with	D	from

Exercise 8. Complete the table and speak about the ways people use natural resources in their everyday life.

<i>Natural Resources</i>	<i>Products</i>	<i>Activities</i>
Minerals	diamond ring, silver bracelet	
Coal		heating homes
.....
.....

UNIT 18.

Exercise 1. Read and translate the text. Learn unknown words.

Renewable Resources

Natural resources can be classified as either renewable or nonrenewable. Renewable resources are replaced naturally and can be used over and over again.



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. It often contains 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.

Exercise 2. Give equivalents for:

replaced naturally, рослинність, to be used over and over again, ерозія ґрунту, a fragile resource, поживні речовини, plant new trees, використовувати хімічні добрива, wildlife, родючий, to reproduce, шар, to preserve natural habitats, формувати ґрунт, general levels, забрудники, enough fish and wildlife, відтворюватися, decayed plants and animals.

Exercise 3. Insert the necessary preposition:

to result ... salinization; one ... the most abundant natural resources; recirculated ... the water cycle; traces ... fertilizers and pesticides; to take ... granted; a layer ... mineral particles; a layer ... parent material; weathering ... the rock.

Exercise 4. Choose the right word to fill in the gaps:

1. We know that the resources are divided into (відновні та невідновні).
2. Irrigating the soil can result in (засолення ґрунтів) that eventually destroys the soil's productivity.
3. Even soil must be protected to remain a (цінним природним ресурсом).
4. Soil rich in humus is usually (родючий) and is black or dark brown.
5. (Відмерлі рослинні та тваринні рештки) make up the top level.
6. Soil is considered to be a renewable resource only if people take measures to (запобігти) erosion, grow plants that restore (поживні речовини), or use natural or chemical (добрива).

Exercise 5. Get ready to the classroom discussion.

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

Exercise 6. The most popular renewable energy sources currently are:

- 1. Solar energy*
- 2. Wind energy*
- 3. Hydro energy*
- 4. Tidal energy*
- 5. Geothermal energy*
- 6. Biomass energy*

Read some information about two of them, find information about the rest, complete the table and share your findings in the classroom.



Solar Energy

Sunlight is one of our planet's most abundant and freely available energy resources. The amount of solar energy that reaches the earth's surface in one hour is more than the planet's total energy requirements for a whole year. Although it sounds like a perfect renewable energy source, the amount of solar energy we can use varies according to the time of day and the season of the year as well as geographical location. In the UK, solar energy is an increasingly popular way to supplement your energy usage.

Wind Energy



Wind is a plentiful source of clean energy.

Wind power is the energy obtained from the wind. It is one of the oldest energy sources used by humans and today it is an efficient renewable energy source. Wind farms are an increasingly familiar sight in our country with

wind power making an ever-increasing contribution to the National Grid. To harness electricity from wind energy, turbines are used to drive generators which then feed electricity into the National Grid.

<i>Type of Renewable Energy</i>	<i>Pros</i>	<i>Cons</i>
Solar	Clean, renewable(until the Sun dies)	No sun at night – no electricity unless we can store it. Panels are expensive.
Wind	Clean, renewable	No wind = no electricity. Wind turbines are noisy and unattractive in the countryside.
Hydro		
Tidal		
Geothermal		
Biomass		

UNIT 19.

Exercise 1. Read and translate the text. Learn unknown words.

Nuclear Energy and Other Sources of 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 been found yet.



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.

Exercise 2. Give equivalents for:

to have certain negative aspects, поверхня землі, hazardous wastes, виробляти електроенергію, extremely dangerous, обмежувати використання, the potential danger of nuclear energy, енергія вітру, in addition, гідроелектростанції, by-products of nuclear energy, приводити в рух, to remain experimental, недорогий, to pump water, використовувати сонячну енергію, inexhaustible power source, вимагати (потребувати), several devices.

Exercise 3. Answer the questions:

1. What are the benefits and negative aspects of using the nuclear energy?
2. What are most people concerned about the nuclear energy?
3. What other sources of energy do people use nowadays?
4. Why is geothermal energy widely used in the world? Are there any geothermal plants in Ukraine?
5. What forms of wind power are you familiar with?
6. Why is wind energy considered to be a non-reliable type of energy?
7. Give examples of using the wind power.
8. What abundant resource do hydroelectric plants use?

Exercise 4. Cross out a word in a line which is different. Number each line according to the headings given below.

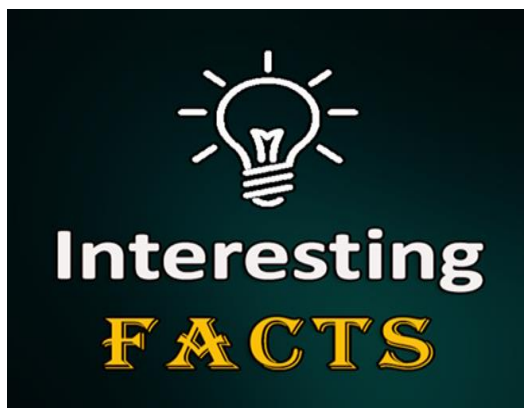
forest	bauxite	soil	wildlife
sun	wind	fossil	geothermal
iron ore	sun energy	copper	fossil fuel
overhunting	overfishing	overlapping	overgrazing
abundant	scarce	exhaustible	fragile
fertilizers	traces	sewage	pesticides

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.

Exercise 5. Supply the 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 _____.



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.

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. Mineral waters have been used from early times as a remedial agent, 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 mineral 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 liters to hundreds of thousands of liters.

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.

Wind Technologies

Wind energy technologies use the energy in wind for practical purposes, such as generating electricity, charging batteries, pumping water, and grinding grain. Mechanical or electrical power is created through the kinetic energy of the wind.

The turbine's blades are similar to the propeller blades on an airplane. The hub of the turbine is rotated as the rotor blades generate lift from the passing wind. This rotating action then turns a generator, which creates electricity.

Since the wind's speed typically increases with height above ground, wind turbines are mounted on a tower to capture more energy. At 100 feet (30 meters) or more above ground, they can take advantage of faster and less turbulent wind.

For the best utilization of wind turbines, they should be placed where wind speeds reach 16-20 mph and are at a height of 50m. It is also important that utility-scale power plants are located near existing power lines and in the windiest sites available.



Wind energy technologies can be used as stand-alone applications, connected to a utility power grid, or even combined with a photovoltaic system. For utility-scale sources of wind energy, turbines are usually built close together to form a wind farm that provides bulk power. Several electricity providers use wind farms to supply power to their customers, including Xcel Energy, MidAmerican Energy, and Basin Electric.

Stand-alone turbines are typically used for water pumping or communications. However, homeowners and farmers in windy areas can also use small wind systems to generate electricity.

Wind Energy Potential Assessment of Ukraine

The rise of Renewable Energy Sources (RES) development (particularly wind and solar energy) is becoming one of the major factors of sustainable development. It is caused by the fact, that energy is a basic sector of the economy. The strategic goal of the economic development of any country is to maximize the share of energy in its energy balance, produced by the country's own energy resources.

The energy resources of Ukraine consist of three main branches: nuclear power, thermal power and hydropower. All the above-mentioned areas of energy in industrialized countries are unpromising and environmentally unsafe. The intensive use of thermal power plants led to the number of environmental problems. During the last decades, the issues related to the development of

renewable energy in the world and in Ukraine are extremely relevant because of the scarcity and limitedness of energy resources and environmental deterioration.

Wind power is a very attractive field. Wind technologies have grown in scope, and in various places wind is becoming a feasible source of energy. This kind of natural resource is vulnerable to weather conditions, but in certain locations, mainly in coastal offshore areas and at high altitudes, there is a steady stream of wind.

Wind power is harnessed through the use of wind turbines, which are turned by the wind to produce electricity. Wind energy is reliable and efficient. Unlike other power plants, wind energy systems require minimal maintenance and have low operating expenses.

Ukraine currently uses only 0.2% of its wind capacity. At present, the total installed capacity of the wind power plants in Ukraine amounts to 146.515 MW.

UNIT 20.

Exercise 1. Read and translate the text. Learn unknown words.

Non-Renewable Resources

Non-renewable resources are described as resources that do not replenish within a short time to keep up with their consumption. These resources are formed from organic material from plant and animal remains that existed millions of years ago. Since the materials took millions of years to form, they also require millions of years to replenish.

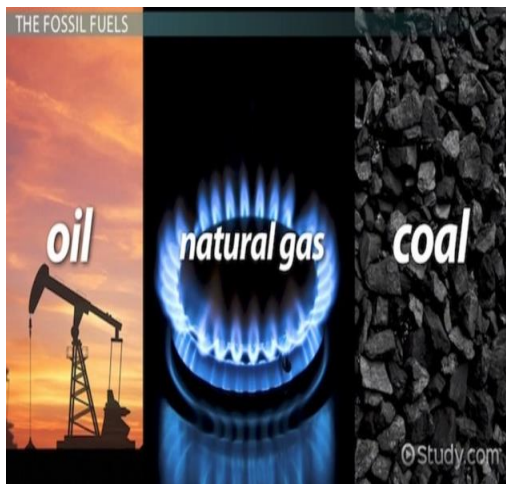
Humans extract non-renewable resources in the form of gas, liquid, or solids, and then convert them into convenient forms for easy consumption. Non-renewable resources, such as coal and oil,

are the primary source of power in the world, and they are used to power vehicles, factories, and homes. Although affordable, they can be harmful to the environment and are one of the notable contributors to global warming.

