МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
ХАРКІВСЬКИЙ НАЦІОНАЛЬНИЙ ПЕДАГОГІЧНИЙ УНІВЕРСИТЕТ
імені Г.С. СКОВОРОДИ

Н.К. СОЛОШЕНКО-ЗАДНІПРОВСЬКА

ENGLISH FOR STUDENTS OF NATURAL SCIENCES

Навчальний посібник для практичних занять з англійської мови для студентів природничого факультету зі спеціальностей: 014 Середня освіта (Біологія та здоров'я людини), 014 Середня освіта (Хімія), 016 Спеціальна освіта (дефектологія та реабілітологія), 091 Біологія

Навчальний посібник

Харків – 2018

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Навчальний посібник

Затверджено на засіданні кафедри теорії і практики англійської мови Харківського національного педагогічного університету імені Г.С. Сковороди. Протокол № 6 від 29.01.2018

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Запропонований посібник містить добірку текстів та завдань до них, які розташовані за принципами тематичності та доступності. Матеріал даного видання упорядковано відповідно до тематики лексичного матеріалу, що опановується студентами під час вивчення профільних дисциплін.

Збірник розрахований на студентів 1-2 курсів немовних факультетів, зокрема природного.

Contents

Передмова

Сучасні умови потребують підготовки в усіх галузях висококваліфікованих спеціалістів, які б вільно володіли щонайменше однією іноземною мовою як засобом професійно-орієнтованого міжкультурного спілкування. Навчальний посібник з англійської мови, який ви тримаєте в руках, певною мірою допоможе вирішити це завдання.

Посібник призначений для навчання студентів немовних спеціальностей англійської мови і розрахований на використання у вищих закладах освіти.

Навчальний матеріал організований за тематичним принципом та розподілений на 15 тематичних частин: Biosphere. Ecosystem, Incredible Earth, Botany, Entomology, Zoology. Ornithology, Entomology, Reptiles and Mammals, Overview of Animal Behavior. Ethology, The problems of environmental protection, Agriculture, The human anatomy, Immunology, Stay Healthy, Cytology, Molecular Biology, Genetics.

Кожний цикл посібника містить мовний матеріал: тексти для читання, проблемні завдання для обговорення, завдання для розвитку писемного мовлення тощо. Викладач може використовувати цей матеріал як в аудиторії, так і для домашніх завдань, у різному обсязі залежно від рівня підготовки студентів.

Різний стартовий рівень володіння студентами іноземною мовою, як відомо, є специфікою немовних факультетів вищих закладів освіти. Для того, щоб викладач мав можливість гнучко підходити до організації навчальної діяльності студентів залежно від рівня їх навченості англійської мови на момент вступу до навчального закладу, посібник включає різні за складністю вправи та завдання.

Отже робота з цим навчальним посібником передбачає професійну творчість з боку викладача щодо вибору тієї методичної стратегії навчання, яка є оптимальною для даної групи і для кожного окремого студента.

I. Biosphere. Ecosystem

I. Lead in.
Discuss the following items.

1. “The earth does not belong to man; man belongs to the earth. This we know. All things are connected, like the blood which unites one family. All things are connected.”

John Hollow Horn

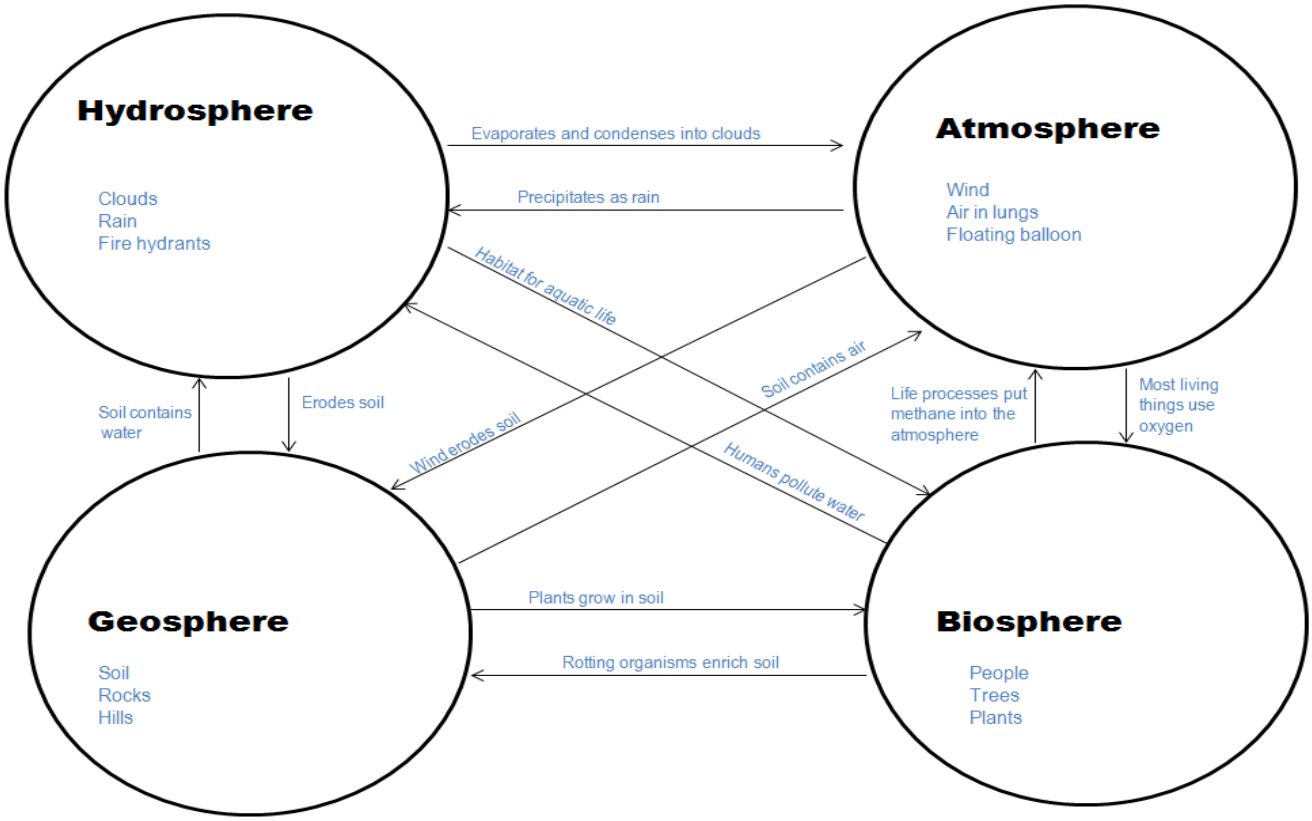
2. “Earth provides enough to satisfy every man's needs, but not every man's greed.”

Mahatma Gandhi

3.“The universe is so arranged that the power to destroy the climate or the ecosystem of your home planet only comes when you also have the wisdom to know that doing so is a fatal mistake. Therefore, any species that does that is suicidal, and will probably not qualify for any kind of help, from the powers of the universe, with fixing that error.”

J.Z. Colby

II. Speaking.
Study and describe the interaction of the following systems.



III. Vocabulary

Find the Ukrainian equivalent to the following words and phrases.

a) a community of plants	1. харчовий ланцюг
b) primary producers	2. хижак
c) a prey	3. середовище існування
d) a delicate balance	4. суворі місця
e) detritivores	5. сонячне випромінювання
f) the harsh places	6. вирубка лісів
g) hotspots	7. випаровування
h) to interact with each other	8. енергія, що поглинається
i) to harvest energy	9. жити в безпосередній близькості один від одного
j) habitat	10. здобич
k) a consumer	11. травоїдні
l) solar radiation	12. органічні складові
m) biotic	13. хлорофіл
n) a predator	14. взаємодіяти один з одним
o) chlorophyll	15. території з вимираючими видами тварин
p) scavengers	16. група рослин
q) deforestation	17. наявність поживних речовин
r) the food chain	18. мертві тканини
s) biodiversity	19. випаровування вологи рослинами

t) symbiosis	20.біотичні фактори
u) transpiration	21.абіотичні фактори
v) organic constituents	22.детритофаги
w) evaporation	23.біологічна різноманітність
x) carnivores	24.редуценти
y) precipitation	25. симбіоз
z) herbivores	26.природна діяльність
aa) abiotic	27.харчова мережа
bb) to live in close proximity to each other	28.первинні продуценти
cc) decomposers	29.хижаки
dd) the captured energy	30.падальщики
ee) the availability of nutrients	31.поглинати енергію
ff) natural activity	32.споживач
gg) dead tissues	33.крихка рівновага
hh) a food web	34.опади

IV. Reading.

1. Match the terms with their definitions.

1.atmosphere	**a.** Concept of Earth as a self-regulating living thing.
2.biosphere	**b.** Rigid outermost shell or layer of a rocky planet; land is part of the lithosphere.
3.Gaia hypothesis	**c.** Layer of gases that surrounds a planet; held in place by gravity.
4.homeostasis	**d.** Tendency of a system to maintain a stable internal environment.
5.hydrosphere	**e.** Combined mass of water found on, under, and over the surface of a planet.
6.lithosphere	**f.** Part of Earth that supports life, including the crust, water, and atmosphere.

2. Read and translate the text.

Is Earth a living organism?

Most scientists agree that the Earth itself is not a living thing. However, the Earth does have some aspects of life. Some scientists argue that the Earth maintains homeostasis, a stable state, just like a living organisms.

The Biosphere

The highest level of ecological organization is the biosphere. It is the part of Earth, including the air, land, surface rocks, and water, where life is found. Parts of the lithosphere, hydrosphere, and atmosphere make up the biosphere. The lithosphere is the outermost layer of the Earth's crust; essentially land is part of the lithosphere. The hydrosphere is composed of all the areas that contain water, which can be found on, under, and over the surface of Earth. The atmosphere is the layer of gas that surrounds the planet. The biosphere includes the area from about 11,000 meters below sea level to 15,000 meters above sea level. It overlaps with the lithosphere, hydrosphere, and atmosphere. Land plants and animals are found on the lithosphere, freshwater and marine plants and animals are found in the hydrosphere, and birds and other flying animals are found in the atmosphere. Of course, there are countless bacteria, protists, and fungi that are also found in the biosphere.

Is the Biosphere Living?

The Gaia hypothesis states that the biosphere is its own living organism. The hypothesis suggests that the Earth is self-regulating and tends to achieve a stable state, known as homeostasis. For example the composition of our atmosphere stays fairly consistent, providing the ideal conditions for life. When carbon dioxide levels increase in the atmosphere, plants grow more quickly. As their growth continues, they remove more carbon dioxide from the atmosphere. In this way, the amount of carbon dioxide stays fairly constant without human intervention.

For a better understanding of how the biosphere works and various dysfunctions related to human activity, scientists have simulated the biosphere in small-scale models. Biosphere 2 is a laboratory in Arizona that contains 3.15 acres of closed ecosystems. Ecosystems of Biosphere 2 are an ocean ecosystem with a coral reef, mangrove wetlands, a tropical rainforest, a savannah grassland and a fog desert. Additional biosphere projects include BIOS-3, a closed ecosystem in Siberia, and Biosphere J, located in Japan.

3. Answer the questions.

1. What is the biosphere?
2. Distinguish between the lithosphere, atmosphere and hydrosphere.
3. Give an example of how Earth is self-regulating.

V. Reading

1. Read and translate the text.

What is an Ecosystem?

An ecosystem, a term very often used in biology, is a community of plants and animals interacting with each other in a given area, and also with their non-living environments. The non-living environments include weather, earth, sun, soil, climate and atmosphere. The ecosystem relates to the way that all these different organisms live in close proximity to each other and how they interact with each other. For instance, in an ecosystem where there are both rabbits and foxes, these two creatures are in a relationship where the fox eats the rabbit in order to survive. This

relationship has a knock on effect with the other creatures and plants that live in the same or similar areas. For instance, the more rabbits that foxes eat, the more the plants may start to thrive because there are fewer rabbits to eat them.

Ecosystems can be huge, with many hundreds of different animals and plants all living in a delicate balance, or they could be relatively small. In particularly harsh places in the world, particularly the North and South Poles, the ecosystems are relatively simple because there are only a few types of creatures that can withstand the freezing temperatures and harsh living conditions. Some creatures can be found in multiple different ecosystems all over the world in different relationships with other or similar creatures. Ecosystems also consist of creatures that mutually benefit from each other. For instance, a popular example is that of the clown fish and the anemone – the clown fish cleans the anemone and keeps it safe from parasites as the anemone stings bigger predators that would otherwise eat clown fish.

