МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

ЛЬВІВСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ

ВЕТЕРИНАРНОЇ МЕДИЦИНИ ТА БІОТЕХНОЛОГІЙ

ІМЕНІ С. З. ҐЖИЦЬКОГО

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ENGLISH

FOR

Ecology students

Lviv HALYCH-PRESS 2025

УДК: 574:811.111
Под 49

Рекомендовано Львівським національним університетом ветеринарної медицини та біотехнологій імені С.З. Ґжицького як навчальне видання для студентів ОП Е2 "Екологія" (Протокол Вченої Ради №7 від 14.05.2025р).

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English for Ecology Students : навчальний посібник. Подоляк М.В., Бінкевич О.М. Львів, ГАЛИЧ-ПРЕС, 2025. 116 с.

Посібник призначений для студентів першого курсу університету Освітньої програми Е2 "Екологія" та вивчають англійську мову за професійним спрямуванням. Метою посібника є допомога майбутнім фахівцям у підготовці до опрацювання англійської оригінальної літератури за обраною спеціальністю.

Посібник розрахований на аудиторні та самостійні заняття, має лекції з лексико-граматичними вправами, тексти для домашнього читання із завданнями для самоконтролю.

ISBN 978-617-8690-08-3

Content

We live on a beautiful blue planet – the Earth. There are a lot of mountains, hills, rivers, seas, oceans, forests, deserts and green fields on it .The Earth is full of wonders and is rich in different animals and plants. There are six continents on our planet : Africa, North and South Americas, Eurasia, Australia and Antarctica. Our planet is very big. When it is day in one country in the east, it is night in another country in the west. When the sun shines brightly, we have summer, but when it is cold and the ground is covered with snow, we have winter.

People live in different countries on five continents and many islands. They speak different languages. But at the same time they live in one big house – our planet we live on. Franklin Pierce said in 1854: " Teach your children what we have taught our children that the Earth is our mother. Whatever befalls the Earth, befalls the sons of the Earth. All things are connected like the blood which unites one family. The Earth does not belong to man, man belongs to the Earth." The Earth is a big place with big problems. All over the world we are losing biodiversity : different kinds of animal, bird, plant and insect life. There are many reasons for this: air and water pollution, growing numbers of people, hunting, global warming, and disappearing habitats. Nowadays much attention must be paid for new specialists who are going to deal their future with nature, with ecology.

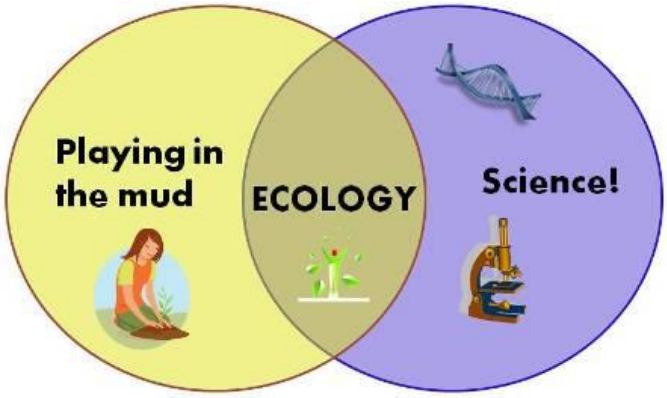
ECOLOGY AS A SCIENCE

Ecology is a branch of science that deals with the relationships living things have to it other and to their environment. Scientists who study their relationships are called *ecologists.*

The world includes a tremendous variety of living things, from complex plants and animals to simpler organisms, such as fungi, amebas, and bacteria.

The study of ecology increases our understanding of the world and its life. This is important because our survival and well-being depend on ecological relationships throughout the world. Even changes in distant parts of the world and its atmosphere affect us and our environment.

Although ecology is considered as a branch of biology. Ecologists use knowledge from many disciplines including chemistry, mathematics, and computer science. They also rely on such fields as climatology, geology, meteorology, and oceanography to learn about air, land, and water environments and their interactions. This multidisciplinary approach helps ecologists understand how the physical environment affects living things. It also aids them in assessing the impact of environmental problems, such as acid rain or the greenhouse effect.



Ecologists study the organization of the natural world on three main levels: (1) population, (2) communities, and (3) ecosystems. They analyze the structures, activities, and changes that take place within and among these levels. Ecologists normally work out of doors, studying the operations of the natural world. They often conduct field work in isolated areas, such as islands, where the relationships among the animals and plants may be simpler and easier to understand. Many ecological studies focus on solving practical problems. For example, ecologists

search for ways to curb the harmful effect of air and water pollution on living things.

1. **Translate the following word combinations:**

Галузь науки, прості і складні організми, у всьому світі, наше виживання і добробут, гриби і бактерії, оточення, бути зруйнованим, світ природи, відокремлені (ізольовані) території, вирішення проблем.

2. **Complete the sentences:**

1) Ecology is a _____ of science.
2) The study of ecology increases our understanding of _____.
3) Scientists who study these relationships are called _____.
4) Ecologists study the organization of the natural world on _____.
5) Ecologists normally work _____.
6) Ecologists use knowledge from many disciplines, including _____ and _____.
7) This _____ helps ecologists understand how the physical environment affects living things.

3. **Answer the following questions:**

a) What is ecology?
b) How do we call scientists who study the nature and its relationship?
c) Why is ecology important for us as a science?
d) Do ecologists use knowledge from other disciplines?
e) Why do they use multidisciplinary approach?
f) How do ecologists divide the organization of the natural world?
g) Where do ecologists work?

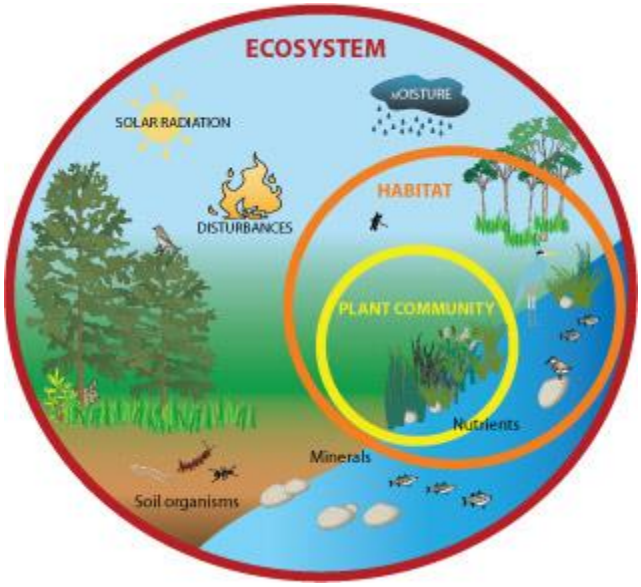
ECOSYSTEMS

An ecosystem is the most complex level of organization in nature. It is made up of a community and its *abiotic* (nonliving or physical) environment,

including climate, soil, water, air, nutrients, and energy. Ecologists who try to link together many different physical and biological activities in an environment are called *systems ecologists.*

Ecologists categorize the elements that make up or affect an ecosystem into six mane parts, based on the flow of energy and nutrients through the system: (1) sun, (2) abiotic substances, (3) primary producers, (4) primary consumers, (5) secondary consumers, and (6) decomposers.

The sun provides the energy that *primary producers* need to make the food. Primary producers consist mainly of green plants, such as grass and trees, which make food by the process of photosynthesis. Plants also need *abiotic substances*, such as phosphorus, and water to grow. *Primary consumers* include mice, rabbits, grasshoppers, and other plant-eating animals. Foxes, skunks, and other *secondary consumers* – or predator – eat animals. *Decomposers*, such as bacteria and fungi, break down dead plants and animals into simple nutrients. The nutrients go back into the soil and are used again by plants.



The series of stages energy goes through in the form of food is called a *food chain*, grass is primary producer. A primary consumer, such as a rabbit, eats the grass. The rabbit, in turn, may be eaten by a secondary consumer, such as a fox or a hawk. Decomposing bacteria break down the uneaten remains of dead grass, rabbits, foxes, and hawks, as well as the body wastes produced by the animals in the food chain.

Most ecosystems have a variety of producers, consumers and decomposers, which form an overlapping network of food chains called a *food web.* Food web seem especially complex in many tropical and oceanic ecosystems. Some species eat many things, but others have very specific food requirements.

Energy moves through an ecosystem in a series of transformations. First, primary producers change the light energy of the sun into chemical energy that is stored in plant protoplasm. The energy stored in plants is then transferred to other organisms in the form of food. Primary consumers change it to a different kind of chemical energy and store it in their body cells. This energy changes again when the secondary consumer eats the primary consumer.

Vocabulary:

Nutrient - поживна речовина

Activity - діяльність

Grasshopper - коник-стрибунець

Predator - хижак

Fungi - грибки

Break down – руйнувати, розкладати

Hawk - яструб

Remains - рештки

Waste – відходи, рештки

Overlapping network – взаємопов'язана сітка (мережа)

Requirement - потреба

Cell – клітина

1. Complete the sentences:

1) An ecosystem is the …	a)… to grow.
2) The sun provides the energy that …	b)… in a series of transformation.
3) Plants need abiotic substances…	c)… primary producers need to make
4) Energy moves through an food ecosystem …	d)… most complex level of
5) The energy stored in plant is organization in nature transferred …	e)… other organisms in the form of food.

2. Answer the following questions:

a) What is ecosystem?

b) How do the ecologists categorize the elements of ecosystem?

c) Why is the sun so important in the ecosystem?

d) Are the decomposers important in the ecosystem? What are their functions?

e) What is the food chain?

f) How can the sun energy be changed?

g) Where can the sun energy be stored

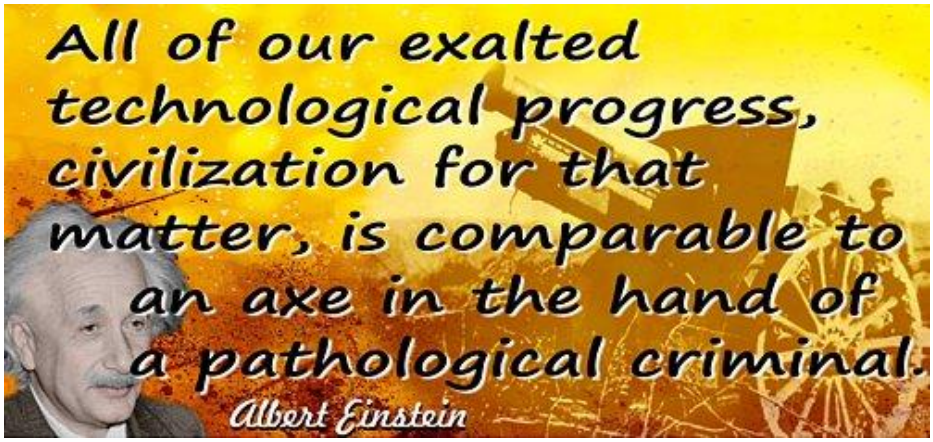
3. Translate the sentences into English:

1) Вся жива і нежива природа взаємопов’язана в екосистемі.

2) Енергія сонця є дуже важливою для рослин і тварин.

3) Поживні речовини повертаються в грунт і використовуються рослинами.

4) Процес фотосинтезу є дуже важливим для рослин.



5) Енергія накопичена в рослинах переходить в інші організми у формі їжі.

4. Describe the example of your own simple food chain.

Learning Project

Project Title: "Exploring the Interconnectedness of Ecosystems"

Objective:

To explore the fundamental principles of ecology, understand ecosystems and their components, and examine the human impact on ecosystems and biodiversity. Students will also analyze the role of ecologists in solving environmental challenges.

Project Overview:

This project requires students to work in groups to research and create a presentation on a specific ecosystem. They will analyze its components, functions, and the role of biodiversity in maintaining ecological balance. Additionally, students will identify and discuss human impacts on the ecosystem and propose solutions to mitigate negative effects.

Part 1: Research & Investigation

Choose an Ecosystem: Select one of the following ecosystems to study:

Forests (e.g., Tropical Rainforests, Temperate Forests)
Oceans (e.g., Coral Reefs, Open Ocean)
Freshwater (e.g., Lakes, Rivers, Wetlands)
Deserts (e.g., Sahara, Mojave Desert)
Grasslands (e.g., Savannah, Prairies)
Tundra (e.g., Arctic, Alpine Tundra)
Research Questions to Answer:

What are the key characteristics of this ecosystem? (e.g., climate, geographical location, types of species)
What are the main components of the ecosystem? (e.g., producers, consumers, decomposers)

How do energy and nutrients flow through the ecosystem? (e.g., food chains, food webs, nutrient cycles)

What role does biodiversity play in this ecosystem? (e.g., species diversity, ecosystem stability)

What are some major environmental challenges this ecosystem faces? (e.g., deforestation, pollution, climate change)

How do human activities impact this ecosystem? (e.g., urbanization, agriculture, conservation efforts)

Part 2: Data Collection & Analysis

Create an Ecological Map: Using your research, create a visual representation (poster, diagram, or digital) of the ecosystem, highlighting its key components (habitats, species, food chains, etc.) and their interconnections.

Human Impact Assessment: Collect data or case studies related to human impact on the selected ecosystem. This could include:

Examples of deforestation, overfishing, pollution, or other activities.

The effects these activities have on species populations, biodiversity, and ecosystem functions.

Propose Solutions: Based on your findings, propose practical solutions to mitigate human impact. These could include:

Conservation strategies (e.g., protected areas, wildlife corridors)

Sustainable practices (e.g., eco-friendly farming, renewable energy)

Community education and awareness programs

Part 3: Presentation & Reflection

Create a Presentation: Each group will create a presentation (PowerPoint, Google Slides, or Poster) that covers:

An introduction to the chosen ecosystem.

Detailed information on the components and functions of the ecosystem.

The role of biodiversity in maintaining ecosystem health.

Analysis of human impact and proposed solutions for sustainability.

A conclusion reflecting the importance of ecology in addressing environmental challenges.

Reflection: Write a short individual reflection (1-2 pages) on what you learned from this project. Discuss:

How ecology helps us understand environmental problems.

The importance of biodiversity and ecosystem conservation.

What role you can play in promoting environmental awareness and sustainability.

Evaluation Criteria:

Research & Content: Quality of research, accuracy, depth of information.

Creativity: How well the ecosystem is represented visually and in the presentation.

Human Impact Analysis: Thoughtfulness and practicality of the proposed solutions.

Collaboration: How well the group works together, including division of tasks and communication.

Reflection: Insightfulness and personal connection to the topic.

Case Study Exercise

Case Study: The Decline of the Coral Reef Ecosystem in the Great Barrier Reef

Background:

The Great Barrier Reef, located off the coast of Queensland, Australia, is one of the most biodiverse ecosystems on Earth. Spanning over 2,300 kilometers, it supports thousands of species, including fish, corals, marine turtles, and dolphins. However, over the past few decades, the reef has faced severe threats due to climate change, pollution, and overfishing.

Case Study Scenario:

You are a team of environmental scientists tasked with investigating the state of the Great Barrier Reef ecosystem. You have been provided with data and case studies related to the reef's biodiversity, human impacts, and recent changes in the environment. Your goal is to analyze the state of the ecosystem, identify key challenges, and propose sustainable solutions to help protect and restore the reef.

Objectives:

Understand the structure and components of the coral reef ecosystem.

Investigate the impact of human activities on the ecosystem.

Analyze the ecological consequences of these impacts.

Propose strategies for the conservation and restoration of the ecosystem.

Part 1: Ecosystem Components

Identify Key Components of the Coral Reef Ecosystem:

Producers: What are the primary producers in the reef ecosystem (e.g., types of algae, coral polyps)?

Consumers: What are the primary, secondary, and tertiary consumers (e.g., herbivorous fish, carnivorous fish, marine predators)?

Decomposers: Identify the decomposers and their role in nutrient cycling (e.g., bacteria, certain types of fish).

Abiotic Factors: What are the key abiotic factors (e.g., temperature, salinity, sunlight) that affect the reef ecosystem?

Food Web Creation: Using the components identified above, create a food web that shows the relationships between producers, consumers, and decomposers in the reef ecosystem.

Part 2: Human Impact on the Ecosystem

Examine the Effects of Human Activity:

Climate Change: How has rising ocean temperatures due to climate change affected the coral reefs (e.g., coral bleaching, changes in species populations)?

Pollution: What types of pollution are most harmful to coral reefs (e.g., plastic pollution, agricultural runoff, oil spills)?
Overfishing: How does overfishing impact the biodiversity and structure of the reef ecosystem?
Tourism: What are the positive and negative impacts of tourism on the Great Barrier Reef?
Analyze Data: You have been provided with the following data:

A decline in coral cover over the past 30 years.
Increased sea surface temperatures in the region.
Decline in fish populations, especially fish that rely on coral for shelter.
Increased frequency of coral bleaching events.
Using this data, analyze how each factor has contributed to the decline of the reef ecosystem.

Part 3: Consequences of Ecosystem Changes
Ecological Consequences:

Biodiversity Loss: What are the consequences of losing coral species and fish populations for the overall biodiversity of the ecosystem?
Ecosystem Services: How does the decline of the reef affect ecosystem services such as coastal protection, tourism, and food sources for humans?
Species Interactions: How do changes in one species (e.g., the decline in coral populations) affect other species in the ecosystem (e.g., fish, marine predators)?
Ecosystem Feedback Loops:

Discuss potential feedback loops in the ecosystem. For example, how might coral bleaching create a cycle that further accelerates ecosystem decline?

Part 4: Conservation and Restoration Strategies

Propose Conservation Strategies: Based on your analysis, propose at least three strategies to conserve and protect the Great Barrier Reef ecosystem. These strategies could include:

Marine protected areas

Reducing carbon emissions to combat climate change

Pollution reduction programs

Sustainable fishing practices

Restoration Efforts: What efforts are being made to restore the coral reefs? For example, could coral farming or artificial reefs help to rebuild damaged areas? What are the potential benefits and challenges of these restoration efforts?

Sustainable Tourism: How can tourism be managed to prevent further damage to the reef while still allowing people to visit and enjoy the ecosystem?

Part 5: Report and Presentation

Write a Case Study Report: Prepare a detailed report (3-5 pages) that includes:

An introduction to the Great Barrier Reef and its ecological importance.

A breakdown of the ecosystem components and their interrelationships.

A detailed analysis of the human impacts on the reef ecosystem.

The ecological consequences of these impacts.

Proposed conservation and restoration strategies.

A conclusion that reflects on the importance of preserving the Great Barrier Reef for future generations.

Group Presentation: Present your findings to the class or a panel of experts in a 10-minute presentation. Your presentation should include:

A summary of your analysis of the ecosystem and its challenges.

Visuals, such as a food web diagram, data charts, and images of the reef.

The strategies you propose to protect and restore the ecosystem.

A call to action for the importance of ecological conservation.

Evaluation Criteria:

Research and Content: Depth of research, understanding of the ecosystem, and accuracy of information.

Critical Analysis: Ability to analyze human impacts and their consequences on the ecosystem.

Creativity and Innovation: Originality and feasibility of proposed solutions.

Collaboration: Teamwork and contribution from all group members.

Presentation: Clarity, organization, and effectiveness of the group presentation.

THE SCIENTIFIC-TECHNOLOGICAL PROGRESS AND THE FUTURE OF MANKIND

Our planet, the Earth, is a unique phenomenon in the Universe. So far it is known to be the only planet where life exists. The crown of this life is Homo sapiens – Man thinking. Space flights of earthmen have proved that we all belong to one family, mankind, living on a tiny island in the infinitive Universe.

Mankind is approaching the third millennium of the new era. This turning point in history gives ample food for a critical evaluation of our past and present. Such an evaluation enables us to see that mankind today faces two major problems.

One of them is the problem of war and peace and the other is the problem of the relationship between man and nature (ecology).

Today economic, social, technological and biological progress are so interconnected and interdependent that it is clearly necessary to consider modern productions as a complicated ecological-economic system. Man and nature should interact and cooperate in order to build a sensible ecological-economic system. It is only international cooperation in environmental protection that will help us save our planet from ecological devastation.

Environmental protection is a task of requiring the joint efforts of governments, public organizations and individual members of society. Shortcomings in nature preservation are often due to the lack of ecological awareness (education) of people and specialists. The conflict between man and nature can be avoided by fostering a scientific ecological education, encouraging all people to take an active part in nature protection.

We know that nature is weak and defenseless before man, who has grown so strong. We should therefore base our relations with nature on the mercy for which she has constantly appealed to our reason. So humanism is today what we need most of all, in politics, in relations among people, and in our attitude to nature. It's for this goal that people of different convictions must work together.

SOME FACTS ABOUT OUR WORLD

- **The Earth** is the third planet as for the distance from the Sun.
- **The average distance** from the Earth up to the Sun is 149.6 mln.km. The average distance from the Earth up to the Moon is 384.4 km
- **The time of full turn** round its axle is 23 hours 56 min. 4.09 sec.
- **Orbit's length** of the Earth 93.120.000 km.
- **The Earth's weight** is 510.5 x 106 sq.kg.
- **The hottest place** in the world is considered by many to be AL AziZiya, in Africa.
- **The coldest place** in the world is the station Vostok in Antarctica.
- **Approximately 70 % of the Earth surface is water.**
- **Eurasia** is the largest mainland. 21.242.047 sq.m. approx. 12% of earth's land.
- **Greenland** is the largest island in the world, in the north Atlantic Ocean. Its size is 839.999 sq.miles.
- **Mt. Everest.** The highest mountain peak in the world is in the Himalayan mountain range in Asia, on the border of Nepal and China.

- **Dead Sea.** The lowest place in the world is the floor of the Dead Sea. It is located Between Israel and Jordan.
- **The Nile River.** The longest river in the world, the Nile, is located in the northeast Africa. It flows north into the Mediterranean Sea.
- **Angel Falls.** The highest water-fall in the world is Angel Falls, located in Venezuela.

Topics for discussion:

1. Technological Advancements and Human Evolution

How will advancements in artificial intelligence, robotics, and biotechnology shape the future of human life?

Could technology enhance human intelligence and physical abilities? What are the ethical implications of human enhancement?

Will we ever reach a point where machines surpass human capabilities? How would this affect society and individual identity?

2. Climate Change and Sustainability

What steps can humanity take to reverse or slow the effects of climate change? Are we doing enough?

How might future generations adapt to a changing climate? What new technologies or methods could emerge to address environmental challenges?

Could there be a future where humans live in harmony with nature, or are we inevitably headed for conflict with the environment?

3. Space Exploration and Colonization

Do you think humanity will eventually colonize other planets? If so, how should we approach this new frontier?

What ethical considerations come into play when exploring space and potentially inhabiting other worlds?

Could space exploration hold the key to the survival of mankind if Earth becomes uninhabitable?

4. The Future of Work and Economy

How will automation and artificial intelligence affect jobs in the future? Will there be a universal basic income?

As technology advances, how will society ensure that everyone has access to the benefits of these innovations?

What will work look like in the future? Will we all have more leisure time, or will work become more integrated into our lives?

5. Globalization vs. Localism

Will the future be more globally connected, or will there be a shift towards localism and self-sufficiency?

What are the pros and cons of a more interconnected world in terms of culture, economy, and politics?