Types of Non-Renewable Resources

The two broad categories of non-renewable resources are fossil fuels and nuclear energy (from uranium ore).

1. Fossil fuels



Fossil fuels are formed due to the continuous heating and compressing of organic matter buried beneath the earth's surface. The organic matter mainly comprises of plant and animal remains that have decomposed, heated, and compressed over millions of years to form fossil deposits.

The deposits are extracted through drilling or mining, and they can be in liquid, gas, or solid form. Fossil fuels are highly combustible, making them a rich source of energy. Examples of fossil fuels include crude oil, natural gas and coal.

2. Nuclear energy (Uranium)

Apart from fossil fuels, the other category of non-renewable resources is nuclear fuels. It is primarily obtained through the mining and refining of uranium ore, a naturally occurring radioactive element below the earth's surface.

Uranium is found in small quantities, and miners often gather the uranium deposits for refining and purification. The mineral

generates power through a process known as nuclear fusion, which creates enough pressure to run turbines and generate nuclear power.

Exercise 2. Give equivalents for:

To replenish, в малій кількості, remains, ядерний синтез, to extract, постійне нагрівання, solids, видобувати шляхом буріння, to power vehicles, виробляти атомну енергію, apart from, потребувати довгий час для утворення, mining and refining of uranium ore.

Exercise 3. Choose the right word to fill in the gaps:

1. (Природні ресурси) are naturally occurring materials that are used to produce (товари та послуги).
2. People (використовують) natural resources in many different ways.
3. (Енергетичні ресурси) support industrialization.
4. Human innovations help the earth produce more (сільськогосподарських) resources.
5. All places on the earth have (переваги та недоліки) for human settlement. A natural resource is a great advantage to a group of people able to use it.
6. Land, (грунт і вода) are examples of natural resources. Other examples include fish, wildlife, vegetation, and minerals.
7. Minerals are inorganic (речовини) found in the earth's crust, such as (вугілля), copper, and (залізна руда).

Exercise 4. Read the abstract and decide which answer (A, B, C or D) best fits each gap.

Non-renewable resources are almost (1) _____ to replace and their supplies (2) _____ with each use.

Such important resources as coal, oil, natural gas, iron (3) _____, copper, gold, and silver are non-renewable resources. As people use these resources, they cannot be replaced.

Resource (4) _____ can be slowed through recycling. Recycling is the process by which products that have been used and

discarded can be reused. (5) _____, 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 (6) _____ recycled materials. Youth groups and (7) _____ organizations often collect newspapers and other paper products to sell to recycling factories. The factories (8) _____ 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	A	important	B	impossible	C	immerge	D	immense
2	A	loose	B	leech	C	locked	D	lessen
3	A	owe	B	ore	C	owl	D	own
4	A	recognition	B	ignition	C	depletion	D	ammunition
5	A	Resurrectionists	B	Conservationists	C	Receptionists	D	Philanthropists
6	A	commonly	B	recently	C	rarely	D	kindly
7	A	comfortable	B	capable	C	valuable	D	charitable
8	A	grind up	B	make up	C	keep up	D	set up

Exercise 5. Match the terms with their definitions. Find some information about fossil fuels (crude oil, natural gas and coal) and share your findings with the groupmates.

A nonrenewable resource

a mixture of gases which are rich in hydrocarbons. All these gases (methane, nitrogen, carbon dioxide etc.) are naturally found in atmosphere.

Crude oil

a natural substance that is not replenished with the speed at which it is consumed.

Natural gas

combustible black or brown rock, used primarily as a fuel.

Coal a naturally occurring petroleum product composed of hydrocarbon deposits and other organic materials; a type of fossil fuel.

Exercise 6. Study the following, if necessary find additional information to complete the tables.

A **nonrenewable resource** is a substance that is being used up more quickly than it can replace itself. Its supply is finite. Most fossil fuels, minerals, and metal ores are nonrenewable resources.

Renewable resources such as solar and wind power and water are unlimited in supply.

Crude oil is the raw natural resource that is extracted from the earth and refined into products such as gasoline, jet fuel, and other petroleum products. **Crude oil** is a global commodity that trades in markets around the world.

Coal is a nonrenewable fossil fuel that is combusted and used to generate electricity. Mining techniques and combustion are both dangerous to miners and hazardous to the environment; however, coal accounts for about half of the electricity generation in the United States.

Coal is the largest source of energy for generating electricity in the world, and the most abundant fossil fuel in Ukraine.

Table 1

Advantages of fossil fuels	Disadvantages of fossil fuels
They generate large amounts of energy quite cheaply.	They release carbon dioxide when they are burnt and lead to the pollution.
Oil and gas can be transported through pipelines.	Oil spills can cause environmental damage.

Table 2

Advantages of nuclear power	Disadvantages of nuclear power
------------------------------------	---------------------------------------

Only small amounts of fuel needed to produce lots of energy compared to fossil fuels.	Accidents and leaks can be deadly and last for a long time.
Low carbon emissions.	Nuclear waste is highly radioactive.
.....
.....

Exercise 4. As our world becomes more advanced, our need for energy is constantly growing Everybody knows that the future of using non-renewable energy is limited, so there has been a lot of interest in developing new forms of energy production. Prepare a short report as a participant of the students' conference the key issue of which is developing renewable energy sources.

UNIT 21.

Exercise 1. Read and translate the text. Learn unknown words.

Difference between Renewable resources and Non-Renewable resources

Renewable resources are the resources used by the mankind from the starting of human life. Our ancestors used wood for cooking and heating purposes, wind energy for transportation, solar energy for lighting purposes, etc.

But after the discovery of the **non-renewable resources** like fossil fuels, coal, etc. the working of the entire mankind has seen a drastic change and it resulted in rapid industrialization.

RENEWABLE RESOURCES

The resources which are being continuously consumed by man but are renewed by nature constantly are called as Renewable Resources. These resources are inexhaustible because they cannot be exhausted permanently. Renewable resources are also called as “Non-Conventional” sources of energy.

Examples

- ❖ Solar energy
- ❖ Wind energy
- ❖ Tidal energy
- ❖ Hydro power
- ❖ Geothermal energy
- ❖ Biofuels

NON-RENEWABLE RESOURCES

The resources which are non-renewable are called as Non-Renewable sources. The Non-Renewable resources do not replenish and cannot be renewed. It took thousands of years of time to form the non-renewable resources, which exist inside the earth in the form of coal, fossil fuels, etc.

Examples

- ❖ Coal
- ❖ Mineral Ores
- ❖ Metal Ores
- ❖ Crude Oil
- ❖ Nuclear Energy

The supply of non-renewable resources on the Earth is limited. It means that we’re using them much more rapidly than they are being created. Eventually, they will run out and our future generations are left with no crude oil and nuclear resources. We have a responsibility to transfer the resource to our future generations, for that we have to use the non-renewable and renewable resources in a balanced way and promote sustainability of resources.

RENEWABLE RESOURCES	NON-RENEWABLE RESOURCES
are present in the atmosphere of the earth.	are typically found in the underground layers of the earth.

RENEWABLE RESOURCES	NON-RENEWABLE RESOURCES
<i>Replaceable</i>	
are replaced by nature itself in a very short period.	cannot be replaced by nature during the time of human life span.
<i>Availability</i>	
are available and abundant in nature.	are scarce resources and not available in an abundant manner in nature.
<i>Cost</i>	
are obtained free of cost or at very less cost in nature.	are very costly and not easily available.
<i>Impact on Environment</i>	
do not affect the environment of the earth and don't cause any climate changes in the atmosphere.	seriously affect the environment and cause climate changes in the environment.
<i>Pollution</i>	
The Renewable resources do not cause pollution in the environment and do not release any pollutants into the environment.	The Non-Renewable resources pollute the earth by releasing various types of pollutants into the air, water, soil, etc. when fossil fuels are burned.
<i>Impact on Atmosphere</i>	
are also referred to as “Clean and Green” energy sources because they don't produce harm to the environment.	release “Green House” gasses into the atmosphere which leads to global warming.
<i>Impact on Health</i>	

RENEWABLE RESOURCES	NON-RENEWABLE RESOURCES
do not cause any health problems to the living beings of the earth.	adversely affect the health of the living beings by releasing smoke, radiations, carcinogenic or cancer causing elements into the environment.

Exercise 2. Read the abstract and do the following tasks after it.

A. Fill in each blank with the correct form of the word from the box (if necessary). Use each word only once.

<i>entire</i>	<i>jump</i>	<i>downside</i>
<i>maintenance</i>	<i>myth</i>	<i>shine</i>
<i>store</i>	<i>rain</i>	<i>worry</i>

Solar power is probably the one that (1) _____ to mind for most of us when it comes to off-grid energy. The sun-powered option, which includes solar panels, an inverter and batteries, can provide lots of electric power (especially if you get a lot of solar exposure where you live) for a long time, without any moving parts and a little (2) _____.

The (3) _____, at least for now, is the cost. It is rarely cost-effective to power an entire home (4) _____ with solar, even allowing for several decades for a positive return on the investment. Add to that the wide variance of solar exposure by location and the fact that solar only works when the sun is (5) _____, and it's easy to see why solar remains a part of the answer, and not the whole thing.