At a basic functional level, ecosystem generally contains primary producers (plants) capable of harvesting energy from the sun through the process called photosynthesis. This energy then flows through the food chain. Next come consumers. Consumers could be primary consumers (herbivores) or secondary consumers (carnivores). These consumers feed on the captured energy. Decomposers work at the bottom of the food chain. Dead tissues and waste products are produced at all levels. Scavengers, detritivores and decomposers not only feed on this energy but also break organic matter back into its organic constituents. It is the microbes that finish the job of decomposition and produce organic constituents that can again be used by producers.

Energy that flows through the food chain i.e. from producers to consumers to decomposers is always inefficient. That means less energy is available at secondary consumers level than at primary producers level. Its not surprising but amount of energy produced from place to place varies a lot due to amount of solar radiation and the availability of nutrients and water.

An ecosystem can be destroyed by a stranger. The stranger could be rise in temperature or rise in sea level or climate change. The stranger can affect the natural balance and can harm or destroy the ecosystem. Its a bit unfortunate but ecosystems have been destroyed and vanished by man-made activities like deforestation, urbanization and natural activities like floods, storms, fires or volcanic eruptions.

2. Read the sentences. Then circle T (True) or F (False).

1. An ecosystem is a community of living organisms interacting as a system.	T	F
2. Each kind of relationships has a knock on effect with the other creatures and plants.	T	F
3. Ecosystems are always large, they couldn`t be small.	T	F
4. Ecosystems consist of creatures that mutually benefit from each other.	T	F
5. Each creature has just one ecosystem to exist in.	T	F

6. Microbes finish the job of decomposition and produce organic constituents. T F

7. The process of harvesting energy from the sun is called photosynthesis. T F

8. Any kind influence on the natural balance can harm or destroy the ecosystem. T F

3. Answer the questions.

1. Choose the phrase that correctly finishes this statement: "A species is..."
A specific part of the abiotic environment
B. A way of describing all the living parts of an ecosystem
C. A group of organisms that can successfully mate with each other and reproduce
D. Part of the natural decomposing materials in soil

2. Ecology is the study of the
A. Abiotic parts of the environment, such as climate, air, and soil
B. Biotic parts of the environment, such as animals and plants
C. Interactions between organisms
D. Interactions between organisms as well as the interactions between organisms and their environment

3. What is an ecosystem?
A. All the interacting organisms that live in an environment and the abiotic parts of the environment that affect the organisms
B. A person who observes and studies the interactions between the biotic and abiotic parts of the environment
C. The relationship among the biotic parts of the environment
D. The relationship between all the abiotic elements of a pond

4. An organism that creates its own food is called
A. A producer
B. A consumer
C. A scavenger
D. A decomposer
E. A carnivore

5. A consumer is
A. An organism that produces its own food
B. An organism that does not need food to survive
C. An abiotic organism
D. An organism that cannot produce its own food

6. Which of the following two organisms are producers?
A. Plants and phytoplankton

B. Plants and consumers
C. Consumers and phytoplankton
D. Phytoplankton and chlorophyll
E. Phytoplankton and herbivores

7. A species of plant or animal that is facing imminent extinction or extirpation is said to be
A. Extinct
B. Extirpated
C. Endangered
D. Threatened
E. Special concern

VI. Reading.
1. Read and translate the text.

Types of Ecosystem

There are very many types of ecosystems out there, but the three major classes of ecosystems, sometimes referred to as 'biomes', which are relatively contained, are the following:

- Freshwater Ecosystems
- Terrestrial Ecosystems
- Ocean Ecosystems

Freshwater Ecosystems

These can then be broken up into smaller ecosystems. For instance, in the freshwater ecosystems we find:

- **Pond Ecosystems** – These are usually relatively small and contained. Most of the time they include various types of plants, amphibians and insects. Sometimes they include fish, but as these cannot move around as easily as amphibians and insects, it is less likely, and most of the time fish are artificially introduced to these environments by humans.
- **River Ecosystems** – Because rivers always link to the sea, they are more likely to contain fish alongside the usual plants, amphibians and insects.

These sorts of ecosystems can also include birds because birds often hunt in and around water for small fish or insects.

Freshwater ecosystems are those that are contained to freshwater environments. This includes, but is not limited to, ponds, rivers and other waterways that are not the sea (which is, of course, saltwater and cannot support freshwater creatures for very long). Freshwater ecosystems are actually the smallest of the three major classes of ecosystems, accounting for just 1.8% of the total of the Earth's surface. The ecosystems of freshwater systems include relatively small fish (bigger fish are usually found in the sea), amphibians (such as frogs, toads and newts), insects of various sorts and, of course, plants. The absolutely smallest living part of the food web of these sorts of ecosystems is plankton, a small organism that is often eaten by fish and other small creatures.

Terrestrial Ecosystems

Terrestrial ecosystems are many because there are so many different sorts of places on Earth. Some of the most common terrestrial ecosystems that are found are the following:

- **Rainforests** – Rainforests usually have extremely dense ecosystems because there are so many different types of animals all living in a very small area.
- **Tundra** – As mentioned above, tundra usually have relatively simple ecosystems because of the limited amount of life that can be supported in these harsh conditions.
- **Deserts** – Quite the opposite of tundra in many ways, but still harsh, more animals live in the extreme heat than live in the extreme cold of Antarctica, for instance.
- **Savannas** – These differ from deserts because of the amount of rain that they get each year. Whereas deserts get only a tiny amount of precipitation every year, savannas tend to be a bit wetter which is better for supporting more life.
- **Forests** – There are many different types of forests all over the world including deciduous forests and coniferous forests. These can support a lot of life and can have very complex ecosystems.
- **Grasslands** – Grasslands support a wide variety of life and can have very complex and involved ecosystems.

Since there are so many different types of terrestrial ecosystems, it can be difficult to make generalizations that cover them all.

Because terrestrial ecosystems are so diverse, it is difficult to make generalizations about them. However, a few things are true almost all of the time. For instance, most contain herbivores that eat plants (that get their sustenance from the sun and the soil) and all have carnivores that eat herbivores and other carnivores. Some places, such the poles, contain mainly carnivores because not plant life grows. A lot of animals and plants that grow and live in terrestrial ecosystems also interact with freshwater and sometimes even ocean ecosystems.

Ocean Ecosystems

Ocean ecosystems are relatively contained, although they, like freshwater ecosystems, also include certain birds that hunt for fish and insects close to the ocean's surface. There are different sorts of ocean ecosystems:

- **Shallow water** – Some tiny fish and coral only live in the shallow waters close to land.
- **Deep water** – Big and even gigantic creatures can live deep in the waters of the oceans.
- **Warm water** – Warmer waters, such as those of the Pacific Ocean, contain some of the most impressive and intricate ecosystems in the world.
- **Cold water** – Less diverse, cold waters still support relatively complex ecosystems. Plankton usually forms the base of the food chain, following by small fish that are either eaten by bigger fish or by other creatures such as seals or penguins.

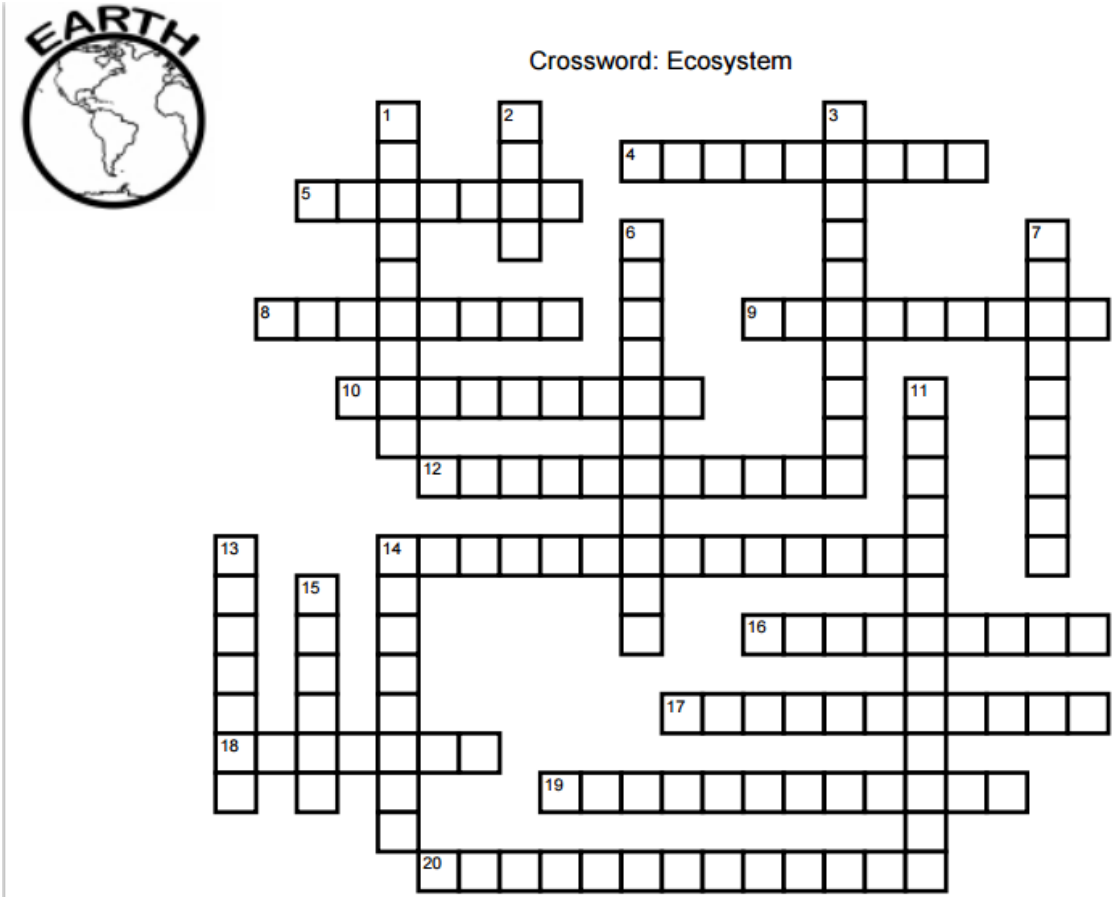
Ocean ecosystems are amongst some of the most interesting in the world, especially in warm waters such as those of the Pacific Ocean. This is not least because around 75% of the Earth is covered by the sea, which means that there is lots of space for all sorts of different creatures to live and thrive. There are actually three different types of oceanic ecosystems: shallow waters, deep waters and the deep ocean surface.

These plankton and other plants that grow in the ocean close to the surface are responsible for 40% of all photosynthesis that occurs on Earth. From this there are herbivorous creatures that eat the plankton, such as shrimp, that are then themselves usually eaten by bigger creatures, particularly fish. Interesting, in the deep ocean, plankton cannot exist because photosynthesis cannot occur since light cannot penetrate that far into the ocean's depths. Down in the deepest depths of the ocean, therefore, creatures have adapted very strangely and are amongst some of the most fascination and the most terrifying and intriguing living creatures on Earth.

2. Answer the questions.

1. What makes up an ecosystem?
2. How can change in one part of an ecosystem affect change in other parts of the ecosystem?
3. Why is sunlight essential to life on Earth?
4. How do humans have an impact on the diversity and stability of ecosystems?

VII. Do the crossword



Across

4. organisms that produce their own food
5. network of related food chains
8. ecosystems where species are endangered
9. organisms that get nutrients by eating other organisms
10. a type of consumer that eats plant material
12. tiny plants and animals that break down dead materials into nutrients
14. the process plants use to make food from sunlight, water and carbon dioxide
16. a partnership between organisms that helps one or both of them survive
17. change of water from a liquid to a gas state
18. non-living factors that affect organism survival, such as water availability, pollution, and temperature range
19. the number of different organisms in an ecosystem
20. water vapor forms clouds and returns to Earth

Down

1. plants and animals in an area, functioning together with their surroundings
2. an animal killed for food
3. consumers that feed upon organisms that other organisms have killed
6. green material in plant leaves
7. a type of consumer that eats animal material
11. water lost to the atmosphere by the activities of plants
13. natural home of a plant or animal
14. an animal that kills other animals for food
15. living factors that directly or indirectly affect an organism in its environment, such as disease, predators, and parasites

VIII. Writing. A food chain is a community or organisms where one member is eaten in turn by another member. Choose and describe one of the natural food chains.

II. Incredible Earth

I. Lead in.

Discuss the following items.

1. What do you do in your life to care for the Earth?
2. What do you know about the surface of the Earth?
3. What are the biggest challenges facing Earth?
4. Do you think it's possible to save the Earth?
5. What will happen to the Earth if all humans disappear from it?

