Міністерство освіти і науки України

Житомирський державний університет імені Івана Франка

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English for Ecology Students

Посібник-практикум для студентів природничого факультету

спеціальності «Екологія»

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Посібник-практикум містить матеріал, необхідний для проведення практичних занять та організації самостійної роботи з англійської мови студентів-екологів природничого факультету. Тексти та вправи подані для виконання шести змістових модулів. Матеріал розрахований на поглиблення фахових спеціальних та загальних комунікативних навичок студентів у процесі професійно спрямованого вивчення англійської мови.

Розрахований на студентів денної та заочної форми навчання.

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CONTENTS

PREFACE

Посібник-практикум «English for Ecology Students» («Англійська для студентів-екологів») призначений для студентів природничого факультету спеціальності «Екологія». Його метою є вдосконалення навичок усного та писемного мовлення за допомогою автентичних текстів для читання, укладених відповідно до тематики вивчення курсу «Іноземна мова» на вказаному факультеті.

Посібник-практикум відповідає програмі вивчення іноземної мови на природничому факультеті і вимогам необхідного кваліфікаційного рівня. Матеріал поділено на шість розділів, тексти яких охоплюють інформацію про: екологію як науку, забруднення води, глобальне потепління та парниковий ефект, кислотні дощі, вирубку лісів.

Кожний розділ складається з тексту, який містить спеціальну наукову термінологію, та лексичних дотекстових, текстових та післятекстових вправ, за допомогою яких формуються навички говоріння, читання, письма, розуміння англійських текстів в межах поданих тем. Вправи дають змогу студентам закріпити нову лексику та розвивають вміння використовувати її в усному та писемному мовленні.

Сучасні матеріали посібника відповідають змінам у сфері екології. У сучасному світі виникає потреба в оволодінні новою фаховою термінологією та вмінням вільно використовувати її у галузі екології в актах комунікації фахового характеру та під час перекладу фахових текстів українською мовою.

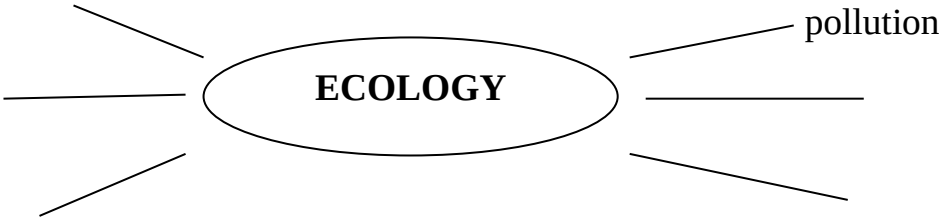
Unit 1

ECOLOGY AS A SCIENCE

1. Work in pairs and discuss the following questions:

1. How would you define ecology?
2. What branches of ecology do you know?
3. What is the purpose of studying ecology?
4. Think of the word *ecology*. What comes to your mind?

Complete the chart and share your ideas with your fellow students:



2. Pronounce the following words. Find Ukrainian equivalents.

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

3. Make sure that you know the pronunciation and translation of the following words and expressions from the text (use a dictionary):

relationships -
environment -
branch -
living organisms -
be coined -
apply -
wonder about -
be aware of -
be content -
know a great deal about -
be affected by -
habitat -

4. Look through the text and explain the meaning of the following Greek words:

oikos, logos, habitat

The Science of Ecology

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

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

For the most part, however, people do not think ecologically. When we see a bird or wildflower, our first question is: What is it? Most people **are content** to know the names of some of the living things around them in nature. Perhaps you are the sort of person who **wonders** further: What does it do? You may want to know the organism's role in its environment, and how it affects and is affected by other organisms. Ecologists wonder about the same things.

5. Read the text and choose the best title for each paragraph:

1) Ecology is a new science.
2) The Indians of the North America were the first ecologists.
3) Ecology is the science of the environment.
4) What do ecologists study?
5) The relationships between living things and the environment is the main subject of ecology.

6. Read the text and find English equivalents to the following Ukrainian phrases. Use them in the sentences of your own.

Взаємовідносини між; навколишнє середовище; дати визначення; доісторичний; залежати від; багато знати про; екологічні знання; усвідомлювати; мати вплив на.

7. Answer the following questions

1. What is ecology?
2. What does ecology deal with?
3. Who were the first ecologists?
4. What are the main problems of ecology?
5. Is it important to study ecology? Why?
6. Where do we use knowledge of ecology?

6. Say if the statements are true or false.

1. Ecology plays an important role in the life of modern world.
2. Ecology is the study of the relationships between living things and their environment.
3. The term “ecology” comes from two Latin words, *oikos* and *logos.*
4. Environments of living organisms include animals and plants, climate and soil.
5. The science of ecology is a new one.

6. Prehistoric people didn’t know anything about the ecology of plants.

7. Theophrastus is called the "first true ecologist".

8. The Indians of the North American plains knew a great deal about the ecology.

7. Fill in the gaps using appropriate words and expressions from the text.

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

2. No one is sure when the word ecology was first …. .

3. Ernst Haeckel was the first to … ecology in 1869.

4. People … their knowledge of ecology thousands years ago.

5. Theophrastus was the first to … plants … of their habitats, such as forest and marsh.

6. Today we often use ecological knowledge without … of it.

8. Find the equivalents in the first and second columns

1. ecology 2. relationship 3. environment 4. living things 5. prehistoric 6. habitat 7. marsh 8. science 9. soil 10. climate	a) the surroundings or conditions in which a person, animal, or plant lives or operates; b) relating to or denoting the period before written records; c) the weather conditions prevailing in an area in general or over a long period; d) the branch of biology that deals with the relations of organisms to one another and to their physical surroundings; e) the natural home or environment of an animal, plant, or other organism; f) an area of low-lying land which is flooded in wet seasons or at high tide, and typically remains

	waterlogged at all times; g) the intellectual and practical activity encompassing the systematic study of the structure and behaviour of the physical and natural world through observation and experiment; h) a living (or once living) entity; i) the upper layer of earth in which plants grow, a black or dark brown material typically consisting of a mixture of organic remains, clay, and rock particles; j) the way in which two or more people or things are connected, or the state of being connected.

9. Fill in prepositions:

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

2. The term comes … two Greek words.

3. Prehistoric people had to know something … the ecology of wheat and com.

4. Theophrastuswas the first to write … plants … terms of their living places.

5. The Indians knew a great deal … the ecology …the bison.

6. Today we often use ecological knowledge … being aware of it.

10. Work in pairs. Discuss the following statements:

1. Ecology is a very complicated science.

2. Ecology is closely related to natural sciences.

3. Basic ecology concepts are important for almost every profession.

4. Modern life simply wouldn't be possible without knowledge of ecology.

11. Give the summary of the text (7-10 sentences).

Vocabulary 1

affect [əˈfɛkt] вадити, вдавати

climate [ˈklʌɪmət] клімат

ecology [ɪˈkɒlədʒi,ɛˈkɒlədʒi] екологія

environment [ɪnˈvʌɪrənm(ə)nt,ɛnˈvʌɪrənm(ə)nt] оточення, навколишнє оточення

forest [ˈfɒrɪst] ліс

habitat [ˈhabɪtat] природне середовище

lawn1[lɔːn] газон

marsh [mɑːʃ] болото

prehistoric [priːhɪˈstɒrɪk] доісторичний

relationship [rɪˈleɪʃ(ə)nʃɪp] взаємовідносини, зв'язок

shady [ˈʃeɪdi] поганий, сумнівний

soil [sɔɪl] грунт

successfully [səkˈsɛsf(ə)li] успішно

surroundings [səˈraʊndɪŋz] околиці, оточення

Unit 2

WATER POLLUTION

1. Look at the pictures (1-3) and say as many words as you can relate to each one.

2. Which of the problems in the pictures exist in your country? Use the prompts to make up sentences as in the example. Use your own ideas.

- water
- garbage
- factories
- cause
- pollution
- plastic
- runoff

E.g.: There are more and more plastic bags thrown into rivers and seas.

3. Work in pairs and discuss the following questions:

1. What is the role of water in our lives?
2. What are the sources of fresh water?
3. What are the reasons of water pollution?
4. What problems are caused by water pollution?
5. What are the ways to save water sources?