How do you think global challenges like pandemics and international conflicts will influence the future of human society?

6. The Role of Ethics in the Future

As humanity pushes the boundaries of science and technology, what ethical dilemmas might arise, and how should we address them?

Should there be limits to human progress in areas like genetic engineering, AI, or space exploration?

Who gets to decide the moral and ethical frameworks for future advancements, and how do we ensure fairness and justice?

7. The Future of Education

How will education evolve to prepare future generations for a rapidly changing world?

Will technology, like virtual reality or AI, play a significant role in the future of education? How might this change the traditional classroom?

Could the future see a shift towards self-directed learning, or will structured education continue to dominate?

8. Human Interconnectivity and Social Evolution

With increasing global connectivity, how will human relationships and social structures change in the future?

Will we move towards a more collective, global society, or will individualism become even more pronounced?

How might advancements in virtual reality or augmented reality change the way we experience social interactions?

9. The Ethical Future of Genetic Engineering

Will genetic engineering become commonplace in humans, and what are the potential risks and benefits of altering human DNA?

Could we one day create "designer babies" with selected traits? What are the moral implications of this?

How might genetic modifications impact diversity and equality in human society?

10. The Role of Artificial Intelligence in Shaping Humanity

How will AI change the way we live, work, and think in the coming decades?

Could artificial intelligence ever develop emotions, creativity, or consciousness, and what would that mean for human society?

As AI becomes more integrated into our lives, what safeguards should we implement to ensure it benefits humanity as a whole?

THE SCIENCE OF ECOLOGY AND ITS HISTORICAL DEVELOPMENT

Ecology is the branch of biological science concerned the distribution, abundance, and productivity of living organisms, and their interactions with each other and with their physical environment. As a scientific discipline, it is relatively young.

The history of ecology dates from about the turn of XX century but the historical roots of the subject are much older. The Egyptians left evidence in their sculpture and wall paintings of a well-developed appreciation of animals and plants, and the Greeks gave us the first formal record of botany and plant ecology.

In the fourth century B.C., Aristotle wrote about plagues of field mice and locusts, echoing earlier concerns of Egyptian and Babylonian societies about outbreaks of animal pests. There is evidence in these early writings of a recognitions of a "balance of nature" and a harmony among plants, animals, and humans. In about 300 B.C., Theophrastus, a pupil of Aristotle, demonstrated a clear understanding of habitat selection by different plants, the effects that different habitats have on growth and morphology of plants, and the implications of these effects for the utilization of trees by people.

The name for the new science was coined originally as *oecology* by two German zoologists, Reither and Haekle, in 1869. However, the word did not appear again 1895, when a report on ecological plant geography was published by Warming, a Danish botanist. The word is derived from the Greek words *oikos*, meaning "house", and *logos*, meaning "the study of". Development of ecology gathered momentum in the first two decades of this century, but most of the major advances have been achieved in the past 60 years. Only in the pas 30years has it been recognized as a major branch of biological science.

1. **Translate the following word combination:**

Interaction with each other, scientific discipline, date from, first record of botany, to be evidence, to appear again, two decades, major branch, animal pests, utilization of trees.

2. **Answer the following questions:**

a) Is ecology the branch of science?
b) Is ecology a young science?
c) Do we have historical roots of this science?
d) What is the origin of the word ecology and what does it mean?
e) When has ecology been recognized as a major branch of biological science?
f) Can you name any modern ecologists?

3. Fill in the propositions and translate them:

Branch … biological science

… the first two decades

historical roots … the subject

… wall-painting and sculpture

utilization … people

… 1869

was published … Warming

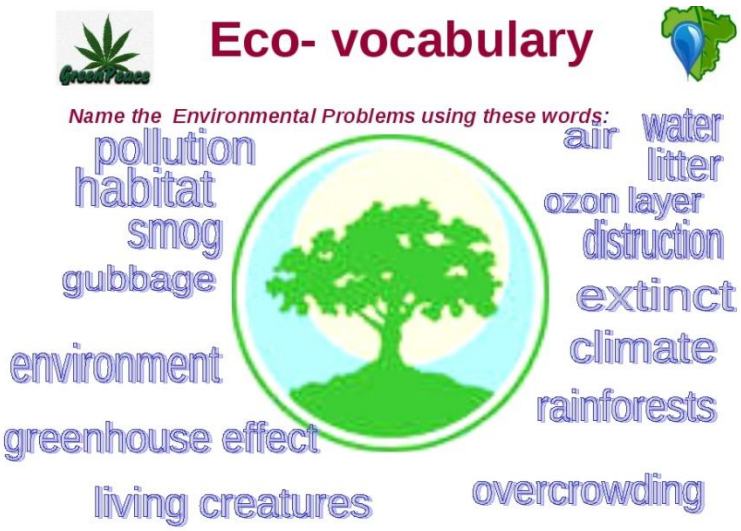
to be derived … the Greek

development … ecology

THE PROBLEMS OF ECOLOGY

(Part I)

Pessimism about the human condition the 1980s stemmed from more than the problems of the present. It derived as well from a fear about the future, the future of the earth's human being, of the earth itself, and of what is termed its ecology. The word ecology is often used to refer to human being and their environment , but it is much broader than that. Ecologists think of humans as related to a vast chain of life which extends through mammals, amphibians, invertebrates and the simplest microorganisms, either plants and animals. In popular usage ecology may be synonymous with pollution problems. Again this is an oversimplification. The causes and prevention of pollution make up important elements in the study of ecology, but they are not its whole subject. Equally important is the use of our environment in was that will safeguard the heritage of fertile soil, pure air, fresh water and forests for those who come after us.



Ecological violations consist not merely of poisoning the atmosphere and contaminating oceans, river, and lakes by dumping wastes into them, but of any assault upon them that makes them less valuable for human survival. The excessive constructions of dams, for example, causes the silting of rivers and the accumulating of nitrates at a faster rate than the surrounding soil can absorb. The use of insecticides, especially those containing DDT, may result in upsetting the balance of nature.

In 1986, a nuclear power station at Chernobyl, near Kiev, exploded, producing highly dangerous radioactive fallout not only in the vicinity of the accident but, because of prevailing winds, across the continent of Europe. Affected countries protested, while citizens increased the pressure of their governments to the curtail the manufacture of such lethal industrial and military by-products.

The ecological problem is caused nit simply by the dumping of harmful and non degradable products. It is also the result of wastage of land as our most valuable natural resource. In many parts of the world rivers run brown because they are filled with earth washed from the fields bordering them. In some of the largest American cities two-thirds to three-quarters of the land area is paved with streets and parking lots. A close exists between the problems of ecology and the population explosion that is occurring throughout the world. Indeed, if the population had not increased alarmingly in recent years, the problems of ecology

might well have passed unnoticed. For example, New York City on the eve of the Civil War had a total population of 700,000. The area was not essentially smaller than it is now. Yet the inhabitants of the five boroughs constituting the city have multiplied ten times over.

There are many different words referring to features of the environment. Here are some arranged on small to large scales.

Brook -> stream -> river	hillock -> hill -> mountain
Cove -> bay -> gulf	copse ->wood -> forest
Puddle -> pond -> lake	footpath ->lane -> road

There are many environmental problems in the world today. Check with a dictionary if you do not know any of the terms below.

Air; river and sea pollution; overfishing; the greenhouse effect; the destruction of the ozone layer; destruction of the rainforests; battery farming; waste disposal; overpopulation.

Finish the sentences.

1. The word ecology is often used to … .
2. The use of insecticides may result in upsetting … .
3. The ecological problem is … .
4. In many parts of the world river run brown because … .
5. A close link exists between the problems of ecology and … .

THE PROBLEMS OF ECOLOGY

(Part II)

Until recently the planet was a large world in which human activities and the nature were in balance. Acid rain, global warming, ozone reduction, widespread desertification and species loss: we have to face it now. Ecology and economy are closely connected. First economy influenced the state of our environment. Now we have to face degradation of soils, water, atmosphere and forests. Millions of trees are dying in German's Black Forests and thousands of lakes in Sweden are so acidic that nothing can live in them. In Scotland farmers complain that acid rains kill their fish. Forests in Denmark, France, Northern Italy, Greece and Norway are damaged. Thousands of lakes in Canada and the USA can no longer support fish life. The Mediterranean Sea has one of the dirtiest coastlines in the world.

Ten of millions of tons of oil, industrial waste, chemicals are pumped into the sea every year. It causes diseases like typhoid, dysentery, hepatitis and cholera. The Rhone in France, the PO in Italy, the Ebro in Spain and the Nile in Egypt carry pesticides and chemical wastes. Many industries produce waste products, which can be difficult or dangerous to dispose of. Many countries have no storage facilities for the spent nuclear fuel.

The search for ways to dispose of radioactive waste goes on. In 1982 seventeen countries took part in the United Nations environmental program. The World Commission on Environment and Development, headed by the Prime Minister of Norway, was set up in 1983 by the United Nations. Its aim was to examine the environment and development problems on the planet and to formulate realistic proposals to solve them. Now some chemicals are banned and some must be controlled. In several countries there is frequent analysis of water around the coast. The time has come for the governments and their people to take responsibility for the policies that cause the environmental damage.

WATER

1. Pre-reading activity

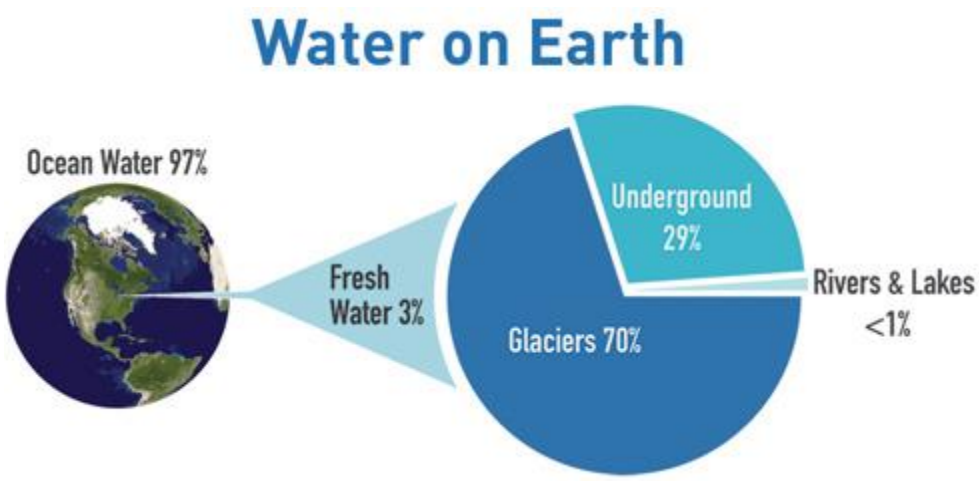
Answer the following questions:

1. Why is water important for humans being?
2. What for do we use water?
3. Is water important for flora and fauna? Why?
4. Do we have any pollution problems with water?
5. Are there any regions where there is a lack of water?

Text: Water

Water is made up of 2 parts of hydrogen and one of oxygen. This relatively simple combination accounts for 70% of earth's surface and is vitally important to all living things.

Water is present in many different forms on the Earth. Ninety-seven percent of the earth's water is found in the ocean.1.9% is held in the polar ice caps and in glaciers, 0.5% is held in ground and soil water, 0.02% is held in rivers and lakes, and 0.0001% in the atmosphere as gas. Based on these figures fresh water (water without salt) makes up less than 3% of the total water on the Earth, and only a little of that is available for consumption.



Each of the above phases in which water is held account for a part of hydrologic cycle, or water cycle. The hydrologic cycle is the planet's water system, characterized by the movement of water from the ocean to the atmosphere to the continents and back to the sea. This process occurs through evaporation (the loss of water from surface waters as it is turned to gas by heating from the sun), transpiration (the flow of water through the tissue of a plant and into the atmosphere), and evapotranspitation (the loss of water from the soil thtough evaporation and transpiration), followed by precipitation (the term is used for all moisture – soil and liquid – that falls from the atmosphere), and then runoff (the flow of water from the land as both surface and surface discharge) to the ocean again. The process is dynamic and always happening, with water in each of the different stages at once.

Not only do humans need water to drink, but we also use water in various other ways to benefit our lives. In particular, we use water to discharge sewage, to bathe, to clean, to cook, for recreation, in industrial processes, and to produce food. While we receive the benefit of using water for these purposes we also often pollute our fresh water sources. Of these uses the most polluting are: sewage

discharge, industrial processes, and cleaning. Sewage discharge and household cleaners release bacteria and dissolved chemicals into water ways. Industrial processes pollute water by using harmful chemicals in production which are then released into waterways as waste. In addition, industries often use water to cool machinery, which is released far above the normal temperature of water in the waterway (this is called thermal pollution). Water pollution problems are evident throughout the world, to varying degrees, due largely to these uses.

In addition to water pollution problems, many parts of the world also face problems of water supply. Some regions are very dry, receiving little precipitation, and therefore populations in those areas have little water for drinking and other uses. They need to conserve water to live. Other areas, like Lviv, have water supply problems due to poor water delivery systems that contain leaks and are generally inefficient. In these areas people also have to be sure to conserve water to live. In actually water conservation is a concern for everyone despite the region in which one lives or the efficiency of water delivery. This is especially true as the world population grows and all resources are further stressed, including water.

2. Translate the following word combinations into Ukrainian:

Simple combinations, hydrogen and oxygen, earth's surface, living things, polar ice caps, fresh water, water system, to be characterized by, to need water, to pollute water, dry regions, delivery system, to contain leak.

3. Complete the sentences:

1. Water is present in many different _____ (forms, systems, surfaces) on the Earth.
2. Each molecule of water consists of two _____ (gas, atom, pieces) of hydrogen and one of oxygen.
3. Fresh water is water without _____ (solid, sugar, salt) .
4. Not only do ___ (humans, industry, flora) need water to drink.

5. Industrial processes pollute water by using harmful _____ (plants, chemicals, actions).

4. Test yourself:

1. How much water is in human body?

A. 15% B. 40% C. 75%

2. How much of the Earth is covered with water?

A. 25% B. 50% C. 70%

3. How much of water on the Earth is usable and fresh?

A. 1% B. 10% C. 15%

4. How much of water does it take to grow a wheat for one loaf of bread?

A. 720L B. 3800L C. 5700L

5. Which country uses the most water per person?

A. the USA B. China C. Ukraine

6. Which regions may run out of water by the year 2050?

A. South America B. Australia C. Africa

7. How many liters of water is needed to produce 2 kg of beef?

A. 16,000L B. 100L C. 7,000L

Keys: 1 - C; 2 - C; 3 - A; 4 – B; 5 – A; 6 – C; 7 - A

5. Translate the following sentences into English:

1.Вода – це рідина, доступна для споживання.

2. Випаровуваня є частиною процесу кругообігу води в природі.

3. Ні птахи, ні тварини не можуть жити без води.

4. Тіло людини на 75% складається з води.

5. Вода в природі може існувати у формі рідини, твердої речовини або пари.

6. Вода є їжею для рослин.

7. Шкідливі хімічні відходи можуть забруднювати навколишнє середовище і водні ресурси.

GRAMMAR

Present Continuous

6. Complete using the correct present continuous form of the verb in brackets. You may have to use some negative form.

a) Gordon? I think he _____ (to write) a letter at the moment.

b) Yes, the match is on TV now, but we _____(to lose).

c) Right now, Margaret _____(to have) a shower. Do you want to ring her later?

d) Sally ____ (to stay) with her aunt for a few days.

e) I ____(to lie)! It's true! I did see Madonna at the supermarket.

f) ____(you/play)music up there? It's really noisy!

7. Complete the sentences. Use the present continuous.

Model: *My dad watches a lot of sport. This month he is watching the Olimpics.*

a) You don't usually play well, but today you _____ brilliantly!

b) I usually read novels, but at the moment I _____anything.

c) We usually have lunch at twelve, but today we _____ lunch at two.

d) He often works on Saturdays. But he _____ today. He's at home.

e) They don't often save money, but at the moment they _____ to buy a car.

8. Complete the conversations. Use the present continuous of the verbs in the brackets.

1 A: _____ the party? (you/ enjoy)

B: Yes, we _____. We _____ a great time. (to have)

2 A: What _____ here? (you/do)

B: I _____for some friends. (wait)

3 A: _____ her computer? (Holly/use)

B: No, she _____.She_____ any work today. (not do)

4 A: _____ the news at the moment? (they/watch)

B: No, they _____. They _____ dinner. (prepare).

9. Use the present simple or present continuous. Circle the correct answer.

a) Do tigers live/ are tigers living in Asia?

b) Martha cooks/ ‘s cooking lunch at the moment.

c) Film stars usually buy/ are usually buying their clothes at expensive shops.

d) Listen. I think someone calls/’s calling us.

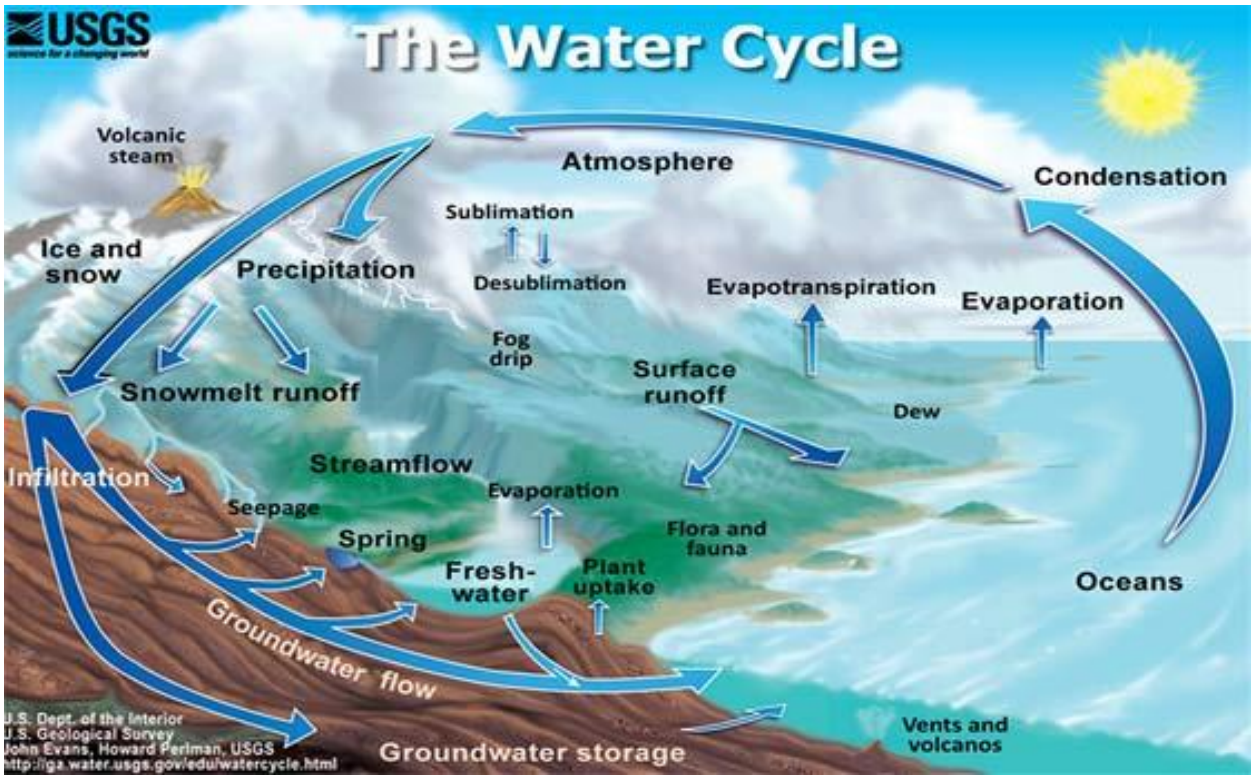
e) We have/ ‘re having a big party in the garden every summer.

f) She usually goes/ is going to see her cousins once a month.

g) Why o you wear/ are you wearing a coat? It’s hot today.

10. Text for reading.

Water Cycle Skit



This is the story about Severyn the Water Molecule and his trip through the water cycle.

Severyn was born in the ocean, his source. He floated around happily with all his millions of brothers and sisters who were all water molecules.

One day the sun decided to shine very strongly upon Severyn and his family and un-oh! Suddenly he evaporated. He transformed from being a part of the ocean to floating in the sky as part of the cloud.

He then lived happily in the clouds floating around the world. One day when he was floating above Ukraine, the sky became very dark and cold and a thunderstorm began… and uh-oh! Suddenly he dropped out of his comfortable cloud and was falling towards the earth. He had become precipitation.

He then found himself rolling on the ground near Lviv. He wanted to be absorbed into the ground so he could help the trees grow but the ground was already full of water and he became run-off.

He was quickly running downward. Further and further down until he arrived at a river, the Poltva. He suddenly felt very ill and covered with dirt and smile. He was very sad.

What do you think happens next?

Learning project.

Learning Project: The Importance and Science of Water

Objective:

To understand the role of water in our environment, its scientific properties, and its importance for all living things.

Tasks and Steps:

1. Research and Presentation on the Water Cycle

Goal: Learn about the water cycle (evaporation, condensation, precipitation, and collection).

Activity:

Research how water moves through the environment.

Create a visual representation (poster, digital image, or animated video) that shows the stages of the water cycle.

In your presentation, explain how each stage contributes to maintaining water in nature.

2. Exploration of Water Properties

Goal: Understand the physical and chemical properties of water (such as polarity, surface tension, etc.).

Activity:

Conduct simple experiments to demonstrate water's properties (e.g., drop water on different surfaces to observe surface tension or mix oil and water to show polarity).

Write a brief report on the results of your experiments, explaining how the properties of water affect daily life (such as in weather, plant growth, or cleaning).

3. Water Usage and Conservation

Goal: Investigate the importance of water conservation and sustainable water use.

Activity:

Research how much water is used in daily activities (e.g., showering, watering plants, food production).

Create a plan for reducing water usage at home or school and suggest ways to promote water conservation in the community.

Make a poster or infographic to raise awareness about water-saving techniques.

4. Water Quality and Pollution

Goal: Explore the impact of pollution on water resources and human health.

Activity:

Research sources of water pollution (industrial waste, agricultural runoff, plastic waste) and their consequences.

Perform a simple water quality test using available kits or by researching methods to assess the quality of local water sources.

Present your findings in a report or video, highlighting the importance of clean water and ways to prevent pollution.

5. Global Water Issues

Goal: Examine water scarcity and its global implications.

Activity:

Research regions in the world that face water scarcity (e.g., parts of Africa, the Middle East, and South Asia).

Create a map or infographic showing the most water-stressed regions of the world.

Present possible solutions or actions that could be taken to address water scarcity on a global scale (e.g., water purification, better infrastructure, or desalination).

6. Reflection and Discussion

Goal: Reflect on the learnings from all parts of the project.

Activity:

Write a 1-2 page reflection about what you learned about water, its importance, and the global challenges we face in managing water resources.

Have a group discussion or share with a peer group what steps can be taken at the individual, community, and global levels to protect and conserve water.