One of the biggest (6) _____ about solar power is that it won't be effective when it's cloudy. Homeowners who live in areas with a lot of sea fog, for instance, may be (7) _____ that getting solar power isn't worth it. The reality is that solar panels can still capture sunlight even when it's cloudy outside. In fact, panels can often produce up to 25% of their typical output even when clouds are present. When it's (8) _____, your solar panels may produce

about 10% of their regular output. During weather events, your solar panels can draw upon their (9) _____ of saved energy so your home can stay off the grid until the sun comes out again.

B. Form a group with two or three students and discuss the questions.

How do solar panels work?

Does solar power work at night?

Do solar panels overheat?

How many panels are needed to run a house?

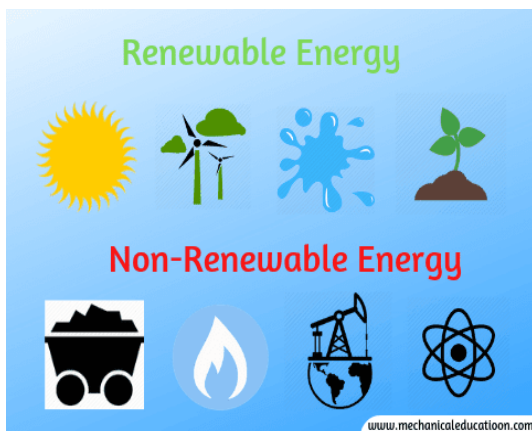
Can solar panels be recycled?

Are solar panels expensive to maintain?

Do solar panels really save you money?

What are the advantages and disadvantages of using solar panels?

Exercise 3. Revise the material and try to find the right answer to the questions.



QUIZ “Renewable & Non-Renewable Resources: Definition & Differences”

1. *What is the main difference between renewable and non-renewable resources?*

Their location on Earth.

The way they are used in our everyday lives.

The time needed for their regeneration.

The period of time during which they can be stored.

2. Which of the following is NOT an example of a renewable resource?

Water

Coal

Fish

Wind

3. Why is recycling so important to the environment?

It prevents the waste of renewable and non-renewable resources.

It prevents non-renewable resources from being extracted from the ground.

It decreases the amount of time a renewable resource takes to regenerate.

It prevents the waste of non-renewable resources only.

4. What are renewable resources?

A limited amount and cannot be replaced in a human lifetime.

Saved energy.

Coal, oil, and natural gas.

Resources that can be replaced in our lifetime through natural processes.

5. Wood is...

a renewable resource.

a nonrenewable resource.

used to make oil.

used to make plastic and glass.

6. What does a 'finite resource' mean?

The supply is renewable.

The resource will continue forever.

There is a limited supply.

7. Which of these is a renewable source of energy?

Fossil fuels Nuclear power None of the above

8. A group of non-renewable resources, called _____, include coal, oil, and natural gas.

Fossils Energy Resources Fossil fuels

9. Coal comes from _____
animals that died millions of years ago.
plants that died millions of years ago.
a factory and electricity generating plants.
burning fossil fuels.

10. We can get energy from coal by _____
breaking it down.
digging it up.
burning it.
rubbing it together.

11. What is an advantage of using fossil fuels?
They are clean and non-polluting.
They will never run out.
They generate large amounts of electricity relatively cheaply.
They can be recycled and used again.

12. What is a disadvantage of using fossil fuels?
They release carbon dioxide when burnt.
They are highly explosive.
They can only be found under the sea.
They are fragile.

13. Which energy form uses uranium or plutonium to create energy?
Nuclear power Hydroelectric power Solar power Wind power

14. Which form of renewable energy would most likely get complaints about noise pollution?
Solar power Wave power Wind power Nuclear power

15. What is geothermal energy?
A power plant.
Heat energy generated and stored in the ground.

Nuclear Energy.
A nonrenewable resource

16. _____ *is the efficient use of resources.*

Fossil Fuels Conservation
Recycling Natural Resources

UNIT 22.

Exercise 1. Read and translate the text. Learn unknown words.

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.

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.

Exercise 2. Give equivalents for:

Головне джерело енергії, the energy needed, забезпечувати, alternative energy sources, орати поля, tidal energy, виробляти товари, to use nuclear energy, шукати нові джерела, the oil-consuming nations, хіміки, limited resources, сировина, the oil-consuming nations.

Exercise 3. Answer the questions:

1. What was the primary source of energy in early times? How was it used?
2. What are the three major fossil fuels?
3. What was the most important energy source in the first half of the XXth century?
4. What products might countries lack if there are oil shortages?
5. How are the oil-consuming nations going to deal with the problem of oil resources depletion?

Exercise 4. Choose the right word to fill in the gaps:

1. The use and value of resources are affected by cultural differences, changing technologies, (економічних факторів), and geopolitics.

2. Technological advances have changed (моделі використання ресурсів) throughout the world.
3. Some natural resources are (відновні) — they are replaced naturally and (запаси) can be used over and over again.
4. Other natural resources are (невідновні) — their (запаси зменшуються в процесі використання) and are not replaced.
5. Both renewable and non-renewable natural resources help people (задовольняти їх потреби) and wants.
6. Mineral resources are (нерівномірно розподілені) on the Earth. This (нерівномірний розподіл призводить до) global interdependence.
7. Energy resources are essential to industrial societies. (Вугілля, нафта та природний газ) are non-renewable fossil fuels.
8. Hydroelectricity and solar energy are based on abundant or renewable resources, but each of these (альтернативних джерел енергії) has disadvantages.
9. Industrial societies (залежать від) non-renewable energy sources but they are also experimenting with other sources such as hydroelectricity, nuclear energy, and solar energy.

Exercise 5. Match the verbs close in meaning. Make up your own sentences with five of them.

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

Exercise 6. Prepare a short report about the supplies of some energy resources.

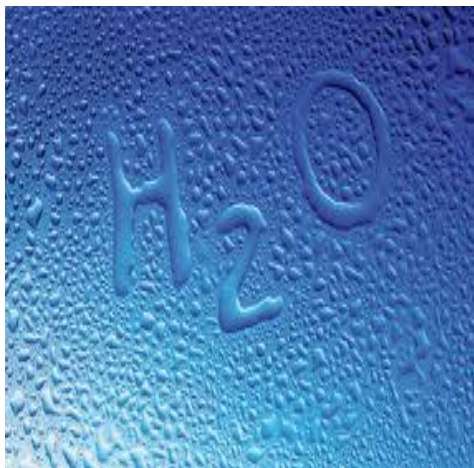
UNIT 23.

Exercise 1. Read and translate the text. Learn unknown words.

Water in Our Life

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.

Exercise 2. Give equivalents for:

важливі якості води, humans and animals, перетравлювати їжу, dissolved materials, рідина, need these materials to grow and to build healthy bodies, випадати у вигляді дощів, the crust of the earth, замерзати, to determine climate, складатися з, gas and solid, підтримувати різні форми життя, humankind, існувати без води, air that surrounds the earth.

Exercise 3. Answer the questions:

1. What is the role of water on the Earth?
2. In what forms is water presented on the Earth?
3. What do we call the change of water from a liquid to a gas? From a gas to a liquid?
4. What are some of the water's special qualities?

Exercise 4. Complete the sentences:

1. Water covers... .
2. Water supports
3. On the earth the water is present in
4. The qualities of water
5. Water helps humans and animals

Exercise 5. Read a short text and do the tasks below.

A. Decide which answer (A, B, C or D) best fits each gap.

Water is probably Earth's most (1) _____ resource. It is the only planet that has water.

Oceans, seas and rivers are not the only places we have water. It is also present under the ground and as (2) _____ in the air. Clouds formed by the vapor ensure that water falls back down to the Earth as rain, sleet, snow or (3) _____.

If we have so much water around us, why do we often speak about the necessity to conserve water? It has to do with the water's (4) _____, or saltiness. Ocean water has too much salt in it for us to drink. Approximately 97% of Earth's water is salt water. The process of desalination, or removing salt from water, is expensive. That leaves only about 3% that is freshwater for (5) _____ the needs of people, plants and animals. This is why there is (6) _____ for protecting this rare and critical resource. Unfortunately, only about a third of our freshwater is even available for us to use. The rest is frozen solid in (7) _____, in the snow on high mountaintops and in the polar ice caps. So the end result is that we have only about 1% of all the water on Earth that we can use.

It is important to protect our water (8) _____ from pollution. Once the water becomes polluted, it can be difficult or even impossible to clean.

1	A	profound	B	profitable	C	precious	D	prosperous
2	A	vanish	B	vapor	C	vendor	D	vessel
3	A	pail	B	snail	C	hail	D	nail
4	A	salinity	B	infinity	C	purity	D	conformity
5	A	breaking	B	standing	C	making	D	meeting
6	A	suspense	B	concern	C	devotion	D	sacrifice
7	A	cavities	B	deckers	C	drums	D	glaciers
8	A	resorts	B	rebels	C	demands	D	supplies

B. Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to confirm your answers.

1. With so much water all around us, why is there so little water for us to use?
2. How is the process of removing salt from water called?
3. What are the four forms that water takes when it returns to Earth from the clouds?
4. What is the main idea of this passage?
5. What is the available amount of water for people to use?

Exercise 6. Watch a short video, pay attention to new words and try to guess their meaning choosing a-c variants, think about the importance of water in our lives.