4. Read the following words. Do you know the words? If you do, can you say why?

atmosphere, ocean, cycle, mile, cubic, condensation, globe, planet, material, industry, irrigation, container, reservoir, climate, topography, utilization, conservation, protection

3. Read the text «WATER POLLUTION». Make sure that you know the pronunciation and translation of the following words and expressions from the text (use a dictionary):

renewable resources **-**
depollute **–**
mankind –
diversion –
recycling –
recreational activities –
composition –
domestic purposes –
identifiable source –
effluents –
spread over –
runoff –
transboundary pollution –
livestocks –

WATER POLLUTION

Water is one of the **renewable resources** essential for sustaining all forms of life, food production, economic development, and for general well being. It is impossible to substitute for most of its uses, difficult to **depollute**, expensive to transport, and it is truly a unique gift to **mankind** from nature. Water is also one of the most manageable natural resources as it is capable of **diversion**, transport,

storage, and **recycling**. All these properties impart to water its great utility for human beings. The surface water and groundwater resources of the country play a major role in agriculture, hydropower generation, livestock production, industrial activities, forestry, fisheries, navigation, recreational activities etc.

The simplest definition of water pollution is "the loss of any of the actual or potential beneficial uses of water caused by any change in its **composition** due to human activity". The beneficial uses of water are varied and include its use for drinking and for **domestic purposes**, for watering livestock and the irrigation of crops, for fisheries, for industry and for food production, for bathing and for recreational use.

Every type of water pollution comes from either a *point* or *a nonpoint source*. *Point sources of pollution* are those which have direct **identifiable source**. Example includes pipe attached to a factory, oil spill from a tanker, **effluents** coming out from industries. Point sources of pollution include wastewater effluent (both municipal and industrial) and storm sewer discharge and affect mostly the area near it.

In contrast, *nonpoint-source pollution* comes from many places **spread over** a large area. As runoff produced by rain and snowmelt makes its way across farms, lawns, and streets, it picks up accumulated fertilizers, pesticides, salt, oil, and other pollutants. The **runoff** eventually carries all of this nonpoint-source pollution to bodies of water such as streams, lakes, or the ocean. Sometimes pollution that enters the environment in one place has an effect hundreds or even thousands of miles away. This is known as **transboundary pollution**. One example is the radioactive waste that travels through the oceans from nuclear reprocessing plants to nearby countries.

Water pollutants may be *organic* and *inorganic* water pollutant.

1. Organic water pollutants: They comprise of insecticides and herbicides, organohalides and other forms of chemicals; bacteria from sewage and livestocks farming; food processing wastes; pathogens; volatile organic compounds etc.

2. Inorganic water pollutants: They may arise from heavy metals from acid mine drainage; silt from surface run-off, logging, slash and burning practices and land

filling; fertilizers from agricultural run-off which include nitrates and phosphates etc. and chemical waste from industrial effluents.

4. Read the text and find English equivalents to the following Ukrainian words and phrases. Use them in the sentences of your own.

Відновлювальні ресурси; загальне самопочуття; знезараження; унікальний подарунок людству; природні ресурси; зберігання; переробка; ресурси підземних вод; генерація електроенергії; тваринництво; оздоровчі заходи; завдяки діяльності людини; побутові цілі; зрошення сільськогосподарських культур; точне або неточне джерело; стічні води, що надходять з галузей промисловості; зливова каналізація; стік; транскордонне забруднення; радіоактивні відходи.

5. Read the characteristics of point and nonpoint sources of chemical inputs to receiving waters and divide them into two columns:

Point Sources	Nonpoint Sources
….	- Septic tank leachate and runoff from failed septic systems

- ~~Septic tank leachate and runoff from failed septic systems~~
- Wastewater effluent (municipal and industrial)
- Runoff and leachate from waste disposal sites
- Runoff from abandoned mines
- Runoff and infiltration from animal feedlots
- Runoff from mines, oil fields, unsewered industrial sites
- Urban runoff unsewered and sewered areas with a population <100,000
- Runoff from pasture and range
- Storm sewer outfalls from cities with a population >100,000

- Activities on land that generate contaminants, such as logging, wetland conversion, construction, and development of land or waterways

-Overflows of combined storm and sanitary sewers

- Runoff from construction sites >2 ha

- Runoff from agriculture (including return flow from irrigated agriculture)

- Runoff from construction sites

- Atmospheric deposition over a water surface

6. Match the category of a nonpoint source pollution to its definition in sections "Sources" and "Pollutant" by writing the letter in the corresponding blank.

Categories of Nonpoint Source Pollution:

A. Urban Pollution

B. Rural Pollution

C. Atmospheric Pollution

D. Natural Pollution

Definitions – Sources:

_____cultivation soil, production crops, raising livestock, mining, logging, and construction

_____concentrated population areas including homes, industry, business, and schools

_____wind and rain-carried particles

_____rocks, minerals, and soil that erode by wind and runoff that contribute their natural characteristics to water

Definitions – Pollutant:

_____motor oil, grease, herbicides, pesticides, household chemicals, pet waste, dirt and dust from construction

_____nutrients in the form of pesticides, herbicides, dirt and dust from plowing agricultural fields

_____nitrogen from lightning storms, nutrients from wildlife, salts and metals from rocks and minerals

_____acid rain

7. **Read the text «Effects of water pollution» and choose the title for each paragraph.**

A. Destruction of ecosystems
B. Disruption of food-chains
C. Economic cost
D. Diseases
E. Death of aquatic (water) animals

EFFECTS OF WATER POLLUTION

The effects of water pollution are varied and depend on what chemicals are dumped and in which locations.

1. _____

The main problem caused by water pollution is that it kills organisms that depend on these water bodies. Dead fish, crabs, birds and sea gulls, dolphins, and many other animals often wind up on beaches, killed by pollutants in their habitat (living environment).

2. _____

Pollution disrupts the natural food chain as well. Pollutants such as lead and cadmium are eaten by tiny animals. Later, these animals are consumed by fish and shellfish, and the food chain continues to be disrupted at all higher levels.

3. _____

Eventually, humans are affected by this process as well. People can get diseases such as hepatitis by eating seafood that has been poisoned. In many poor nations, there is always outbreak of cholera and diseases as a result of poor drinking water treatment from contaminated waters.

4. _____

Ecosystems (the interaction of living things in a place, depending on each other for life) can be severely changed or destroyed by water pollution. Many areas are now being affected by careless human pollution, and this pollution is coming back to hurt humans in many ways.

5. _____

From the above it is evident that there is some real financial implications that will result from water pollution. It can cost a lot more to purify drinking water that takes its source from nutrient-polluted water bodies. Fishing stock is affected negatively when there is a depletion of oxygen. Consumers are also wary of fish from these sources and tend to stay away from them, costing fisheries to lose revenue. In places where there are water activities or sports, lots of money is spent to clean up the water from algae blooms and the like.

8. Complete the following sentences:

1. Water is one of the renewable resources essential for… .
2. Water is one of the most manageable natural resources as it is capable of … .
3. The surface water and groundwater resources play a major role in … .
4. Water pollution is … .
5. The beneficial uses of water include … .
6. There are two types of water pollution: … .
7. Transboundary pollution is …. .
8. Water pollutants may be of two types: … .
9. The effects of water pollution are … .

9. Match English and Russian word combinations.

water	**вода**
ground fresh white	безвідходна свіжа ґрунтова

clarified	освітлена
purified	зворотна
non-waste	очищена
polluted	забруднена
residuary	підземна
underground	

10. Find words close in meaning

sewage water, prior, pollute, facility, amount, treat, reduce, quantity, decrease, produce, process, manufacture, aim, goal, contaminate, possibility, before, residuary water

11. Find antonyms:

harmful, minority, many, near, small, increase, harmless, liquid, far, majority, safe, few, large, decrease, dangerous, solid.