Materials Needed:

Access to the internet for research

Water quality testing kits (optional)

Art supplies for posters (paper, markers, etc.) or digital tools for presentations

Access to educational videos or documentaries about water (optional)

Assessment Criteria:

Completeness and accuracy of research

Creativity and clarity in the presentation of the water cycle, water properties, or conservation tips

Depth of understanding in the water quality and pollution sections

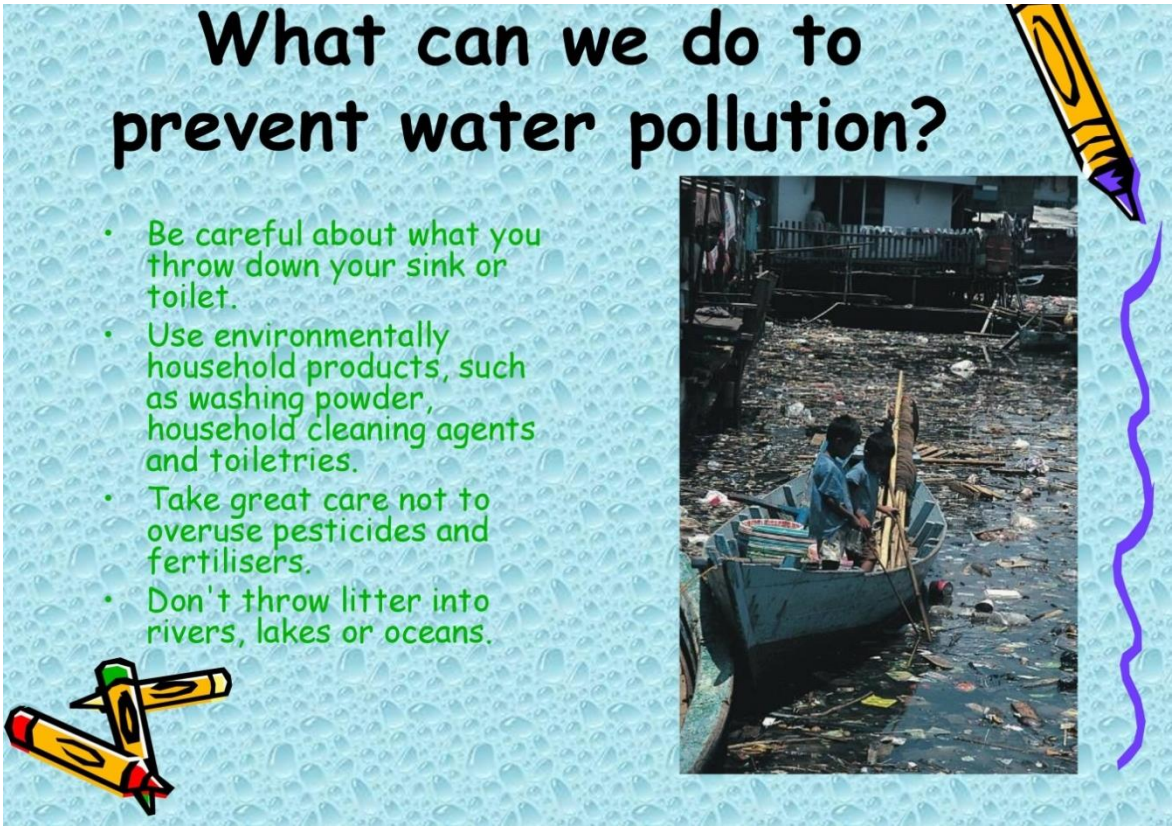
Effectiveness in communicating global water issues and solutions

Quality of reflection and critical thinking about the topic

WATER POLLUTION

Water pollution is the contamination of surface or ground water supplies by sewage, industrial wastes or garbage and other refuse. It has become a health hazard but also a critical economic problem – a threat to industries, agriculture and metropolitan areas. It destroys fish and wild life and spoils recreational areas.

The living resources of the sea are renewable. If managed rationally they could provide food and materials probably for ever, but even here, we have a history of overexploitation. In spite of international regulation, of intergovernmental organizations, we have failed to protect the world's fisheries which are dying because their raw materials are going to an end. The only way to overcome a catastrophe is to put the ocean under greater international control, perhaps under that of the United Nations. The freedom of the seas has been too often interpreted as a permission to destroy. The territorial waters of most nations are already being spoiled, but the individual nations must be prevented from ruining the waters beyond their own limits. Waters outside these limits should come under a new ocean regime of the United Nations who should allow the



exploitation of the biological resources only with permission and according to strict rules. Under this regime the mineral and other resources of the oceans would become reserves and not for use by this or the following generations.

The United Nations should also be given the responsibility for the quality of the Earth's atmosphere. The appearance of the supersonic jet airliners has presented many problems. These airliners use up tons of oxygen and throw out over 150,000 tons of water vapour into the Stratosphere every day, increasing the temperature and cloud as they do. It has to be decided if this is right in ecological terms.

Water pollution control calls for an overall reduction in the quantities of contaminants discharged, adoption of better industrial and agricultural practices and waste water treatment by physical, chemical and biological processes (sedimentation, coagulation, filtration, etc.) Modern methods include biological filters and activated sludge in which microorganisms in aeration tanks are used as active absorbers of organic water.

Finish the sentences :

1. It is still possible to renew the resources of _____.
   A. the lakes
   B. the air
   C. the sea
   D. the Earth
2. The resources could be used to produce _____.
   A .machines
   B. clothes
   C. furniture
   D. food
3. International riles have not helped to protect _____.
   A. the hunting grounds

B. the fisheries

C. the forests

D. the rivers

4. The oceans should be put under the control of _____ .

A. the European Parliament

B. the USA Congress

C. the United Nations

D. Greenpeace

5. The condition of most national territorial water is _____ .

A. very bad

B. only satisfactory

C. excellent

D. quite good

6. The United Nations should be also responsible for the Earth's _____.

A. resources

B. atmosphere

C. flora

D. fauna

7. At present our generation should not make use of such resources as _____.

A. the wind

B. the ocean

C. the sun

D. the atom

8. The reason for such a catastrophe is the absence of _____.

A. special machines

B. good fishermen

C. modern boats

D. necessary raw materials

Pre-reading activity

1. What is air?
2. Why is air important for all living things?
3. What problems do we have with air?
4. Do we have any other resources for breathing?

Learning project

Learning Project: Understanding and Addressing Water Pollution

Objective:

To explore the causes, effects, and solutions to water pollution, and to raise awareness about the importance of protecting our water resources.

Tasks and Steps:

1. Research on Causes of Water Pollution

Goal: Understand the various sources and types of water pollution.

Activity:

Research different causes of water pollution (e.g., industrial discharge, agricultural runoff, plastic waste, sewage, oil spills, etc.).

Create a chart or infographic that lists these causes and explains how each one affects water quality and the environment.

Write a brief summary (1 page) explaining the major causes of water pollution and the potential risks to human health, wildlife, and ecosystems.

2. The Impact of Water Pollution on Ecosystems

Goal: Investigate how water pollution impacts aquatic life and ecosystems.

Activity:

Research how water pollution affects animals and plants that live in or depend on water bodies (e.g., fish kills, loss of biodiversity, algal blooms).

Create a case study or report on a specific water pollution event, such as the Deepwater Horizon oil spill or the Flint water crisis.

Design a poster or digital presentation showing the impact of polluted water on aquatic life, including images and key facts.

3. Water Pollution in Your Local Community

Goal: Identify and understand local water pollution issues.

Activity:

Investigate local water sources (lakes, rivers, oceans, etc.) and identify any pollution issues in your area. This can involve online research or local surveys, if applicable.

If possible, collect a water sample from a nearby river, pond, or lake (ensure safety). Test its quality using a water testing kit or online resources for basic parameters like pH, turbidity, or contamination signs.

Write a report detailing the current state of local water quality, potential sources of pollution, and possible solutions.

4. Water Pollution Solutions and Prevention

Goal: Explore solutions for reducing and preventing water pollution.

Activity:

Research methods for preventing water pollution, such as better waste management, reducing plastic use, recycling, and eco-friendly farming practices.

Create a "How to Reduce Water Pollution" guide, which could include tips for individuals, communities, and industries. Include ways to reduce single-use plastics, promote green energy, and use non-toxic chemicals.

As a group or individual, propose a new initiative or campaign to reduce water pollution in your community or school (e.g., a plastic waste reduction project or organizing a local waterway cleanup).

5. Raise Awareness Campaign

Goal: Raise awareness about water pollution and encourage others to take action.

Activity:

Develop a campaign to educate others about water pollution and its effects. This could include designing posters, creating a social media campaign, or making an informational video.

Use your campaign to explain the causes, effects, and solutions to water pollution. Include action steps that people can take to help reduce pollution.

Present your campaign to your class or community group. Alternatively, share it on social media or within your school or community newsletter.

6. Reflection and Discussion

Goal: Reflect on the learning experience and discuss ways to continue addressing water pollution.

Activity:

Write a personal reflection on what you learned about water pollution, its impact, and what changes you can make to help.

Participate in a group discussion (or virtual discussion) on the importance of water pollution awareness and long-term solutions. Discuss how individuals, communities, and governments can work together to improve water quality.

Materials Needed:

Access to the internet for research

Water testing kits (optional but helpful)

Art supplies for posters (paper, markers, etc.) or digital tools for presentations

Social media tools (optional) for campaign creation

Documenting tools (camera or smartphone) to record your activities

Assessment Criteria:

Quality of research on water pollution causes and effects

Creativity and clarity in presenting findings (posters, infographics, reports)

Effectiveness of proposed solutions and community-based actions

Engagement and impact of the awareness campaign

Reflection on personal learning and contributions to the topic

Case study exercise

Case Study Exercise: The Flint Water Crisis

Objective:

To understand the causes, effects, and potential solutions to water pollution through a real-world example.

Background Information:

In 2014, the city of Flint, Michigan, switched its water supply source from Lake Huron (via Detroit's water system) to the Flint River as a temporary cost-saving measure. Almost immediately, residents began to notice problems with the water, including discoloration, a strong odor, and an unpleasant taste. Over time, it was discovered that the water was contaminated with high levels of lead, posing serious health risks to the community, especially children. The water crisis in Flint is one of the most well-known examples of water pollution in the United States and serves as a powerful case for studying the consequences of poor water management and pollution.

Tasks and Questions:

1. Cause Analysis

Task: Research the reasons behind the Flint water crisis.

Questions to Consider:

Why did the city of Flint switch its water source to the Flint River?

What were the initial signs of water pollution in Flint?

How did the lack of proper water treatment and monitoring contribute to the crisis?

Why were the effects of lead contamination not immediately recognized by authorities?

2. Impact on Health and Community

Task: Investigate the health and social impact of the Flint water crisis.

Questions to Consider:

What are the health risks associated with lead-contaminated water?

How did the Flint water crisis disproportionately affect vulnerable groups such as children, the elderly, and low-income families?

What steps were taken by local, state, and federal authorities to address the crisis? Were these efforts sufficient or timely?

How did the crisis impact public trust in government institutions and water management systems?

3. Long-Term Consequences

Task: Explore the long-term environmental and economic consequences of water pollution in Flint.

Questions to Consider:

What are the potential long-term health effects on people who were exposed to lead in the water?

How has the Flint water crisis impacted the local economy, particularly in terms of property values, public health costs, and tourism?

What environmental damage occurred as a result of using the Flint River as a water source?

Has the water supply been fully restored to safety, and if so, what measures were taken to ensure that the water is now safe to drink?

4. Prevention and Solutions

Task: Propose solutions to prevent similar water pollution crises in other communities.

Questions to Consider:

What steps should governments take to ensure that water sources are regularly tested and treated to prevent contamination?

What role can technology and innovation play in improving water quality monitoring and treatment?

How can communities become more involved in ensuring the safety of their water supply?

Based on the Flint case, what lessons should be learned to prevent future water pollution incidents?

Activities:

Research and Report:

Compile your findings into a comprehensive report that answers the questions above. Be sure to include evidence from your research, such as articles, news reports, or interviews with experts.

Provide a timeline of key events in the Flint water crisis, outlining when the problem started, when it was discovered, and when actions were taken.

Presentation:

Create a PowerPoint or video presentation summarizing your case study. Highlight the main causes, effects, and the steps taken to address the water pollution crisis in Flint.

Discuss what could have been done differently to prevent the crisis and propose recommendations for improving water quality management in other cities.

Group Discussion:

In a group setting, discuss the ethical considerations of the Flint water crisis. For example, discuss the role of government responsibility in protecting public health, and whether the actions taken were adequate and timely.

Debate the long-term social and economic consequences of the crisis and how communities can rebuild trust in their water supply systems.

Materials Needed:

Internet access for research

Articles, documentaries, and reports on the Flint Water Crisis (some suggested resources: news outlets like The New York Times, BBC, or documentaries like Flint or Time: The Kalief Browder Story)

PowerPoint or video editing tools for presentation

Notebook for reflection and group discussion

Assessment Criteria:

Depth and accuracy of research

Ability to analyze and identify causes, impacts, and solutions

Quality and clarity of the report and presentation

Participation in group discussion and ability to critically assess ethical issues related to water pollution

AIR

Air is requirement for the life of human beings, and all other animals, that surpasses all others. A human being could survive for a few weeks without food, probably a few days without water, but only a few minutes without air. Every day a man breathe about 35 pounds of air, and in our lifetimes we take about 625 million breathes.

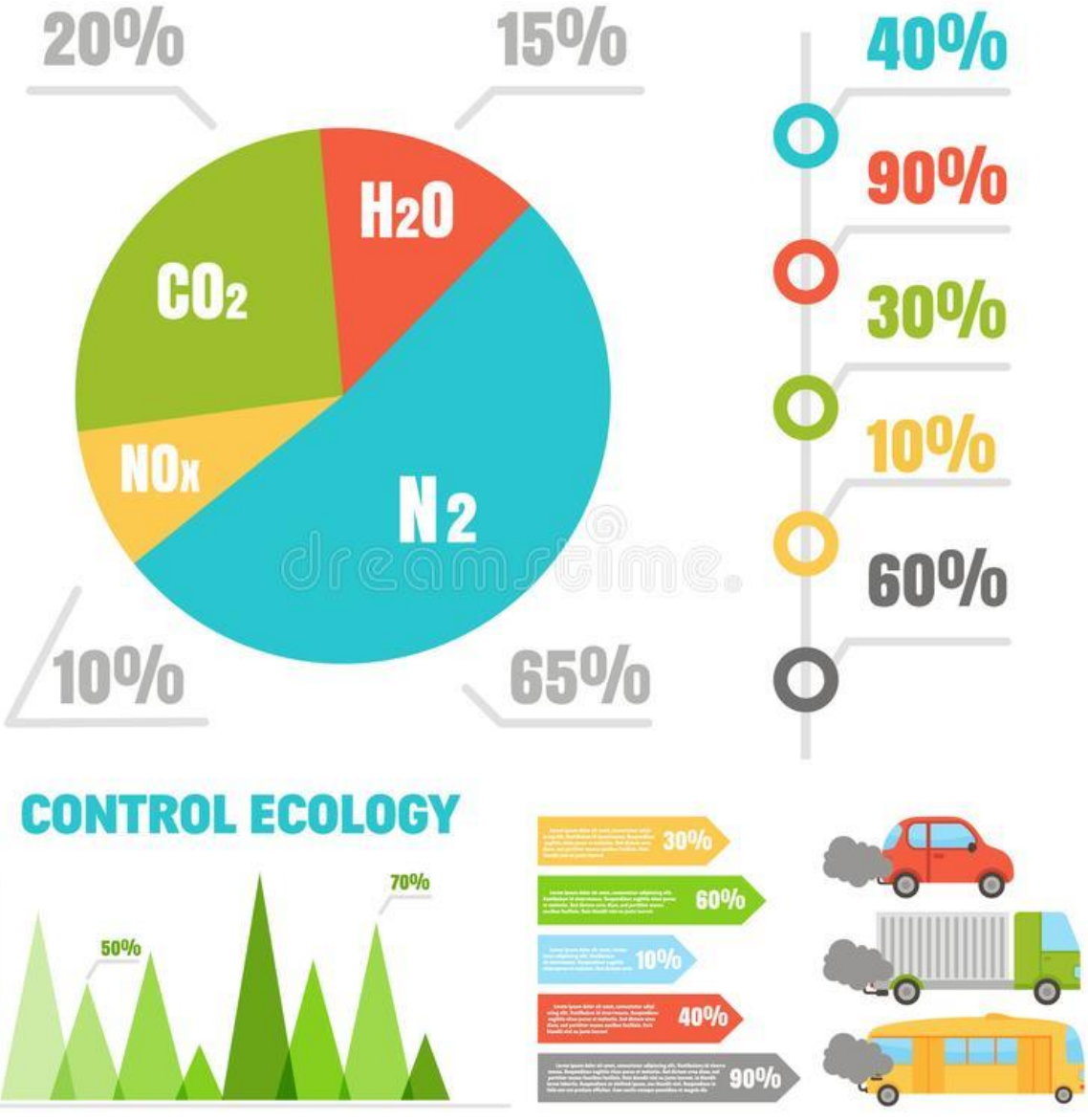
Clean air is mixture of invisible and odorless gases, mostly nitrogen (78%) and oxygen (21%), but with small amounts of water vapor (up to 7%), argon (0.94%), and carbon dioxide (o.03%),as well as small amounts of other gases such as neon, helium, and hydrogen.

The ocean of air that we call the atmosphere stretches from the earth's surface to the beginning of space, but the air we actually breathe is located in the troposphere, which stretches to 12 kilometers above the earth's surface. Pollution of the troposphere, therefore, is severe because it effects the health of all animals. This pollution occurs in many ways and from various sources. The 6 main tropospheric air pollutants include: carbon monoxide (CO), sulfur dioxide (CO_2), the nitrogen oxides (NO and NO_2), lead (Pb), particulates (solid particles or liquid droplets), and tropospheric ozone or bad ozone (O_3).

These have various sources, including coal burning power plants (producing particulates, Nitrogen Oxides, and SO_2), vehicle exhaust (producing CO, Pb, and Nitrogen Oxides), mining (producing particulates), and the combination of

different pollutants under sunlight which produces troposphere or bad ozone (O_3). Of these pollutants lead (Pb) is particularly a problem in Ukraine due to the prevalent use of leaded gasoline for vehicles. One pollutant that is not listed but that pertains particularly to Ukraine is Radiation. Large amount of radioactive pollution were released into atmosphere from Chornobyl nuclear accident in 1986.

Although the air in the troposphere is the only air we breathe, the upper atmospheric layer are also very important to life on earth. In the stratosphere, for example, the ozone layer filters out dangerous ultraviolet rays from the sun. This layer contains good ozone molecules which, which by filtering out ultraviolet radiation and help prevent skin cancer resulting from overexposure to the sun.



Vocabulary:

Odorless – без запаху

amount - кількість

to occur - траплятися

a particulate - часточка

vehicle exhaust - вихлопні гази

mining - добувна промисловість

prevalent - широко поширений

leaded gasoline - бензин з вмістом свинцю

nuclear accident - ядерний вибух

ultraviolet ray – ультрафіолетовий промінь

skin cancer - рак шкіри

overexposure - надмірно піддаватися впливу

1. **Translate the following word combinations:**

Odorless gas, small amount of water vapor, earth's surface, to effect the health, to occur in many ways, various sources, combination of different pollutants, due to prevalent, upper atmospheric layers, to filter out ultraviolet rays.

2. **Complete the sentences and translate them:**

1) A human being could survive for a few weeks without food but only … … without air.
2) Clean air is … of invisible and odorless gases.
3) The air we actually breathe is located in … … .
4) One pollutant that is not listed but that pertains particularly to Ukraine is … .
5) The air in the … is the only air we breathe.
6) In the stratosphere the ozone layer filters out dangerous … … from the sun.

3. **Answer the questions:**

a) Can human being survive without air?

b) What is clean air?

c) Where is the air we breathe located?

d) What is troposphere and how large is it?

e) What are the main air pollutants?

f) Why are the upper atmospheric layers very important?

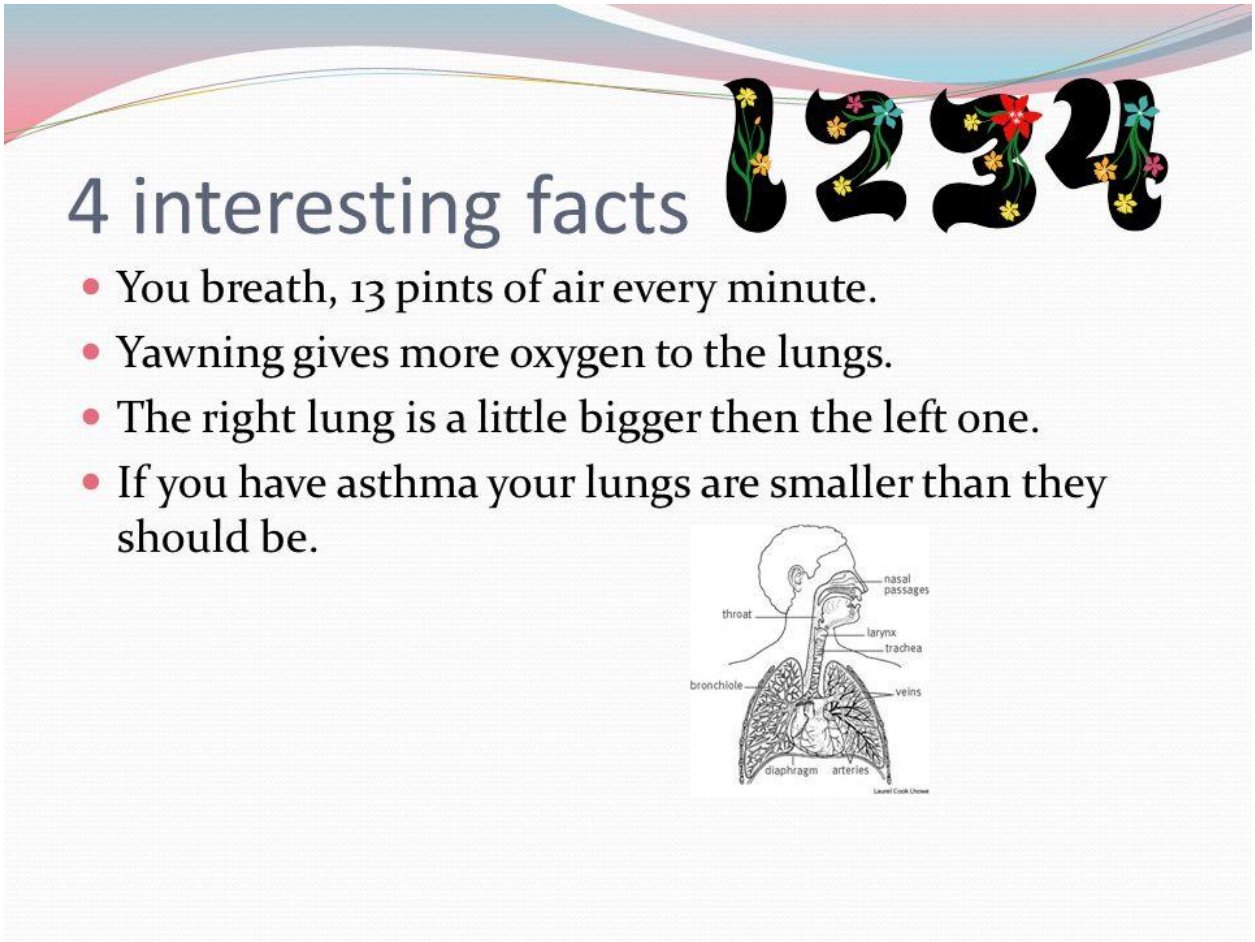
g) What are the main function of ozone layer?