II. Reading.

1. Read and translate the text.

Incredible Earth

Earth is round, like an orange. Earth has a skin. We call this skin Earth's crust. Under the crust there is very hot rock. Earth's crust has different pieces. These pieces move very, very slowly. Millions of years ago, the pieces moved and made mountains. When two pieces of the crust move and meet there can be earthquakes.

A volcano is a hole in Earth's crust. When a volcano erupts, hot rock flies out from under the ground, and melted rock pours out over the ground. Volcanoes under the ocean sometimes make new islands.

There are many different rocks in Earth's crust. They are millions of years old. The rocks are often different colors. In the Painted Desert in Arizona in the USA you can see the different rocks.

On Earth there is more ocean than land. Did you know that there are mountains and valleys under the ocean? Some of these mountains are bigger than on land. The water in the ocean is always moving. Waves hit the land and break the rocks. Sometimes, big pieces of rock fall into the ocean. They leave big cliffs.

Rivers usually begin as streams in mountains. The water comes from rain or snow. All rivers then go to the ocean. Big rivers are very strong. When the ground under a river is soft, the river makes valleys. When the ground under it is hard rock, there are waterfalls or rapids.

The coldest places on Earth are in the highest mountains, and at the North and South Poles. Here, there are rivers made of ice. They are called glaciers. Glaciers begin when snow falls. Mountain glaciers move very, very slowly down the mountain. When the ice melts, the water goes into rivers. It can take thousands of years for the water from a glacier to get to the ocean. At the North and South Poles, where the glaciers are near the ocean, very big pieces of ice break off. These are called icebergs.

Icebergs move slowly on the ocean. Near the North Pole, Ilulissat is one of the most incredible places on Earth - and one of the coldest. The glacier and icebergs here are very, very big. The glacier is about 40 kilometers long and it moves slowly to the Arctic Ocean. It moves about 30 meters every day

Imagine you are in the park. Suddenly, you hear a loud noise of water moving very fast. Then hot water and steam pour out of the ground. You are looking at a geyser. What makes a geyser? When it rains or snows, the water goes into the ground. Deep under the ground there is hot rock. If rainwater touches a lot of hot rock, it begins to boil. Then there is a lot of steam. Suddenly the water can't stay under the ground. It has to come out. Geysers are very hot, so don't go near them!

The biggest mountain chain in the world is the Himalayas in Asia. It began when two pieces of Earth's crust met and moved up. They began to move about 50 million years ago - and they are moving now, very slowly. The top of Mount Everest in the Himalayas is the highest place on Earth - it's about 9 kilometers above the ocean. Everest is very big and it's getting bigger. The top of Everest goes up about 5 millimeters every year because Earth's crust is moving all the time.

Caves are incredible underground worlds. What makes cave? Near the coast, ocean waves hit cliffs and make holes. In the mountains the moving ice in a glacier

makes caves in the rock. The most incredible caves are in soft rock called limestone. Rain falls on the limestone and makes holes. Slowly, the holes grow bigger and make caves. This takes thousands and thousands of years. Caves are usually very wet because water comes through the rock.

A desert is a dry place, with almost no rain. About 20 percent of the land on Earth is desert. What are deserts made of? Some deserts are made of sand, and many deserts are made of stones or rocks. Deserts are usually hot, but not always. Antarctica is a cold desert. It doesn't rain often there but there's lots of ice The Sahara Desert in Africa is the biggest hot desert on Earth.

Wind, rain, sun and snow - the weather is a part of Earth's story. This story began millions of years ago, and it is still going on. What an incredible story it is!

2. Read the sentences. Then circle T (True) or F (False).

1.	Earth's crust is its skin.	T	F
2.	A volcano is a rock in Earth's crust.	T	F
3.	The rocks are all the same color.	T	F
4.	Oceans cover more territory than land does.	T	F
5.	Valleys are made by oceans. .	T	F
6.	The water from a glacier gets to the ocean very quickly.	T	F
7.	Geysers can't stay under the ground because of steam.	T	F
8.	It is usually very dry in the caves.	T	F
9.	All the deserts are made of sand.	T	F
10.	The biggest mountain chain began with two pieces of Earth's crust	T	F

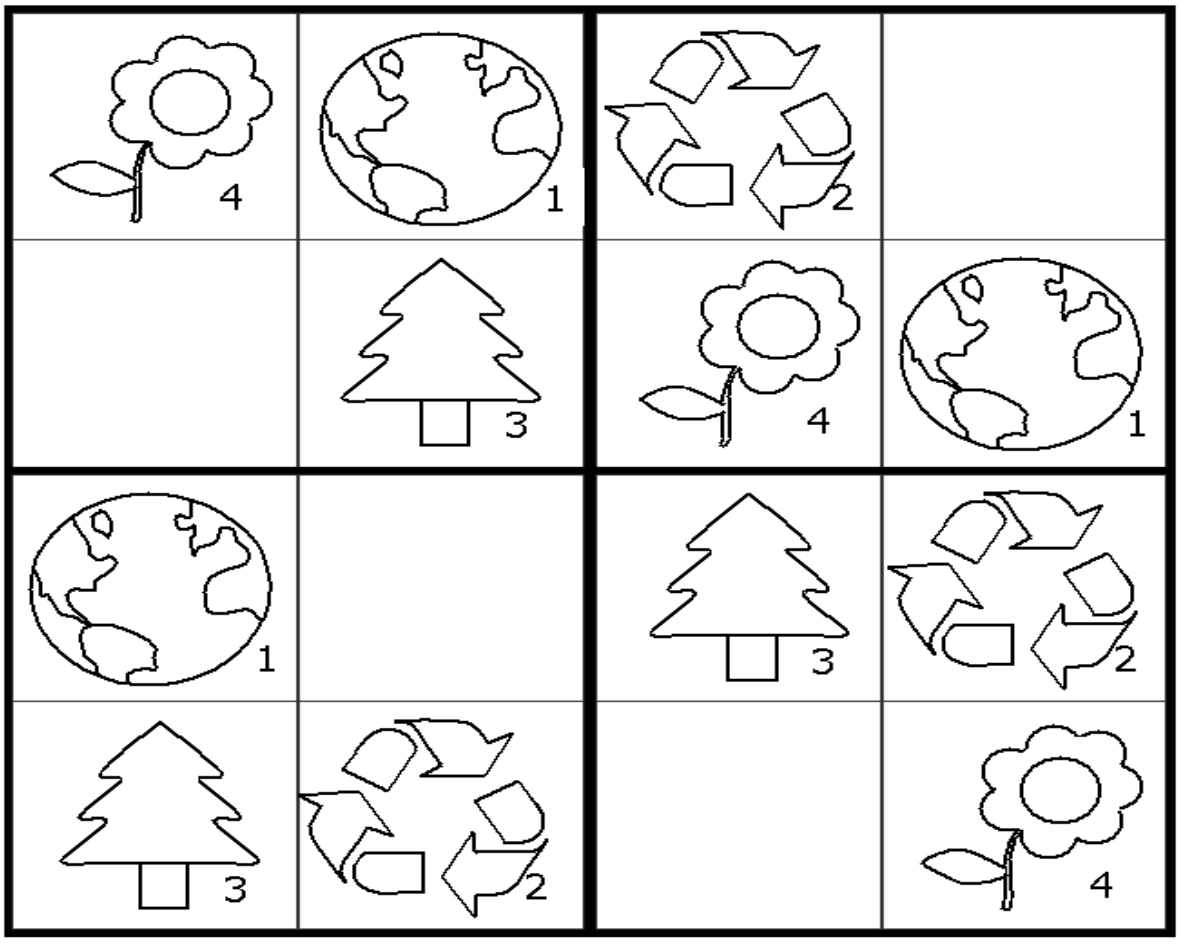
3. How many different words can you make from the phrase?

The Earth is our home

_____	_____
_____	_____
_____	_____
_____	_____

III. Have some fun. Complete the Sudoku puzzle making sure no image is repeated in a row, a column or a square. You can draw the images in or just use the numbers that correspond to the image.

Earth Day Sudoku



Each row, each column and each of the large four squares should have one of each image. Fill in the blanks!

IV. Reading.

1. Before reading answer this question then read and translate the text.

What is the difference between Flora and Fauna?

What are 'Flora and Fauna'?

No matter where we go on the planet, there are stunning plants, flowers and animals that catch our attention. They are two very important aspects of any eco-system. Of all the living organisms on the planet, the most commonly seen by us are the plant life and the animal life. The flora and fauna i.e. plant and wildlife of the earth are fascinating to observe and study.

What is Flora? Flora is the name given to the collective plant life that grows or once grew in a certain area or during a given time period. It usually refers to the native plant life present but does include new species that have been introduced as well. The flora and fauna of the earth have names derived from Latin.

In the language, 'Flora' was a goddess of flowers and plants. In the Roman mythology, she was the goddess of fertility. The study of the plant life around the world is very interesting since is makes different classifications of the flora.

Plant life on the earth can be distinguished from each other in a number of ways. The simplest is to divide on the basis of region. Plants that grow specifically in the mountains will be very different from those that grow in the desert. Similarly, the plants that have adapted to living underwater are treated as a unique form of flora. Scientists can also study 'Fossil Flora', which comprises of plant life that was found in pre-historic times. The current flora and fauna of the earth is also divided on the basis of the environment in which it is grown or seen naturally.

When we talk about 'Native Flora', we are referring to the plant life that is indigenous to a particular region. Cacti are the native flora of deserts all over the world. When we refer to 'Agricultural Flora', we are talking about plant life that has been grown by humans for a certain purpose.

They may or may not be native, but are used by humans for their own needs. Similarly there is 'Garden Flora' or 'Horticultural Flora', which are plants grown for decorative purposes. And then we have the 'Weed Flora', which are plants that are either undesirable in certain areas or invasive within the native plant life.

What is Fauna? Fauna on the other hand, is the name given to collective animal life that lives or was once found in a certain area or time period. In Latin, Fauna is derived from three different sources. Fauna by itself was the name of a Roman goddess representing fertility and the earth and Faunus was another Roman god. And then there were Fauns, which were known to be forest spirits.

Both the flora and fauna of the earth have been given sub-divisions. Fauna is also distinguished in many different ways. However, these ways are much more complex than floral divisions because animal life has evolved into many different forms.

To begin with, the animal kingdom by itself is Fauna. However, within it we have the 'Avifauna' that refers to the birds and 'Piscifauna' referring to the fish. These are simpler classifications, since they do not cover small single celled organisms such as bacteria and virus. They also do not account for the microscopic organisms that abound in nature but cannot be seen by the human eye. Such animal life is known as 'Microfauna'. Much of the flora and fauna of the earth can be seen, but there is a very large percentage that has yet to be named and even discovered.

This is why classifications such as 'Cryptofauna' arise, which refers to animals that are extremely rare and may even be mythological. There are also 'Microfauna', which refers to the extremely small animals and 'Megafauna', that talks about the large animals we usually see.

Planet earth has been blessed in more ways than one. We have complex ecological systems that not only provide us with resources, but make the world a

more beautiful place to live in. Little of this would be possible without the varying flora and fauna of the earth.

2. Match the words with their definition.

a) Eco-system	1. refers to all the animals living in a particular period or a region.
b) Flora	2. all the plants that grow in a particular place or country.
c) Native Flora	3. refers to microscopic organisms that exhibit animal-like qualities.
d) Horticultural Flora	4. the fauna that exist in protected or concealed microhabitats.
e) Weed Flora	5. a fish fauna; fish life of an area.
f) Fauna	6. the birds, or all the kinds of birds, inhabiting a region.
g) Avifauna	7. the plant life occurring in a particular region or time, generally the naturally occurring or indigenous—native plant life
h) Piscifauna	8. all the animals and plants in a particular area, and the way in which they are related to each other and to their environment.
i) Microfauna	9. include the largest animals
j) Cryptofauna	10. plants that are grown for decorative purposes in gardens and landscape design projects, as houseplants
k) Megafauna	11. refers to plant species that are deemed undesirable

3. Reading.

What do you know about flora and fauna of your country? Read and translate the text to find out more about it.

Flora and Fauna of Ukraine

Geographical location of Ukraine, especial geological development, relief, climate, a great number of rivers stipulated a numerous varieties of plant and wild life.

The plant life of Ukraine numbers close to 30,000 species, over four hundred of which are registered on the endangered-species list. Natural vegetation covers over 19 million hectares or close to one third of the country's territory.

Most of the endemic, rare or declining species are located in the Crimean and Carpathian mountains. Almost half of the endemic and 30 percent of the rare and declining plants are concentrated there.