12. Match a word with its definition.

1. pollutant	a. the action or process of converting waste into reusable material
2. natural resources	b. disturbance or problems which interrupt an event, activity, or process
3. diversion	c. the nature of something's ingredients or constituents; the way in which a whole or mixture is made up
4. recycling	d. having been made impure by exposure to or addition of a poisonous or polluting substance
5. composition	e. liquid waste or sewage discharged into a river or the sea
6. effluents	
7. runoff	
8. transboundary pollution	
9. disruption	
10. contaminated	

	f. the action of turning something aside from its course g. the presence in or introduction into the environment of a substance which has harmful or poisonous effects h. the draining away of water (or substances carried in it) from the surface of an area of land, a building or structure, etc i. the pollution that originates in one country but is able to cause damage in another country's environment j. materials or substances occurring in nature which can be exploited for economic gain

13. Read the solutions of water pollution prevention. Add your own piece of advice.

➢ Never throw rubbish away anyhow. Always look for the correct waste bin. If there is none around, please take it home and put it in your trash can.

➢ Use water wisely. Do not keep the tap running when not in use. Also, you can reduce the amount of water you use in washing and bathing.

➢ Do not throw chemicals, oils, paints and medicines down the sink drain, or the toilet. In many cities, your local environment office can help with the disposal of medicines and chemicals. Check with your local authorities if there is a chemical disposal plan for local residents.

➢ Buy more environmentally safe cleaning liquids for use at home and other public places. They are less dangerous to the environment.

➢ If you use chemicals and pesticides for your gardens and farms, be mindful not to overuse pesticides and fertilizers.

➢ Plant lots of trees and flowers around your home, so that when it rains, chemicals from your home does not easily drain into the water.

14. Tell some sentences about:

- point and nonpoint sources of water pollution;
- organic and inorganic water pollutants;
- destruction of ecosystems;
- disruption of food-chains.

15. Comment on the following items.

a) sources of water pollution;
b) types of water pollutants;
c) effects of water pollution;
d) prevention of water pollution.

16. Make up a dialogue with your partner "The ways to reduce water pollution". Use the following phrases:

I'd like to know what/when/why/how/who/if …

Could you tell me what/when/why/how/who/if …

I wonder what/when/why/how/who/if …

Would you tell me what/when/why/how/who/if …

It's interesting to know what/when/why/how/who/if …

As far as I know/understand/can judge …

17. Make up a presentation for the ecological conference "Water: pollution, treatment and research".

Vocabulary 2

composition [kɔmpəˈzɪʃ(ə)n] склад (води)

contaminated [kənˈtamɪneɪtɪd] забруднений, заражений

depollute [diːpəˈluːt] знезараження

disruption [dɪsˈrʌpʃn] відпадання, відрив, руйнування

diversion [dʌɪˈvəːʃ(ə)n,dɪˈvəːʃ(ə)n] відвернення, відступ

domestic purposes – побутові цілі

effluents [ˈɛflʊənt] стічні води

identifiable source [ʌɪdɛntɪˈfʌɪəb(ə)l] визначене джерело

livestocks [ˈlʌɪvstɔk] домашня худоба

mankind [mænˈkaɪnd] людство

pollution [pəˈluːʃ(ə)n] забруднення

recreational activities [rɛkriˈeɪʃənl] рекреаційна діяльність

recycling [riːˈsʌɪklɪŋ] переробка

runoff [ˈrʌnɒf] стік

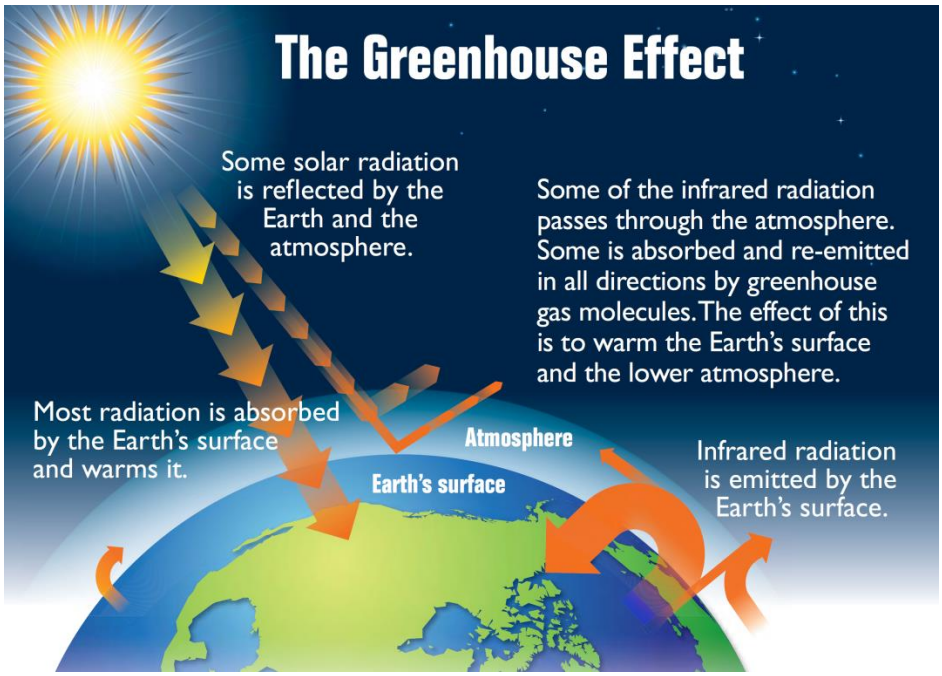
spread over [sprɛd] ширитись

transboundary [trɑːnzˈbaʊnd(ə)ri,tranzˈbaʊnd(ə)ri] транскордонний

Unit 3

GLOBAL WARMING AND GREENHOUSE EFFECT

1. You are going to read an article about Earth's climate. Look at the scheme. What does it tell you about it?



2. Discuss with your partner the following questions.

1. What do you know about the problem of climate change in the global aspect?
2. What are the reasons for it?

3. Read the following quotes about climate change and the environment. Do you agree with them? Comment on the quote that impressed you the most.

✓ "If you really think that the environment is less important than the economy, try holding your breath while you count your money." — *Guy McPherson*

✓ "Climate change is the environmental challenge of this generation, and it is imperative that we act before it's too late."- *John Delaney*

✓ "We do not inherit the earth from our ancestors. We borrow it from our children." – *Native American Proverb*

✓ “Climate change does not respect border; it does not respect who you are – rich and poor, small and big. Therefore, this is what we call ‘global challenges,’ which require global solidarity.” – *Ban Ki-moon*

4. Make sure that you know the pronunciation and translation of the following words and expressions from the text (use a dictionary):

global warming
increase
average temperature
carbon dioxide
greenhouse gases
fossil fuels
polar ice caps
ice melting
icesheets
species
the greenhouse effect
water vapour
enhanced

Global warming

Global warming is the term used to describe a gradual **increase** in the average temperature of the Earth's atmosphere and its oceans, a change that is believed to be permanently changing the Earth’s climate. There is great debate among many people, and sometimes in the news, on whether global warming is real (some call it a hoax). But climate scientists looking at the data and facts agree the planet is warming. While many view the effects of global warming to be more substantial and more rapidly occurring than others do, the scientific consensus on climatic changes related to global warming is that the **average temperature** of the Earth has risen between 0.4 and 0.8 °C over the past 100 years. The increased volumes of **carbon dioxide** and other **greenhouse gases** released by the burning of **fossil fuels**, land clearing, agriculture, and other human activities, are believed to be the primary sources of the global warming that has occurred over the past 50 years. Changes resulting from global warming may include rising sea levels due to the melting of the **polar ice caps**, as well as an increase in occurrence and severity of storms and other severe

weather events. Most scientists agree that this increase in temperature is due to human activities, especially the burning of fossil fuels.

Climate change

Global warming is causing climate change. Climate change means any change in climate, whether due to natural processes or human activities. Evidence of the current change in our climate includes an increase in average global temperatures, **ice melting** in polar and mountain regions, rising sea levels and more extreme weather events. Climate change is not new — it has been happening for millions of years. Ice ages come and go, and sea levels rise and fall. During colder periods, glaciers increase, **icesheets** and the polar icecaps expand and sea levels fall. During warmer periods, glaciers, icesheets and icecaps retreat, and sea levels rise.

However, the current rapid rate of warming and its impact on climate may damage many species and ecosystems. The Earth's animals and plants are used to slow changes, which allow time for **species** to adjust to climatic changes such as rising temperatures.