4. Make up the sentences and translate them:

1) We/ every/ breath/ air/ of/ day.

2) Of/ the/ effects/ pollution/ the / health/ troposphere/ of / animals/ all.

3) Radioactive/ large / of / pollution / were / amount / into / the / released / from / the / nuclear / atmosphere / Chornobyl / accident.



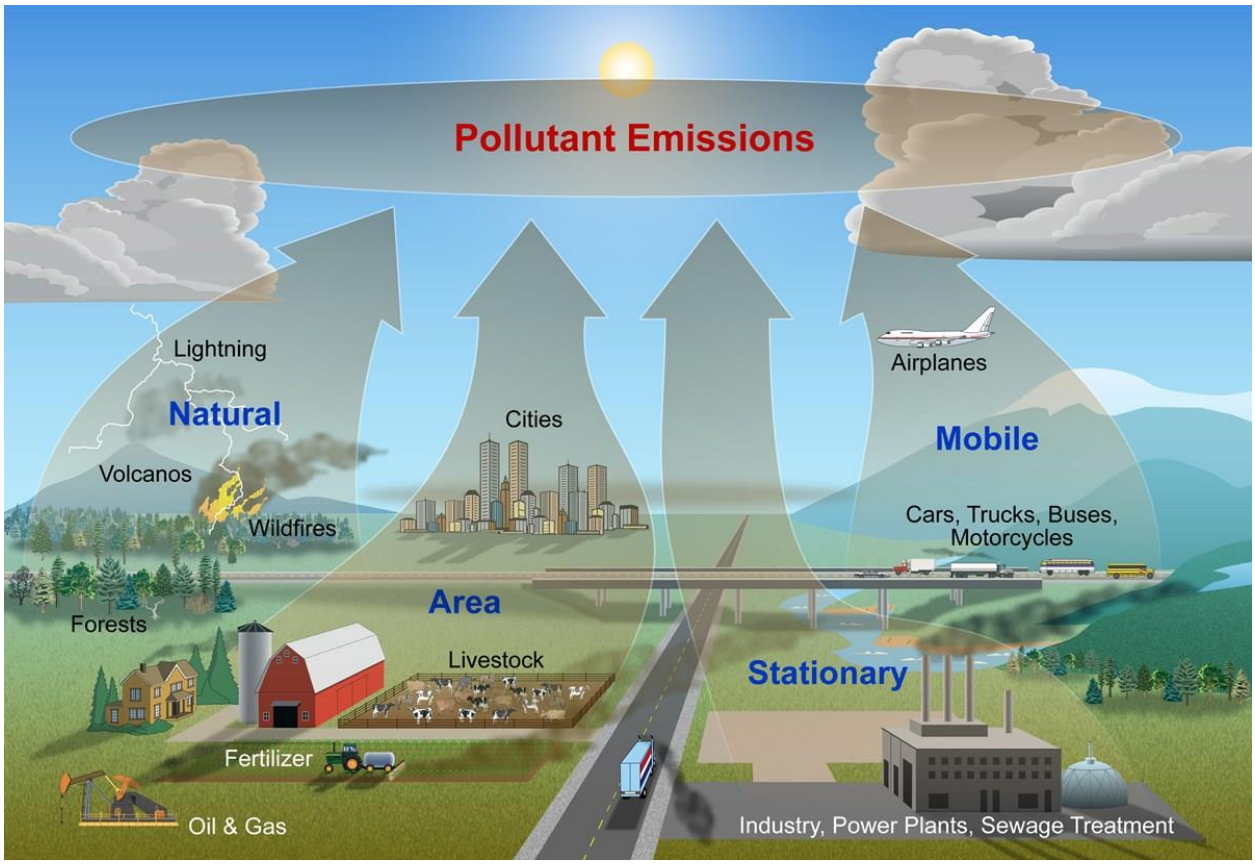
AIR POLLUTION

Atmospheric pollution is the result of air contamination by liquid or solid particles (dust, grit), gases, vapours or exhaust fumes injurious to human health or comfort, to animal, plants or property, and introduced into the air artificially. Dusts from industrial processes, including ash and unburnt fuel, are generally ejected from chimneys and ventilating flues. Smaller liquid or soil particles in the effluents tend to remain suspended in the air for longer periods as aerosols. Noxious gases contribute to pollution by mixing uniformly with the air and not separating from its by settlement. Some of them are destroyed by reaction with other constituents only to yield other noxious or innocuous products. Sulphur dioxide, for instance, is oxidized by atmospheric oxygen to sulphur trioxide which combines with water vapour to form droplets of sulphuric acid which itself is a noxious pollutant.

Air pollution is a major cause of ill health or disease in human beings. The toxic effect of many industrial effluents is known, and legislation exists in most countries to prevent such pollutants from reaching toxic concentrations. Smog is one of such example – the result of prolonged atmospheric inversion with little air movement, under an anticyclone, trapping smoke and sulphur dioxide. It the cause of considerable cardiac and bronchial ailment rate.

The air in urban areas with high traffic density is also polluted by exhaust fumes from motor vehicles as a result of imperfect internal combustion. The gases include carbon monoxide, oxides of nitrogen, unburnt hydrocarbons and compounds of lead. Abatement of pollution involves measures to trap pollutants and minimize their emission by such methods as: removing particulate materials from effluent gas streams by settlement chambers, by passing the gases through filters, scrubbers electrostatic precipitators. In town planning itself more attention must be paid to climatic and topographic conditions in allocation sites for industrial plants and residential and commercial development; in areas subject to inversion and failure of natural means of dispersion, special administrative powers

to enforce the shutting down of all operations emitting pollutants in emergencies can minimize the risk of major damage.



Answer the following questions :

1. In what way is the atmosphere contaminated?
2. Why are noxious gases so dangerous?
3. What is the smog and how does it arise?
4. In what sense does smog represent a health hazard?
5. In what way are motor vehicles exhaust fumes dangerous?
6. How can town planning help combat atmospheric pollution?

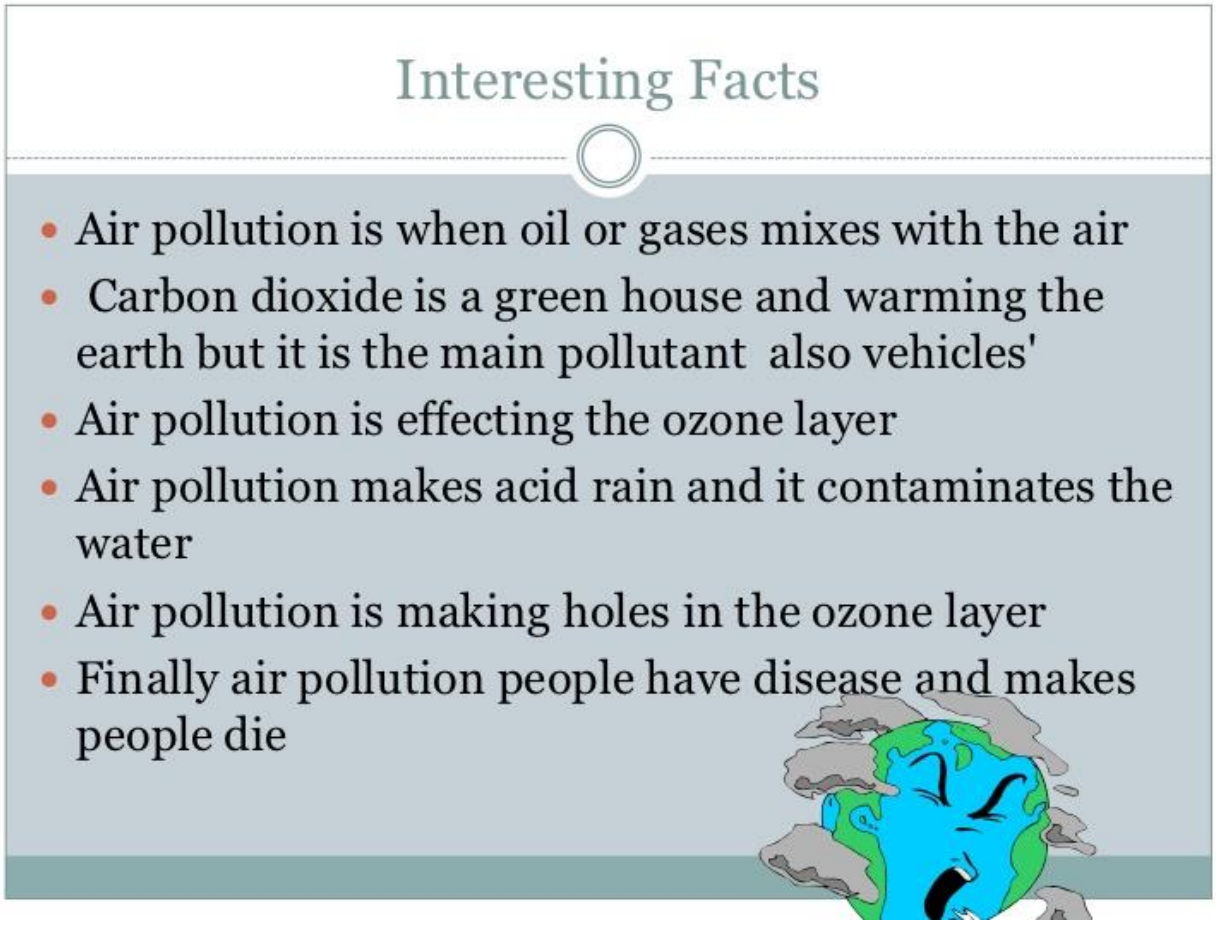
Translate into English :

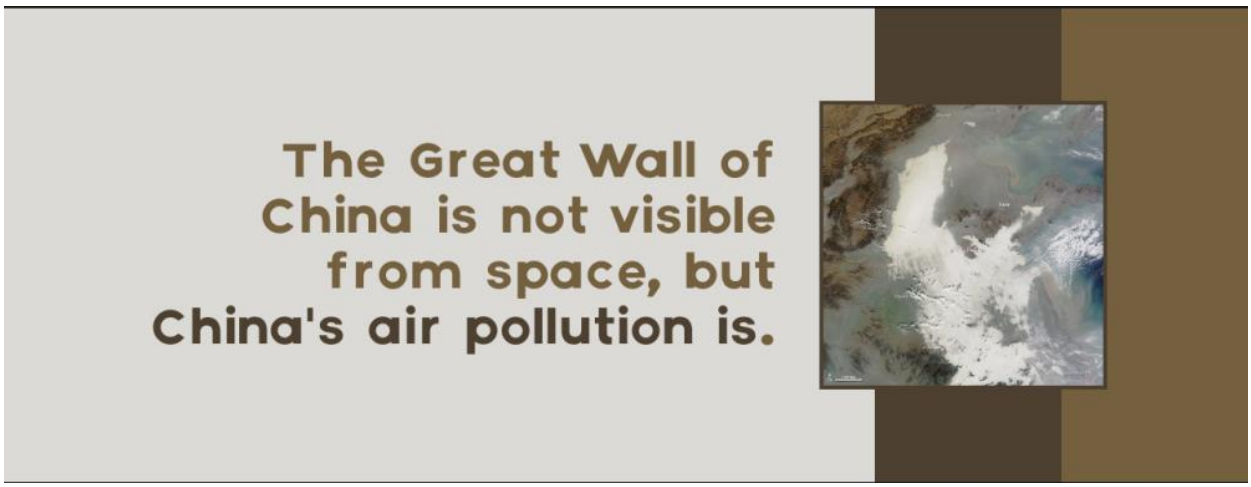
1. Концентрація промислових викидів ніколи ще не була такою високою, як тепер.

2. Ми впровадили біологічні фільтри, вентилятори, очищувачі рідини та електричні вловлювачі пилу і сподіваємося покращення екологічної ситуації.
3. Керівники підприємств, на яких шкідливі речовини не знешкоджуються, слід змушувати встановлювати очисні споруди.

Form sentences of your own:

In human being, or, air pollution, a major cause, disease,is, of ill health.





Case study exercise The Delhi Air Pollution Crisis

Objective:

To investigate the causes, impacts, and potential solutions to severe air pollution in Delhi, India, and understand how urbanization, industry, and policy decisions contribute to environmental health risks.

Background Information:

Delhi, the capital city of India, has one of the highest levels of air pollution in the world. The air quality in Delhi has reached hazardous levels, particularly during the winter months, due to a combination of factors like vehicular emissions, industrial activities, crop burning in neighboring states, and weather patterns. This pollution causes severe health problems for residents, including respiratory diseases, heart conditions, and premature deaths. The situation in Delhi has attracted global attention, with experts calling it a public health emergency.

Tasks and Questions:

1. Cause Analysis

Task: Research and analyze the causes of air pollution in Delhi.

Questions to Consider:

What are the major sources of air pollution in Delhi (e.g., vehicle emissions, industrial pollution, crop residue burning)?

How does the geography and climate of Delhi contribute to the concentration of pollutants in the air?

How have rapid urbanization, population growth, and increased industrialization affected the quality of air in Delhi?

What role does the government play in regulating and managing pollution? Are existing policies effective?

2. Health and Environmental Impacts

Task: Investigate the effects of air pollution on human health and the environment.

Questions to Consider:

What are the immediate and long-term health risks posed by the high levels of air pollution in Delhi, particularly for vulnerable groups such as children, the elderly, and those with pre-existing conditions?

How does air pollution affect the environment, including soil, water, and plant life in and around Delhi?

How has air pollution affected the quality of life for residents of Delhi, including daily activities, work productivity, and general well-being?

3. The Role of Government and Policy Measures

Task: Explore the role of government actions in managing air pollution in Delhi.

Questions to Consider:

What policies have been implemented by the Delhi government and the Indian central government to control air pollution (e.g., odd-even car rationing, banning construction during high pollution days)?

How successful have these policies been in reducing air pollution? Are there any shortcomings or challenges in enforcement?

What more can the government do to improve air quality, particularly in light of rapid urban growth and industrial expansion?

4. Technology and Innovation Solutions

Task: Identify technological or innovative solutions that could help reduce air pollution in Delhi.

Questions to Consider:

What role can green technologies, such as electric vehicles, renewable energy, and air purifiers, play in reducing air pollution in urban areas like Delhi?

How can technological advancements in transportation, energy production, and waste management help address the problem of air pollution?

Are there any successful case studies from other cities around the world that could be implemented in Delhi to combat air pollution?

5. Community Engagement and Public Awareness

Task: Investigate the importance of public awareness and community engagement in tackling air pollution.

Questions to Consider:

How can citizens of Delhi reduce their personal contribution to air pollution (e.g., reducing car use, reducing burning of waste, using cleaner energy)?

How can schools, NGOs, and media organizations raise awareness about the dangers of air pollution and encourage citizens to take action?

What role does social media play in mobilizing community efforts and influencing government policies to address air pollution?

Activities:

Research and Report:

Compile your findings into a detailed report. Answer all of the questions in the sections above, providing data and evidence to support your analysis.

Include a timeline or infographic that shows how air pollution levels have changed in Delhi over the last decade and the policies or actions taken to mitigate the issue.

Presentation:

Create a PowerPoint presentation or infographic summarizing your research and conclusions. Include key statistics, images of air pollution in Delhi, and actionable solutions.

Focus on the most important points that can help both policymakers and residents of Delhi take action. Present your solutions and ideas for improving air quality.

Group Discussion/Debate:

Organize a group discussion or debate where students argue for or against the effectiveness of certain policies like the odd-even car rationing scheme or crop residue burning bans. Discuss other potential measures that could be implemented to reduce pollution.

Discuss ethical issues surrounding the balance between economic development and environmental protection. For example, is it fair to limit industrial activities that provide jobs and economic growth to reduce pollution?

Materials Needed:

Access to the internet for research (government reports, news articles, and scientific studies)

Articles, documentaries, and reports on Delhi's air pollution crisis (such as from The New York Times, BBC, or the World Health Organization)

Tools to create presentations (PowerPoint, Canva, or video editing software)

Data visualization tools for creating infographics

Assessment Criteria:

Depth and accuracy of research on the causes, impacts, and solutions to air pollution in Delhi

Creativity and clarity of the report and presentation

Ability to critically assess the role of government, technology, and community involvement in addressing the crisis

Quality of proposed solutions and their potential effectiveness in improving air quality

Active participation in group discussions or debates

Learning project Understanding and Addressing Air Pollution

Objective:

To learn about the causes and effects of air pollution, understand its impact on human health and the environment, and propose practical solutions to reduce air pollution.

Tasks and Steps:

1. Research and Report: Causes of Air Pollution

Goal: Identify and understand the various sources of air pollution.

Activity:

Research different sources of air pollution, both natural (e.g., wildfires, volcanic eruptions) and human-made (e.g., vehicle emissions, industrial activities, deforestation, and agricultural practices).

Create a detailed report that explains each major source and how it contributes to air pollution.

Include relevant data such as statistics on emissions, the chemicals involved, and the global scale of air pollution.

Extension Activity: Create a visual chart or infographic that breaks down the sources of air pollution with examples of each.

2. Health and Environmental Impact

Goal: Investigate the health risks and environmental consequences of air pollution.

Activity:

Research the health effects of air pollution on humans, such as respiratory diseases (asthma, bronchitis), heart problems, and premature deaths.

Explore the environmental effects, such as damage to ecosystems, soil, and water quality, as well as the impacts on wildlife.

Write a 1-2 page report or create a presentation explaining these effects.

Extension Activity: Interview a local healthcare professional or environmental scientist (if possible) about the health and environmental consequences of air pollution in your area.

3. Global Air Quality and Case Study: Major Cities

Goal: Examine the global problem of air pollution through a case study of a major polluted city.

Activity:

Choose a city known for severe air pollution (e.g., Delhi, Beijing, Mexico City) and research the causes, consequences, and efforts taken to improve air quality.

Create a case study report or presentation that includes:

Key Facts: Air pollution statistics, major sources, and pollution levels.

Health and Economic Impacts: How pollution affects the population.

Solutions: What actions have been taken by the government and community (e.g., clean air policies, public transportation initiatives, green technologies).

Future Outlook: What further measures are needed to improve air quality?

4. Solutions and Prevention: How Can We Reduce Air Pollution?

Goal: Propose practical solutions to reduce air pollution.

Activity:

Research and identify current strategies and technologies used to combat air pollution (e.g., electric vehicles, renewable energy sources, stricter emission regulations, green spaces, and sustainable agriculture).

Create a “How to Reduce Air Pollution” guide that includes practical actions for individuals, communities, and governments.

Include specific recommendations for reducing pollution from transportation, industries, households, and agriculture.

Extension Activity: Organize a community clean-up event or plant trees in your local area to help reduce pollution (if applicable).

5. Raise Awareness: Design an Awareness Campaign

Goal: Raise awareness about the dangers of air pollution and encourage action.

Activity:

Design an awareness campaign to educate others about the effects of air pollution and the importance of reducing pollution. This could include:

Creating posters, flyers, or social media posts.

Designing an educational video or presentation that highlights the issue and provides tips on how to reduce air pollution.

Hosting a workshop or webinar to engage your school, community, or family on how to tackle air pollution.

Extension Activity: Collaborate with local organizations, schools, or social media influencers to spread the message and create a wider impact.

6. Reflection and Discussion

Goal: Reflect on what you've learned and discuss future actions.

Activity:

Write a 1-2 page reflection about the importance of understanding air pollution and what you can personally do to reduce your carbon footprint.

Participate in a group discussion or debate about the most effective solutions to air pollution and how individuals, communities, and governments can work together to reduce pollution on a larger scale.

Materials Needed:

Access to the internet for research (articles, reports, case studies)

Art supplies or digital tools for creating infographics, posters, or presentations

A camera or smartphone for capturing photos or videos (optional)

Local government or environmental reports for statistics and data (optional)

Assessment Criteria:

Research Depth: Completeness and accuracy of the research on air pollution causes, effects, and solutions.

Creativity: Originality and clarity of the solutions and awareness campaign.

Presentation: Ability to effectively communicate the findings, either through written reports, presentations, or creative visuals.

Practical Application: How well students propose realistic solutions and actions to combat air pollution.

Reflection: Personal insight into the importance of air pollution and taking responsibility for improving air quality.

THREATS TO LAND

Arable land is currently under threat from many different sources. Millions of hectares of good land are built on, lost to buildings and roads. Agricultural land is subject to degradation – soil erosion is on the increase. The use of intensive methods of farming is leading 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. Aridity affects nearly one-third. Desertification is not being produced by climatic changes but by overcropping, overgrazing, and salinization. It can also be produced by deforestation, which exposes soil to wind and rain, resulting in sudden soil erosion and flooding. But as the soil disappears so does the ability of the land to trap and retain moisture, the desert begins to get the upper hand.