Affected by the human commercial activity, the plant life of Ukraine has undergone considerable change: during the 16th to 19 centuries forest in the forest-steppe zone has been reduced more than five times, while the area with the most valuable oak and beech shrunk by quarter in the 19th century alone. Great damage had been inflicted to forests after the WWII during the reconstruction of the national economy.

As of today, fourteen percent of the Ukrainian territory is covered by forests, which composition of wood species is changing being influenced by the commercial activity. Plantations of fine wood are being expanded while that of the less valuable forest trees (hornbeam and aspen) reduced. Approximately half of the wood stock of Ukraine is conifers: pine, spruce and silver fir.

The forests of Ukraine are rich in berries, mushrooms, fruits of wild growing plants and medicinal plants, which 250 species are used in Ukraine for medical purposes including 150 in medical science. Regions most abundant with medicinal plants are Polissia (marshy woodlands), forest-steppe zone, and Carpathians.

The portrayal of plants is an important element of Ukrainian folk symbolism. In the national tradition symbolic meaning and representation attributed to trees and plants is very similar to that of the all European. Thus, an oak personifies power and endurance, a pine incarnates vital energy and prolificacy, a willow is believed to be a “fore tree” of life and is associated with the alchemy of spring. The guelder rose incarnating sun, fire, perpetuity of life, maiden beauty and eternal love is the traditional symbol of Ukraine.

The wildlife of Ukraine is distinguished by a large variety of species with almost 45 thousand kinds of animals. There are many unique natural localities in Ukraine where one can encounter rare surviving animals.

Elk, roe deer, wild boar, red deer, squirrel are inhabitants of forest zone; foxes and wolves are numerous, one may meet brown bears and lynx there. Of the avifauna, there is a large number of black cock, hazel grouse, wood grouse, starling, blue titmouse, cranes. The steppe zone is inhabited with ground squirrel, hamster, jerboa, field mouse, and marmot; of birds, there are skylark, quail, pink starling, steppe eagle, and others.

Some fur animals (nutria, mink, silvery-black fox, muskrat) were brought in from afar, and they acclimatized themselves well to the environment.

Wildlife of the coast region of the Back Sea and the Sea of Azov is highly varied; birds are especially numerous: martins, pochards, wild ducks, herons, bittern, pelicans, sea gulls, cormorants, etc. In the above seas, there is sturgeon, mackerel, bullhead, and so on. Rivers, lakes and manmade reservoirs are inhabited with perch, bream, zander, pike, crucian carp, sazan; and trout - in the Carpathians rivers.

The South Coast of Crimea and the mountaineous region of peninsula with climatic conditions similar to the Mediterranean, harbor such creatures as Crimean

and rock lizards, leopard snake, southern nightingale, black vulture, red deer, and mouflon.

Hoofed, fir and bird-game are also widespread on the territory of Ukraine. In the game-preserves that may be found in practically all the regions of Ukraine, hunting is arranged for elk, wild boar, hare, fox, wild duck and goose, etc.

Eleven national nature parks, 4 biosphere preserves, 16 nature reserves, numerous dendrological parks are organized in Ukraine; there are also monument sites of landscape architecture there. Among them the most famous are Askania-Nova (late 19th century, Kherson oblast, Shatsky national nature park (Volyn oblast), dendrological parks: Spfiyivka (Cherkassy oblast), Oleksandria (Kyiv oblast), and Trostianetsky (Chernihiv oblast), as well as natural monuments: Dovbush Rocks in Ivano-Frankivsk and Lviv oblasts, Tomb of Stone in Donetsk and Zaporizhia oblasts, the Great Canyon in Crimea.

V. Writing.

Do you know how to write an essay? Follow this guide and you'll manage to get an impressive piece of writing.

How To Write an Essay

1. Select the topic of your essay.
2. Choose the central idea, or thesis, of your essay. For example: Information technology has revolutionized the way we work.
3. Outline your essay into introductory, body and summary paragraphs.
4. The introductory paragraph begins with an interesting sentence. For example: Home workers have grown from 150,000 to over 12 million in the past 5 years thanks to the wonders of the computer. There are a number of types of introductions: Interesting statistics, a quote from a famous person, or a rhetorical question such as "Did you know that ...".
5. After this first sentence, add your thesis statement from above. The thesis clearly outlines what you hope to express in the essay.
6. Use one sentence to introduce every body to follow. This linking to ideas you will develop further in your body paragraphs provides structure to your essay.
7. Finish the introductory paragraph with a short summary or goal statement.
8. In each of the body paragraphs (usually two or three) the ideas first presented in the introductory paragraph are developed.
9. Develop your body paragraphs by giving detailed information and examples. For example: When the Internet was first introduced it was used primarily by scientists, now it is common in every classroom.
10. Body paragraphs should develop the central idea and finish with a summary of that idea. There should be at least two examples or facts in each body paragraph to support the central idea.
11. The summary paragraph summarizes your essay and is often a reverse of the introductory paragraph.

12. Begin the summary paragraph by quickly restating the principal ideas of your body paragraphs. For example: The Internet in the home, benefits and ease of use of modern computer systems...
13. The penultimate sentence should restate your basic thesis of the essay. For example: We have now passed from the industrial revolution to the information revolution.
14. Your final statement can be a future prediction based on what you have shown in the essay. For example: The next step: The complete disappearance of the workplace.

Tips:

1. Use strong verbs and avoid modals to state your opinion. It is better to write: The workplace has evolved than The workplace seems to have evolved
2. Do not apologize for what you are saying. An essay is about your opinion.
3. Do not translate from your mother tongue. It will quickly get you into trouble!

What You Need:

- Computer or Typewriter
- Dictionary
- Thesaurus

Now choose one of these topics and write an essay.

1. How are humans effecting wildlife?
2. Interesting Plant Behavior
3. Natural Medicines
4. Trees That Disappeared
5. The Life of Rocks
6. Animals That Help People
7. Extinct Animals
8. Animal testing is vicious or beneficial
9. Environmentally Friendly Products
10. Ukraine most beautiful natural reserves

III. Botany

I. Lead in

Discuss the following items.

1. It's been proven by quite a few studies that plants are good for our psychological development. If you green an area, the rate of crime goes down. Torture victims begin to recover when they spend time outside in a garden with flowers. So we need them, in some deep psychological sense, which I don't suppose anybody really understands yet.

Jane Goodall

2. “Plants can feel pressure and emotion. When something is said or done with intention, a plant can respond. So every day we tell our tree that it is beautiful, it will get more and more beautiful. I hope that tree knew how beautiful I thought it was.”

Kate McGahan, Jack McAfghan: Return from Rainbow Bridge

II. Reading.
Read and translate the text.

History of Botany

Botany is the study of plants. It is one of the major fields of biology, together with zoology (the study of animals) and microbiology (the study of bacteria and viruses).

Aristotle and Theophrastus, living in ancient Greece about the fourth century B.C., were both involved in identifying plants and describing them. Theophrastus is called the "father of botany," because of his two surviving works on plant studies. While Aristotle also wrote about plants, he received more recognition for his studies of animals.

The early study of plants was not limited to Western cultures. The Chinese developed the study of botany along lines similar to the ancient Greeks at about the same time. In A.D. 60, another Greek, Dioscorides, wrote De Materia Medica, a work that described a thousand medicines, 60% of which came from plants. It remained the guidebook on medicines in the Western world for 1,500 years until the compound microscope was invented in the late sixteenth century, opening the way to the careful study of plant anatomy.

During the seventeenth century progress was made in experimenting with plants. Johannes van Helmont measured the uptake of water in a tree during the 1640s, and in 1727 Stephen Hales, an Englishman who is credited with establishing plant physiology as a science, published his experiments dealing with the nutrition and respiration of plants in a work entitled Vegetable Staticks. He developed techniques to measure area, volume, mass, pressure, gravity, and temperature in plants. In the latter part of the eighteenth century, Joseph Priestley laid the foundation for the chemical analysis of plant metabolism.

During the nineteenth century advances were made in the study of plant diseases because of the potato blight that killed potato crops in Ireland in the 1840s, an event that led to a mass migration of Irish to America. The study of plant diseases developed rapidly after this event. When the work in genetics by Gregor Mendel, an Austrian monk, was applied after 1900 to plant breeding, the development of modern plant genetics began. During the early part of the nineteenth century, progress in the study of plant fossils was made, and ecology began to develop as a science in the late nineteenth and early twentieth centuries.

Technology has helped specialists in botany to see and understand the three-dimensional nature of cells, and genetic engineering of plants has improved agricultural output. The study of plants continues as botanists try to both understand the structure, behavior, and cellular activities of plants in order to develop better

crops, find new medicines, and explore ways of maintaining an ecological balance on Earth to continue to sustain both plant and animal life.

III. Idioms.
Read the idioms and their definition. Give the Ukrainian equivalent.

1. beat around the bush	This expression is used to tell someone to say what they have to say, clearly and directly, even if it is unpleasant.
2. nip in the bud	If you nip a problem or an unacceptable situation in the bud, you stop it at an early stage, before it develops or becomes worse.
3. root and branch	If an action is performed thoroughly or completely, it is done 'root and branch'.
4. sow seeds of suspicion	If someone's behavior, or something they say, sows the seeds of suspicion, it leads people to suspect that they are guilty.
5. grass roots	The term grass roots refers to the ordinary people who form the main body of an organization.

IV. Reading.
Read and translate the text.

Plant Anatomy

Plant anatomy is the study of plant tissues and cells in order to learn more about the way these organisms are constructed and how they work. These studies are very important because they lead to a better understanding of how to care for plants and fight plant diseases. Plant anatomy is also known as phytotomy.

A plant is a complex structure that consists of a number of parts which constitute the whole plant. If you learn to identify each individual part, you will gain a much greater understanding as to how the plant works as a whole.

The Life Span of a Plant

Plant species vary not only in appearance, but also in their longevity (length of life). Annual flowering plants only live for one year whereas biennial plants live for two years, producing only leaves in the first year and flowering in the next. Perennial plants live for more than two years. They might be evergreen (never losing their leaves) or deciduous (loses the leaves in autumn). A plant's status as an annual, biennial, or perennial can vary due to its geographical location and purpose of cultivation. All plants consist of some basic parts as follows.

The Flower

The flower of a plant is a complex structure. These are the various parts which make up the flower of a plant:

1. the petals (made up of the corolla)
2. the calyx (the outer, or green, leaves)
3. the stamen (containing the pollen which insects and birds are attracted to)
4. the pistil (containing the ovary, the style and the stigma of the flower).

The Fruits and Seeds

The seed of a plant contains the nucleus; a new plant grows from the seed as long as the growing conditions are right for it to do so. Plants also contain fruits which might be described in one of the following ways: follicule, legume (pod), drupe, achenium, caryopsis, cremocarp, nut, berry, samara, pome, pepo, silique, capsule, cone.

The Leaves

The leaves grow on the part of the stalk called the petiole. Leaves might be short, fat, long, thin, hairy, curvy, indented, wispy or any number of other shapes, textures and colors. The various types of leaves on a plant are botanically identified as follows:

1. Lanceolate
2. Cuneate
3. Sagittate
4. Ovate
5. Cordate
6. Pinnate
7. Pectinate
8. Runcinate
9. Eliptical
10. Palmate
11. Pedate
12. Obovate
13. Reniform
14. Hastate
15. Serrate
16. Peltate
17. Dentate
18. Crenate
19. Sinuate

The Stem

Stems are found on all flowering plants and gravitate towards the light and air, away from the root. Some plants might appear stemless but they actually have the stem below ground or the stem is extremely short. A tree's stem is better known as the trunk. Herbs have stems which die after flowering.