The Greenhouse Effect

The greenhouse effect is a natural process. The gases in the Earth's atmosphere act like the glass of a greenhouse, trapping the sun's warmth. Without the atmosphere, the Earth's surface would be about 15 °C cooler than it is. **Water vapour** and gases such as carbon dioxide and methane are responsible for the greenhouse effect. These gases make up only a small proportion of the atmosphere, but any variation in their amounts can have an effect on the Earth's temperature.

The **enhanced** greenhouse effect is the increased ability of the Earth's atmosphere to trap heat. Since the Industrial Revolution, the composition of the Earth's atmosphere has changed. Humans have added extra carbon dioxide (CO2) and other greenhouse gases to the air, particularly by burning fossil fuels (oil, coal and gas) and by cutting down trees. With more gases in the air to trap heat, the Earth's temperature is rising.

5. Read the text and answer the following questions:

1) Do you agree that climate change is synonymous with global warming? Why? Why not?

2) What is climate change?

3) Outline the difference between global warming and climate change.

4) What causes climate change?

5) Is climate change natural, or do human activities account for some or most of the change?

6) What could happen if the climate changes?

7) How has the climate changed in your region over the last decade?

8) What can we do about climate change?

9) Use the analogy of a car in the sun with its windows up to explain the greenhouse effect.

6. Study the diagram of the enhanced greenhouse effect. List five human activities that add greenhouse gases to the environment.

7. Give the Ukrainian equivalents to the following:

Gradual increase; average temperature; Earth's atmosphere; permanently changing; the effects of global warming; the scientific consensus on climatic changes; related to global warming; volumes of carbon dioxide and other greenhouse gases;

burning of fossil fuels; primary sources of the global warming; rising sea levels; due to the melting of the polar ice caps; ice melting; current rapid rate of warming; to adjust to climatic changes; the enhanced greenhouse effect; to trap heat.

8. Read the text and find the information about:

a) the average temperature of the Earth;
b) the effects of global warming;
c) human activities causing climate changes;
d) evidence of the current climate changes;
e) greenhouse gases.

9. Read the text «The Global Carbon Cycle» and name two important carbon sinks.

The Global Carbon Cycle

The carbon cycle explains how carbon dioxide is added to and removed from the atmosphere. Carbon dioxide is exchanged by photosynthesis and respiration. Oceans act as carbon sinks, absorbing carbon dioxide and eventually transporting and storing it deep in the ocean floor. Over enormous periods of time, carbon can also be converted to other carbon resources such as oil, coal, gas and coral reefs.

An imbalance has occurred in the carbon cycle because more carbon is being released than is being absorbed or stored away. This has occurredvery rapidly since the Industrial Revolution — before the 1800s, the concentration of CO2 in the atmosphere was about 280 ppm (parts per million); it was 380 ppm in 2005, an increase of about 30 per cent in just over 200 years.

10. Explain why an imbalance in the carbon cycle has occurred in recent times. Study the diagram of the global carbon cycle.

(a) List the locations with the three highest concentrations of carbon.

(b) How can trees both contribute to, and reduce, the amount of atmospheric carbon?

11. Fill in the blanks with prepositions where necessary.

of, in, due to, for, without, over, on,

1. Global warming is a gradual increase … the average temperature of the Earth's atmosphere and its oceans.

2. The scientific consensus … climatic changes related to global warming is that the average temperature of the Earth has risen … the past 100 years.

3. The increased volumes … carbon dioxide and other greenhouse gases released by the burning of fossil fuels, land clearing, agriculture, and other human activities.

4. Changes resulting from global warming include rising sea levels … the melting of the polar ice caps.

5. Scientists agree that the increase in temperature is … human activities.

6. Evidence of the current change in our climate includes an increase … average global temperatures, ice melting …polar and mountain regions, rising sea levels and more extreme weather events.

7. The urgent rapid rate … warming and its impact on climate may damage many species and ecosystems.

8. … the atmosphere, the Earth's surface would be about 15 °C cooler than it is.

9. Water vapour, carbon dioxide and methane are responsible … the greenhouse effect.

10. The enhanced greenhouse effect is the increased ability … the Earth's atmosphere to trap heat.

12. Solve the climate change crossword

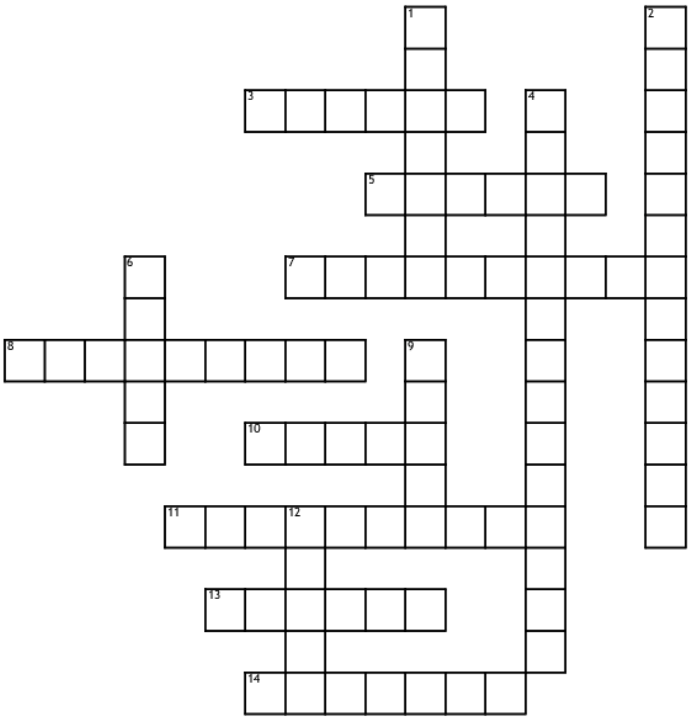
Across

3. _____ fuels
5. _____ dioxide is what we exhale
7. _____ gases can cause global warming
8. A change in the quality of the environment that can adversely affect the heaalth of humans or other living organisms
10. Water _____
11. The mixture of gases surrounding the earth
13. _____ warming
14. You can _____ a plastic bottle

Down

1. The average weather for a region over a long time period
2. ___ ___ is another name for global warming
4. Process that occurs in living green plants where carbon diox converted to oxygen
6. _____ energy: direct radiant energy from the sun
9. Planet _____ is heating up because of global warming
12. The ___ Layer has holes in it due to global warming

CLIMATE CHANGE



13. Work in pairs. Discuss the following topics using the words and phrases from the box:

to my mind; I don't think so; I agree with you; it's (quite) right; it's not right; sorry, you are wrong

1. The difference between global warming and climate change.
2. The reasons of climate changes.
3. The effects of climate changes.
4. Ways to reduce global warming .

14. Give the summary of the text (7-10 sentences).

Vocabulary 3

average temperature [ˈav(ə)rɪdʒ] середня температура

carbon dioxide - вуглекислий газ

carbon sinks - вуглецеві воронки

enhanced [ɪnˈhɑːnst] покращений

fossil fuels [ˈfɒs(ə)l ˈfjuːəlz] горючі корисні копалини

global warming – глобальне потепління

greenhouse gases [ˈgriːnhaʊs] парникові гази

ice melting [ˈmeltɪŋ] танення льоду

icesheets [aɪsʃiːts] крижини

increase [ɪnˈkriːs] зростати, збільшувати

photosynthesis [ˌfəʊtə(ʊ)ˈsɪnθɪsɪs] фотосинтез

polar ice caps – полярні льодовикові шапки

respiration [rɛspɪˈreɪʃ(ə)n] дихання

species [ˈspiːʃiːz] види

the greenhouse effect [ˈgriːnhaʊs ɪˈfɛkt] парниковий ефект

vapour [ˈveɪpə] пара

Unit 4

ACID RAIN

1. Discuss these questions in pairs.

What is acid rain?

What causes acid rain?

What can be done to solve the acid rain problem?

2. Match the words and their description:

1) Sulfuric Acid
2) Nitric Acid
3) Precipitation
4) Evaporate
5) Condense
6) Dry Deposition
7) Runoff Water
8) Acid Deposition
9) Hydrologic Cycle

A. Water falling to the Earth. Mist, sleet, rain, hail, fog, and snow are the most common kinds of precipitation.

B. Water that flows off land into lakes and streams.

C. To change from liquid into gas.

D. An acid that can be produced in the atmosphere from sulphur dioxide, a pollutant that results from burning fossil fuels.