<https://www.youtube.com/watch?v=CT99lgYRtBM&t=34s>

1. essential

- a. huge
- b. significant
- c. unimportant

2. liquid

- a. fluid
- b. ice
- c. solid

3. glacier

- a. floe
- b. snow
- c. glass

4. ancestors

- a. descendants
- b. ascendants
- c. landowners

5. divine

- a. unsacred
- b. cloudy
- c. celestial

6. purpose

- a. goal
- b. bargain
- c. hatred

7. dam

- a. ballot
- b. bridge
- c. barrage

8. livelihood

- a. superstition
- b. sustenance
- c. suspect

9. tiny

- a. miniature
- b. enormous
- c. vast

UNIT 24.

Exercise 1. Read and translate the text. Learn unknown words.

Water - Supply Problems

Humans are facing a worldwide water crisis, according to the United Nations. Many people do not have access to clean water to drink or to wash with. Sometimes there just is not enough water and sometimes the available water is unclean and unhealthy.

Humans use six times as much water today as they did 100 years ago. People living in developed countries use a far greater proportion of the world's water than people in less developed countries. Water scarcity is a problem now and will become an even larger problem in the future as water sources are reduced or polluted and population grows.

Water Distribution

Water is unevenly distributed around the world. Large portions of the world receive very little water from rainfall or rivers relative to their population. This includes much of northern Africa and central Asia. Over time, there will be less water per person within many river basins as the population grows and global temperatures increase so that some water sources are lost. Over time, many nations, even developed nations, are projected to have less water per person than now.

Global warming will change patterns of rainfall and water distribution. As the Earth warms, regions that currently receive an adequate supply of rain may shift. Regions that rely on snow melt may find that there is less snow and the melt comes earlier and faster in the spring, causing the water to run off and not be available through the dry summers. A change in temperature and precipitation would completely change the types of plants and animals that can live successfully in that region.

Water Shortages Key Facts

Four billion people — almost two thirds of the world's population — experience severe water scarcity for at least one month each year.

Over two billion people live in countries where water supply is inadequate.

Half of the world's population could be living in areas facing water scarcity by as early as 2025.

Some 700 million people could be displaced by intense water scarcity by 2030.

By 2040, roughly 1 in 4 children worldwide will be living in areas of extremely high water stress.

Exercise 2. Give equivalents for:

Розподіл водних запасів, unevenly distributed, гостра нестача води, relative to the population, стикатися з проблемами нестачі води, patterns of rainfall and water distribution, бути переселеним, to shift, зменшувати (скорочувати), precipitation, басейн річки, inadequate water supply.

Exercise 3. Rearrange the letters in the anagrams to form equivalents for the Ukrainian words.

заснавати, страждати -

доступний, наявний -

хереенсри

liavaleba

недостатній, незадовільний -

дефіцит, нестача - **уцсрасит**

деаіатеуq

луневе - нерівномірно

тіпреоніпта - опади

Exercise 4. Guessing the meaning of unknown words.

A. Match the words with their meanings.

1 **water**
scarcity

a confront and deal with or accept a difficult or unpleasant task, fact, or situation.

2 **face**

b the way in which something is shared out among a group or spread over an area.

- | | | | |
|---|----------------------|---|--|
| 3 | supply | c | water that falls from the clouds towards the ground, especially as rain or snow. |
| 4 | distribution | d | a stock or amount of something supplied or available for use. |
| 5 | precipitation | e | a water deficiency or a lack of safe water supplies. |

B. Look at the following examples, translate them and make up your own sentences with new terms.

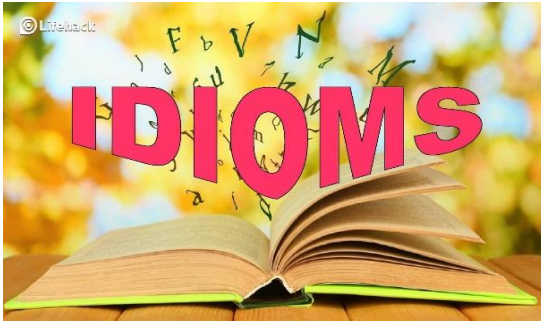
1. Are you permitted to distribute the leaflets on the territory of the university campus?
2. The map shows the distribution of this species across the world.
3. Acid precipitation may cause a reduction in crop yields.
4. The forecast is for dry, cloudy weather with no precipitation expected.
5. There is a great scarcity of food in the drought-stricken areas.
6. Regions where water scarcity is a threat should pay much attention to the problem and make necessary policy changes.
7. She stays calm when facing a crisis.
8. Our water supply is becoming polluted with nitrates.

C. Choose the right word to complete the sentence.

1. Climate change is *disrupting/disregarding* weather patterns, leading to extreme weather events and exacerbating water scarcity.
2. Such *intact/impacts* can drastically affect the quantity and quality of water that children need to survive.
3. Around 74 percent of natural disasters between 2001 and 2018 were water-related, including *drafts/droughts* and floods.
4. The *facility/frequency* and intensity of such events are only expected to increase with climate change.
5. Around 450 million children live in areas of high water *vulnerability/perceptibility*.
6. This means they do not have enough water *to meet/require* their everyday needs.

7. **Rising/Arising** temperatures can lead to deadly pathogens in freshwater sources, making the water dangerous for people to drink.
8. Contaminated water **poses/possesses** a huge threat to children's lives.

Exercise 5. Study the material, choose 5 idioms to your liking and make up your own sentences.



An idiom is a phrase, saying, or a group of words with a metaphorical (not literal) meaning, which has become accepted in common usage.

An idiom's symbolic sense is quite different from the literal meaning or definition of the words of which it is made. There are a large number of Idioms, and they are used very commonly in all languages. There are estimated to be at least 25,000 idiomatic expressions in the English language.

<p>In deep water = to be in a difficult or serious situation</p> <p><i>The football team is in deep water; there's no way they can come back from a 3-1 score to win.</i></p>	<p>In hot water = in trouble because you have done something wrong</p> <p><i>If you don't finish your history project, you're going to land in hot water with Mrs. Smith.</i></p>
<p>Feel like a fish out of water = to feel uncomfortable because you feel like you don't belong in a place or situation</p>	<p>Blood is thicker than water = family relationships are more important than all others</p>

<p><i>Robert felt like a fish out of water surrounded by the girls who had been doing judo for years.</i></p>	<p><i>Even though I know my brother is annoying, blood is thicker than water, and I will always defend him when people tell him to shut up.</i></p>
<p>Take to (an activity) like a duck to water = to learn or adapt to something new very quickly</p> <p><i>Even though she'd never played guitar before, Louise took to it like a duck to water, and was soon playing with a rock band.</i></p>	<p>Keep your head above the water = to just manage to survive in a difficult situation, especially concerning money</p> <p><i>Thanks to a donation from the charity after Mrs. Hudson lost her job, the family are keeping their heads above water.</i></p>
<p>Pour cold water on something = to criticize someone's idea or plan so much they no longer feel excited about it</p> <p><i>I know you don't think the camping trip is exciting, but there was no need to pour cold water over Billy's suggestion. He planned it all himself!</i></p>	<p>Pour oil on troubled waters = to try to stop an argument by calming people down</p> <p><i>Mum always manages to pour oil on troubled waters when my siblings and I get into a fight.</i></p>

Exercise 6. Watch the video and do the following tasks.

<https://www.youtube.com/watch?v=OCzYdNSJF-k>

A. Decide whether the following statements are TRUE or FALSE. Suggest correct answers.

1. 43% of the world's population endures extreme water scarcity.
2. People cannot consume 97% of water because it's full of minerals.
3. 3% of water can be found in ice caps and glaciers.

4. The existing sources of water are slowly replenished by rain and snowfall.
5. The amount of water is evenly distributed around the globe.
6. Agriculture is the biggest consumer of water supplies.
7. Agriculture poses the smallest threat to the regional water supplies.

B. Explain the meaning of the following words and word combinations, use them in your own examples.

To run out of something, to be depleted, finite, ingenious ways.

Exercise 7. Find the information about reasons of water pollution and present it in the classroom. Suggest ways of solving the water supply problems.

UNIT 25.

Exercise 1. Read and translate the text. Learn unknown words.

Water on Land

A drop of water is constantly circulating in its journey from sea to land and back to the sea. This journey can take thousands of miles. A drop of water may make several stops on land, staying in one place for some period of time. But eventually, every drop of water finds its way back to the sea. Let's consider the stops a drop of water may take after rising from the sea as water vapor and falling back to earth in some form.

One possible stop for a drop of water is a lake. Lakes are bodies of slowly moving or standing fresh water. Lakes can be found in all continents and in all ecosystems. But the continents of North America, Africa, and Asia contain about 70 percent of the total lake

water. Lakes also occur far beneath the ice sheets of Antarctica. However, the data related to their volume and other characteristics remain incomplete.

Lakes vary in size. Some of them are very small and people can even relax near them at the backyards. Others are big enough to be called seas. The Caspian Sea with an area of more than 370,000 square kilometres is considered to be the world's largest lake.



Most of the world's lakes are freshwater lakes. Freshwater lakes have surface rivers or underground streams and springs flowing into and 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.