The Roots

The root of a plant is usually located in the soil below the plant. It acts as an anchor for the plant. Types of roots include:

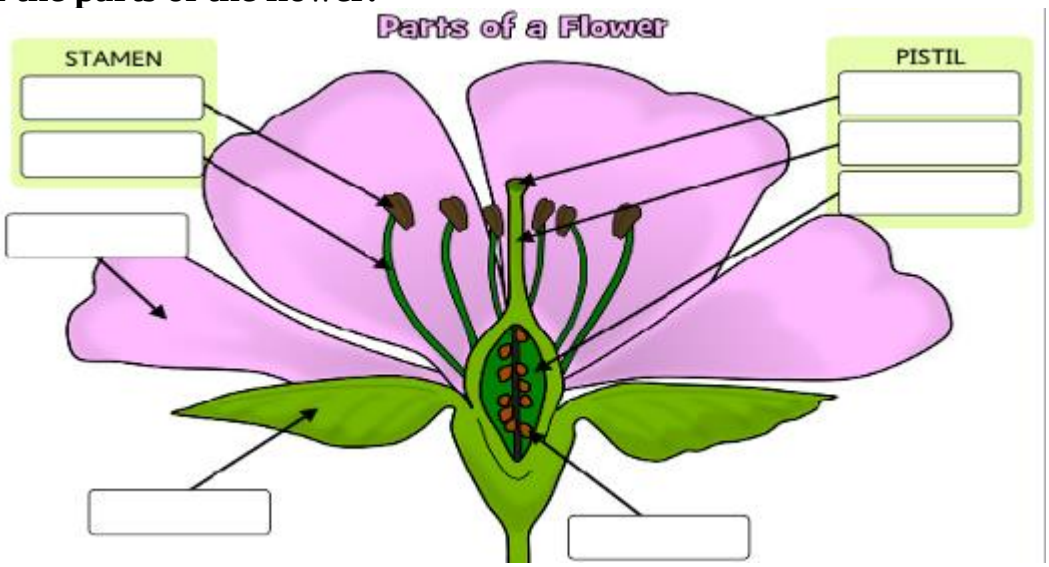
1. Fusiform root – root tapers both up and down, for example, a radish (Rhapanus sativus)
2. Fasciculated root – the fibers or branches are thickened
3. Tuberiferous root – some of the branches of the root become rounded knobs, such as in a potato (Solanum tuberosum) and sometimes culminate in a branch known as a palmate root
4. Aerial root – the root actually grows into the open air, such as in Indian Corn
5. Conical root – the root tapers regularly from the crown to the apex of the plant, for example, a carrot (Daucus carota)
6. Napiform root – the root is swollen at the base and extends horizontally more than vertically, such as in a turnip (Brassica napa)
7. Rhizome root – thick, spreading root such as in ginger (Zingiber officinale).

V. Vocabulary practice.

1. Match the words with their definitions.

1. Anther	a. a tiny structure in the ovary of a flower and on the scale of a cone that contains an egg cell and can develop into a seed following fertilization
2. Petal	b. the pollen producing part of a flower, usually with a slender filament supporting the anther.
3. Sepal	c. the female part of a flower that produces seeds.
4. Stamen	d. one of the coloured parts of a flower that are shaped like leaves.
5. Filament	e. the outer parts of the flower (often green and leaf-like) that enclose a developing bud.
6. Pistil	f. the stalk of a stamen.
7. Stigma	g. it is a long, slender stalk that connects the stigma and the ovary.
8. Style	h. the part of a female plant that produces seeds.
9. Ovary	i. the top of the centre part of a flower that receives the pollen which allows it to form new seeds
10. Ovule	j. the part of a male flower which contains pollen

2. Label the parts of the flower.



VI. Reading.

1. Read and translate the text.

The process of photosynthesis

The food-making and energy process for plants to survive is called photosynthesis. The process is complex but with the sun, water, nutrients from the soil, oxygen, and chlorophyll, a plant makes its own food in order to survive.

Chlorophyll is a green chemical inside a plant that allows plants to use the Sun's energy to make food. Without chlorophyll a green plant would not be able to survive.

The following are the steps in photosynthesis:

1. The sunlight is absorbed through a plant by its leaves, or other green parts.

2. The water and nutrients from the soil are absorbed through the roots of the plant.

3. The chlorophyll inside the plant's leaves traps the energy from the sunlight.

4. Carbon dioxide in the air enters through the leaves of the plants.

5. Inside the chlorophyll there are chloroplasts which contain water and the carbon dioxide from the air.

6. The chloroplasts are like tiny manufacturing plants. The water and carbon dioxide from the air combine to make sugar and water. Basically, it is the food for the plant to survive and grow.

7. Sugar is then made and released into the veins of the leaf and it spreads throughout the rest of the plant.

8. The oxygen the plant has made is then released into the air.

The entire process is called photosynthesis, and without it people and other animals would not be able to live and grow. This is the reason it is important for the survival of trees and plants. They give off oxygen which help people and other animals to breathe.

The plants also give people and animals food to eat. The food could be the different kinds of fruit or the many varieties of vegetables from apples and oranges to green beans and peas. When people and animals eat this food from the plants it also gives them the energy to live and grow. Without plants, animals and people would not be able to survive.

During the fall in certain parts of the world photosynthesis no longer takes place. When this happens the leaves begin to turn different colors. The leaves may turn yellow, orange or maybe even red, or a combination of those colors. Surprisingly, these colors are the original colors of the leaves. As the temperature drops, though, the leaves of trees, other than evergreens, stop making the chlorophyll. The chlorophyll begins to vanish and the leaves begin to change colors.

In summary, photosynthesis is the food-making and energy process for plants to survive. A plant's leaves contain chlorophyll which is a green chemical inside a plant that allows plants to use the Sun's energy to make food. Chloroplast inside the chlorophyll contain water and the carbon dioxide from the air to make the food for the plant to survive. Without photosynthesis, the plants would not be able to live and grow.

2. Answer the questions.

1) Which of the following statements is true?

A. Chloroplasts are the green chemicals inside a plant that allows plants to use the Sun's energy to make food.

B. Chlorophyll is a green chemical inside a plant that allows plants to use the Sun's energy to make food.

C. Chlorophyll is a green chemical inside the roots of a plant that allows plants to use the Sun's energy to make food.

D. Chlorophyll is a green chemical absorbed into a plant that allows them to use the Sun's energy to make food.

2) Fill in the blank with the correct answer. Carbon dioxide, which is carbon and oxygen combined, in the air enters through the _____of the plants.

A. Roots
B. Chlorophyll
C. Leaves
D. Energy

3) Food for a plant to survive is

A. Sugar and water
B. Carbon and oxygen
C. Chlorophyll
D. Chloroplasts

4) Which of the following in plants are like tiny manufacturing plants?

A. Chloroplasts
B. Chlorophyll
C. Leaves
D. Roots

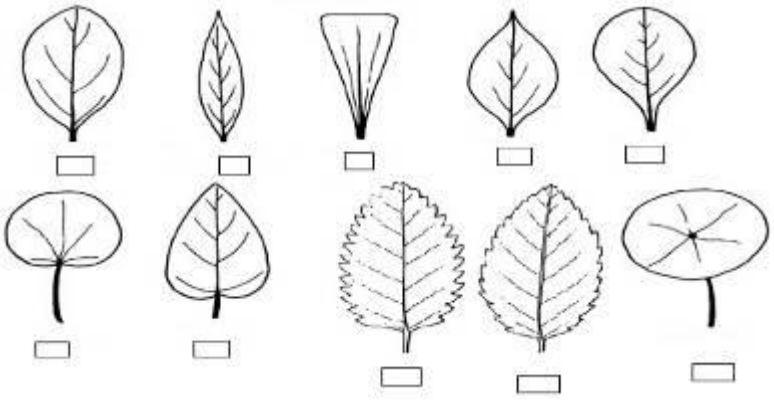
5) In the fall leaves begin to turn different colors because

A. There is less oxygen in the air for the plants
B. There is too much chlorophyll in the leaves of the plant
C. The carbon dioxide in the air cannot reach the leaves of the plant
D. The temperature begins to drop and leaves cannot produce chlorophyll

VII. Vocabulary practice.

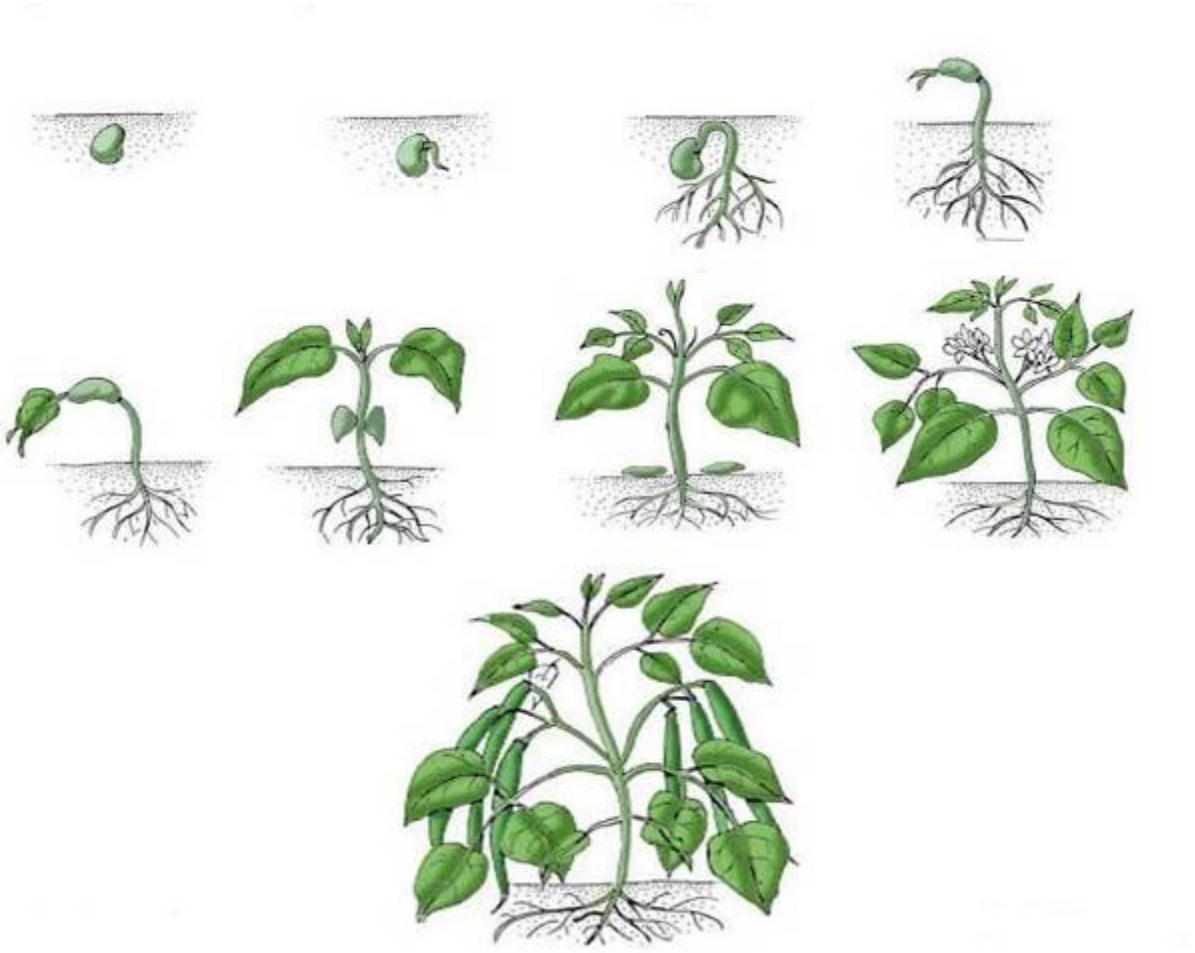
Label the leaf shapes.

1. Lanceolate	2.Ovate	3. Cordate	4.Serrate	5. Dentate
6. Eliptical	7. Cuneate	8. Reniform	9.Obovate	10. Peltate



VIII. Speaking.

Look at the picture and describe the plant lifecycle.



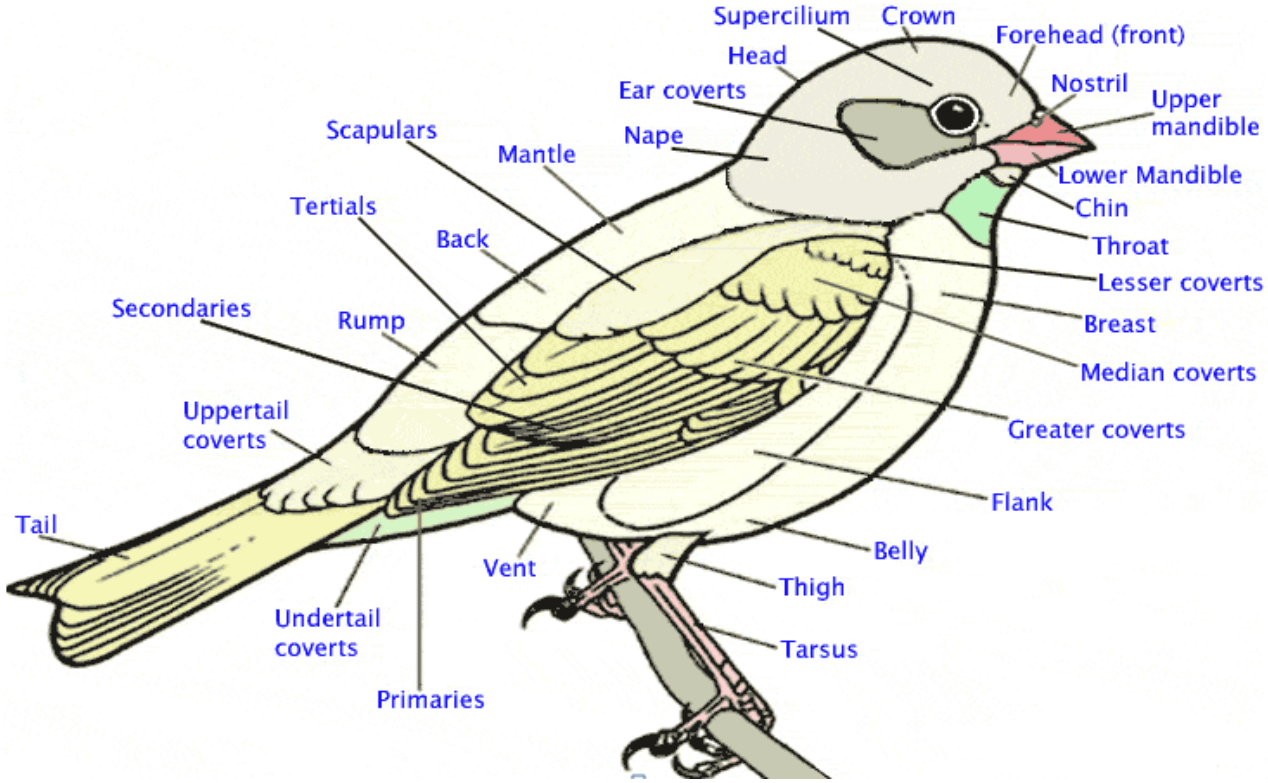
IX. Translation.
Translate into English.