E. Acidic material that falls from the atmosphere to the Earth in either wet (rain, sleet, snow, fog) or dry (gases, particles) forms.

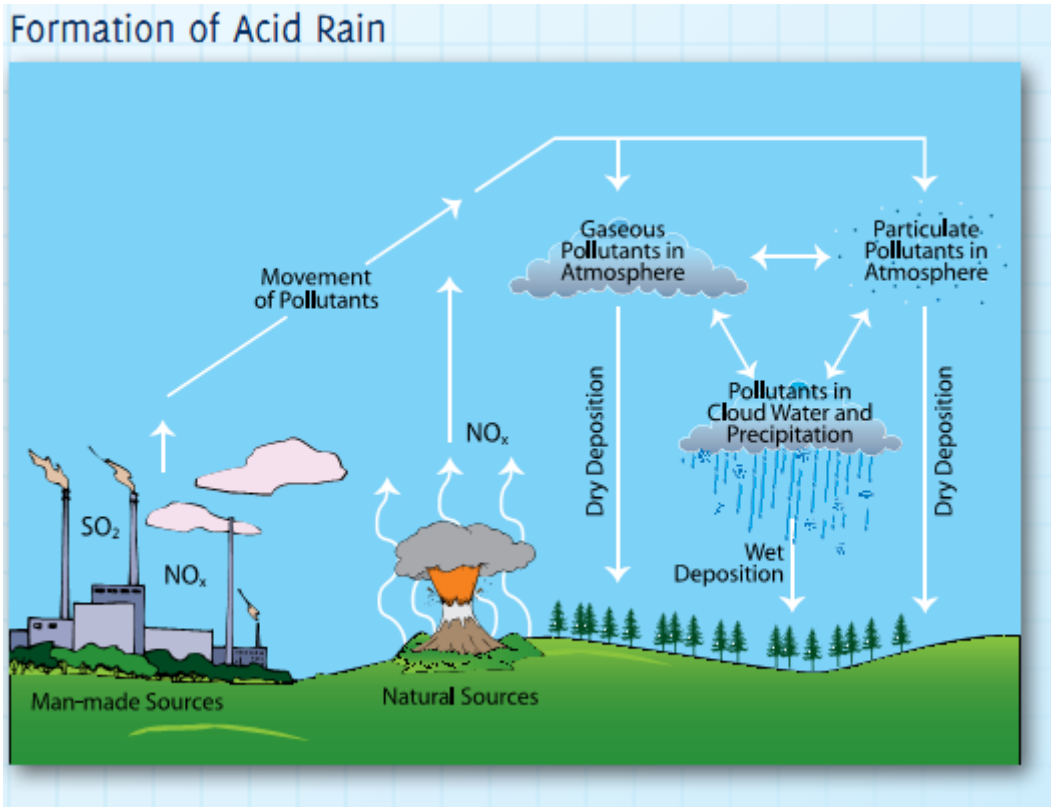
F. An acid that can be produced from nitrogen oxide, a pollutant that results from the burning of fossil fuels.

G. The falling of small particles and gases to the Earth without rain or snow.

H. To change from gas or vapor to liquid form.

I. The movement of water from the atmosphere to the surface of the land, soil, and plants and back again to the atmosphere.

3. Look at the scheme and explain the formation of acid rain:



4. Read the text and pay attention to the underlined words:

Acid Rain

Acid rain is rain that is more acidic than it should be. Acid rain is a complicated problem affecting soil and water chemistry, as well as the life cycles of plants and animals on land and in the water. In addition, weather conditions contribute to air pollution and cause acid rain to spread vast distances.

Scientists have discovered that air pollution from the burning of fossil fuels is the major cause of acid rain. Power plants and factories burn coal, oil, and natural gas to produce the electricity we need to do all kinds of things, like light our homes. Cars, trucks, and airplanes also run on gasoline, a fossil fuel. When we burn things, they

do not disappear. For example, when you burn a log in a campfire, ash is left. But what happened to the rest of the log? Water from the log becomes vapour and enters the air. Burning wood also releases chemicals and particles into the air. The same thing happens when we burn fossil fuels. Burning fossil fuels sends smoke and fumes into the atmosphere, or the air above the Earth. In the air, these pollutants combine with moisture to form acid rain. The main chemicals in air pollution that create acid rain are sulfur dioxide (SO_2) and nitrogen oxides (NO_X). Acid rain usually forms high in the clouds where SO_2 and NOX react with water and oxygen. This forms **sulfuric acid** and **nitric acid** in the atmosphere. Sunlight increases the speed of these reactions, and therefore the amount of acid in the atmosphere. Rainwater, snow, fog, and other forms of **precipitation then** mix with the sulphuric and nitric acids in the air and fall to Earth as acid rain.

Acid rain does not account for all of the acidity that falls back to Earth from pollutants. About half of the acidity in the atmosphere is deposited onto buildings, cars, homes, and trees— anything!—as particles and gases. This process is called dry deposition. In some instances, these gases and particles can damage or alter the things on which they settle. **Dry deposition** (gases and particles) is sometimes washed from trees and other surfaces by rainstorms. When that happens, **the runoff water** contains acid from acid rain and dry deposition, making the combination more acidic than the falling rain alone. The combination of acid rain (wet deposition) plus dry deposition is called acid deposition.

There are also natural sources of acids such as volcanoes, geysers, and hot springs. Nature has developed ways of recycling these acids by absorbing and breaking them down. These natural acids contribute to only a small portion of the acidic rainfall in the world today. In small amounts, these acids actually help dissolve nutrients and minerals from the soil so that trees and other plants can use them for food. Unfortunately, the large amounts of acids produced by human activities overload this natural acidity and throw ecosystems off balance.

5. Read the text and find English equivalents to the following English words and phrases. Use them in the sentences of your own.

complicated problem; affecting soil; life cycles of plants and animals; weather conditions; air pollution; fossil fuels; release chemicals into the air; pollutants; forms of precipitation; dry deposition; making the combination more acidic; natural sources; ways of recycling; small amounts; dissolve nutrients and minerals; throw off balance.

6. Comment on the following:

1) Define acid rain;
2) Explain the cause of acid rain;
3) Explain the effects of acid rain on vegetation;
4) Explain the effects of acid rain on water;
5) Explain the effects of acid rain on manmade objects;
6) Explain the effects of acid rain on humans;
7) Describe what can be done to solve the acid rain problem.

7. Solve the quiz:

1. Acid rain can come in which form?
    a) Dry only
    b) Wet only
    c) Wet and dry
    d) None of the answers are correct.
2. What is the pH scale, and what is its range?
    a) A scale for measuring how acidic something is with a range of 0-14
    b) A scale for measuring the amount of rainfall with a range 0-50
    c) A scale for measuring height with a range of 0-100
    d) A scale for measuring temperature with a range of 0-200
3. Which of the following gases is involved in acid rain?
    a) Carbon dioxide

b) Nitrogen

c) Oxygen

d) Sulfur dioxide

8. Read each clue below then find the number in the puzzle that corresponds to each clue. To assist you, there is a list of possible answers to each clue below the puzzle.

Across

3. A solution is _____ when it has a pH higher than 7.0.

5. When power plants burn _____, they release sulfur dioxide and nitrogen oxides into the air.

7. Wet _____ refers to acidic rain, fog, and snow.

9. _____ deposition can be wet or dry.

11. You can _____ acidic water by adding a base.

13. A _____ removes sulfur dioxide from the gases leaving the smoke-stack of a power plant.

Down

1. The government gives an _____ to a power plant, letting it release a set amount of sulfur dioxide.

2. One way that people can help prevent acid rain is by joining a _____, in which individuals share rides to their destination and reduce the number of cars polluting the air.