The Caspian Sea, the Dead Sea, and the Aral Sea are really lakes because they are

surrounded on all sides by land. 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 are viewed as an important part of water cycle. These water bodies are important in preserving wildlife. They serve as migration stops for many birds and as refuges for a wide variety of other animals. They provide homes for a diversity of organisms, from microscopic plants and animals to fish that may weigh hundreds of kilograms.

Throughout the centuries lakes have provided routes for travel and trade. Farmers use lakes to irrigate the crops. Lakes are also popular recreation and vacation spots. People enjoy boating, swimming, water-skiing and fishing. Many public parks are built

near lakes, allowing people to picnic, camp, hike, bike, and enjoy the wildlife and scenery the lake provides.

Exercise 2. Give equivalents for:

to vapor, inland seas, below sea level, ice sheets, to enjoy the scenery, recreation and vacation spots, diversity of organisms, to provide homes, to preserve wildlife, moving or standing water.

Exercise 3. Rearrange the letters in the anagrams to form equivalents for the Ukrainian words.

забезпечувати	irodepv	поверхня	rusfcea
оточувати	dounrsru	струмки	assretm
прохолода	looc	різномаїття	tydisirev

Exercise 4. Decide which answer (A, B, C or D) best fits each gap.

Lakes are found all around the world. You can find them in all environments, in deserts, great plains, and mountains. The most common continents to find lakes are in North America, Africa, and Asia. These continents (1) _____ around seventy percent of the (2) _____ lakes in the world. You can even find lakes underneath ice sheets in Antarctica.

Lakes are a body of water that is (3) _____ by land. They (4) _____ in size and shape, some small enough to fit in your back garden and some two kilometers deep.

But what (5) _____ do they have to us? Farmers make use of lake water to irrigate their crops. Water is vital for the production of crops, without this water we wouldn't be able to feed the world and keep the supply of crops needed to (6) _____ our ever growing population. Many people see lakes as a tourist (7) _____. There are plenty of examples around the world of famous lakes that have now become a place of travel.

1	A	host	B	ghost	C	hostess	D	boost
2	A	average	B	approximate	C	total	D	common

3	A	delivered	B	surrounded	C	sent	D	supplied
4	A	blast	B	swing	C	vary	D	crawl
5	A	stage	B	craft	C	shape	D	benefit
6	A	aggravate	B	exaggerate	C	sustain	D	convert
7	A	agency	B	destination	C	plot	D	site

Exercise 5. Answer the questions:

1. What is the water cycle?
2. Give the definition of the term “lake”.
3. Name the territories rich in lakes.
4. Why are some lakes saltwater lakes?
5. Are there any saltwater lakes in Ukraine?
6. What functions do lakes play for environment (economy)?
7. What is the world’s largest natural lake? Where is it found?
8. What is the biggest (the deepest) lake of Ukraine? Present information about it to your group mates.

Exercise 6. Read the abstract, translate it in written form and do the following tasks.

A. Make up your own example sentences with the underlined words.

B. Prepare a short report about any lake in Ukraine and make a list of its uses.

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.

UNIT 26.

Exercise 1. Read and translate the text. Learn unknown words.

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.

Rivers and streams are always at work on the land, destroying rock and soil (erosion), washing them away (transportation), and putting them down someplace 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.

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.

Exercise 2. Give equivalents for:

знищувати ґрунт, for sport and recreation, вимір, powerful, виробляти, to generate power, транспортувати товари, to change highlands into lowlands, гирло річки, keep a balance, приєднуватися до маленьких річок, a river source, відкладення, a river's flow.

Exercise 3. 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

Exercise 4. Answer the questions:

1. What is a river system?
2. What is a drainage basin?
3. What is a stream or river called if it flows into another stream or river?
4. What is it called if it flows out of a stream or river?
5. How do erosion, transportation, and deposition help rivers do their work of shaping the land?
6. What makes a river great?
7. What are some of the ways people use rivers?

Exercise 5. 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

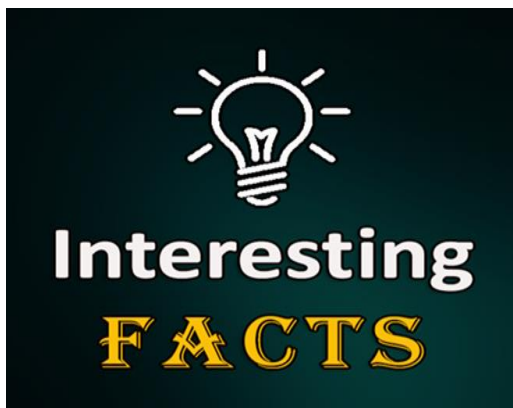
1. Words associated with rivers.
2. Work of rivers and streams.
3. Adjectives describing water.
4. Something that can melt.
5. Purposes that lakes serve.
6. Words associated with seas.
7. Water pollutants.
8. Processes involved in the water cycle.

Exercise 6. Translate the sentences into your native tongue and write down your own sentences with the underlined words:

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.
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. The earth's water supply stays the same year after year because of the water cycle.
5. Polluted water carries germs. People who drink polluted water often get sick and may even die.

Exercise 7. Using different sources find the necessary information to complete the table. Choose any river from the suggested list and get ready to speak about its role in the economy of the country.

The world's largest rivers	
The Amazon river	is in South America. It is the second-longest river in the world, measuring at 6347 km.
The Colorado river	is in the United States. It runs through the Grand Canyon and is 2.334 km long.
The Dnieper	
The Danube	
The Thames	
The Nile	
The Seine	



VATERFALLS

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 horseshoe 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.

UNIT 27.

Exercise 1. Read and translate the text. Learn unknown words.

Impact of Human Activity

A new study shows that 86 per cent of the world's rivers have been damaged by human activity. The study was conducted by researchers from a university in Toulouse, France. They examined data on over 2,500 rivers around the world. They did not look at rivers in the polar regions of the Arctic and Antarctica or in deserts. The scientists looked into changes to biodiversity over the past 200 years. They discovered that biodiversity in over half of rivers has been seriously damaged by humans. The researchers said there were many reasons for this damage. A big reason is the introduction of new species of fish into rivers. Other reasons include pollution, dams, overfishing, farming and climate change.

The researchers say the worst-hit rivers are in western Europe and North America. This is because these regions have large and rich towns and cities. The lead researcher said: "Rivers which have the most economic development around them, like the Mississippi River, are the most strongly impacted." The River Thames in London was one of the worst-affected rivers in the study. The least-

impacted rivers are in Africa and Australia. The researcher said: "This is probably due to a slower rate of industrialization in Africa and low population density around rivers in Australia." He added that rivers in many rich nations are unrecognizable compared with how they were 200 years ago.

Exercise 2. Develop your reading skills. Decide whether the following statements are *True* or *False*.

1. A half of the world's rivers has been damaged as a result of human activity. ***True / False***
2. Researchers looked at data on more than 2,500 rivers and lakes. ***True / False***
3. Scientists looked at biodiversity loss over the past 2 millenniums. ***True / False***
4. Farming is one reason for the damage done to rivers. ***True / False***
5. The worst-hit rivers are those in South America. ***True / False***
6. The rivers with the least damage are in Africa and Australia. ***True / False***
7. Rivers today look very different to how they looked 200 years ago. ***True / False***

Exercise 3. Match the words with their meanings.

1	study	a	The variety of life in the world or in a particular habitat or ecosystem.
2	conducted	b	Dirty, harmful or poisonous things in the air, rivers, countryside, etc.
3	biodiversity	c	Organized and carried out.
4	examined	d	About the North or South Pole.
5	polar	e	A detailed checking and look of a subject or situation.
6	pollution	f	Looked at in detail.
7	data	g	Facts and statistics.

Exercise 4. Look at these words and write their synonyms, a definition or your own sentence to show that you understand their meaning.

1. damaged
2. conducted
3. discovered
4. reason
5. due to
6. impacted
7. species



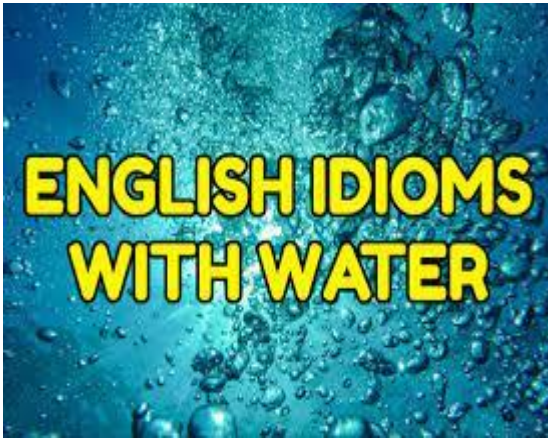
Exercise 5. Scan the text again and write down some questions you would like to ask the class about the text. Ask your groupmates to answer them.

Exercise 6. Fill in the blanks with the correct words from the table suggested below.

<i>release</i>	<i>dumped</i>	<i>caused</i>
<i>safety threshold</i>	<i>crucial</i>	<i>consuming</i>

1. Rivers are considered to be a major source of life. They provide fresh water which is for all living organisms.
2. The rapid increase in human population as well as its activity have massive pollution of rivers throughout the world.
3. The of toxic chemical wastes from industries have led to the lack of clean drinking water.
4. The Mississippi River is one of the most polluted rivers in the world. More than 12.7 million pounds of poisonous chemicals such as mercury, fertilizers, sediments etc. have been into the Mississippi River in just one year.
5. The Danube is the most polluted river with antibiotics in Europe. The water samples taken from this river in Austria show the traces of seven antibiotics surpassing the

6. The toxin levels in the water make it dangerous for both living creatures having their habitat in water bodies and people it.