Життя людини тісно пов'язане з навколишньою природою. Цей зв'язок існує з часу виникнення людини. Життя на Землі стало б неможливим, якби не було безперервного процесу фотосинтезу, що відбувається в зелених рослинах. Рослинність - основний стабілізатор вуглецево-кисневого балансу повітряного басейну. Будучи найбільш важливим компонентом живої природи, рослини забезпечують нормальний біологічний кругообіг речовин у біосфері, збагачують повітря киснем і накопичують органічні речовини, необхідні для життя людини і тварин.

Значення рослинності в житті людини дуже велике. Рослинність формує середовище, необхідне для життя людини і розведених нею організмів, є невичерпним (при розумному використанні й охороні) джерелом різноманітних харчових продуктів, технічної і лікарської сировини, будівельних матеріалів. Рослини - основний корм для домашніх тварин, використовуються людиною в різноманітних технологічних процесах. Рослини беруть участь в утворенні корисних копалин, ґрунтів, захищають ґрунти від руйнування потоками води і вітром, від засипання піском.

IV. Zoology. Ornithology

I. Vocabulary.
Give Ukrainian equivalents and label the bird parts.



II. Reading.
Read and translate the text.

What is ornithology

Ornithology is a branch of Zoology or Biology concerned with the scientific study of birds, creatures belonging to class Aves. The science of Ornithology includes the study of classification of birds, evolution, body structure, habits, song, flight and breeding behavior. Birds are generally divided into two major groups. Ostriches, Emus, and Kiwis are ratites, flightless birds that lack keel-like extension on the breast bone. The vast majority of the birds, however, are non-ratites and possess the keel to which the powerful muscles that power the wings are attached. There are over 9200 extant species of birds divided into 30 orders & 174 families. Their ability to fly has allowed them to colonize every land mass on earth including the Arctic and Antarctic and some, like the Penguins have adapted an aquatic lifestyle coming to shore only to breed and raise young. Fossil evidence of the ancestors of modern birds indicates that they were contemporaneous with dinosaurs.

Classifying Bird Species:

The scientific name of a species has two parts. The first name describes the Genus and the second describes the bird specie. The second name may also be a person's name - often the name of the ornithologist that first discovered the bird. This naming system is called the Binomial nomenclature and a more modern Trinomial nomenclature is now being used in which the third name describes the sub-species.

There is some evidence to suggest that these feathered creatures are in fact the highly evolved living incarnation of the reptiles. This long evolutionary history has allowed for the development of the many unique morphological, physical and behavioral attributes in birds that make the science of ornithology such an interesting vocation.

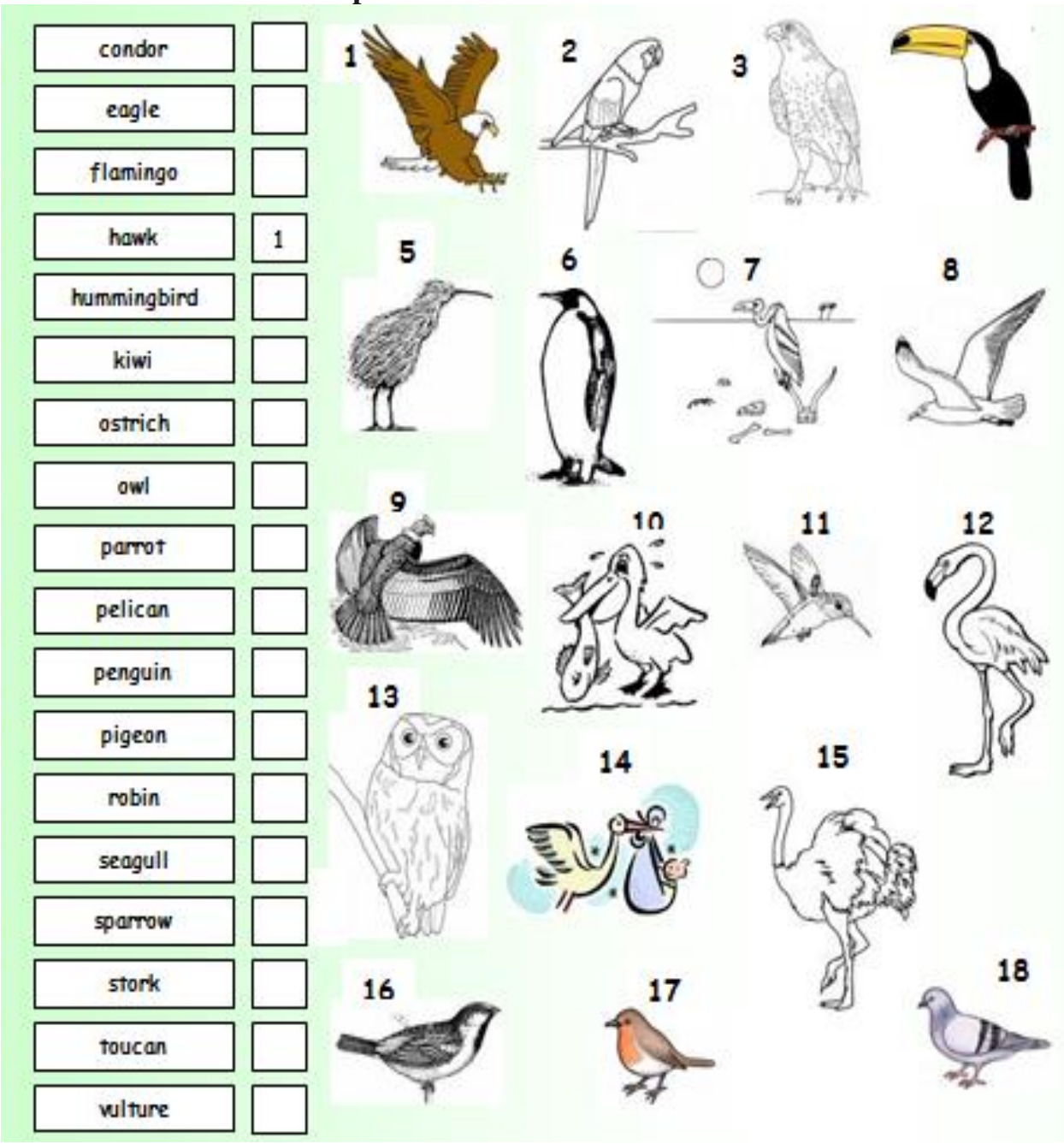
As scientists learn more about birds, they are able to arrange the 10,000+ species of birds into the correct Order, Family and Genus. There is a surprising amount of debate about some birds. Are they really a species or not? They may actually be a race of a similar species in the same genus. Combining two apparent species into just one new species is called "lumping". Separating a species into two or more species is called "splitting". This "splitting" and 'lumping' of species is becoming more frequent today as DNA research is used.

Scientific classification is undergoing a big change. Dr. Charles G. Sibley did research for over twenty years using DNA from bird's blood. He and his associates suggested a new way to classify the birds of the world. His system is called the Sibley/Ahlquist/Monroe classification. Dr. Sibley discovered that some species are more closely related than thought earlier. He also rearranged Orders and Families in an unexpected new way. Additional research being done today is proving that Dr. Sibley is probably right. The SAM classification seems, to many scientists, to be better than the one used for the last 100 years. Scientists want to be very sure this new system is better than the traditional classification before they make an official change.

Dr Salim Ali (1896 - 1987) was India's most well-known Ornithologist and bird watcher. Today there are many scientists or ornithologists investigating birds. It is certain that their work will make bird species appear and disappear as they

continue lumping and splitting. That is why a computerized list of the world's birds makes more sense than a printed list in a book. You can update your computer and always have the best, most current classification list possible. A book listing all the birds of the world is obsolete by the time you read it.

III. Match the words and pictures.



IV. Reading.
Read and translate the text.

Bird migration

Bird migration is the mechanism behind the seasonal appearance and disappearance of some species of birds, mammals, fish and insects.

Scientific investigation of bird migration began in 1802 when birds were tagged with metal leg bands. It was not until this century when large numbers of bands with printed numbers and letters became available that this method really began to deliver results. The numbering of the rings is controlled by a national body in most countries and the rings have a contact address on them. These national bodies co-operate with each other in exchanging information on banding records (either live caught or found dead) of birds ringed outside the country in which they are caught. This work over the last 20 years has generated a lot of useful information.

Birds generally begin migration when they have a favorable tailwind. Once started however, only very bad weather will stop them. Many birds fly high when migrating because of prevailing winds at higher altitudes and also because the cold at these altitudes helps them disperse heat being generated by their flight muscles.

Timing of migration is a mix of internal stimulus which results in a feeding binge to put on fat to survive the journey and then the tendency to aggregate into flocks. Once the pre-migration flock is gathered, the feeding continues while the birds wait for suitable weather conditions. Thus while the birds' internal clock probably releases the hormonal triggers at a fairly accurate date each year, the availability of food and the presiding weather conditions decide when the migration starts and hence when we see the first spring migrants arrive and the last autumn ones leave.

For geographical reasons, i.e. mountains, coasts and rivers, many migrating birds travel certain general flyway or routes. Migratory routes are not fixed and in some species part of the population follows one route and part another.

Little is known about how birds navigate. Experiments show that most migratory birds have a built-in sense of direction and know innately which direction they need to travel. Some birds appear to use landmarks and obviously at a height of several thousand feet they can see a considerable distance. A number of elegant experiments involving and/or displacing birds to different geographical regions have shown that many birds use the sun, at least during the day, as a cue to direction when migrating or homing.

Birds of prey, Swallows and Crows migrate by day. Thrushes, Warblers, Cuckoos and Woodpeckers migrate by night. Wildfowl migrate both day and night. Most songbirds migrate at night.

Migrations mostly consist of birds flying south for the winter and north in spring to breed. To a large extent this reflects the distribution of the continents on the planets. There is a lot more temperate and tundra landscape in the north than in the south. Migrations to and from alpine areas are not uncommon, such as the Mountain Quail which breeds at heights up to 3000 m, but winters below 1500 m. Interestingly, the bird is flightless so it walks up and down the mountains in groups single file.