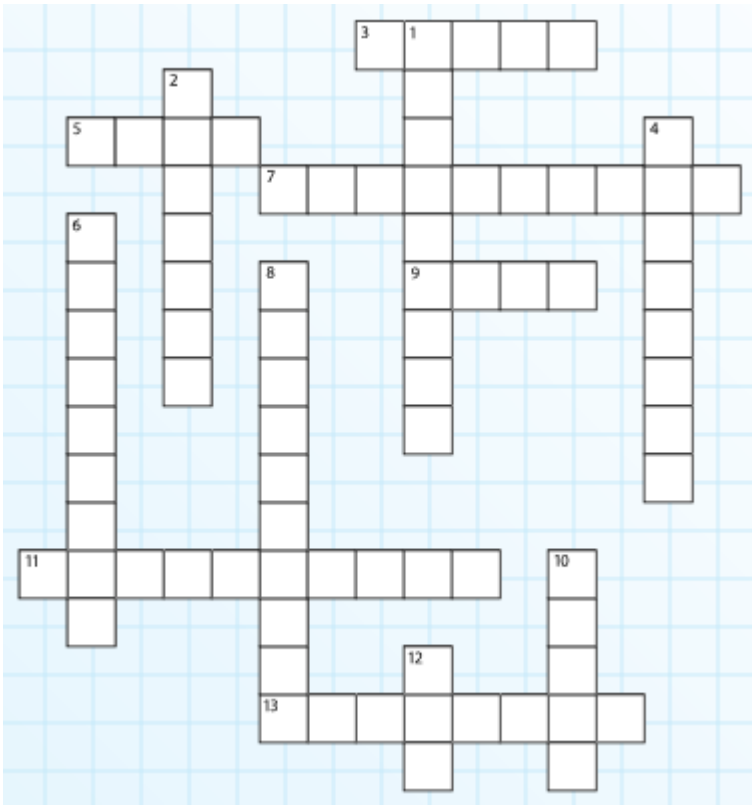
4. _____ is to turn from gas or vapor into liquid form.

6. An _____ consists of plants and animals and the environment in which they live.

8. Sulfur dioxide, nitrogen oxides, ozone, and particulate matter are examples of _____.

10. Hydroelectricity is produced from the energy of running _____.

12. Solar energy is energy that comes from the _____.



Possible Answers

Acid Allowance Basic Carpool Coal Condense
Deposition Ecosystem Neutralize Pollutants Scrubber
Sun Water

9. Fill in the gaps:

Also, although, as much as, as well as, however, because, after.

1..... all the processes that burn coal and oil contribute, the main producers of sulphur dioxide in the atmosphere are coal fired power stations.

2. Acid precipitation includes rain .....mist, snow and dry depositions.

3. Rainfall is naturally a c id ..... it absorbs carbon dioxide in the atmosphere and becomes a weak carbonic acid.

4. Amounts of sulphur are now increasing again ..... a drop in the 1980-s.

5. Exhaust gases ..... react with strong sunlight to produce poisonous ozone gas.

6. In the world as a whole, ...50% of the sulphur dioxide in the air comes from natural sources of sulphur.

7. In Europe, ...only 15 % comes from natural sources.

10. Define true or false sentences.

1. Acid rain is a complicated problem affecting the life cycles of plants and animals.

2. Air pollution is the major cause of acid rain.

3. Power plants and factories burn coal, oil, and natural gas which disappear in the atmosphere.

4. Burning wood and fossil fuels never releases chemicals and particles into the air.

5. In the air the pollutants combine with moisture andform acid rain.

6. The main chemicals in air pollution that create acid rain are sulfur dioxide and nitrogen oxides.

7. All forms of precipitation then mix with oxygen in the air and fall to Earth as acid rain.

8. Dry deposition is sometimes washed from trees and other surfaces by rainstorms.

9. There are no natural sources of acids.

10. Acids actually help dissolve nutrients and minerals from the soil so that trees and other plants can use them for food.

11. All words that are listed below are hidden in the collections of scrambled letters. Your goal as an acid rain detective is to find as many words as possible. Look very carefully — the words can go forwards, backwards, up and down, and diagonally.

Acidic	Carpool	Emissions
Allowance	Chemical	Geothermal
Basic	Coal	Hydropower
Buffer	Deposition	Pollution
Cap	Ecosystem	Scrubbers

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

11. Complete the following sentences:

1. When combined with moisture in the air, sulfates and nitrates ...
2. Acid rain increases the acidity of ...
3. Sulphur emissions in one country can travel across international borders causing acid rain ...
4. The most reliable way to protect the environment from acid rain is to ...
5. Sulphur dioxide is emitted when ...

12. Answer the following questions:

1. Define acid rain.
2. Explain the pH difference between acid rain and pure water.
3. Describe the major cause of acid rain.
4. Why is acid rain of particular interest?
5. What are the main chemicals in air pollution that create acid rain?
6. How long does the chemical reactions take that change air pollution to acid rain?
7. What did the U.S. government do at first to reduce the pollution from smokestacks?
8. How successful was this government action?
9. Which region of the Continental United States is the most affected by acid rain?
10. Which region is the least affected by acid rain?

13. Make a project "Ways to reduce acid rains".

Vocabulary 4

absorb [əbˈzɔːb] поглинати

acid rain [ˈæsɪd] кислотний дощ

acidic [əˈsɪdɪk] кислий

affect [əˈfɛkt] впливати

ash [æʃ] попіл

cause [kɔːz] спричинювати

chemicals [ˈkemɪkəlz] хімікати

conditions [kənˈdɪʃənz] умови

deposition [ˌdɛpəˈzɪʃ(ə)n] опади

dioxide [dʌɪˈɒksʌɪd] діоксид

fossil fuels[ˈfɒs(ə)l ˈfjuːəlz] горючі корисні копалини

gasoline [ˈgasəliːn] бензин

natural sources [ˈsɔːsɪz] природні джерела

overload [ˌəʊvəˈləʊd] перевантажувати

Unit 5

SOIL AND ITS MANAGEMENT

1. Look at the picture and comment on the quote.

2. Read the following words and guess their meaning.

factors, phosphorus, calcium, magnesium, system, mixture, rock, organic materials, machinery, natural, operation, practice, recommend, result, macro elements, molybdenum, cultivated.

3. Read and practice the pronunciation of the following words.

farming -
loamy soils -
consume -
consumer -
to till -
tillage -
germination –
tiller -
tilth -
lime -
treatment -
to lack -
rate -

4. Read the text and pay attention to the highlighted words and phrases.

SOIL AND ITS MANAGEMENT

Good soil management means proper use of many factors such as natural conditions, land, crops, **livestock**, **machinery**, fertilizers and some others. All these factors have to be put it together to farming system work successfully. One of the most 11 important things to be taken into consideration in producing plants and crops is the soil, which is known to be 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, fruit and food products obtained by man directly from the soil, domestic animals **consume** grain and forage and provide people with meat, milk, eggs and other products used as human food. These are the products **obtained** from the soil indirectly.

Some good **clay and loamy soils** are naturally highly **fertile**; some light sandy soils are naturally poor. Various factors that make up the soil fertility are **moisture conditions**, plan 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 lo, soil for the production of crops.

Plant growth and yields can be increased by applying certain recommended soil management practices, **liming**, fertilization and **irrigation** producing, as a rule, immediate **yield increases**. Good soil management results in better yield and lower cost per 33 unit of production. Fertile soils produce plans that are less affected by diseases and less attacked by insects. In this case we have smaller losses of crops.

Some time ago attention was centered on such macro elements 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 (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. Thus, the most important thing for the farmer is to get the land into good condition and to keep it that way. Such land is more easily cultivated and provides better conditions for **seed germination** and plant growth. The quality and yields of crops producer partially depend on the soil management followed. They also depend on the quality of the seed to be used, the variety of the crop to be grown, and some other factors.

5. Translate the following words and phrases into Ukrainian:

crop cultivation, crop cultivation improvement, proper management of the soil, plant protection measures, great soil erosion difficulties, industry and agriculture contribution, modern equipment requirements, new machinery and equipment deliveries, clay and loamy soils, land reclamation work, world water resource distribution, ecosystem equilibrium state, products obtained from the soil, soil nitrogen content analysis, primary plant food elements, machinery maintenance problems, the quality of the seed, per capita water consumption.