Exercise 7. Study the explanations of some idioms, translate the examples and make your own sentences.

- 1. Keep your head above the water** = to manage to survive in a difficult situation, especially concerning money
- 2. It's water under the bridge** = what happened in the past should be forgotten
- 3. Dead in the water** = to describes a plan or idea that is unlikely to be successful
- 4. Uncharted waters** = a situation or activity you've never tried or experienced before
- 5. To be as/like oil and water** = if two things or people are like oil and water, they are very different and they cannot exist together or be mixed with each other successfully.

Examples:

1. Many students entered uncharted waters with online education.
2. Don't worry about that stupid mistake, it's water under the bridge.
3. I consider his plan to win the next elections is dead in the water.
4. Nobody expected to see them together at that party, they were like oil and water.
5. Tom lost his job two months ago. But thanks to some savings, he is keeping his head above water.

Exercise 7. Write a magazine article about biodiversity in rivers and how governments should spend huge amounts of money cleaning them up. Include imaginary interviews with people who are for and against this.

Exercise 8. Role Play

You think rivers are those things that require the protection from human activity most of all. Give at least three reasons of it. Tell your groupmates what is wrong with the river waters in your region.

UNIT 28.

Exercise 1. Read and translate the text. Learn unknown words.

Fresh Water Problem

Water covers 70% of our planet, and you might think that it is a plentiful resource we will never run out of. However, freshwater used by people for meeting their needs — drinking, cooking, hand-washing, bathing, irrigating the fields — is incredibly rare. Only 3% of the world's water is fresh water.

What is water scarcity? *Water scarcity* is defined as a water deficiency or a lack of safe water supplies. As the population of the world grows and the environment becomes further affected by climate change, access to fresh drinking water dwindles.

In 2000, the World Health Organization estimated that 1.2 billion people were not able to meet their needs for safe water. Every day, over 800 children die from dirty water, due to diarrhea caused by poor water, sanitation and hygiene and scarce or

unreliable water and sanitation facilities in many communities around the world.

The impacts of water scarcity affect families and their communities. Without clean, easily accessible water, they can



become locked in poverty for generations. Children drop out of school and parents struggle to make a living.

As the international authority on public health and water quality, WHO leads global efforts to prevent transmission of waterborne disease, advising governments on the development of

health-based targets and regulations.

WHO produces a series of water quality guidelines, including on drinking water, safe use of wastewater, and safe recreational water environments.

Exercise 2. Guessing the meaning of unknown words.

A. Find the words 1-6 in the text and guess their meanings.		B. Now match the words 1-6 with their meaning a-f.	
1	teeming	a	indigence
2	waterborne	b	measure, try to value
3	poverty	c	indigent
4	dwindle	d	swarming with
5	impoverished	e	carried by or through water
6	estimate	f	decline, diminish

Exercise 3. Put these words into the spaces in the paragraph below.

*shift mission trend confirmed
acronym areas massive result*

The USA's space agency NASA has (1) _____ that human activity is responsible for a (2) _____ redistribution of freshwater across Earth. It said the redistribution is continuing as populations (3) _____ and demand for food increases. In particular, equatorial regions were drying, while tropical (4) _____ and higher latitudes were gaining water supplies. NASA warned that if this (5) _____ continued, many highly populated urban areas could struggle to find sufficient water in the future. NASA's claims are the (6) _____ of a 14-year study into shifting locations and depleting resources of freshwater. It was part of a (7) _____ conducted between 2002-2016 called GRACE, which is an (8) _____ for Gravity Recovery and Climate Experiment.

Exercise 4. Discussion questions.

1. What images are in your mind when you hear the word 'fresh'?
2. Do you take having freshwater for granted?
3. How fresh is the water in your area?
4. What do you think of having to buy water?
5. Why do people need so much water?
6. Should humans change their activity to conserve water?
7. What would you do if water were scarce?
8. How can we use less water?
9. What will happen to populated areas without water?
10. Should there be a big tax on water use?

Exercise 5. Pay attention to water collocations. Write your own example sentences.



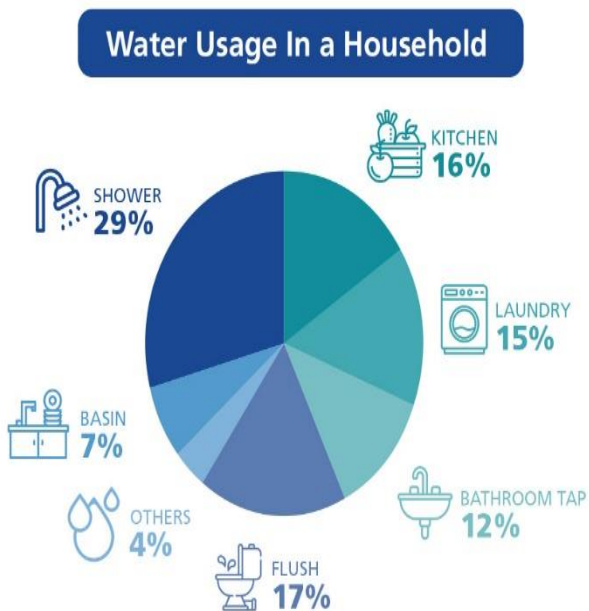
We say that words that occur together frequently “collocate”.

There are no rules or logical explanations for why some words collocate and others do not.

adjective + water collocations	
Lukewarm water (slightly warm)	<i>Drinking lukewarm water in the morning is great for waking up your organism.</i>
Tepid water (slightly warm)	<i>The regular drinking of tepid water will provide many benefits for your body.</i>
Brackish water (salty, dirty and unpleasant)	<i>Brackish water is saltier than fresh water but not as bad as seawater.</i>
Fresh water	<i>Rivers, lakes, and marshlands are types of freshwater systems.</i>
Running water	<i>All the rooms have hot and cold running water.</i>
verb + water collocations	
slosh water around = move it in different directions	<i>He is always sloshing too much water on the floor while having a bath.</i>
contaminate/pollute water	<i>Heavy industry pollutes the rivers and streams with chemicals.</i>
purify water	<i>Boiling is a reliable way to purify water.</i>

Exercise 6. Study the following, if necessary find additional information to complete the table.

Do you know how much water you use for different activities at home? Below is a pie chart showing the percentage breakdown of water use for each activity in a typical household.



PUB Household Water Consumption Study in 2018/2019

NOTE: PUB is a statutory board under the Ministry of Sustainability and the Environment (MSE). It is the national water agency, which manages Singapore’s water supply, water catchment, and used water in an integrated way. From April 2020, PUB also took on the responsibility of protecting Singapore’s coastline from sea-level rise as the national coastal protection agency.

How can you be more water efficient?

Being careful with how much water we use helps make sure there's enough for everybody. There are things we can all do every day to be more water efficient.

We all need to do our bit to save water by following the current Water Wise Guidelines and reducing outdoor water use. If we adopt some simple tips, we will be able to save as much as 140 liters of water per person per day.

Kitchens, bathrooms and laundries

- ✓ Thaw frozen foods in the fridge rather than placing them under running water.
- ✓ Take shorter showers. Every minute less in the shower saves one bucket of water.

.....
.....

Gardens

- ✓ Wash your car on the lawn so that you water and fertilize the grass at the same time. Car shampoos use phosphates that are like many fertilizers.

.....
.....

WORD LIST

with useful phrases

ENGLISH	UKRAINIAN
acid rain	кислотний дощ
air <i>air pollution, quality, pressure;</i> <i>in the open air = outside</i> <i>to breath in, inhale, pollute, purify air</i>	повітря
be threatened with extinction	бути під загрозою вимирання
bins <i>litter, rubbish, waste, wastepaper bins;</i> <i>to provide special bins to separate waste</i>	контейнери, баки
by-product	побічний продукт
carbon dioxide	вуглекислий газ
to cause / to be caused by smth. <i>to cause illness, decease, death;</i> <i>to cause destruction</i> <i>to cause troubles</i> <i>to cause pollution</i> <i>A burning cigarette caused the fire.</i> <i>Smoking causes lung decease.</i>	спричиняти/бути спричиненим
chop down	вирубувати
coast	берег
consequences	наслідки