Vocabulary:

arable land – орна земля
to be subject to – піддаватися впливу
soil erosion – ерозія ґрунту
increase - збільшення
organic matter – органічні речовини
topsoil – верхній шар ґрунту
buildup – накопичення, утворення
aggravate - погіршувати
fertilizer - добриво
dung - гній
crop residues – рештки рослин
peat - торф
aridity - засуха

salinization – засолювати (про ґрунти)

expose – відкривати

flooding – повінь, затоплення

to trap and retain moisture – захоплювати і втримувати вологу

to get the upper hand – перемагати

1. **Translate the following word-combinations into English:**

бути під загрозою

бути забудованим

збільшуватись, наростати

втрата органічних речовин

накопичення токсинів

органічне добриво

головна проблема

бути спричиненим (чимось)

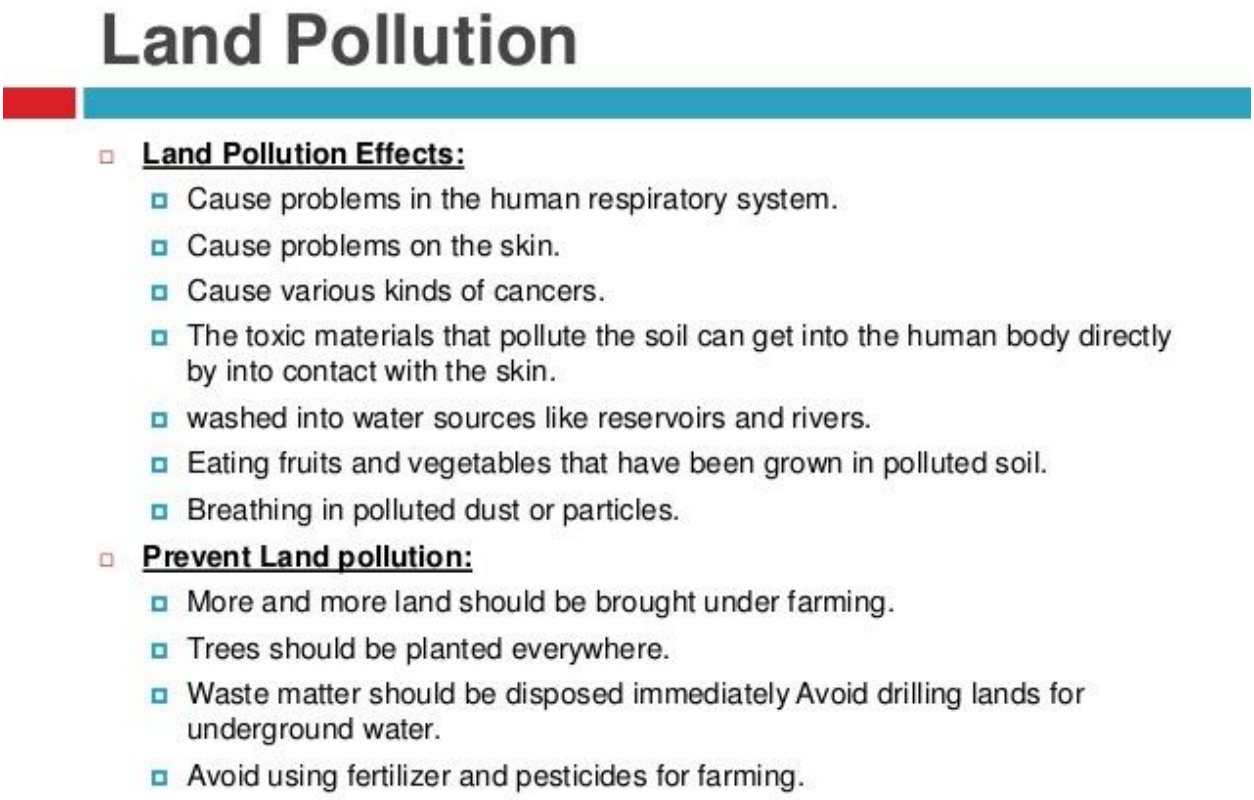
втримувати вологу

перемагати (щось)

2. **Answer the questions:**

a) What threats for environment does construction work impose if it is carried out on arable lands?
b) What is meant by “soil erosion”?
c) What is the problem aggravated by?
d) Is the desertification one of the main problems?
e) Can you think of any examples to demonstrate how deforestation leads to soil erosion and desertification?

f) What are harmful effects of overcropping and overgrazing as a result of land mismanagement?



3. Translate into English:

А) Дезиртифікація – це небезпечний процес, який загрожує сільськогосподарським землям.

Б) Ерозія ґрунтів є однією з основних проблем екології.

В) Правильне використання органічних речовин покращує якість ґрунту.

Г) Втрата лісових насаджень призводить до погіршення верхніх шарів ґрунту.

Learning Project: Understanding and Addressing Soil Pollution

Objective:

To learn about the causes, impacts, and solutions to soil pollution, while understanding its effects on the environment, human health, and agricultural productivity.

Tasks and Steps:

1. Research and Report: Causes of Soil Pollution

Goal: Identify and understand the primary sources of soil pollution.

Activity:

Research the various causes of soil pollution, such as industrial waste, agricultural chemicals (pesticides, fertilizers), improper waste disposal, deforestation, and urbanization.

Create a detailed report explaining each cause, how it contributes to soil contamination, and the chemicals or substances involved.

Include real-world examples of soil pollution (e.g., the impact of plastic waste, heavy metals, or oil spills).

Extension Activity: Create an infographic that summarizes the key causes of soil pollution, including their effects and prevention methods.

2. Impact of Soil Pollution on Health and the Environment

Goal: Investigate the effects of soil pollution on human health, wildlife, and the ecosystem.

Activity:

Research the short- and long-term health effects of soil pollution on humans (e.g., diseases caused by contaminated food, water pollution from leaching toxins).

Investigate how soil pollution affects the environment, including its impact on plants, animals, and the quality of agricultural land.

Write a 1-2 page report or create a presentation that explains the main health risks and environmental consequences of soil pollution.

Extension Activity: Design a chart comparing the effects of different pollutants (e.g., plastics, heavy metals, pesticides) on soil health and biodiversity.

3. Case Study: Soil Pollution in Your Local Area

Goal: Explore local soil pollution issues in your community.

Activity:

Investigate the state of soil pollution in your local area. Identify potential sources of soil contamination (e.g., illegal dumping, industrial waste, agricultural runoff).

Collect information from local environmental reports or news sources that discuss soil pollution issues in your region.

Create a case study of a specific soil pollution issue in your community, outlining the causes, impacts, and possible solutions.

Extension Activity: Conduct a soil sample test (if resources allow) to check for contaminants or signs of pollution. Document the process and findings in a report.

4. Solutions to Prevent and Clean Up Soil Pollution

Goal: Identify solutions to prevent and clean up soil pollution.

Activity:

Research existing methods and technologies used to prevent or clean up soil pollution, such as bioremediation, phytoremediation (using plants to remove pollutants), and sustainable agricultural practices.

Create a list of recommendations for individuals, businesses, and governments to reduce soil pollution. These could include practices like composting, reducing chemical usage, improving waste management, and using eco-friendly products.

Extension Activity: Develop a plan for a local initiative that aims to reduce soil pollution, such as a recycling program or a community garden that promotes soil health.

5. Raise Awareness: Design an Awareness Campaign

Goal: Raise awareness about the importance of soil health and the dangers of soil pollution.

Activity:

Design an awareness campaign to educate others about soil pollution. This could include:

Creating posters, flyers, or social media posts with information on the causes and effects of soil pollution.

Developing a video or presentation that explains soil pollution and provides practical tips to reduce contamination.

Hosting a local workshop or online webinar to spread knowledge about soil conservation and pollution prevention.

Extension Activity: Collaborate with local organizations or schools to hold a clean-up event or workshop on reducing soil pollution.

6. Reflection and Discussion

Goal: Reflect on what you've learned and discuss how to protect soil health moving forward.

Activity:

Write a 1-2 page reflection on the importance of soil health and what actions you can personally take to prevent soil pollution.

Participate in a group discussion or debate about the most effective solutions to soil pollution. Discuss the balance between industrial development, urbanization, and environmental protection.

Materials Needed:

Access to the internet for research (articles, reports, case studies)

Art supplies or digital tools for creating infographics, posters, or presentations

Local environmental reports or government data (optional)

Soil testing kits (optional, for hands-on learning)

Video recording or editing tools (optional)

Assessment Criteria:

Research Depth: Quality and depth of the research on soil pollution causes, effects, and solutions.

Creativity: Originality and clarity of the awareness campaign and proposed solutions.

Presentation: Ability to effectively communicate the findings, either through written reports, presentations, or creative visuals.

Practical Application: How well students propose realistic and actionable solutions to soil pollution.

Reflection: Insight into the importance of soil conservation and individual responsibility for reducing pollution.

Pre-reading activity

1. Where do plants grow?
2. Why are plants important for people?
3. How do we use plants?
4. Are plants important for animals and birds?
5. Do we have to take care the plants? Why?

PLANTS

Plants grow in almost part of the world. We use such plants as flowers, grass, and trees nearly every day. Plants also grow on mountaintops, in the oceans, and in many desert and polar regions.

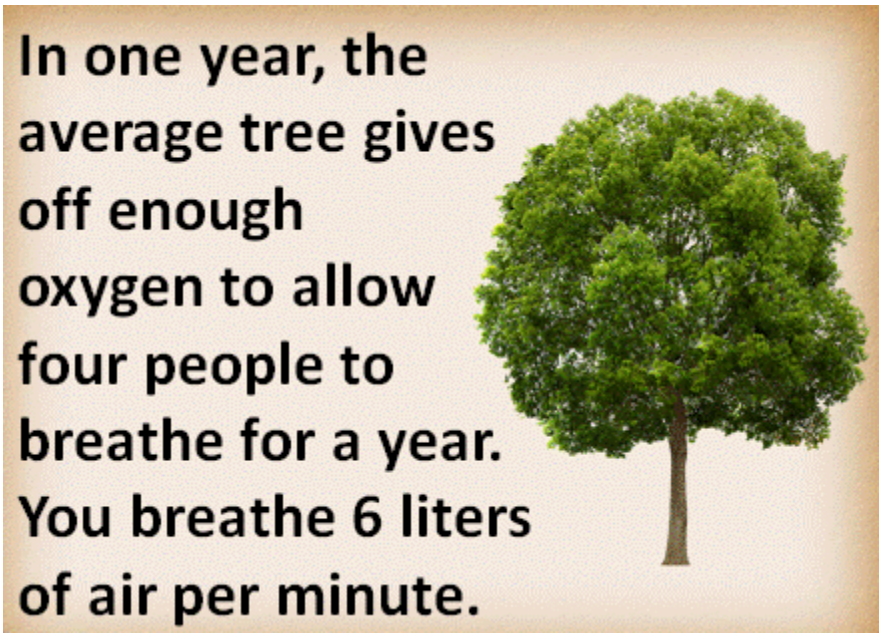
Without plants, there could be no life on the earth. People could not live without air or food, and thus could not live without plants. The oxygen in the air we breathe comes from plants. The food that we eat comes from plants or from animals that eat plants. We build houses and make many useful products from lumber. Much of our clothing is made from the fibers of the cotton beauty and pleasure to our lives. Most people enjoy the smell of flowers, the sight of a field waving grain, and the quiet within a forest.

Scientists believe there are more than 350,000 species (kinds) of plants, but no one knows for sure. Some tiny plants that grow on the forest floor can barely be seen. Other tower over people and animals. The largest living things on earth are the giant sequoia trees of California. Some stand more than 290 feet (88 meters) high and measure 30 feet (9 meters) wide. Plants are also the oldest living things. One bristlecone pine tree in California started growing 4,000 or 5,000 years ago.

Not all plants are helpful to people. Some species grow in the fields and gardens as weeds that choke off useful plants. Tiny bits of pollen from certain plants cause such health problems as asthma and hay fever. Some plants are poisonous if eaten.

Plants are probably the most important to people as food. People get food from many kinds of plants – or parts of plants. The seeds of such plants as corn, rice, and wheat are the chief source of food in most parts of the world. We eat bread and many other products made from the grains, and almost all of our meat comes from animals that eat them. When we eat beets, carrots or potatoes, we are eating the roots of plants. We eat the leaves of cabbage, lettuce and spinach plants; the stems of asparagus and celery plants; and the flower buds of broccoli and

cauliflower plants. The fruit of many plants also provide us with food. They include apples, bananas, berries and oranges, as well as some nuts and vegetables.



Plants supply people with many important raw materials. Trees give us lumber for building homes and making furniture. Wood chips are used in manufacturing papers. Other products made from trees include cork, natural rubber, turpentine. Most people wear clothing made from clothing. Plants also provide an important source of fuel.

2. Name it part of the text and made the plane.

3. Translate the following word combinations:

Desert region, useful products, species of plants, tiny plants, giant plant, to choke off, poisonous plants, seed and steam, to supply people, source of fuel, chief sources, certain plants, living things.

4. Answer the following questions:

a)What kinds of plants do we use?

b) Why are plants important for living things?

c) How many species of plants are there on earth?

d) Are plants always helpful for animals?

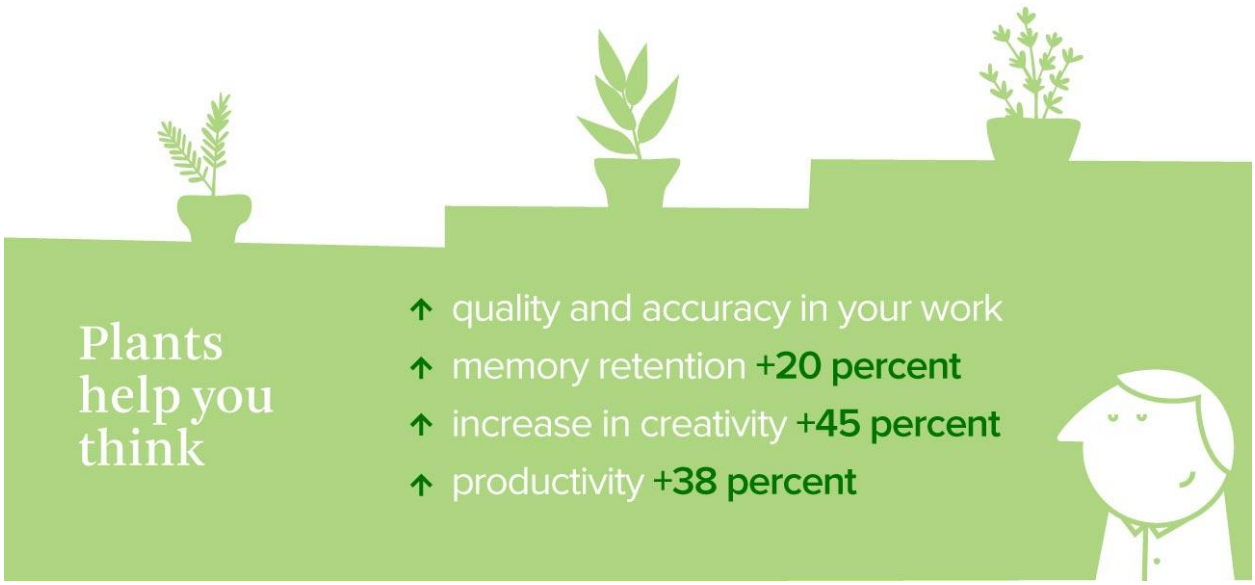
e) Why are plants important for animals?

f) What parts of plants do we use as our food?

g) What do plants supply people with?

5. Translate the sentences into English:

1. Рослини дають нам кисень щоб дихати.
2. Рослини є не тільки їжею для людей, але й для тварин.
3. На землі не може існувати життя без рослин.
4. Вчені вважають, що існує більше як 350 тис. видів рослин.
5. Рослини – це складні організми.
6. Люди використовують рослини не тільки як їжу, але й як сировину для одягу, будівництва чи медичних засобів.
7. Деякі види рослин є найдревнішими на землі.



PARTS OF PLANTS

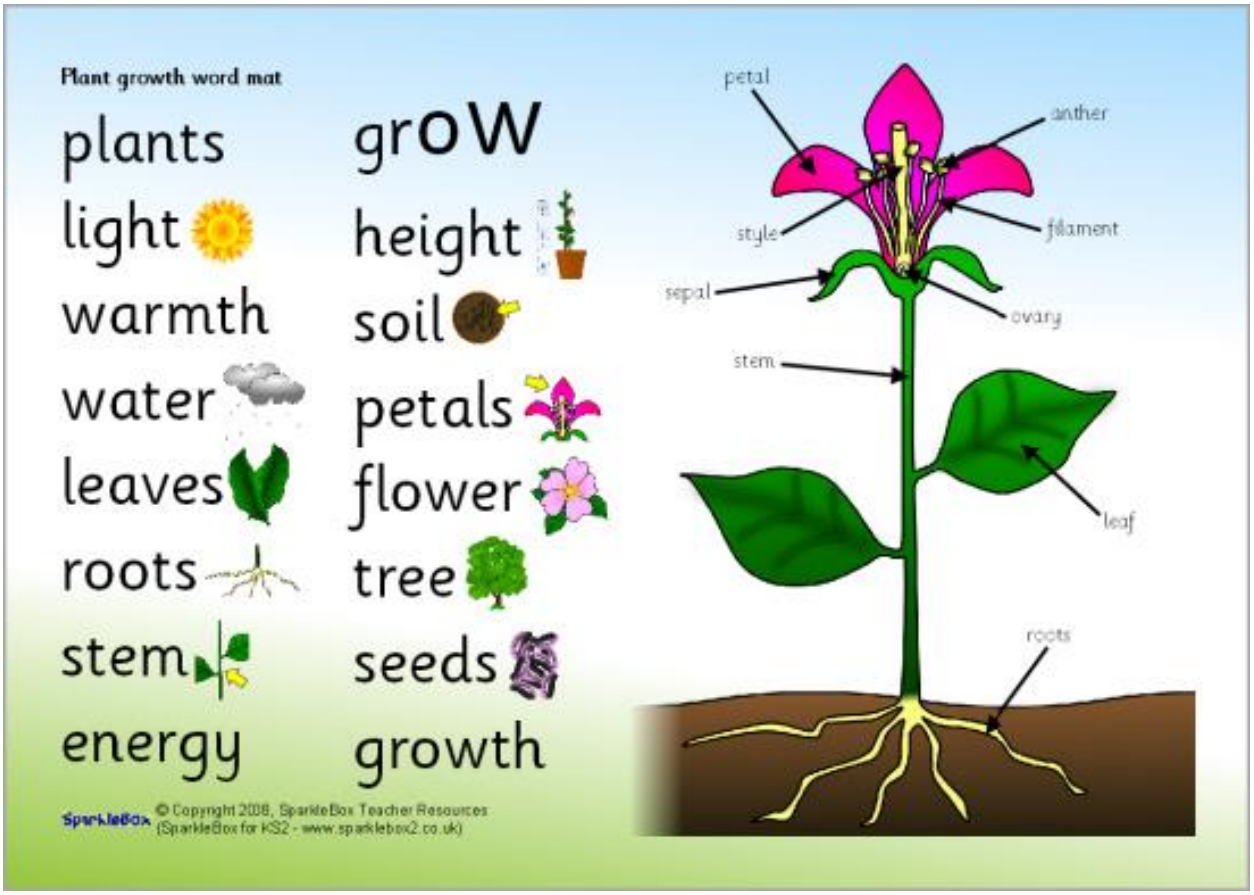
All plants – like all living things – are made up of cells. In plants there are many kinds of cells that have special jobs and together these cells form the various parts of the plant. A giant redwood tree, for example, has many billions of cells. A group of cell that are organized to perform particular functions are called *tissues* .Plants are made up of many types of complex tissues.

A plant is made up of several important parts. Flowering plants, the most common type of plants, have four main parts: roots, stems, leaves and flowers. The

roots, stems and leaves are called the *vegetative* parts of plants. The flowers, fruits and seeds are called *reproductive* parts.

Speaking about roots, we must say that most roots grow underground. As the root of a young plant spread, they absorb the water and minerals that the plant needs to grow. The roots also anchor the plant in the soil. There are two main kinds of root systems – fibrous (grass, wheat) and taproot (carrot, beet).

Stems of plants differ greatly among various species. They make up the largest parts of some kinds of plants. For example, the trunk, branches, and twigs of trees are all stems. Other plants such as cabbage and lettuce, have such short stems and large leaves that they appear to have no stem at all. Most plants grow upright and support the leaves and reproductive organs of plants. The stems hold these parts up in the air where they can receive sunlight.



Leaves make most of the food that plants need to live and grow. They produce food by a process called *photosynthesis*. In photosynthesis, chlorophyll in

the leaves absorbs light energy from the sun. This energy is used to combine water and minerals from the soil with carbon dioxide from the air. Leaves differ greatly in size and shape. Some plants have leaves less than 2.5 centimeters long and wide. The largest leaves, those of the raffia palm, grow up to 20 meters long and 2.4 meters wide.

Flowers contain the reproductive parts of flowering plants. Flowers develop from buds along the stem of a plant. Some kinds of plants produce only one flower, but other grow many large clusters of flowers. Most flowers have four main parts: the calyx, the corolla, the stamens and the pistils. The flower parts are attached to a place on the stem called the receptacle.

Seeds vary greatly in size and shape too. Some seeds are so small that they are difficult to be seen. But on the other hand, the seeds of one kind of coconut tree may weigh more than 9 kg. There are two main types of seeds – naked and enclosed.

1.Translate the following word combinations into Ukrainian:

Many kinds of cells, complex tissues, minerals and nutrients, roots and leaves, to be made up (of), to absorb water, to anchor the plant, root system, stem of plant, reproductive organs, to use for growth and repair, to be stored, clusters and flowers, tiny flowers, to vary in size and shape.

2. Complete the sentences and translate them into Ukrainian:

1) All plant are made up of …

a) cells; b) leaves; c) seeds;

2) A plant is made up of several important … .

a) roots; b) parts; c) tissues;

3) Most roots grow … .

a) underground; b) inside; c) upperground;

4) Leaves produce food by a … called photosynthesis.

a) relationship; b) action; c) process;

5) Flowers contain … parts.

a) reproductive; b) growing; c) seed;

6) Seeds vary greatly in … .

a) colour and smell; b) size and shape; c) flowers and leaves;

3. Answer the following questions:

1) What are the main parts of plants?

2) What is tissue?

3) What are the main kinds of root system?

4) What for do plant use root system?

5) Why is a process of photosynthesis important for plant?

6) Why are flowers important for plants?

7) Do seeds vary in size and shape?

8) What parts of plants are called vegetatives and reproductives?

4. Translate the sentences into Ukrainian:

1) Most roots anchor a plant and absorb water and minerals from the soil if water dissolves them?

2) Most stems support the plant's flowers and leaves. Stems are woody and herbaceous.

3) The root is one of the first parts of a plant that starts to grow.

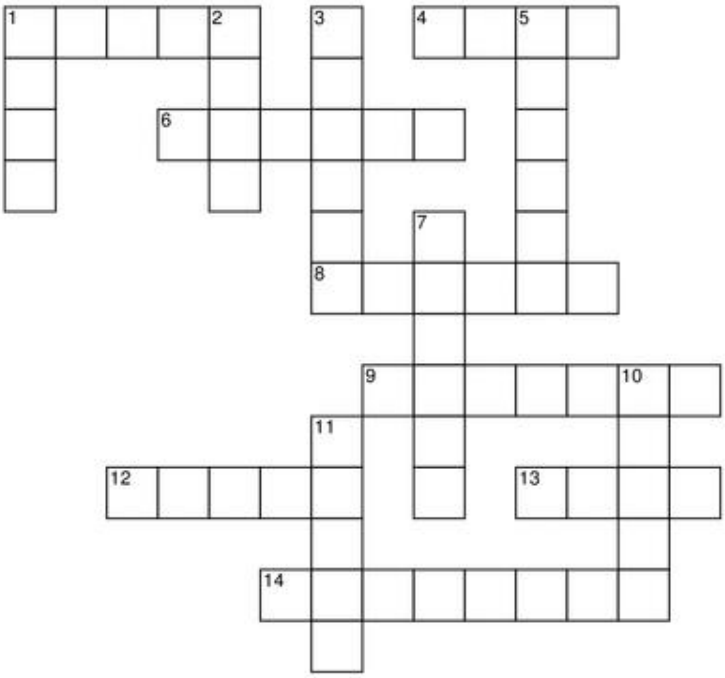
4) Plants with woody stems include trees and bushes.

5) Seeds consists of three main parts: the seed coat; the embryo; and the food storage tissue.

6) Many flowering plants are pollinated by bees and other animals.

7) Flowering plants reproduce by a process is called pollination.

Plants



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ACROSS

1 New plants grow from tiny _____.
4 Like all living things, plants _____ and change.
6 The _____ of a plant grow on the stem.
8 Roots hold plants in the _____.
9 Most plants have _____ that make seeds.
12 All plants need sunlight, food, and _____.
13 The stem carries _____ and water to all the parts of the plant.
14 Plants use _____ to stay healthy.