6. Choose five highlighted words from the text and make up your own sentences.

7. According to the text, what…

1. is good soil management?
2. are the factors of good soil management?
3. is soil?
4. are the factors that make up the soil fertility?
5. are recommended soil management practices?
6. are primary plant food elements?
7. should people do to get good soil?
8. microelements do you know?

8. Complete the sentences by putting the correct form of the word in brackets into each gap.

1. Good soil management means proper use of many factors such as … conditions, land, crops, livestock, machinery, fertilizers and some others. (NATURE)

2. Soil is a mixture of particles of rock, organic materials, … forms, air and water. (LIVE)

3. People depend upon the soil either … or indirectly. (DIRECT)

4. Some good clay and loamy soils are naturally … fertile; some light sandy soils are naturally poor. (HIGH)

5. … factors that make up the soil fertility are moisture conditions, plan food, and soil structure. (VARY)

6. All these components may be … by proper management of the soil. (REGULATE)

7. Soil management is the science of tillage operations, … practices, using fertilizers, lime and other treatments. (CROP)

8. Plant growth and yields can be increased by applying certain recommended soil management practices, liming, fertilization and … producing. (IRRIGATE)

9. Fertile soils produce plans that are … affected by diseases and less attacked by insects. (LITTLE)

10. It is well known that microelements may be … important, for crop yields, for livestock and human health. (HIGH)

9. Find antonyms of the following in the text:

artificial, man-made	fertile
decrease	inorganic
directly	living forms
domestic animals	neither... nor
drainage	produce

proper	the same
smaller	worse

10. Match the words to make phrases:

1. sandy	a) management
2. natural	b) germination
3. domestic	c) health
4. yield	d) elements
5. organic	e) conditions
6. proper	f) soils
7. small	g) increase
8. secondary	h) animals
9. human	i) losses
10. seed	j) matter

11. Look through the text again and compose three special questions. Ask your neighbour.

12. Agree or disagree with the following statements

1. Good soil management means proper use of fertilizers and pesticides.
2. Soil is one of the most important things to be taken into consideration in producing plants and crops.
3. Soil is a mixture of sand and water.
4. People depend upon the soil directly.
5. There are no products obtained from the soil indirectly.
6. Some soils are naturally highly fertile and some are naturally poor.
7. Moisture conditions is one of various factors that make up the soil fertility.

8. Soil management is the science of tillage operations, cropping practices, using fertilizers, lime and other treatments conducted on.

9. Fertile soils produce plans that are more affected by diseases and more attacked by insects.

10. Primary and secondary plant food elements are highly important, for crop yields, for livestock and human health.

11. All farmers make soil tests in order to to determine the rate of fertilizers to be applied.

13. Read the following issues. Choose one and discuss it in small groups.

- Factors of good soil management.
- The products obtained from the soil directly and in directly.
- Primary and secondary plant food elements.

14. Find some information and make a report on the following issues (15 sentences).

1. “The soil is the great connector of lives, the source and destination of all. It is the healer and restorer and resurrector, by which disease passes into health, age into youth, death into life. Without proper care for it we can have no community, because without proper care for it we can have no life.” ― *Wendell Berry, The Unsettling of America: Culture and Agriculture*

2. “Like the soil, mind is fertilized while it lies fallow, until a new burst of bloom ensues.” ― *John Dewey, Art as Experience*

3. “Our most important job as vegetable gardeners is to feed and sustain soil life, often called the soil food web, beginning with the microbes. If we do this, our plants will thrive, we’ll grow nutritious, healthy food, and our soil conditions will get better each year. This is what is meant by the adage ”Feed the soil not the plants.” ― *Jane Shellenberger, Organic Gardener's Companion: Growing Vegetables in the West*

Vocabulary 5

consume [kənˈsjuːm] споживати

consumer [kənˈsjuːmə] споживач

crop [krɒp] врожай

farming [ˈfɑːmɪŋ] сільське господарство, фермерство

fertilizers [ˈfɜːtəlaɪzəz] добрива

germination [dʒəːmɪˈneɪʃ(ə)n] проростання

insect [ˈɪnsɛkt] комаха

lime [laɪm] скріпляти вапном

livestock [ˈlʌɪvstɒk] худоба

loamy soils [ˈləʊmi] суглинисті ґрунти

moisture [ˈmɔɪstʃə] вологість

provide with [prəˈvʌɪd] забезпечувати

rate [reɪt] норма, розмір

till [tɪl] обробляти землю

tillage [ˈtɪlɪdʒ] обробіток ґрунту

tilth [tɪlθ] оранка

yield [jiːld] урожайність

Unit 6

DEFORESTATION AND FOREST DEGRADATION

1. Before you read the text, look at the following quotation. Do you agree with it?

"If you have forest, if you have green forest, the water table goes up. What happens with deforestation is the water level goes down and we all know how much importance drinking water has". – *MS Dhoni*

2. Work in pairs and discuss the following questions:

1. What is the role of forest in our lives?
2. Is forest in danger?
3. What will happen if forest disappears?

Complete the chart and share your ideas with your fellow students:

3. Read the text and translate the highlighted words. Tick the correct answer:

The text is:

- ❖ *Argumentative*
- ❖ *Narrative*
- ❖ *Informative*

DEFORESTATION AND FOREST DEGRADATION

Deforestation is the conversion of forested areas to non-forest land use such as arable land, urban use, logged area or wasteland. According to FAO, deforestation is the conversion of forest to another land use or the long-term **reduction** of tree canopy cover below the 10% threshold. Deforestation can result from deliberate **removal** of forest cover for agriculture or urban development, or it can be an unintentional consequence of **uncontrolled** grazing (which can prevent the natural regeneration of young trees). The combined effect of grazing and fires can be a major cause of deforestation in dry areas. Deforestation implies the long-term (>10 years) or permanent loss of forest cover.

Deforestation defined broadly can include not only conversion to non-forest, but also **degradation** that reduces forest quality - the density and structure of the trees, the ecological services supplied, the biomass of plants and animals, **the species diversity** and the genetic diversity. Narrow definition of deforestation is: the removal of forest cover to an extent that allows for alternative land use. The United Nations Research Institute for Social Development (UNRISD) uses a broad definition of deforestation, while the Food and Agriculture Organization of the UN (FAO) uses a much narrower definition.

Definitions can also be grouped into those which refer to changes in land cover and those which refer to changes in land use. Land cover measurements often use a percent of cover to **determine** deforestation. Land use definitions measure deforestation by a change in land use. This definition may consider areas to be forest that are not commonly considered as such. An area can be **lacking trees** but still considered a forest. It may be a land designated for afforestation or an area designated administratively as forest. Land cover based definitions can be measured using remotely sensed data. Detailed ground survey is needed to monitor land use type deforestation processes.

Forest degradation is a process leading to a ‘temporary or permanent **deterioration** in the density or structure of vegetation cover or its species composition’. It is a change in forest attributes that leads to a lower productive

capacity caused by an increase in disturbances. The time-scale of processes of forest degradation is in the order of a few years to a few decades. For the purpose of having a harmonized set of forest and forest change definitions, that also is measurable with **conventional techniques**, forest degradation is assumed to be indicated by the reduction of canopy cover and/or stocking of the forest through logging, fire, windfelling or other events, provided that the canopy cover stays above 10%. In a more general sense, forest degradation is the **long-term reduction** of the overall potential supply of benefits from the forest, which includes wood, biodiversity and any other product or service.

4. Tell what is the text mainly about:

- ✓ The solutions to deforestation
- ✓ The causes and effects of deforestation
- ✓ The effects and solutions of deforestation

5. Read the text again and give Ukrainian equivalents to the following words and expressions. Use them in the sentences of your own.

Deforestation; conversion; logged area; wasteland; reduction; deliberate removal of forest; urban development; unintentional consequence; permanent loss; degradation; forest quality; the biomass of plants and animals; species diversity; removal; alternative land use; measurements; afforestation; forest degradation; deterioration; density; harmonized set of forest; conventional techniques; reduction; potential supply.

6. Read the text and find the information about:

- narrow and broad definition of deforestation;
- afforestation;
- forest degradation;
- causes of deforestation and forest degradation;
- effects of deforestation and forest degradation.

7. Look through the text and decide which word or phrase is best for each space.

grazing	**monitor**	**species**	**reduction**	**removal**
	density	**deforestation**	**determine**	

1. … is the conversion of forested areas to non-forest land use.