<p><i>catastrophic, devastating, disastrous, fatal, negative, serious, tragic consequences;</i> <i>direct, immediate, possible, potential consequences;</i> <i>to have, face, suffer, avoid, foresee consequences</i></p>	
<p>conservation <i>biodiversity, forest, landscape, nature, rainforest, wildlife, nature resources conservation;</i> <i>conservation area, measures, efforts;</i> <i>conservation organization, group, agency</i></p>	<p>охорона / збереження</p>
<p>crisis [ˈkraɪsɪs] <i>deep, serious crisis;</i> <i>growing, worsening crisis;</i> <i>financial, economic, pension crisis;</i> <i>ecological, energy, environmental, fuel, oil crisis</i></p>	<p>криза</p>
<p>damage <i>to cause damage, to lead to damage, to suffer damage;</i> <i>ecological, considerable, much, extensive severe,, great, heavy, serious, significant, substantial damage</i></p>	<p>шкода, збитки</p>
<p>damage / to be damaged by smth. <i>to be damaged by fire;</i> <i>The house was so badly damaged.</i></p>	<p>завдати шкоди/бути пошкодженим</p>
<p>decay; rot <i>to speed decay, to cause decay</i></p>	<p>розпад, руйнування, ГНИТТЯ</p>

deforestation	вирубка лісів
depletion <i>soil depletion, resource depletion, ozone depletion;</i> <i>serious, rapid depletion</i>	виснаження
desertification	опустелювання
destroy / to be destroyed <i>to destroy buildings,</i> <i>to destroy hopes</i> <i>The house was destroyed.</i> <i>Fires often destroy forests.</i>	знищувати, руйнувати / бути зруйнованим
destruction <i>the destruction of environment;</i> <i>the destruction of wildlife & countryside beauty;</i> <i>destruction of ozone layer;</i> <i>destruction of rainforests;</i> <i>Pouring oil into the water will cause pollution and the destruction of our seas and rivers.</i>	руйнування, загибель
die out <i>Endangered animals can easily die out.</i> <i>Why do some animals die out? People kill animals for the sake of their skins and destroy their habitats, cutting down forests and polluting water.</i>	вимирати
disappearing = (rare) <i>disappearing species;</i> <i>rare species;</i>	зникаючий (рідкісний)
disaster	катастрофа

<p><i>a terrible disaster</i> <i>nuclear disaster</i> <i>ecological disaster</i></p>	
<p>drought <i>extreme, devastating, extended, frequent droughts;</i> <i>to experience, survive, withstand a drought</i></p>	засуха
<p>dump <i>garbage, waste, nuclear dump;</i> <i>town dump;</i> <i>Take all this litter to the town dump.</i></p>	звалище
dumping	захоронення, дампінг
<p>dump / to be dumped <i>to dump illegally;</i> <i>They dumped a lot of rubbish in the river.</i> <i>All the countries protest against dumping acid wastes in the seas and oceans.</i></p>	викидати у великій кількості / бути викинутим
<p>emissions <i>exhaust, vehicle, aviation emissions;</i> <i>to reduce, regulate, lower, minimize, control emissions</i></p>	викиди
<p>endanger / to be endangered — <i>to endanger animals;</i> <i>to endanger people's lives;</i></p>	загрожувати, наражати на небезпеку
<p>endangered species <i>Nowadays tigers have become endangered animals.</i></p>	зникаючі види

energy <i>Energy is the power from electricity, wind, etc. that helps machines work.</i>	енергія
environment <i>a healthy environment to protect the environment</i>	навколишнє середовище
environmental (= ecological) <i>environmental problems environmental protection</i>	пов'язаний з навколишнім середовищем
environmental contamination	забруднення навколишнього середовища
environmental emergency	надзвичайна екологічна ситуація
environmental protection	охорона навколишнього середовища
extinct <i>to become, go extinct; practically, completely, totally extinct; What extinct animals do you know? Dinosaurs are extinct animals.</i>	вимерлий
extinction <i>mass, total extinction; to be threatened with, face extinction; to be in danger of extinction; to be on the brink of extinction; to cause, prevent extinction</i>	вимирання

<p>fertilizer <i>natural, artificial, liquid, chemical, organic fertilizer;</i> <i>to spray. apply, use, spread fertilizers</i></p>	<p>добриво</p>
<p>filter / purifier <i>to use filters;</i> <i>carbon filter, digital filter</i></p>	<p>фільтр / очищувач</p>
<p>fine <i>to get fined;</i> <i>to be heavily fined;</i> <i>The government should issue a law to fine plants and factories for all kinds of pollution.</i></p>	<p>штрафувати</p>
<p>flood; overflow river <i>flood waters, flood damage, flood victim, flood protection</i></p>	<p>повінь</p>
<p>flooding</p>	<p>затоплення, паводок</p>
<p>foliage <i>dense, tropical, dead, bright foliage</i></p>	<p>листя</p>
<p>fragile <i>fragile health</i> <i>Our fragile planet needs protection.</i> <i>Name 3 things that are fragile.</i></p>	<p>крихкий, ламкий, тендітний</p>
<p>fume <i>dangerous, poisonous, toxic, harmful, hazardous fumes;</i> <i>diesel, petrol, traffic, exhaust fumes;</i> <i>to emit, produce, release fumes;</i> <i>to breathe in, inhale fumes</i></p>	<p>дим</p>

<p>fungus (fungi) <i>a fungus grows/spreads/colonizes something</i></p>	грибок
<p>greenhouse effect <i>the problem of greenhouse effect; Greenhouse effect is the problem of a rise in temperature in the earth's atmosphere.</i></p>	парниковий ефект
<p>green belt</p>	полоса зелених насаджень
<p>habitat <i>a habitat of plants; a habitat of animals; natural, native habitat; habitat loss/destruction A habitat is a place where a certain animal usually lives.</i></p>	середовище проживання
<p>hazardous <i>extremely, highly hazardous; biologically, environmentally hazardous</i></p>	небезпечний
<p>herbicide</p>	гербіцид
<p>humidity</p>	вологість
<p>hurricane</p>	ураган
<p>ice</p>	лід
<p>incineration</p>	спалювання відходів

<p>influence = effect <i>to have a strong influence (effect) on smb.</i> <i>TV has a strong influence on people.</i> <i>Climate has a very important influence on plants, animals and humans.</i></p>	ВПЛИВ
<p>influence smth. (greatly) <i>What influenced his decision?</i> <i>His speech influenced me greatly.</i> <i>Humans influence Nature.</i></p>	ВЛИВАТИ НА ЩОСЬ
<p>include / to be included <i>to include in the Red Book</i></p>	ВКЛЮЧАТИ / МІСТИТИ В СОБІ
landfill	звалище
list of endangered species	Червона книга
<p>litter <i>to drop litter;</i> <i>to clear litter away;</i></p>	дрібне сміття
marsh	болото
maximum allowable emissions	максимально допустимі викиди
multiple use	комплексне використання (ресурсів)
natural calamity	стихійне лихо
negligence	недбалість

<p>nuclear <i>nuclear energy; nuclear power stations; nuclear tests; nuclear weapons; a nuclear waste; Nuclear waste endangers people's lives. People all over the world protest against nuclear tests. Nuclear power stations can go wrong and cause nuclear pollution.</i></p>	<p>ядерний</p>
<p>oil slick <i>massive oil slick, a slick in the sea or ocean</i></p>	<p>нафтова пляма (на воді)</p>
<p>ozone hole</p>	<p>озонова дора</p>
<p>ozone layer</p>	<p>озоновий шар</p>
<p>peninsula</p>	<p>півострів</p>
<p>permafrost</p>	<p>мерзлота</p>
<p>poison / to be poisoned <i>strong, deadly poison People can be poisoned by industrial wastes.</i></p>	<p>отруювати / бути отруєним</p>
<p>pollute / be polluted by <i>To pollute the water, air, atmosphere means to make it dirty and dangerous for people and animals to live in or to use The air in the cities is polluted by car fumes.</i></p>	<p>забруднювати / бути забрудненим</p>
<p>pollution <i>land, air, water pollution;</i></p>	<p>забруднення</p>

<i>reduce, minimize, avoid, control, eliminate, prevent pollution</i>	
pollutant <i>chemical, toxic, environmental, water pollutant;</i> <i>the emission/release of pollutants</i>	забруднювач
prevent <i>to prevent an ecological disaster;</i> <i>to prevent effectively, successfully;</i> <i>to be able/unable to prevent</i>	запобігати
produce <i>to produce goods;</i> <i>to produce domestically, organically, commercially</i> <i>These agricultural machines are produced in Ukraine.</i>	виробляти
prohibit / to be prohibited <i>to be strictly prohibited;</i> <i>Feeding animals in zoos is strictly prohibited.</i>	забороняти
protect the environment <i>to protect the environment from pollution</i>	захищати навколишнє середовище
protection <i>protection of the environment</i>	захист
(p)reserve, sanctuary	заповідник
quality assurance / quality control	забезпечення якості/контроль якості

radioactive wastes	радіоактивні відходи
recycle / to be recycled <i>to recycle waste;</i> <i>to recycle safely, efficiently, continuously</i>	переробляти
recyclable <i>to produce recyclable packaging;</i> <i>easily, completely recyclable</i>	придатний для переробки
recycling	утилізація, вторинне використання
recycling centers <i>There are no recycling centers in our city.</i>	центри переробки
reduce the threat	зменшувати загрозу
renewable energy	відновна енергія
reservoir	водойма
resources <i>natural resources;</i> <i>important, sufficient, adequate, available,</i> <i>limited, useful, extra, finite resources</i> <i>The country is rich in natural resources.</i>	ресурси
reuse	використовувати повторно
rubbish / garbage <i>to throw rubbish</i>	сміття, мотлох
runoff	стоки, відвід

salinity	солоність, засоленість
sampling	відбір проб
sediment, precipitation <i>heavy, increased, annual, average precipitations</i>	опади
sewage	стоки, нечистоти
sewage system	система очищення стокових вод
shortage <i>a shortage of water, natural resources (gas, oil, clean water); a shortage of food</i>	нестача, дефіцит
soil <i>fertile, good, rich, poor soil; acid, wet, contaminated soil; to dig, cultivate, till soil; soil surface, degradation, erosion, conditions, fertility, quality, conservation</i>	грунт
source [so:s] <i>alternative, additional, source; source of information; What are the main sources of land pollution?</i>	джерело
species [ˈspi:ʃi:z] (мн. species) <i>plant, insect species; a species of flowers, a species of animals; widespread, rare, native species;</i>	вид (види)