DOWN

1 A tiny _____ can grow into a beautiful plant.
2 The part of the plant that holds the plant up straight is the _____.
3 Plants are _____ things.
5 Plants give off _____ to help us breathe.
7 Insects carry _____ from flower to flower.
10 The _____ of a plant take in water and minerals from the soil.
11 Sometimes, a plant can grow _____ that we can eat.

WORD BANK: Flowers, food, fruit, ground, grow, leaves, living, minerals, oxygen, pollen, roots, seed, seeds, stem, water.

WHERE PLANTS LIVE

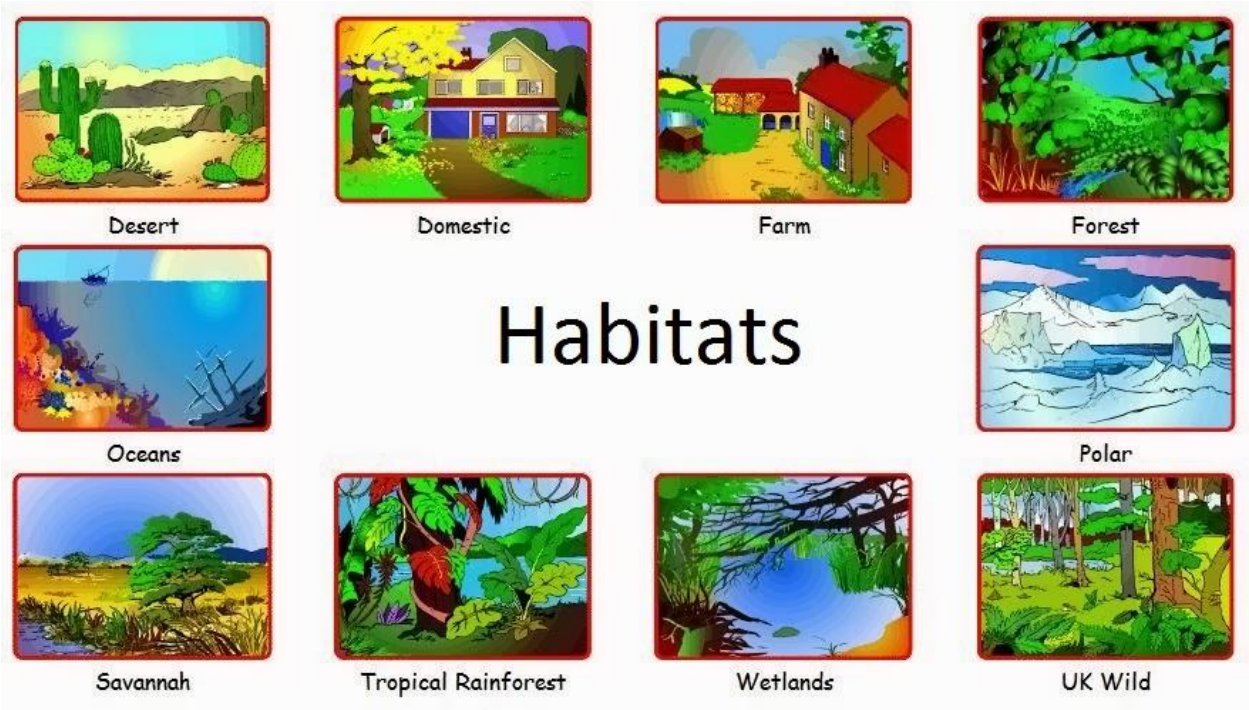
Most species of plants live in places that have warm temperatures at least part of the year, plentiful rainfall, and rich soil. But plants can live under extreme conditions. Mosses have been founded in Antarctic areas where the temperature seldom rises above 0*C. Many desert plants grow in area where the temperature may rise above 38*C.

Not all kinds of plants grow in all parts of the world. For example, cattails live only in such damp places as swamps and marshes. Cactuses, on the other hand, are founded chiefly in deserts. Through long periods of time, many small changes have taken place in various kinds of plants. These changes have enable the plants to survive in a particular environment.

Many elements make up a plant's environment. One of the most important is the weather – sunlight, temperature, and precipitation (rain, melted snow, and other moisture). The environment of a plant also includes the soil and the other plants and animals that live in the same area. All these elements form what scientists call a natural community.

No two natural communities are exactly alike, but many resemble one another more than they differ. Botanists divide the world into *biomes* – natural communities of plants, animals, and other organisms. Important land biomes include (1) the tundra, (2) forests, (3) chaparrals, (4) grasslands, (5) savannas, and (6) deserts.

Human beings have greatly affected the natural communities. In North America, for example, great forests once extended from the Atlantic Ocean to the Mississippi River. Most of the trees were cleared by advancing settlers, and the forests have been replaced by cities and farms. In other parts of the world, irrigation and the use of fertilizers have enabled plants to be grown on once-barren land.



Vocabulary:

Plentiful - рясний

Moss - мох

Cattails -

Swamps and marches

To survive - виживати

Precipitation

Moisture - волога

Chaparrals

Deciduous

Extend

Fertilizers

Once-barren - безплідний

1. **Odd the superfluous word**

a) Kinds, species, types, discussion:

b) Tundra, forest, museum, savannas, desert;

c) Leaf, root, stem, bird, seed;

d) Sun, soil, scientist, sunlight, rain;

e) Area, ocean, territory, biome, regions.

2. Complete the sentences:

1) Most species of plants live in place…	a)… into biomes.
2) Plants can live …	b)… the earth's land area.
3) Botanists divide the world …	c)… that have warm temperatures.
4) Plants live everywhere except …	d)… are broadleaf trees.
5) Tropical rain forests grow in regions	e)… under extreme conditions.
6) Most trees in tropical rain forests …	f)… in regions that have permanent ice.
7) Forests cover almost a third of …	g)… that have warm, wet weather the year around.

3. Answer the following questions:

1) Where do plants live?

2) Do all kinds of plants live in all parts of the world?

3) Do all plants need rich soil?

4) What elements do plants need for life?

5) How do botanists divide the world?

6) What are the main biomes?

4. Describe the plants in your regions.

Learning Project Task: Understanding Deforestation

Objective:

To understand the causes, impacts, and potential solutions to deforestation through research, critical thinking, and creative presentation.

Part 1: Research (Individual Task)

Goal: Gather information about deforestation, its causes, effects, and solutions.

Research the causes of deforestation:

Identify both natural and human-made causes of deforestation (e.g., agriculture, urbanization, logging, wildfires, etc.).

Explore the role of climate change in exacerbating deforestation.

Research the consequences of deforestation:

What environmental, social, and economic effects does deforestation have? (e.g., loss of biodiversity, climate change, disruption of water cycles, etc.)

How does deforestation impact indigenous communities and wildlife?

Explore solutions to deforestation:

What actions are being taken to combat deforestation? (e.g., reforestation programs, sustainable agriculture, policies, and laws).

How can technology, such as satellite monitoring or drones, help fight deforestation?

Part 2: Presentation (Group Task)

Goal: Create a comprehensive presentation based on your findings.

Create a multimedia presentation (PowerPoint, Google Slides, etc.) on deforestation. The presentation should include:

Introduction: Define deforestation and its global significance.

Causes: Detail the major causes of deforestation.

Impacts: Discuss the environmental, social, and economic impacts of deforestation.

Solutions: Present potential solutions and ongoing efforts to reduce deforestation.

Case Study: Pick a specific example of deforestation (e.g., the Amazon Rainforest) and highlight its causes, effects, and ongoing solutions in that region.

Include at least two of the following visual elements:

Infographics that summarize key data (e.g., rate of deforestation, affected regions).

Maps to show areas affected by deforestation.

Short video clips or animations that demonstrate the deforestation process or efforts to prevent it.

Interactive Element:

Design a survey or quiz to test knowledge about deforestation, its causes, and impacts. You could use tools like Google Forms or Kahoot! for this activity.

Part 3: Action Plan (Group Task)

Goal: Develop a personal or community action plan to reduce deforestation.

Develop an Action Plan:

What are some practical steps that individuals, communities, or governments can take to reduce deforestation?

Encourage students to think about sustainable lifestyle changes they can make (e.g., reducing paper consumption, supporting companies with sustainable practices, or planting trees).

Include a discussion of the role of consumer choices in reducing deforestation (e.g., choosing sustainable palm oil, paper products, etc.).

Organize a Virtual Campaign:

As a group, design a short campaign to raise awareness about deforestation. This could include creating posters, social media posts, or even organizing an online event where you present the findings of the research and action plan.

Part 4: Reflection (Individual Task)

Goal: Reflect on what you've learned and how you can contribute to reducing deforestation.

Write a reflection paper (300-500 words) on the following:

What was the most surprising thing you learned about deforestation?

Why do you think deforestation continues to be a major global issue?

How can you personally help reduce deforestation in your daily life?

How does this project influence your view on environmental conservation?

Assessment Criteria:

Research and Knowledge: Depth of understanding of deforestation's causes, effects, and solutions.

Creativity and Presentation: Quality and creativity in presenting the findings (clarity, visuals, engagement).

Collaboration: Active participation in group tasks (research, presentation, and action plan).

Reflection: Thoughtfulness and critical thinking in the reflection paper.

INSECTS

Insect is a small, six-legged animal. Bees, ants, wasps, butterflies, cockroaches, ladybugs, termites, and moths are insects. So are house-flies, mosquitoes, silverfish, grasshoppers, crickets, and fleas. The world of insects includes some of the most beautiful and fantastic animals on earth. No other branch of animal kingdom has such great variety in size, colour and form.

Most insects measure less than 6.4 millimeters long. The smallest one include fairy flies and certain kind of beetles. These insects are about 0.25 millimeters long, and they could easily crawl through the eye of the smallest needle. Giant insects are the Goliath beetle, which grow more than 10 centimeters long and the Atlas moth, which has a wingspread of about 25 centimetres. There are insects of all colours of the rainbow. Insects have an amazing variety of shapes

and special structures. Some insects look like sticks, green leaves, dry leaves, or snail shells.

Scientists discover from 7,000 to 10,000 new species of insects every year. They believe there may be from 1 million to 10 million new species still undiscovered.

Insects live almost everywhere on earth – from steamy tropical jungles to cold polar regions. They live high on snow-capped mountains, and in the deserts below sea level. They can be found in caves deep in the earth, or flying high in the sky. Only in the oceans are few insects found.

We are constantly at war with some insects. They annoy us, bite us, and infect us with deadly diseases. They attack our crops, our pets, and our domestic animals. They invade our homes, eat our food, and damage our property. But insects have also a great value to us. They pollinate many of our crops, provide us with honey and other products, and serve as food for fish, birds, and many other animals. In fact, life as we know it could not exist if all the insects were to disappear.

Insects are among the most fascinating animals on earth. They smell chiefly with their antennae, and some taste with their feet. Many insects hear by means of hairs on their bodies. Others have “ears” on their legs or on the sides of their bodies. Insects have no voices, but some make noises that can be hear 1.6 kilometers away. Insects have no lungs, but breathe through holes in their sides. Some insects have no eyes, and others have five eyes or more. Many insects enormous strength. An ant can lift a weight 50 times as heavy as its body. If a 79-kilogram man could do as well, he could lift more than 3.6 metric tons with his teeth. A flea can broad-jump about 33 centimeters. If a human-being could do as well, he she could jump 210 meters.

Vocabulary:

Bee - бджола

ant - мураха

wasp - оса

butterfly - метелик

cockroach - тарган

ladybug - сонечко

moth – нічний метелик

dragonfly - бабка

silverfish - мотиль

grasshopper – коник стрибунець

lice - воша

cricket - цвіркун

flea – блоха

1. Complete the sentences and translate them into Ukrainian:

1) Insects smell chiefly with their … |
2) Many insects hear by means of … | spiders
   on their bodies. | strength
3) Some insects have no …, and others | lungs
   have five … or more. | antennae
4) Many insects have enormous … . | antennae
5) Insects have no …, but breathe through | eyes
   holes in their sides. | eyes
6) … have eight legs. | wings
7) Most insects have … and …, but spiders. | hears

2. Answer the following questions:

a) How many species of insects have scientists describe?
b) Are all species of insects described?
c) Where do insects live?
d) Are insects helpful for us?
e) When did insects appear on earth?
f) Have they adapted themselves to living conditions?
g) How do we call scientists who study insects?
h) Do insects vary greatly in size and colour?

3. **Translate into English:**

1) Комахи є корисними для людини.

2) Комахи пристосовуються до будь-яких умов життя.

3) Мурахи і бджоли є найбільш працьовитими комахами.

4) Метелики можуть мати забарвлення всіх кольорів веселки.

5) Деякі комахи е небезпечними і для тварин, і для людини.

6) Комахи живуть всюди як в тропіках так і в холодних полярних регіонах.

4. **Fill in the propositions:**

To be … war, to smell … antennae, to taste … their feet, to hear … means of hairs, to have holes … sides, to jump … 33 centimeters, variety … size, story … insects, the world … insects.

An idiom: *I have butterflies in my stomach.- В мене стиснулось серце.*

Learning Project Task: Exploring the World of Insects

Objective:

To understand the role of insects in ecosystems, their diversity, and their impact on the environment, while encouraging research, creativity, and a deeper appreciation for these small but vital creatures.

Part 1: Research (Individual Task)

Goal: Explore and gather information about different aspects of insects.

Insect Classification:

Research and categorize insects into different groups (e.g., beetles, butterflies, bees, ants, dragonflies, etc.).

Explain the basic characteristics that define insects (e.g., three-part body, six legs, exoskeleton).

Insect Roles in the Ecosystem:

Investigate the essential roles insects play in ecosystems (e.g., pollination, decomposition, food sources for other animals, pest control).

Look into how insects impact plant growth and biodiversity.

Insect Adaptations:

Explore the fascinating adaptations that insects have developed to survive in their environments (e.g., camouflage, flight, metamorphosis).

Choose one insect and explain its unique adaptations (e.g., how a moth's camouflage helps it survive).

Threats to Insects:

Examine the current threats to insect populations (e.g., habitat loss, pesticides, climate change, invasive species).

Discuss the consequences of declining insect populations on ecosystems and humans.

Part 2: Field Investigation (Group or Individual Task)

Goal: Observe insects in their natural habitat and collect data.

Insect Observation:

Spend some time outdoors (e.g., in a park, garden, or forest) observing different insects in their natural habitat.

Take notes or photographs of the insects you encounter, noting their behavior, appearance, and environment.

Insect Identification:

Using a field guide or online resources (e.g., iNaturalist), identify the insects you observe and classify them.

Make a list of at least five different insects you find and provide details about each one (name, habitat, role in the ecosystem).

Part 3: Presentation (Group or Individual Task)

Goal: Create a comprehensive presentation based on your research and observations.

Create a Multimedia Presentation (PowerPoint, Google Slides, or Poster): The presentation should include:

Introduction to Insects: Define what insects are and why they are important to ecosystems.

Classification: Provide an overview of the major insect groups and their key characteristics.

Roles in Ecosystems: Explain the roles insects play in nature, with examples of pollinators, decomposers, etc.

Adaptations: Discuss how insects have adapted to survive in different environments.

Threats to Insects: Highlight the major challenges insects face today and the consequences of insect population decline.

Case Study: Focus on one specific insect (e.g., honeybee, monarch butterfly) and explain its role, behaviors, and the challenges it faces.

Visuals:

Include at least two of the following:

A short video or time-lapse showing an insect's life cycle or behavior.

An insect identification chart or infographic.

Photos or drawings of the insects you observed during your field investigation.

Interactive Element:

Include an interactive segment in your presentation, like a "Guess the Insect" quiz or a brief demonstration of how insects move or communicate (if possible).

Part 4: Insect Habitat Creation (Creative Group Task)

Goal: Design and create a model of an insect-friendly habitat.

Design an Insect Habitat:

As a group, design a small-scale habitat that would support a variety of insects (e.g., a butterfly garden, bee hotel, or ant farm).

Consider the types of plants, shelter, and food that would support insects in this habitat.

Build the Habitat:

Create a physical model of the habitat using natural materials (e.g., cardboard, small plants, sticks) or design a digital version (e.g., using a 3D modeling tool).

Present the habitat and explain how it would support different types of insects and their roles in the ecosystem.

Part 5: Reflection (Individual Task)

Goal: Reflect on what you've learned about insects and their importance.

Write a Reflection Paper (300-500 words) on the following:

What did you find most interesting about insects during this project?

Why are insects important to the environment, and what could happen if they disappeared?

What can you personally do to help protect insects and their habitats?

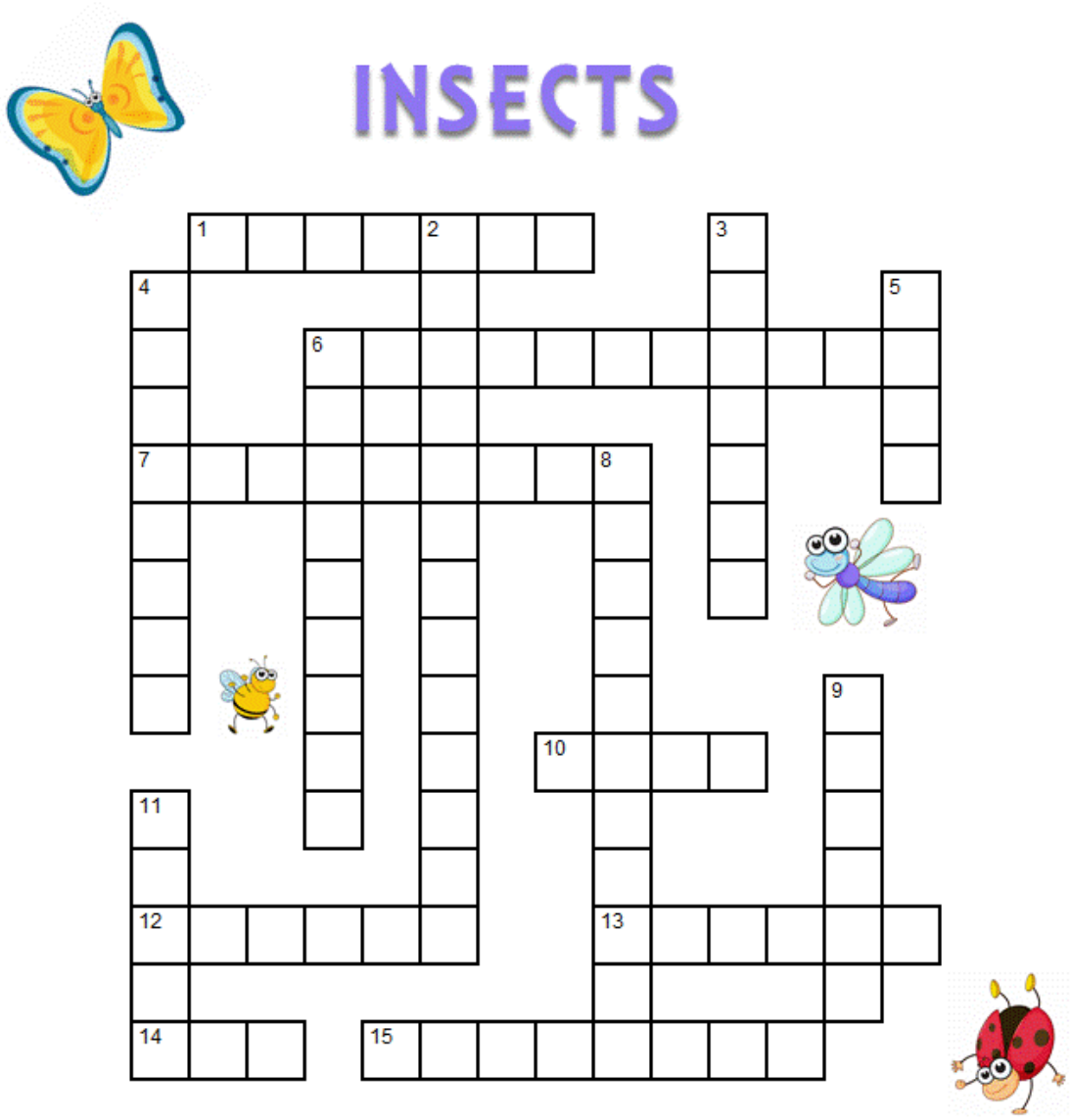
Assessment Criteria:

Research and Knowledge: Depth of understanding about insect classification, roles, adaptations, and the threats they face.

Creativity and Presentation: Quality and creativity in presenting your findings, including visuals and interactive elements.

Collaboration: Active participation in group tasks (field observation, habitat creation, etc.).

Reflection: Thoughtfulness and depth in the reflection paper on the importance of insects.



ACROSS

1. last of the three segments of an insect
6. baby butterfly
7. chemical odor used to communicate
10. first of the three segments of an insect
12. young insects that look almost identical to their parents
13. middle segment of an insect
14. number of legs on an insect
15. long sense organs covered with tiny hairs

DOWN

2. process of changing shape
3. process of shedding the exoskeleton
4. eye with many lenses
5. beetle larvae
6. protected place where metamorphosis takes place
8. hard external shell of an insect
9. young insects that look very different from their parents
11. many, but not all, adults insects have these

BIRDS

God loved the birds and invented trees. Man loved the birds and invented cages.

Jacques Deval

1. Pre-reading activities:

   Answer the following questions:

   1) What is a bird?
   2) Where do birds live?
   3) What are the main features of birds?
   4) Are they vertebrates?
   5) Are birds cold-blooded or warm-blooded?
   6) What do the feed on?
   7) Are birds important and useful for us? Why?

Some species of birds in Ukrainian areas:

Sparrow		горобець
Tit		синиця
Swallow, sand martin		ластівка
Raven, crow		ворон
Owl		сова
Eagle		орел
Falcon		сокіл
Nightingale		соловей
Crane		журавель
Stork		лелека
Woodpecker		дятел
Lark		жайворонок
Pigeon, dove		голуб
Quail		перепілка

Swan		лебідь
Thrush, blackbird		дрозд
Starling		шпак
Cuckoo		зозуля
(to) nest		гніздо, гніздитися
To twitter, to chirp		щебетати, цвірінькати
magpie		сорока

2. Read and translate the text:

BIRDS

Bird is an animal with **feathers.** All birds have feathers, and they are the only animals that have them. But when people think of birds, they usually think first of their flying **ability**. All birds have wings. The fastest birds can reach speeds well over 160 kilometers per hour. No other animal can travel faster than birds. However, not all birds can fly. For example**, ostriches** and penguins are flightless. Instead of flying, ostriches walk or run. They use their wings only for balance. Penguins swim. They use their wings like **flippers.**

People have always **been fascinated** by birds. Their **marvelous** flying ability makes them seem to be the fastest of all animals. Many birds have **gorgeous** colours or sing sweet songs. The charms of birds have **inspired** poets, painters and composers.

There are about 9,700 kinds of birds. The smallest bird is the **bee hummingbird,** which grow only 5 centimeters long. The largest bird is the ostrich, which may grow up 2.4 meters tall. Birds live in all parts of the world, from the polar regions to tropics. They are found in forests, deserts, and cities; on grasslands, farmlands, mountaintops, and islands, and even in caves. Ducks, **gulls,** geese and certain other birds always live near water. Most such birds can swim. Some birds, especially those in tropics, stay in the same general area throughout life. Even in Arctic and Antarctic, some **hardy birds** stay the year round. But many birds migrate each year.