2. Deforestation can result from deliberate … of forest cover for agriculture or urban development.

3. … and fires are major causes of deforestation in dry areas.

4. Degradation reduces the … diversity and the genetic diversity.

5. Land cover measurements often use a percent of cover to … deforestation.

6. Ground survey is needed to … land use type deforestation processes.

7. Forest degradation leads to a deterioration in the …. or structure of vegetation cover.

8. Forest degradation is the long-term … of the overall potential supply of benefits from the forest.

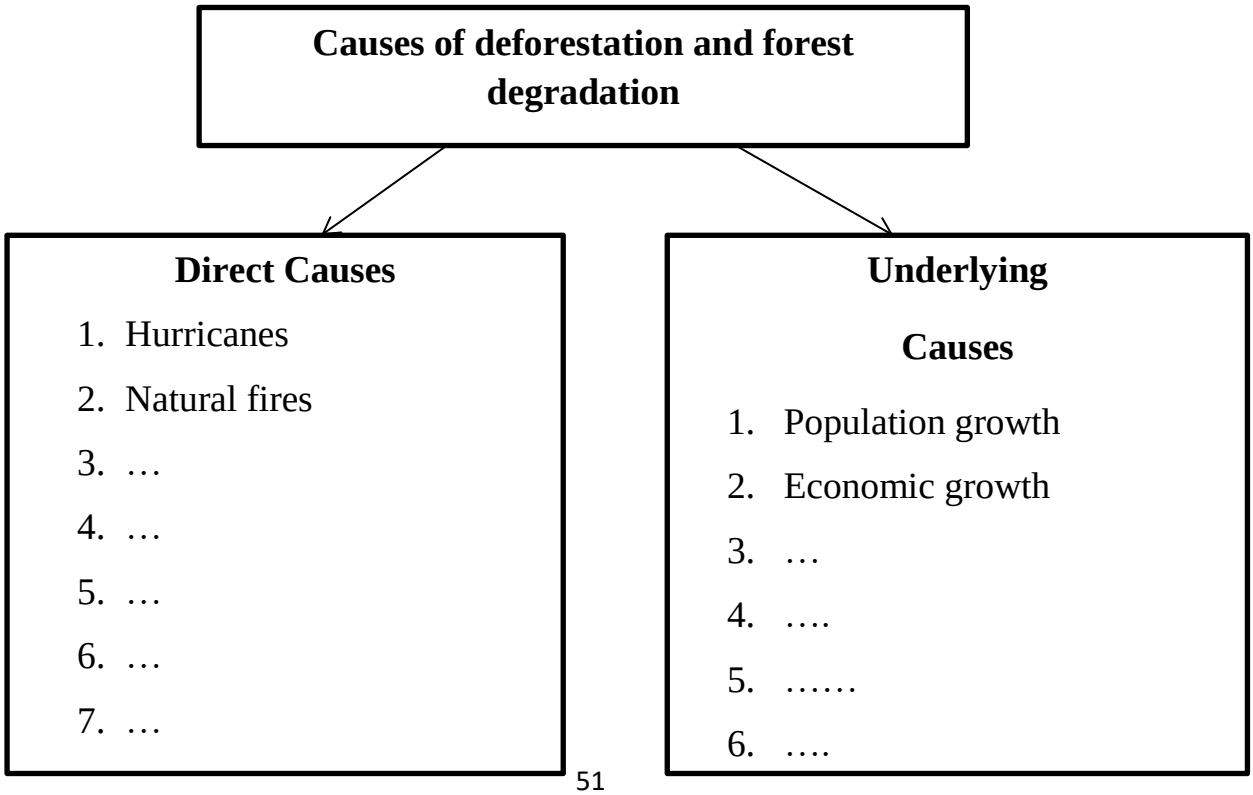
8. Read the text "Causes of deforestation and forest degradation" and fill in the table.

«CAUSES OF DEFORESTATION AND FOREST DEGRADATION»

The most important direct causes of deforestation include logging, the conversion of forested lands for agriculture and cattle-raising, urbanization, mining and oil exploitation, acid rain and fire. In other countries, clear-cut logging practices have been the main reason for forest loss. In the early nineties, Canada and Malaysia were famous examples of countries where logging companies ruthlessly cleared mile upon mile of precious primary forests. Here too, the historical perspective should not be overlooked. Countries like Ireland and Scotland used to be almost entirely

forested, but were nearly completely cleared under British rule to provide timber for English shipbuilders.

During the last few decades, the forest crisis has prompted many international, regional and national preservation initiatives, yet many have had little success. There is general agreement that this is due to the fact that these strategies were too focused on the immediate causes of deforestation, and neglected the underlying causes which are multiple and interrelated. In some cases they are related to major international economic phenomena, such as macroeconomic strategies which provide a strong incentive for short-term profit-making instead of long-term sustain ability. Also important are deep-rooted social structures, which result in inequalities in land tenure, discrimination against indigenous peoples, subsistence farmers and poor people in general. In other cases they include political factors such as the lack of participatory democracy, the influence of the military and the exploitation of rural areas by urban elites. Over consumption by consumers in high-income countries constitutes another of the major underlying causes of deforestation, while in some regions uncontrolled industrialization is at the heart of forest degradation with widespread pollution resulting in acid rain.



9. Answer the following questions:

1. What are some ways that forests impact your daily life?

2. How much of the world's original forest cover has been lost in the past 50 years?

3. Define deforestation in your own words.

4. Why does deforestation occur?

6. How do you think we can work to stop deforestation?

7. How does deforestation relate to biodiversity?

10. Join these pairs of sentences with:

-therefore *-though* *-because* *-so … that*

1. Paper is indispensable in our live.
2. We have to recycle wasted paper.
3. A lot of tress have been cut down.
4. Deforestation is harmful to the Earth.

a. Our earth has limited natural resources.
b. We continue to cut down trees.
c. Millions of species have lost their habitat.
d. We must take care of how to use it.

11. Define true or false sentences.

1. Deforestation takes place only in developed countries.
2. Millions of forests are destroyed each year.
3. Grazing doesn't affect the natural regeneration of young trees.
4. Fires are a major cause of deforestation.
5. Forest quality means the density and structure of the trees, the biomass of plants and animals, the species diversity and the genetic diversity.

6. Ground survey is not useful to monitor land use type deforestation processes.

7. Forest degradation is the long-term reduction of wood, biodiversity and any other product or service.

12. Read the following issues. Choose one and discuss it in small groups.

- Deforestation: Facts, Causes & Effects.
- Deforestation facts and information.
- Environmental Problems Caused by Deforestation.

13. Put these words in the correct order to make questions. Discuss them in pairs.

1. is / What /deforestation?
2. daily life/ How/ impact/ our/ forests / daily/ life?
3. are/ of/ the/ of/ What/ deforestation/ causes?
3. between/ Explain/ and/ deforestation/ forest / the difference/ degradation.
4. does/ deforestation/ Why/ occur?
6. What/ to/ deforestation/ stop/ can/ be done/?
7. are / deforestation/ effects/ of/ the/ What/?
8. do/ What/ reduce/ you/ do/ deforestation/ to/?

14. Find some information and make a report on the following issues (15 sentences)

Vocabulary 6

afforestation [æfˌɒr.ɪˈsteɪ.ʃən] лісонасадження

biomass [ˈbʌɪə(ʊ)mas] біомаса

consequence [ˈkɒnsɪkw(ə)ns] наслідки

conversion [kənˈvəːʃ(ə)n] перетворення

deforestation [ˌdiːfɒrɪˈsteɪʃ(ə)n] вирубка лісів

degradation [ˌdɛgrəˈdeɪʃ(ə)n] дерадація

density [ˈdɛnsɪti] густина

diversity [dʌɪˈvəːsɪti] різноманіття

grazing [ˈgreɪzɪŋ] випас худоби

measurement [ˈmɛʒəm(ə)nt] вимірювання

reduction [rɪˈdʌkʃ(ə)n] зменшення

removal [rɪˈmuːv(ə)l] видалення

species [ˈspiːʃiːz] види

urban [ˈəːb(ə)n] міський

wasteland [ˈweɪs(t)land] пустир

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