<i>The Black Tulip is an unusual species of tulips.</i>	
survive <i>Do you know that camels can survive for many days without eating?</i>	ВИЖИВАТИ
to take actions <i>to take actions to prevent an ecological disaster</i>	ВЖИТИ ЗАХОДІВ
threaten human life	загрожувати ЛЮДСЬКОМУ ЖИТТЮ
timber	лісоматеріали
toxic substance	токсична речовина
unrenewable resources	невідновні ресурси
vegetation <i>green, thick, lush vegetation; aquatic, tropical vegetation; to be covered with/in lush vegetation;</i>	рослинність
wastes <i>waste paper; household waste; nuclear waste; industrial waste; chemical waste; radioactive waste; to minimize, reduce wastes; A lot of waste from factories and plants goes into the rivers. Scientists try to solve the problem of radioactive waste.</i>	ВІДХОДИ
waste <i>not to waste water, electricity;</i>	витрачати дарма

<i>to waste entirely, totally</i>	
water quality criteria	критерії якості води

Important environment issues and their explanations

acid rain	rain which contains large amounts of harmful chemicals as a result of burning substances such as coal and oil.
<i>Burning fossil fuels in one country can cause acid rain in other countries.</i>	
amendments / soil amendments	nutrient-rich materials such as compost, peat moss, bone meal, etc., that are added to the soil to improve its composition and productivity.
ban	to not allow something (e.g. smoking, alcohol, plastic bags, protest marches, etc.)
<i>Our school has banned plastic bottles because they're so bad for the environment.</i>	
biodegradable	able to decay naturally and harmlessly.
<i>Biodegradable packaging helps to limit the amount of harmful chemicals released into the atmosphere.</i>	
biodiversity	the number and variety of plant and animal species that exist in a particular environmental area or in the world generally, or the problem of preserving and protecting this.
carbon monoxide	the poisonous gas formed by the burning of carbon, especially in the form of car fuel.
carbon dioxide	the gas formed when carbon is burned, or when people or animals breathe out.
<i>Trees and plants absorb carbon-dioxide and release oxygen into the air.</i>	
carcinogen	a substance that has been linked to causing one or more types of cancer.
clear-cut	to destroy a forest by cutting down all the trees
<i>Forests never recover fully after being clear-cut.</i>	

climate	the general weather conditions usually found in a particular place.
<i>The Mediterranean climate is good for growing citrus fruits and grapes.</i>	
classify	to arrange by putting into groups according to some system.
conserve	to avoid wasteful or destructive use of something.
conservation	the protection and preservation of natural environments and resources
<i>Conservation wasn't a big issue until the book Silent Spring was published in 1966.</i>	
contaminated	has come in contact with organisms or substances that cause disease
compost	a mixture of decayed plants used to fertilize and improve garden soil.
deforestation	the cutting down of trees in a large area; the destruction of forests by people.
<i>Deforestation is destroying large areas of tropical rain forest.</i>	
desertification	the process by which land changes into desert.
decomposition	the natural process of decay whereby dead plants and animals slowly break down into organic matter.
developing country	a nation that is working towards becoming more economically and socially advanced.
disposable products	describes an item that is intended to be thrown away after use.
domestic waste	garbage that is produced by people in a household.
drought	a long period when there is little or no rain.
<i>This year (a) severe drought has ruined the crops.</i>	
dump	to put waste in the wrong place (e.g. put toxic waste into a river)

<i>You can be sent to jail for dumping hazardous waste, you know.</i>	
ecological	having to do with ecology, the study of organisms and their relationship with their environment.
ecosystem	a complex system of relationships between living things and their environment; a community of organisms living in an environment as an interdependent system.
<i>All those plants, insects and birds in your garden are part of an ecosystem.</i>	
earthquake	a sudden violent movement of the Earth's surface, sometimes causing great damage.
efficient	performing in the best possible manner with little time, money or energy wasted.
endangered species	endangered birds/plants/species animals or plants which may soon not exist because there are very few now alive.
<i>Every year more animals are listed as endangered species.</i>	
energy	the power from something such as electricity or oil, which can do work, such as providing light and heat. There are different types of energy: solar, nuclear, hydroelectric...
<i>The energy generated by the windmill drives all the drainage pumps.</i>	
environment	the air, water and land in or on which people, animals and plants live.
<i>Certain chemicals have been banned because of their damaging effect on the environment.</i>	
environmental services	the collection of environmental processes
fertilize	to add chemicals or organic material to soil so that plants grow better
<i>If you are going to fertilize your lawn, make sure to use an organic fertilizer.</i>	

flood	a large amount of water covering an area that is usually dry.
fossil fuel	a fuel like oil or coal formed from very old plant and animal fossils
<i>Burning fossil fuels is a major cause of global warming.</i>	
fumes	strong, unpleasant and sometimes dangerous gas or smoke.
<i>Petrol fumes always make me feel ill.</i>	
global warming	the rise in the average temperature of the Earth's surface.
greenhouse effect	the retention of heat in the atmosphere caused by the build-up of greenhouse gases.
habitat	a place where plants, animals and microorganisms live.
hazardous waste	a form of garbage that is harmful to health of plants, animals or humans and requires careful disposal (e.g. batteries or paint).
humus	the organic matter component of soil made up of decayed plants and animals.
hydrogen	a plentiful gas which has the potential to be used as fuel.
industrial	related to industry and the production of fuel, power and materials used to manufacture goods, esp. in factories.
investment	money or capital put into a business for profitable returns, e.g. interest or income.
loam	a soil texture consisting of approximately 40% sand, 40% silt, and 20% clay, that is preferred for
micro-organisms	microscopic organisms including fungi and bacteria.
natural resources	things such as minerals, forests, coal, etc. which exist in a place and can be used by people.

<i>Some natural resources, such as natural gas and fossil fuel, cannot be replaced.</i>	
global warming	a gradual increase in world temperatures caused by polluting gases such as carbon dioxide which are collecting in the air around the Earth and preventing heat escaping into space.
greenhouse effect	an increase in the amount of carbon dioxide and other gases in the atmosphere which is believed to be the cause of a gradual warming of the surface of the Earth.
green peace	an organization that fights for the protection of the environment.
habitat	the place in which a species normally lives
<i>Lots of animals will become extinct if their natural habitats are destroyed.</i>	
hazardous waste	dangerous substances that need careful disposal (eg. toxic or nuclear waste)
<i>They increased their profits by dumping hazardous waste into the ocean.</i>	
National Grid	the network that connects all of the power stations in the country to make sure that everywhere has access to electricity.
native	naturally occurring in an area.
organic matter	the part of soil made up of the decomposed remains of once-living plants or animal bodies.
ozone layer	a layer of air high above the Earth, which contains a lot of ozone, and which prevents harmful ultraviolet light from the sun from reaching the Earth.
<i>Scientists believe that there is a hole in the ozone layer.</i>	
pesticide	a chemical that's sprayed on crops to stop insects from destroying them

<i>Can't we find a pesticide that's safe?</i>	
pollutant	a substance or material that damages the natural environment
<i>The Environmental Protection Agency checks levels of pollutants.</i>	
pollute	to release waste substances into the air, water and soil
<i>Fumes from factories pollute our air.</i>	
pollution	the contamination of the environment, esp. by industrial waste products and chemicals like pesticides
<i>All the pollution around here comes from factories and mines.</i>	
preserve	to keep something in its original state
<i>We need stronger laws in order to preserve our forests.</i>	
protect	to keep from harm
<i>It's really important to protect our water supply.</i>	
radioactive	When unstable atoms give off particles that can be harmful to humans.
reforestation	the planting of trees and plants to help a damaged or destroyed forest recover
<i>Plant twenty trees in our reforestation project and you'll get into our dance party for free!</i>	
renewable	can be used without running out, esp. of energy sources like solar and wind
<i>We're producing cheaper renewable energy these days.</i>	
renewable energy	describes a form of energy that can be produced as quickly as it is used.
smog	air pollution caused by a reaction between chemicals in the atmosphere and sunlight.
soil	complex mixtures of minerals, organic matter, air, and water that support plant life on Earth and are, therefore, crucial to all life on the planet.
soil composition	the makeup of a soil according to the proportions of its four basic components:

	minerals, organic matter, air, and water.
soil texture	an indicator of the nutrient and water holding capacities of soil that is determined by the proportion of sand, silt, and clay soil particles.
soil fertility	the capacity of soil to be productive in sustaining and growing plants.
soil particles	the mineral component of soil. Soil particles are classified into three sizes — sand (2mm-0.05mm), silt (0.05mm-0.002mm), and clay (<0.002mm).
species	groups of organisms that resemble one another in appearance, behavior, chemical processes, and genetic structure.
toxic chemicals (toxins)	poisonous substances that can cause disease.
waste	unwanted matter or material of any type, often that which is left after useful substances or parts have been removed.
weathering	a process that occurs as rocks are broken down into smaller and smaller pieces by the effects of physical, chemical, and biotic forces.

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NOTES

NOTES

Навчальне видання

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ACQUAINTANCE WITH OUR PLANET

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