V. Idioms and phrases.

1.Write the bird names under the pictures:

1._____ 2._____ 3._____ 4. _____ 5. _____ 6._____ 7._____

2. Complete the idioms with bird names:

a. …….. feed ___
b. a …… and bull story___
c. a lame …….___
d. …… out___
e. a sitting ……
…___
f. talk ……
……..___
g. cook someone's…….
……___
h. ……. party___
i. count ones ……before they hatch.___
j. as the ……. flies___
k. put/set the cat among the ……._
l. sick as a ……..___
m. wild-…….. chase___
n. …….-fashion____
o. to kill two ……. with one stone ____

3. Find a definition for each idiom:

1. a very small or insufficient amount of money or payment
2. stop participating in a plan or activity because one is afraid when it becomes dangerous or too difficult
3. to plan how to utilize good results of something before those results have occurred.
4. a story or an explanation or excuse that is hard to believe
5. a person or enterprise that is not a success and that has to be helped.
6. a person or object in a vulnerable position that is easy to attack or injure
7. talk seriously and frankly with someone
8. the distance from one place to another in a straight line.
9. to spoil one's plans or ruin one's chances of success, often intentionally
10. before marriage the bride-to-be and her female friends get together for an evening out
11. to achieve two aims with a single action or at the same time
12. provoke quarreling or argument by saying or doing something
13. disgusted or very disappointed
14. a foolish and hopeless search for sy or sg that does not exist or can only be found elwhere
15. without thinking about or understanding the meaning of something

4.Complete the sentences with an idiom:

1. Teachers in Hungary work for ……
2. John was angry because he was sent out on a ……
3. Tim was ……. when

9. Unarmed policemen walking the streets late at night are ……...
10. Our farm is only five miles from town as ……
11. You may be disappointed if you ……

VI. Translation.
Translate the following article into English.

Птахи розмовляють цілими реченнями

Японські фахівці змогли розшифрувати мову птахів. Виявилося, що пернаті розмовляють цілими реченнями.

Орнітологи Національного університету перспективних досліджень довгий час вивчали манеру спілкування східних синиць, які витіснили з ареалу існування великих синиць.

Дослідники вичленили з усього розмаїття мовлення птахів два характерних звукових сполучення. Першу конструкцію умовно позначили як ABC – вона означає сигнал про небезпеку. Друга конструкція під назвою D в перекладі на людську мову означає "Лети сюди!"

Для доказу своєї теорії учені записали обидва поєднання, а потім відтворювали аудіозапис звуків, досліджуючи реакцію синиць. На повідомлення про небезпеку пернаті реагували дуже активно, другий заклик залишали без уваги.

Дослідники припускають, що подібні лексичні конструкції можуть застосовувати інші птахи і тварини.

Нагадаємо, у співі птахів існують аналоги граматичних правил людської мови, і птахи дуже активно реагують на їхні порушення. Такий висновок група вчених зробила у своїй статті в журналі Nature Neuroscience.

V. Entomology

I. Vocabulary

1. Find all of these insect words in the grid above. Note: you don't have to find the titles for each section. Give the Ukrainian equivalents to these words.

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

Insect Bodies:
three body parts
four wings
six legs

Insect Homes:
cocoon
colony
hive

Insect Life Cycles:
egg
grub
larva
caterpillar

Insects:

ant
bee
beetle
butterfly
cicada
cockroach
cricket
dragonfly
firefly
flea
fly
grasshopper
horsefly
ladybug
mosquito
moth
praying mantis
stick bug
termite
wasp

2. Consult a dictionary, find the Ukrainian equivalents and practice the pronunciation of the following words and phrases. Memorize them.

arthropod		tarsus	
arachnids		claws	
myriapods		jugum	
thorax		anal veins	
abdomen		vannal lobe	
antennae		vannal fold	
ocellus		anal margin	
mouth parts		anal angle	
spiracle		apical margin	
cercus		apical angle	
hind wing		pterostigma	
coxa		discal cell	
trochanter		costal margin	
femur		basal cell	
tibia		humeral angle	

II. Reading.

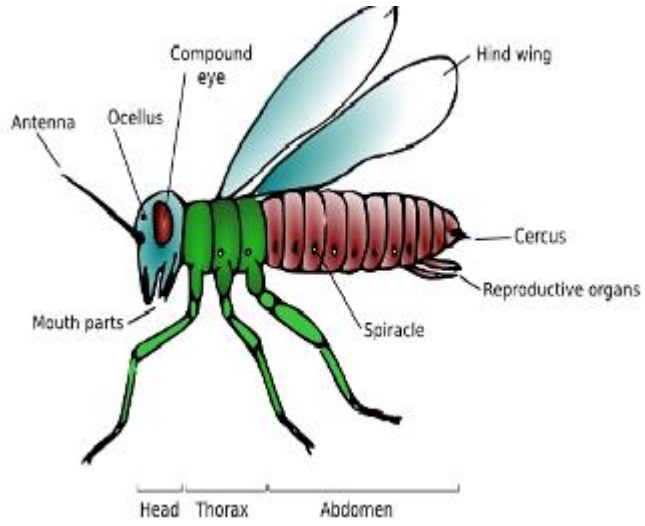
1.Read and translate the text.

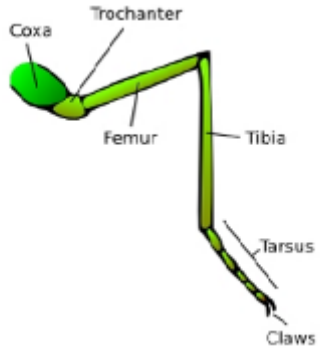
Insects

Entomology is the scientific study of insects, a branch of zoology. In the past the term "insect" was more vague, and historically the definition of entomology included the study of terrestrial animals in other arthropod groups or other phyla, such as arachnids, myriapods, earthworms, land snails, and slugs. This wider meaning may still be encountered in informal use.

Insects are the most numerous life form on the planet (in terms of number of species). Approximately seven out of every eight living species are insects. Insects show a number of characteristics, the three by which they are most easily recognized are:

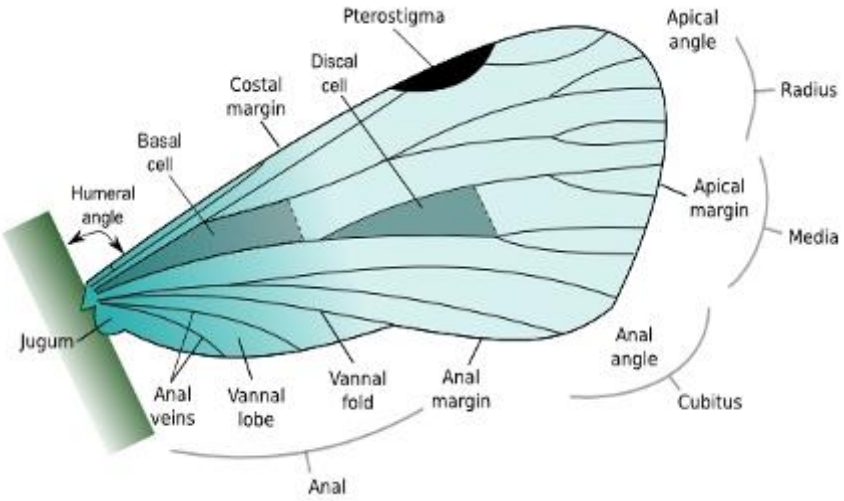
a. The body is divided into three distinct regions - head, thorax, and abdomen. Each region is further divided into segments. Typically, there are six in the head, three in the thorax and eleven in the abdomen. In the more advanced insects segments may become fused together, particularly in the abdomen. The structure of a generalized insect is illustrated, but insects are a very diverse group and have evolved many different forms:





b. There are three pairs of walking legs on the thorax, one pair to each segment. The legs show a very characteristic structure, but this is often modified to fulfill a variety of tasks, e.g. swimming or holding of prey.

c. The adults of most insects show two pairs of wings, one pair on each of segments two and three. The wings are supported by a series of veins, the pattern of veins being important in classification. The naming of the veins and regions on an insect wing are illustrated.



Respiration

Insects 'breathe' through a system of branching tubes, the trachea. Oxygen and carbon dioxide move along these by a process called diffusion. The trachea opens on the surface of the body at special pores, the spiracles. The insect may control the size of these pores. It is this method of 'breathing' which stops insects from getting very large. The insect body cannot get bigger than a diameter of about three centimeters. Above this size diffusion of oxygen into the body tissues becomes too inefficient for the insect to live.

Vision

The head bears a pair of compound eyes. These consist of a number of individual 'eyes', each of which produces a separate image. Hence the overall picture that the insect sees is made up of a series of dots. This is rather like a television picture, but with much poorer sharpness. This type of eye is very good at judging distance and movement. Hence insects which are active predators, such as dragonflies, have very well developed eyes.

Antennae

The antennae (or 'feelers') are mainly organs of smell and taste. They do have other functions in certain insects, e.g. they may be used to detect air currents. Hence the word 'feeler' does not describe their function and should not be used. They are made up of individual 'segments' that are attached to one another by flexible membranes. There are muscles inside the antennae that allow them to move. Antennae come in a variety of forms, and may be different in male and female, e.g. in chironomid midges. The antennae of male chironomid midges are 'bushy' because smell is very important in finding a female to mate with.

2. Read the sentences. Then circle T (True) or F (False).

1. Approximately five out of every eight living species are insects .	T	F
2. Typically the body is divided into 25 segments.	T	F
3. Three pairs of walking legs are all on one segment.	T	F
4. The pattern of wing veins is important in classification.	T	F
5. Diffusion is a process of moving Oxygen and carbon dioxide.	T	F
6. The spiracles are the special pores on the surface of the body.	T	F
7. Individual 'eyes' all produce the same image.	T	F
8. The antennae helps to smell and taste.	T	F
9. Antennae are in the same form for both male and female.	T	F
10. Antennae are moved by muscles which are inside of them.	T	F

III. Match the words with their definition.

1.Metamorphosis	a) to appear or come out from somewhere.
2.Nymph	b) biological process of the shedding or casting off an outer layer or covering and the formation of its replacement.
3.Chrysalis	c) this word refers to the development of the wings outside the body.
4.Instar	d) a young insect with a soft tube-shaped body, which will later become an insect with wings.
5.Moult	e) to arrange or organize something in a new way.
6.Exopterygote	f) the developmental stage of an arthropod between moults.
7.Larva	g) a moth or butterfly at tishe stage of development when it has a hard outer shell and is changing into its adult form.
8.Reorganization	h) a process in which a young insect, frog etc changes into another stage in its development.
9.To emerge	i) sexually immature form usually similar to the adult.
10.Endopterygote	j) inside something rather than outside.
11. Wing bud	k) flattened structures possessed by nymphs from which the wings will develop in the adult insect
12. Internal	l) refers to the development of the wings inside the body.

Insect life cycles

There are two different types of insect life cycle - incomplete metamorphosis and complete metamorphosis. (Metamorphosis means a change of form.)

Incomplete Metamorphosis. This is shown by the less highly developed insects. The life cycle shows only three stages: EGG - NYMPH - ADULT

The nymph resembles a miniature adult but is not able to produce young. This life cycle has the disadvantage that both nymph and adult often share the same food source. Therefore they can be in direct competition with one another for food. The advantage is that the vulnerable pupal (chrysalis) phase is avoided. The wings develop during the nymph stages as wing buds. These grow larger at each successive instar. They are fully formed at the final moult into adulthood. The wings therefore develop outside the body and are said to be exopterygote. This type of life cycle is seen in various insects, including dragonflies, grasshoppers, earwigs, cockroaches and true bugs.

Complete Metamorphosis. This is shown by the more highly developed insects. The life cycle shows four stages: EGG - LARVA - PUPA - ADULT

The larva (or caterpillar) is the growth phase. It is generally very different from the adult. Usually the larva and adult use different food sources. Therefore they are not in direct competition. This is a distinct advantage as more individuals of the species can be fed. The pupa (or chrysalis) is a stage of internal reorganization. There are no visible signs on the outside of the body as to the activity within. Because of this the pupal phase used to be called the "resting" stage. During the pupal phase the internal organs are broken down, more or less forming a "soup". This "soup" then acts as food for special growth buds to develop. These form the adult body. When reorganization is complete, the adult is ready to emerge. When outside conditions are suitable, the final moult occurs and the adult insect emerges. The wings develop inside the pupal case. Therefore this type of development is said to be endopterygote. Such a life cycle is shown by butterflies, moths, bees, wasps, true flies and many other insects, including beetles.

IV. Translation.

Translate the following article into English.