All birds hatch from eggs. Among most kinds of birds, the female lays her eggs in a nest built by herself or her **mate** or by both of them. The majority of birds have one mate at a time, with whom they raise one or two sets of babies a year. Some birds keep the same mate for life but others choose a new mate every year. Most baby birds remain in the nest for several weeks or months after **hatch**ing. Their parents feed and protect them until they can care for themselves.

Birds belong to the large group of animals called vertebrates. Like mammals and unlike fish and reptiles, birds are warm-blooded. Unlike most other vertebrates birds lack teeth. Instead, they have a hard bill, or **beak**, which they use in getting food and for self-defense.

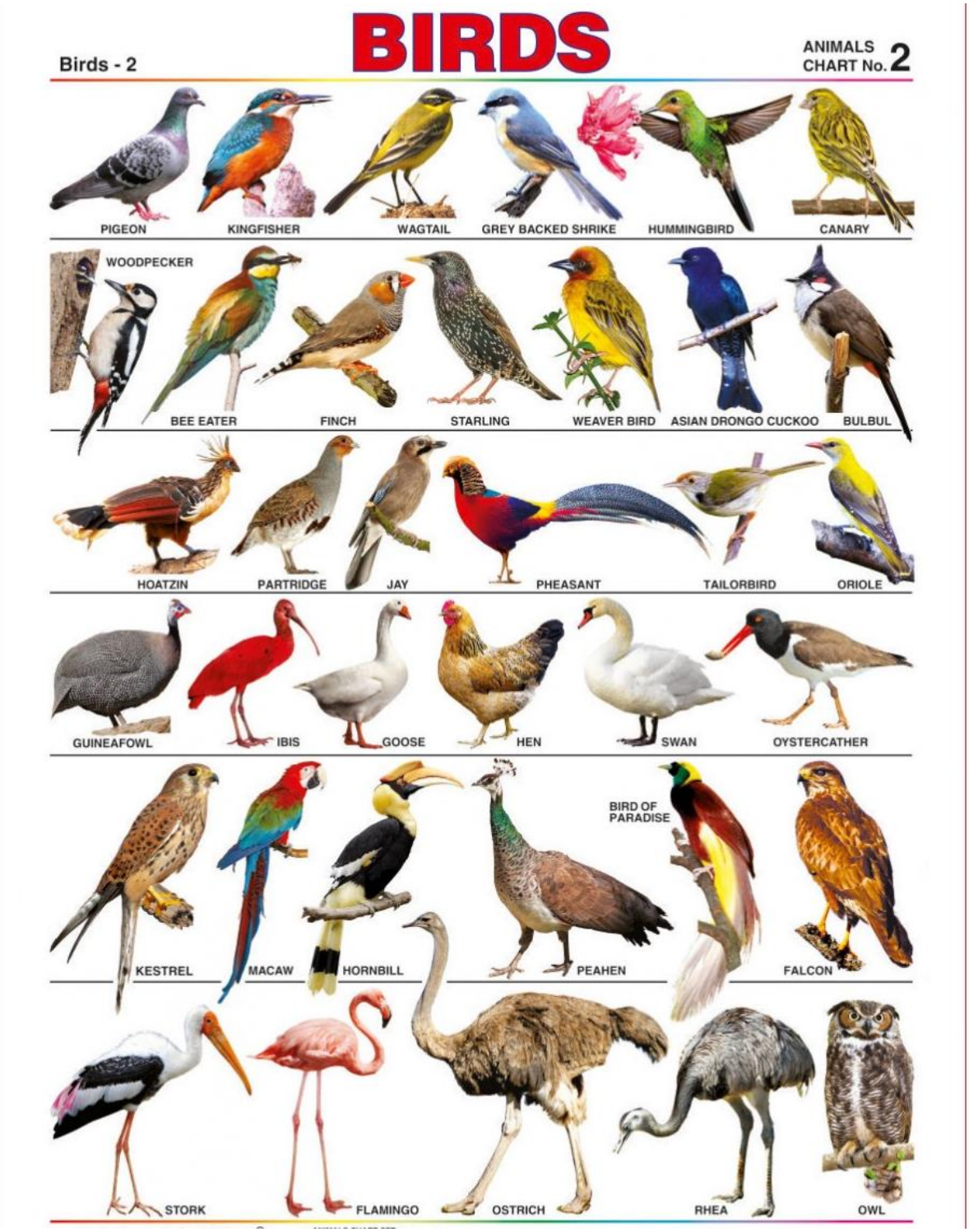
Many birds are valuable to people. Such birds like ducks and chicken provide us with meat, eggs and feathers. Some birds help farmers by eating insects that attack their crops. People have long kept certain kinds of birds as pets. Some types of birds eat farmers' grain and fruit. But in general, birds do much more good than harm.

Since the XVII century about 80 kinds of birds have died out. People have killed off most of them by overhunting or by destroying their environment to create farms and cities. Today most countries have laws to protect birds.

Essential Vocabulary:

Feather		пір'я
an ability		властивості
an ostrich		страус
a flipper		плавник, ласта
to be fascinated		бути зачарованим
marvelous		чудесний
gorgeous		яскравий
to inspire		надихати
a bee hummingbird		колібрі

a gull		чайка
a hardy bird		птах, який стійкий до холоду
a mate		самець, самка
to hatch		вилуплюватись
a beak		дзьоб



3. *Translate the following word combinations:*

Розвивати швидкість, на годину, бути зачарованим, яскраві кольори, полярні регіони, мігрувати в теплі регіони, обирати самця (самку), залишатися в гнізді, належати до великої групи, використовувати для самозахисту, бути цінним для людей.

4. *Fill in the propositions and translate the following word combinations:*

Hatch …the egg, lay eggs … a nest, to have one mate … a time, the same mate …life, … several weeks, to belong … the same group, to help … eating insects, animals … feathers, the charms … birds, to be valuable … people.

5. *Answer the following questions:*

1) Do all birds fly?
2) How many kinds of birds are there?
3) Can any birds swim?
4) Where do birds lay their eggs?
5) What group do birds belong to?
6) What do they use their beaks for?
7) Why are birds valuable to people (to nature balance)?
8) How do people protect the birds?
9) Are birds protected in our region?

6. *Some birds serve as symbols. Complete the sentences and translate them:*

1) People have long regarded the … as a symbol of wisdom. | swan
2) People say that … bring spring on its wings. | owl
3) The … has long represented political and military might. | eagle (2)
4) The … is the symbol of peace. | cock
5) People ask the … “How long I’ll live?” | starling
6) In all countries the … is the symbol of love and loyalty. | dove

7) Double- headed … is the national emblem of Russia. | cuckoo
8) … is the hero of many fairy tales. |

7. Match English proverbs with their Ukrainian equivalents:

1. A bird in a hand is worth two in the brush. 2. Birds of a feather flock together. 3. To kill one birds with one stone. 4. The early birds catches the warm. 5. One swallow doesn't make a summer. 6. A little bird told me.	А) Вбити двох зайців одним пострілом. Б) Одна ластівка весни не робить. В) Краще синиця в руках, ніж журавель в небі. Г) Свій свояка бачить здалека Д) Хто рано встає, тому Бог дає. Е) Сорока на хвості принесла.

8.Make your English better. Idioms:

An early bird	Рання пташка
That's a feather in his cap	Це для нього предмет гордощів
That's will make the feather fly	Через це буде сварка
To feather one's own nest	Нагріти руки, набити кишені
You might have knocked me down with a feather	Я мало не впав від несподіванки
A pigeon-headed person	боягуз

Some interesting facts about birds

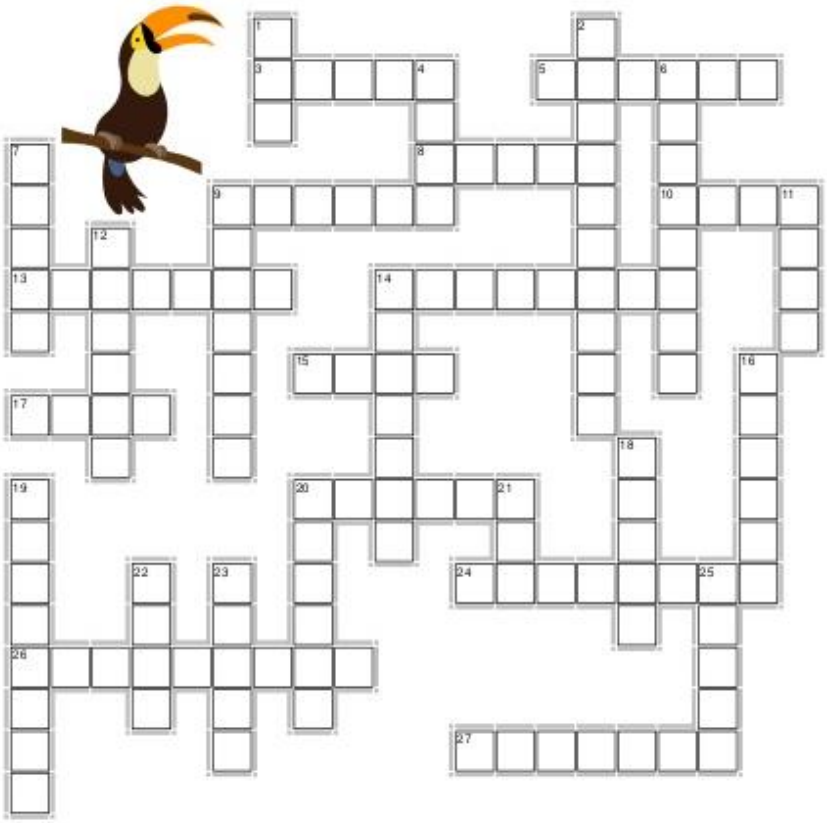
- ✓ The highest flyer is the bar-headed goose. Some flocks of bar-headed geese fly over the world's highest mountain range, Himalaya in Asia, at altitude of more than 7,625 meters.
- ✓ The fastest diver is peregrine falcon (білоголовий сокіл). The bird's broad, powerful wings are streamlined body enable it to swoop on its prey at speed of more than 320 kilometers per hour.
- ✓ The largest bird is male of African ostrich. It may grow as tall as 2.4 meters and weigh as much as 140 kilograms.

- ✓ The smallest bird is bee hummingbird. When fully grow, it measures about 5 centimeters and weigh about 3 grams. The nest of bee hummingbird is the size of half a walnut shell.
- ✓ The greatest traveler, Arctic terns(арктичний альбатрос), can migrate father than any other birds. They travel about 17,700 kilometers each way between their breeding grounds in the Arctic and winter home in Antarctic.
- ✓ The deepest diver is the emperor penguin. Emperor penguins have recorded underwater at depths of almost 270 meters. They use their wings to propel themselves through the water.

9. Say True or False are the following statements after viewing the video:

1) Eagle has a good eyesight.
2) Owl can hunt only at night time and turn his head round 360^{o}.
3) A vulture is a scavenger. But he has not a strong digestive system .
4) Hawk and falcon are the fastest birds.
5) Peacock is one of the most beautiful bird and the national bird in Italy.
6) Woodpecker makes his house in a tree trunk.
7) Crow is the most intelligent bird and can adopt to any climate.
8) Ostriches can fly.
9) Ducks and swans make their nests as on land as in water.

Birds Crossword ★★★



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Word List

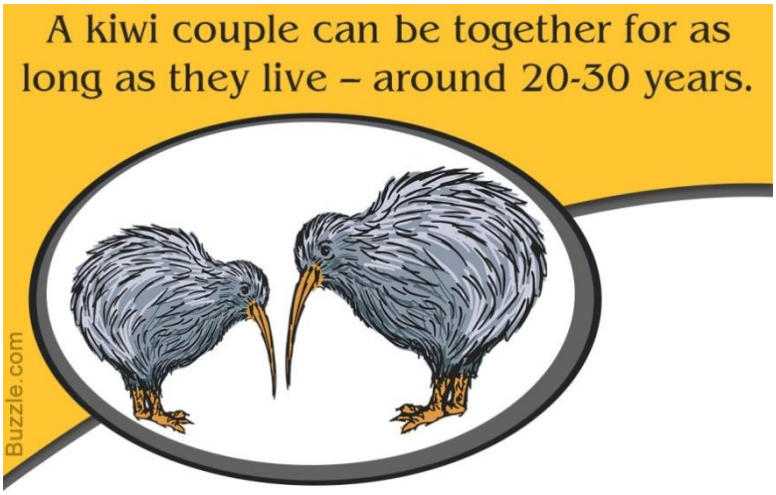
Blackbird
Canary
Cockatoo
Crow
Cuckoo
Duck
Eagle
Emu
Flamingo
Galah
Goose
Honeyeater
Ibis
Kakapo
Kiwi
Lyrebird
Macaw
Ostrich
Owl
Parrot
Peacock
Pelican
Pheasant
Pigeon
Quail
Robin
Seagull
Swan
Toucan
Wren

Across

3. A brightly coloured South American bird
5. A brightly coloured South American bird with a big beak
8. A bird of prey
9. A racing bird
10. New Zealand's national bird
13. Found at the beach
14. Rhymes with pleasant
15. Western Australia's bird emblem
17. A big black bird similar to a raven
20. A clock is named after this bird
24. Usually with light pink to bright red plumage and often stands on one leg
26. Often seen and heard in the garden
27. A flightless bird found in Africa

Down

1. Australia's national bird
2. A bird that collects nectar from flowers
4. A small bird with names like "blue" and "fairy"
6. A common name is "cocky"
7. Rhymes with moose
9. Mr Percival in the book and movie *Storm Boy*
11. A wading bird with a long bill
12. Rhymes with carrot
14. A bright blue bird with a magnificent tail
16. A New Zealand flightless parrot
18. A small cage bird
19. An Australian bird which mimics sounds
20. A cage bird often taken down mines
21. Wise as an ...
22. A domestic bird
23. Often used as a person's name
25. A pink and grey Australian bird



Learning Project Task: Discovering the World of Birds

Objective:

To explore the diverse world of birds, their unique features, behaviors, and ecological importance, while fostering research, observation skills, and creative presentation.

Part 1: Research (Individual Task)

Goal: Investigate the biology, behavior, and ecological significance of birds.

Bird Classification:

Research the major groups of birds (e.g., songbirds, waterfowl, raptors, seabirds, flightless birds) and describe the key characteristics that define each group.

Explain how birds are classified scientifically (e.g., order, family, species) and give examples for each group.

Anatomy and Adaptations:

Study the unique physical characteristics of birds (e.g., beaks, feathers, wings, and talons).

Explore how different birds have adapted to their environments (e.g., beak shape for feeding, wing shape for flight, color for camouflage).

Bird Behavior:

Investigate common bird behaviors such as migration, nesting, courtship, and feeding.

Choose one bird species and describe its specific behavioral patterns, such as migration routes, territorial habits, or social structures.

Ecological Role of Birds:

Research how birds contribute to ecosystems, including their role as pollinators, seed dispersers, predators, and scavengers.

Investigate the importance of birds in controlling pest populations and maintaining balance in natural habitats.

Threats to Birds:

Explore the major threats that birds face today (e.g., habitat loss, climate change, pollution, hunting).

Research the impact of these threats on bird populations and how conservation efforts are addressing these issues.

Part 2: Bird Watching and Fieldwork (Group or Individual Task)

Goal: Observe birds in their natural environment and collect data.

Bird Observation:

Spend time outdoors (e.g., in a park, backyard, nature reserve) observing birds. Take notes on the species you see, their behavior, and their environment.

Use binoculars, a bird guidebook, or an app like iNaturalist to identify different bird species.

Create a Bird Observation Journal:

Record the species of birds you observe, their behavior, and the time of day. Include sketches or photographs if possible.

Pay attention to patterns in their behavior, such as feeding habits, flight patterns, or social interactions.

Conduct a Bird Count (Optional):

Organize a bird count in your local area or a designated outdoor space. Record the number and types of birds you see over a set period (e.g., 30 minutes to 1 hour).

Compare the results with local birdwatching data or share your findings with a citizen science project like the Audubon Society's Great Backyard Bird Count.

Part 3: Presentation (Group or Individual Task)

Goal: Share your research findings and field observations in an engaging format.

Create a Multimedia Presentation (e.g., PowerPoint, Google Slides, or Poster): Your presentation should include:

Introduction to Birds: Define what birds are and why they are important in ecosystems.

Classification of Birds: Present the major bird groups with examples and key characteristics.

Anatomy and Adaptations: Describe the unique features of birds that help them survive in their environments.

Behavioral Patterns: Discuss interesting behaviors like migration, nesting, and feeding with examples of specific birds.

Ecological Role: Explain the role of birds in maintaining healthy ecosystems (e.g., pollination, pest control, seed dispersal).

Threats to Birds: Discuss the main threats birds face and the importance of conservation efforts.

Visuals and Interactive Elements:

Include at least two of the following:

A video of bird migration, feeding, or a bird in flight.

Infographics or charts about bird migration patterns or population declines.

Photos or sketches of birds from your field observations.

You could also create a short quiz or game about bird species for the class to participate in after the presentation.

Part 4: Conservation Project (Group Task)

Goal: Propose solutions to protect birds and their habitats.

Research Conservation Efforts:

Investigate existing bird conservation programs (e.g., protecting migratory routes, creating bird sanctuaries, banning harmful pesticides).

Research local bird species that are endangered or at risk and the efforts being made to protect them.

Create a Conservation Action Plan:

As a group, design a simple action plan to protect birds in your community or region. This could include activities like:

Planting bird-friendly plants (e.g., native flowers, trees).

Setting up bird feeders or birdhouses.

Organizing local birdwatching events to raise awareness.

Starting a petition or letter-writing campaign to support bird protection laws.

Present your action plan to the class and discuss how others can get involved in bird conservation.

Part 5: Reflection (Individual Task)

Goal: Reflect on the significance of birds and the role you can play in conservation.

Write a Reflection Paper (300-500 words) on the following:

What was the most surprising or interesting thing you learned about birds during this project?

Why do you think birds are crucial to the health of ecosystems and humans?

What are some ways that you personally can contribute to the protection of birds and their habitats?

How did this project change your perspective on conservation and the importance of biodiversity?

Assessment Criteria:

Research and Knowledge: Depth of understanding about bird classification, behaviors, anatomy, and ecological roles.

Creativity and Presentation: Quality and creativity in presenting your findings, including visuals and interactive elements.

Collaboration: Active participation in group tasks (fieldwork, conservation project, action plan).

Reflection: Thoughtfulness and depth in the reflection paper, demonstrating a personal connection to the topic.

Pre-reading activity:

Where do animals live?

What are some ways in which animals and plants are connected?

Are animals important for us? Why?

Who is the main predator of animals?

Do animals need our protection? Why?

ANIMALS

Animals come in many shapes and sizes. They live throughout the world. Animals walk or crawl on land and dig through the soil. They swim in the water and fly through the air. They even live inside bodies of other animals. Bats, dogs, horses, kangaroos, and moles are all animals. So are butterflies, frogs, and jellyfish, pigeons, sharks, snakes and worms.

Most kinds of animals are less than 2.5 centimeters long. Many are so tiny that they can be seen only with a microscope. The largest animal is the blue whale. It is about as long as five elephants in a row. Animals are not only a kind of living things. Scientists divide living things into five main *kingdoms* (groups) – animals, plants, fungi, protists, and minerals.

No one knows exactly how many kinds of animals there are. So far, scientists have identified more than 1.5 million types of animals. About 1 million of these are insects. There are about 21,000 kinds of fish, 9,700 kinds of birds, 6,500 kinds of reptiles, 4,000 kinds of amphibians and 4,500 kinds of mammals. Many new species are discovered every year. Scientists believe there may be from 2 million to as many as 50 million kinds of animals alive today. Many other kinds of animals used to live on the earth but have died out. They include dinosaurs and dodos.

Animals have provide people with food and clothing. For example, cattle supply meat, milk and leather. Chickens lay eggs. Sheep provide wool and meat.

Some domesticated animals help people work Water buffaloes pull plows in Asian rice fields. Horses and camels carry people from one place to another. At first, people kept cats in their houses to catch rats and mice. They raised dogs to

help them hunt and to warn them when danger approached. Today, cats and dogs are kept largely as pets.

Certain insects are useful to people. Bees make honey, which people harvest for food. Bees also pollinate many food crops, including fruits and vegetables. Silk comes from fiber made by silkworms.

Vocabulary:

to crawl
a jellyfish
a worm
to lay –
to pull plow –
to raise –
to warn –
to pollinate –
crop

1. Translate the following word combinations. Pay attention on propositions.

Жити у всьому світі
Літати в повітрі
Види тварин
вимирати
бути видимим через мікроскоп
поділяти на п’ять груп
забезпечувати людей їжею
без тварин
перевозити людей з одного місця на інше
понад половину видів

2. Complete the sentences and translate them into Ukrainian.

1) The largest animal in the world is … . |
2) The tallest of all animals is … . | African elephant
3) The largest ears of all animals are those of the | peregrine falcon
… . Its ears grow as large as 1.2 meters across. | blue whale

4) Some … … have lived more than 100 years. | giraffe
5) Some animals can be dangerous to people. … | white shark
… sometimes kill and eat people. | giant tortoises
6) The fastest animal is … . With powerful wings |
this bird can reach a speed of more than 320 |
kilometers per hour. |

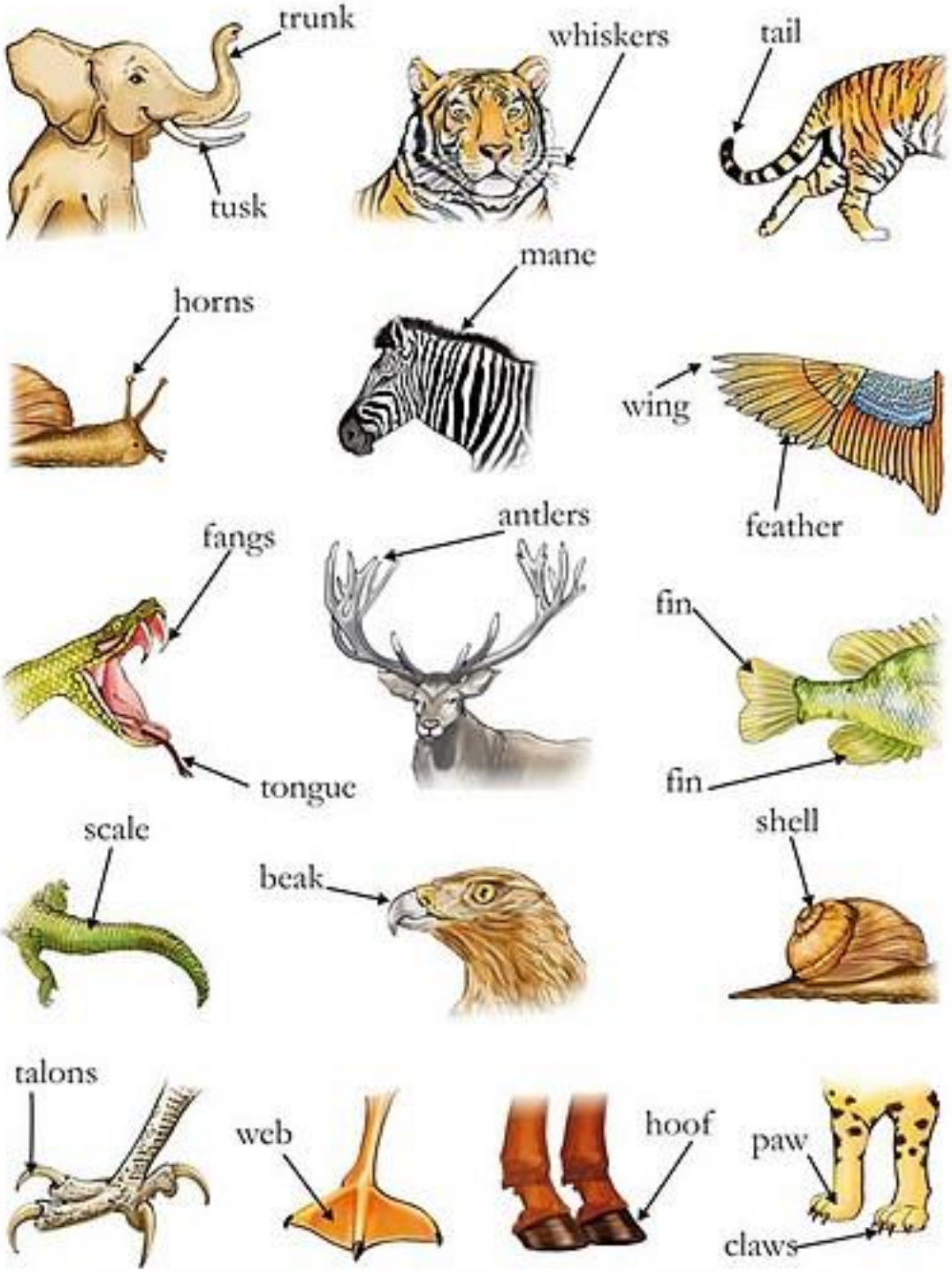
3. Answer the following questions:

a) Where do animals live?
b) How do they differ from each other?
c) How do scientists divide all animals?
d) Why are animals important for people?
e) How do domesticated animals help people to work?
f) Are any insects useful to people?

Where can the animals live?
Unjumble the names of the places

- forest
- Ervir
- Glejun
- Tainsmoun
- Rycount
- Sertde
- Ceoan
- Afrm
- Wnto
- Riafca
- Bergice

Animal Body Parts



KINDS OF ANIMALS

People often divide animals into various groups based on certain similarities the animals share. For example, some animals can be kept as pets, but others are wild. Arranging animals according to their similarities is a handy way of remembering and understanding them.

Animals can be grouped in many ways. They can be arranged according to whether they live on land or in water. Animals that live on land are known as *terrestrial animals.* They include cats, dogs, lizards, mice, and worms. Animals that live in water are called *aquatic animals.* They include eels, fish, octopuses, and whales.

Some animals are called *cold-blooded*, and others are *warm-blooded.* The bodies of cold-blooded animals are warm when their surrounding are warm and cool when their surroundings are cool. Warm-blooded animals, on the other hand, almost always have the same body temperature, regardless of the warmth of their surroundings. Birds, mammals, and a few species of fish and insects are warm-blooded. All other kinds of animals are cold-blooded.

Animals are also commonly divided into groups according to whether they have backbones. *Invertebrates* do not have backbones, but *vertebrate* do. The vast majority of animals are invertebrates. They include clams, insects, jellyfish, sea urchins, snails, spiders, sponges, and worms. Birds, fish and mammals are vertebrates. So are amphibians – frogs, salamanders and other animals that spend part of their lives in water and part on land.

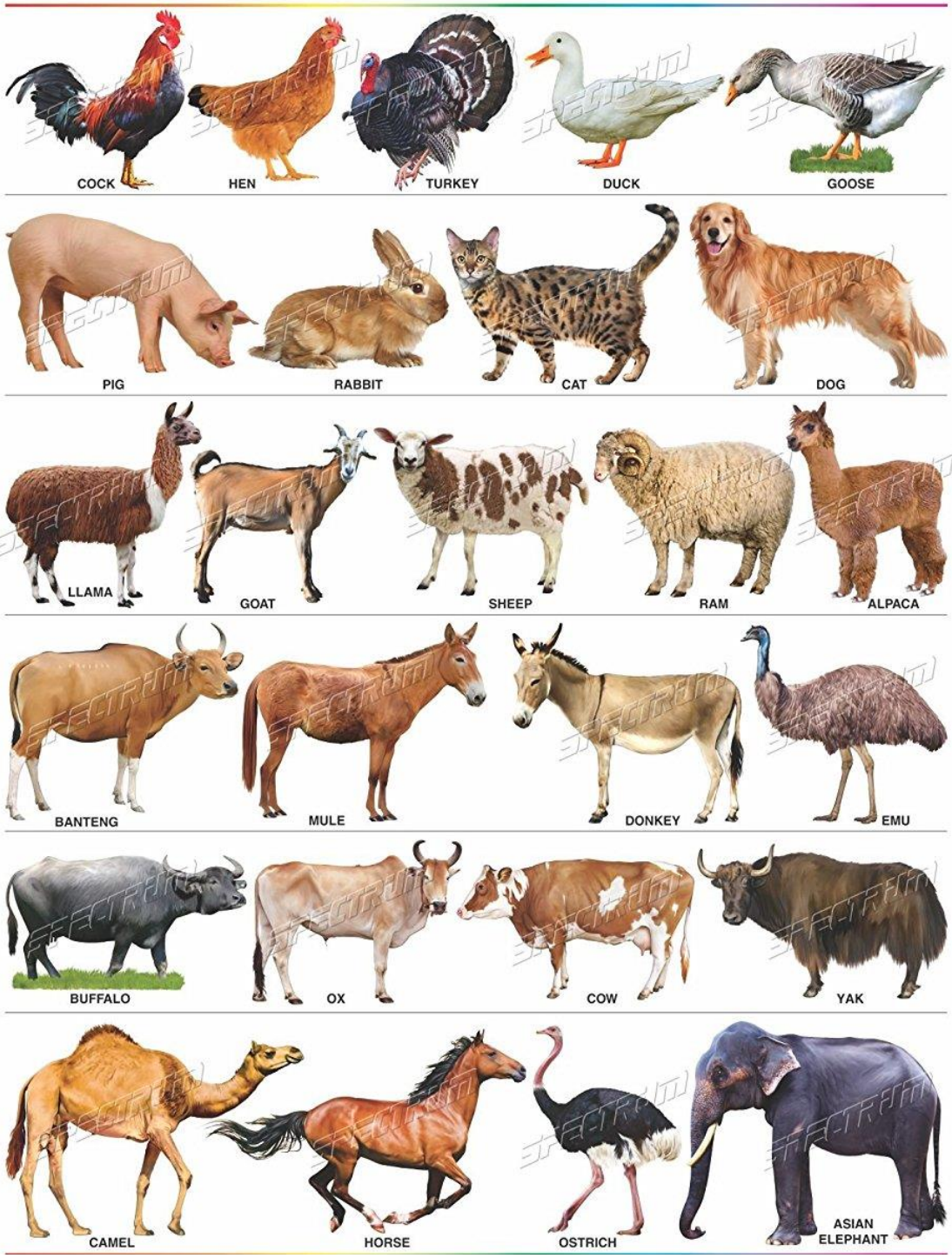
All animals need food to survive. Animals eat plants, other animals, or both plants and animals. Animals that eat plants are called *herbivores.* Zebras, cows, and moose are herbivores. Animals that lives on other animals are called *carnivores* or *meat-eaters.* Dogs, lions or sharks are carnivores. Animals that eat both animals and plants are known as *omnivores.* Bears are omnivores.

Biologists describe the relationship between animals in a habitat and the foods they eat as a food chain.

Domestic Animals

ANIMALS

ANIMALS CHART No. 6



1. Translate the following word-combinations:

to divide into

to be based on

to be kept as

according to

to be grouped

to be known as

on the other hand

a few species of

to be called

to need food to survive

2. Answer the questions:

a) How do we call animals that are kept as pets?

b) How do we call animals that are not domesticated?

c) How can animals be grouped according to whether they live?

d) How do we group animals according to the temperature of their bodies?

e) What do animals eat? How do we group them?

3. Put down the names of animals into the table:

Horse, cat, owl, deer, canary, crocodile, goldfish, elephant, squirrel, penguin, pigeon, snake, seahorse, turtle, wolf, goose, duck, sheep, mouse, salamander, perch, bear, zebra, goat, ostrich, monkey, tuna.

Mammals	Birds	Fish	Reptiles

4. Describe some animals in writing.

THE EXTINCTION OF SPECIES

Exactly how many species the Earth supports is still unknown – estimates vary from 3 to 10 million. New plant species are being recorded each year. What is clear, however, is that many species are disappearing. Current estimates are that 2,000 vertebrates are in danger of extinction as are 10 per cent of all the flowering plants known to science – about 25, 000 species. Of 145 indigenous cattle breeds found in Europe and the Mediterranean, no less than 115 are now threatened with extinction.

It is vital that as many species as possible be saved. Almost all of our agriculture and much of our medicine depend on strains which have been successfully adapted from the wild gene pool.

Rubber and quinine both came from the discovery of new trees. It is quite possible that new products of equal importance may yet emerge from the gene stock which is still waiting to be discovered, particularly in the tropical rain forests. The armadillo, for example, has recently be discovered to be the only animal other than man capable of contracting leprosy. As a result of this, a leprosy vaccine is now being developed. And in view of the growing importance of biotechnology, the preservation of microbial strains of life is also becoming urgent.

Vocabulary:

extinction - вимирання

estimate – приблизна оцінка

indigenous – місцевий, природній
strain – порода, штам
gene pool (stock) – Генетичний резерв (запас)
rubber - каучук
quinine - хінін
emerge – з'явитися
armadillo - броненосець
contract leprosy – захворіти на проказу
urgent – важливий

1. **Translate the word-combinations:**

   extinction of species
   to save from extinction
   conservation
   human interference
   involvement of local population
   to depend on
   cattle breed
   to be quite possible
   to be urgent

2. **Answer the following questions:**

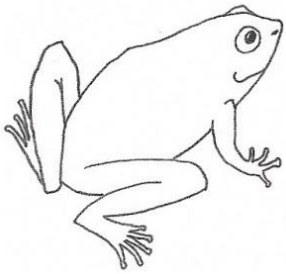
a) Do we have danger of extinction any species?
b) How many species are in danger of extinction?
c) What facts can you give to illustrate the danger of extinction of species?
d) In what way does the Gene Pool serve humanity?
e) Is the growing of biotechnology important?

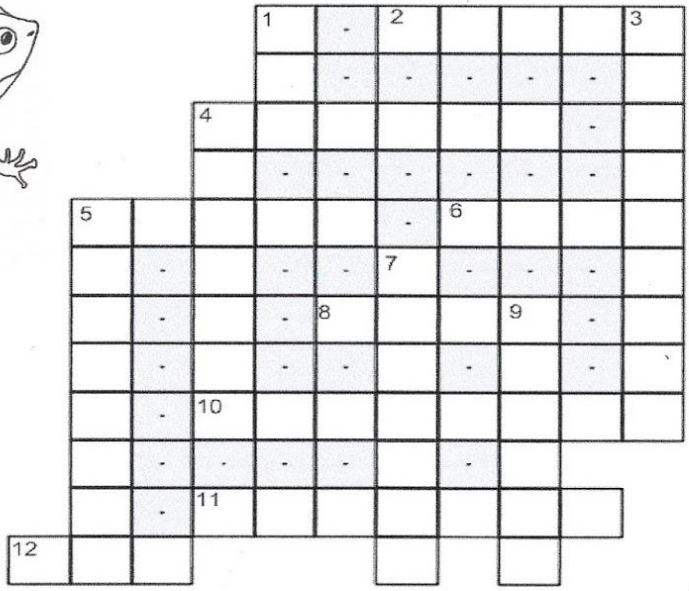
3. **Translate the following sentences into English:**

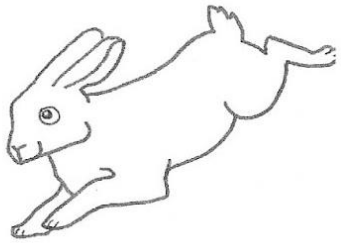
1) Кожного року наші вчені відкривають нові види тварин і рослин.
2) Людська діяльність призвела до вимирання багатьох видів.
3) Майбутнє нашої екосистеми залежить від нашої діяльності.
4) Створення нових національних парків допоможе нам зберегти природу.

5) Є життєво необхідним зберегти якомога більше видів.
6) Наука повинна служити не тільки людині, алей природі.
7) Екологи повинні залучати місцеве населення до збереження навколишнього середовища.

Animal Crossword





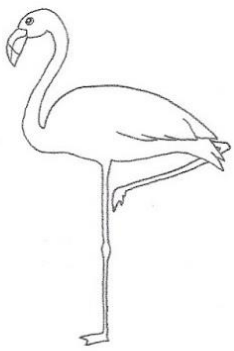


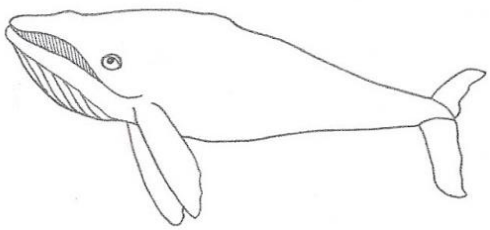
Across

2. This large, gentle mammal eats bamboo.
4. Some kinds of this colorful bird can be trained to talk.
5. This fish is the top predator in the ocean.
6. This bumpy amphibian starts its life as a little tadpole.
8. This amphibian can regrow its tail if it gets bitten off by a predator.
10. This bouncy mammal carries its young in a pouch.
11. This intelligent mammal is the largest in the primate family.
12. Some types of this slippery fish can stun their prey.

Down

1. This limbless reptile squeezes its prey.
3. This tough mammal rolls into a ball to protect itself.
4. This bird uses its impressive tail to attract a mate.
5. The male of this type of fish carries its eggs in a pouch to protect them.
7. This flightless bird is an excellent swimmer.
9. This reptile has a strong shell to protect itself from predators.





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Project Title: "The Impact of Animal Extinction on Ecosystems and Biodiversity"

Objective:

To understand the causes and consequences of animal extinction, raise awareness about endangered species, and explore conservation efforts to protect biodiversity.

Learning Goals:

Understand the causes of animal extinction – natural and human-made factors.

Analyze the consequences of animal extinction on ecosystems.

Research and identify endangered species – focusing on different species worldwide.

Evaluate conservation efforts – governmental and non-governmental.

Present findings and propose actions to protect endangered species.

Project Steps:

Introduction to Extinction (Research Phase)

Write a brief summary (1-2 pages) explaining the concept of extinction.

Differentiate between "extinct," "endangered," and "vulnerable" species.

Identify at least 3 key reasons animals go extinct, including natural factors and human impacts like habitat destruction, climate change, poaching, and pollution.

Case Study: Endangered Species

Choose 3 endangered species from different ecosystems (e.g., marine, terrestrial, or aviary).

For each species, provide:

Scientific name

Habitat and geographic location

Reasons for endangerment

Current conservation efforts

Role of the species in its ecosystem

Consequences of Extinction on Ecosystems

Investigate how the extinction of one species can affect an entire ecosystem.

Write a 2-page report discussing:

Trophic cascades (e.g., the removal of a predator or prey)

Disruption of food chains and biodiversity loss

Impact on human societies (e.g., agriculture, medicine, tourism)

Conservation Efforts

Research and provide examples of successful conservation programs for endangered species (e.g., captive breeding, habitat restoration, anti-poaching laws).

Discuss the role of international organizations like the WWF, CITES, and the IUCN in combating extinction.

Propose an Action Plan

Develop a creative action plan to protect one of the endangered species researched.

This could include advocacy campaigns, awareness programs, or innovative conservation strategies.

Present your action plan as a proposal (1-2 pages) with key steps, timelines, and a list of stakeholders (governments, NGOs, local communities).

Final Presentation

Prepare a presentation summarizing your research and action plan (using PowerPoint, Prezi, or a poster).

Include visuals such as pictures, infographics, and charts to support your findings.

Present to your class, community, or group, highlighting the urgency of animal conservation.

Assessment Criteria:

Depth and accuracy of research

Clear understanding of extinction causes and consequences

Creativity and practicality of the action plan

Quality of presentation (organization, visuals, and engagement)

Contribution to class discussions and reflections

WILDLIFE

Animals are a part of the environment, too. Millions of them are killed or treated cruelly by man every year. There are five main groups:

a) animals are used for scientific research (e.g. rabbits, dogs);
b) animals are killed for sports (e.g. foxes, migratory birds);
c) animals are killed for their fur and skin (e.g. crocodiles, elephants, snakes);
d) animals are in danger because their environment are in danger (e.g. gorillas, sea animals, fish, insects). The polluted environments also caused problems with their immune and reproductive systems;
e) animals are kept in cruel conditions (e.g. stray animals, domestic animals).

A ban should be imposed on the hunting of species on the brink of extinction (like the black-necked crane, for example). It's high time a moratorium be put on the shooting of certain species of migratory ducks and geese. In this way birds in Siberia, Europe, China, Africa and other regions could be protected. Antarctica is expected to be the zone of protection for 90 per cent of the world's whales, which feed in the waters of the southern hemisphere, so all whaling in more than 28 million square kilometers around Antarctica should be stopped and the zone should be turned into the sanctuary.

"The cod fishery, the herring fishery, the pilchard fishery, the mackerel fishery, and probably all the great sea fisheries are inexhaustible". Thus wrote a researcher in 1883. But he was wrong. Fisheries are the most blatantly exhaustible resource on the planet: fish need stronger protection.

Yet regulation of net sizes, fishing limits or boat numbers, the solution urged on us endlessly by Greens, has failed almost everywhere, most spectacularly in the case of the European Common Fisheries Policy, because politicians have every incentive to be lenient and fishermen to cheat.

So, the lack of comprehensive environmental legislation results in the problem with fisheries, when they tend to collapse from overfishing.

Vocabulary:

wildlife – жива природа
fur - хутро
to stray – бродячі, бездомні

ban - заборона
crane - журавель
migratory birds – перелітні птахи
whaling – полювання на китів
sanctuary - заповідник
cod - тріска
herring - оселедець
pilchard - сардина
mackerel – скумбрія
(in)exhaustible – (не)вичерпний
to fail – зазнати поразку
spectacularly – явно, помітно
incentive - стимул
lenient - поблажливий
cheat – обманювати

1. **Translate the following word-combinations into English:**

Використовувати для наукових досліджень

Хутро та шкіра

Бути в небезпеці

Спричиняти проблеми

Репродуктивна система

Мисливство і рибалка

Відстріл певних видів

Перетворюватись на

Бути неправильним

Обмеження рибальства

2. **Answer the questions:**

a) Why do man kill animals?

b) Do polluted environment kill animals?

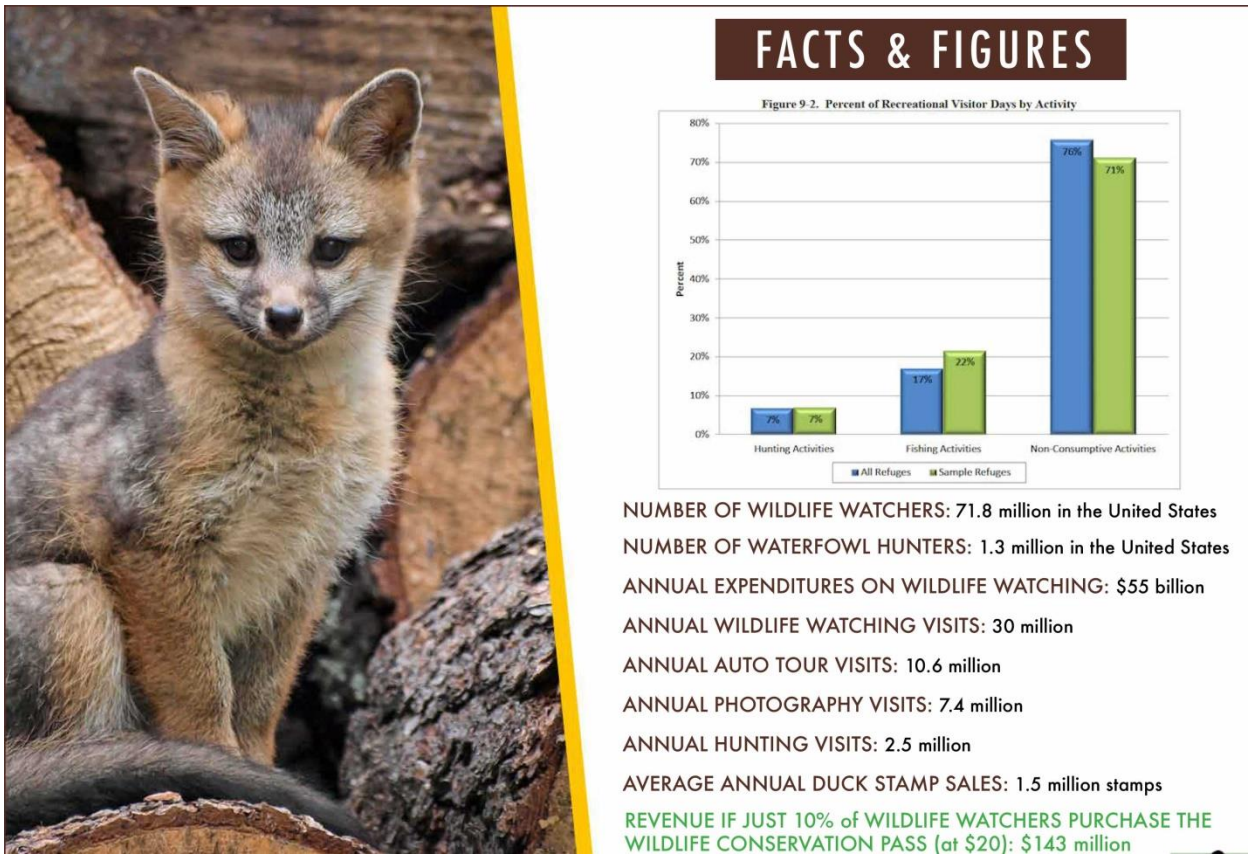
c) Can a ban on hunting protect animals and birds?

d) What part of the Earth is the largest sanctuary zone?

e) Do fish need stronger protection?

f) What solutions are suggested?

3. **Imagine that you are a member of international conference. Retell you friends about the problems of wildlife in your region (country).**



Навчальне видання

Подоляк Михайло Володимирович,
Бінкевич Олена Михайлівна

English for Ecology Students

Навчальний посібник

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Відповідальний за випуск – Борис Корпан

Підписано до друку 26.06.2025. Формат 60х84/16
Гарн. Times New Roman. Папір офсетний. Ум. друк. арк. 6,74
Наклад 30 прим. Зам. № 26/06

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