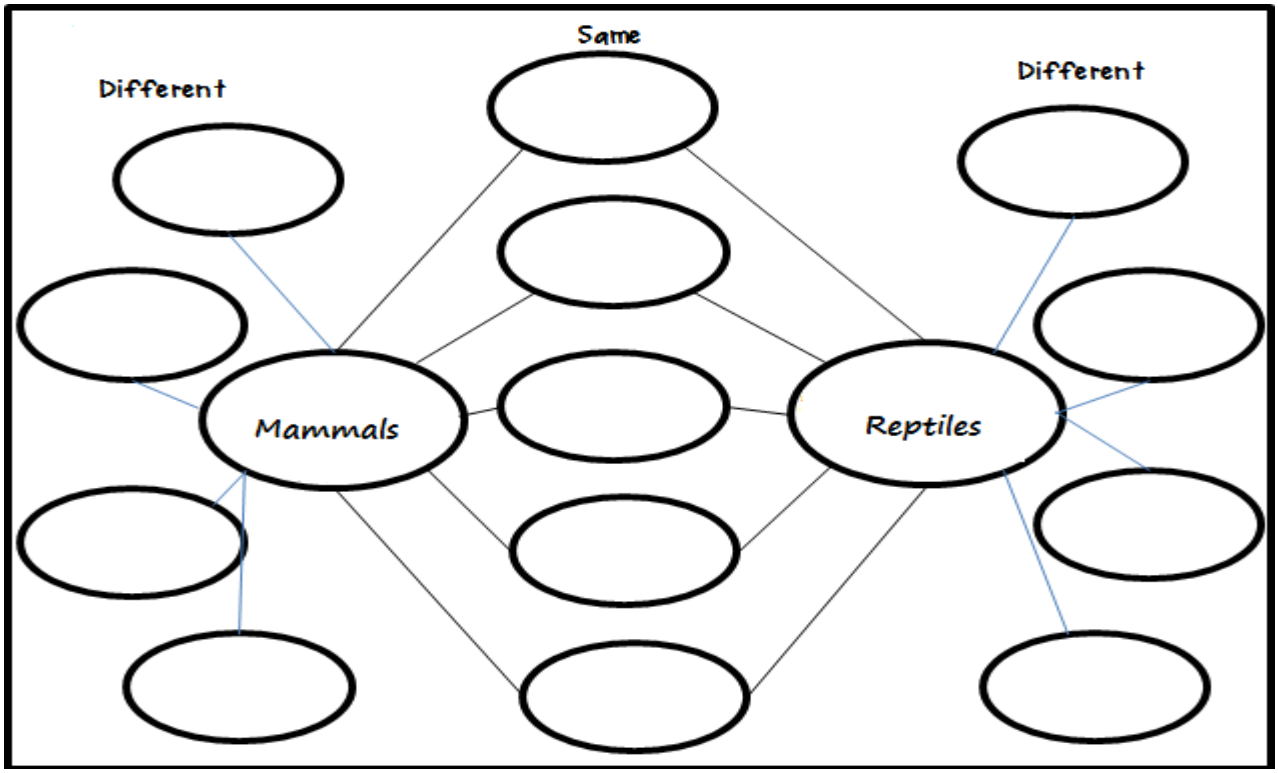
Ніхто не знає точно, скільки всього існує типів комах. Ентомологи, установили близько мільйона різних видів і щодня знаходять нові. Комахи нараховують більше видів, ніж будь-яких інших класів тварин. Вони поширилися по планеті й живуть майже в усіх регіонах, починаючи від неродючих пустель і закінчуючи морськими та засоленими ареалами.

Близько 90% всіх тварин на Землі - комахи. Однак довгий час питання збереження рідкісних видів безхребетних організмів, зокрема комах, не розглядалося, але ж цей клас тварин не менш важливий в екосистемі нашої планети, ніж будь-який інший. У перше видання Червоної Книги України (1980 рік) було внесено всього 18 видів комах, у другому виданні кількість рідкісних безхребетних членистоногих значно збільшилася - до 173. За останні роки тенденція щодо збереження рідкісних видів не особливо поліпшується. В останньому списку зникаючих комах України за 2009 рік нараховується 226 видів.

VI. Reptiles and Mammals

I. Lead in.

1. What do you know about the differences and the similarities between the largest kinds of animals?



2. Discuss the following questions.

1. Why are camels, dogs, whales, and humans all considered mammals?

2. Like all animals, mammals have certain adaptations that enable them to survive in their environment. For example, giraffes with long necks could reach food in high tree branches while short-necked giraffes could not. When the food on the ground was all gone, the short-necked giraffes died, but the long-necked giraffes survived for many generations. What are some human adaptations that help us live in our environment?

3. Most mammals give their young more protection and training than do other animals. Discuss how specific mammals take care of their offspring. What behaviors are unique to mammals?

4. Chimpanzees and humans are not only both mammals, they share many other characteristics. List some of the similarities between humans and chimpanzees. For example, we both use tools, and walk upright.

5. What characteristics distinguish humans from all other mammals? What unique traits make people "human"?

II. Reading.
1.Read and translate the text.

Reptiles and Mammals

There are several types of animals that can be found all over the world. Two of the largest kinds of animals are reptiles and mammals. Both types of animals live together in different habitats even though there are several differences between them.

Reptiles include turtles, lizards, snakes, crocodiles, and alligators. Snakes are also reptiles even though a few of them do not lay eggs. Some of the dinosaurs were also reptiles like the T-Rex or Tyrannosaurus Rex. Reptiles can usually be found on land, but some of them spend a lot of time in the water, too.

People are mammals. Other mammals include dogs, bears, apes, rabbits, dolphins, whales, and about 4,000 other species. Rodents, which includes beavers, mice, and other small animals, are the largest group of mammals. The bat is the only mammal that can fly. Some mammals only eat meat or plants, others eat both.

There are some characteristics reptiles and mammals share. First, they both have lived on the Earth for millions of years. Next, both reptiles and mammals breathe in oxygen to survive. Third, both types of animals are vertebrates.

Vertebrates are animals with a skeleton inside their bodies, including a backbone. Fish are another example of a type of animal classified as a vertebrate.

Fourth, all reptiles and mammals have the same organs which include the brain, heart, stomach, lungs, and a few others. The final characteristic the animals share is having four limbs, either all legs or two arms and two legs.

Though there are several characteristics reptiles and mammals share, there are many more differences. Most reptiles lay eggs in order to produce their young. Mammals, on the other hand, give birth to living offspring. When the newborn of a reptile is born, it can live on its own. However, when a newborn of a mammal is born it must be cared for by the parent. In addition, newborn reptiles look like the parent, but newborn mammals do not resemble the parent.

Another big difference is the outside covering of their bodies. Reptiles are covered in scales for protection, and mammals are covered in hair or fur. Finally, reptiles are cold-blooded animals. Cold-blooded means they cannot control their body temperature, but must use the sun for heat. A reptile's body temperature is usually the same as the air temperature. Mammals are warm-blooded. Warm-blooded means they can control their body temperature and produce heat. No matter what the temperature is, a mammal's body temperature will stay the same.

There are also a few interesting facts about mammals and reptiles. Reptiles shed their skin as they grow, and many of them have claws on their feet. The largest mammal is the blue whale, which can be 100 feet long and weigh 300,000 pounds. Some reptiles and mammals hibernate during the winter months.

In summary, reptiles and mammals can live together throughout the world even though there are many differences between them. On the other hand, they have some interesting differences between them. Two of the biggest differences include the covering on their bodies, and reptiles are cold-blooded, and mammals are war-blooded.

2. Answer the questions.

1) Which of the following animals is a reptile?
A: Rabbit
B: Turtle
C: Dolphin
D: Whale

2) Which of the following animals is a mammal?
A: Dolphin
B: Snake
C: Alligator
D: T-Rex

3) Which of the following is the same for both reptiles and mammals?
A: They are vertebrates.
B: Shed their skin as they grow.
C: Newborns look like the parent.
D: They give birth to living offspring.

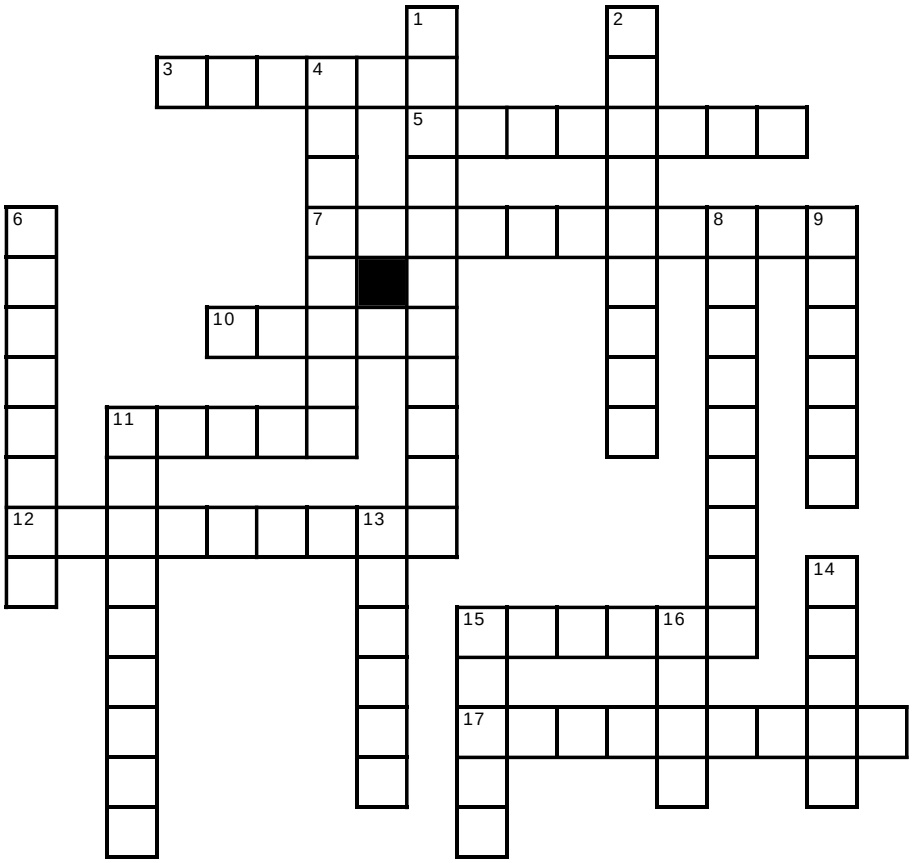
4) Which of the following is a difference between reptiles and mammals?
A: Number of limbs.
B: Same kind of organs.
C: They are vertebrates.
D: Outside covering of skin.

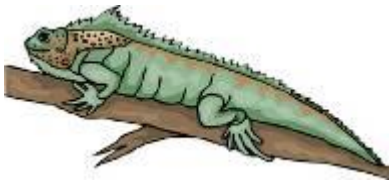
5) When an animal cannot control its body temperature, and uses the Sun for heat it is:
A: Warm-blooded
B: Even-blooded
C: Cold-blooded
D: Hot-blooded

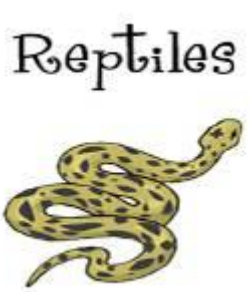
6) What happens to a newborn of a reptile?
A: The parent feeds it.
B: The newborn has to live on its own.
C: The parent teaches it to survive.
D: The newborn relies on the parent.

7) What happens to reptile skin as they grow?
A. Shed their skin.
B. Change it into fur.
C. It stays the same.
D. Their skin changes the color.

III. Do the crossword.







Across

3. A lizard that eats fruits and vegetables and has long toes.

5. A reptile with a hard shell that lives on land.

7. A word meaning having blood that changes temperature.

10. Snake teeth.

11. A venomous snake from India.

12. A reptile that lives in the ocean and comes ashore once a year to lay eggs.

15. Reptiles have these on their skin.

17. An American reptile with a long, round mouth.

Down

1. A venomous snake that often gives a warning before biting.

2. A dangerous reptile in the Nile River.

4. The largest snake in the world.

6. A mythical reptile that fought Harry Potter.

8. Large extinct reptiles.

9. A mythical reptile that fought knights.

11. A lizard that can change colors.

13. A chameleon or iguana.

14. Snake poison.

15. Cobra or anaconda

16. Most reptile babies come from these.

IV. Writing.

Write a report about an animal - a bird, mammal, reptile or an insect. You can include the following information: Anatomy/Appearance, Habitat and Range, Life cycle, Reproduction, Behavior, Classification etc.

VII. Overview of Animal Behavior. Ethology

I. Vocabulary.

Match the vocabulary word with the proper definition.

a. aggression	g. learning
b. circadian rhythm	h. nature-nurture debate
c. cooperation	i. reflex
d. ethology	j. social animal
e. innate behavior	k. society
f. instinct	l. stimulus

_____ 1. branch of biology that studies animal behavior
_____ 2. whether behaviors are controlled mainly by genes or by the environment
_____ 3. something that triggers behavior
_____ 4. are regular changes in biology or behavior that occur in a 24-hour cycle
_____ 5. a close-knit group with other members of their species
_____ 6. a change in behavior that occurs as a result of experience
_____ 7. the ability of an animal to perform a behavior the first time it is exposed to the proper stimulus
_____ 8. behaviors that are closely controlled by genes
_____ 9. allows animals to do many things that a lone animal could never do
_____ 10. a response that always occurs when a certain stimulus is present
_____ 11. behavior that is intended to cause harm or pain
_____ 12. animals that live in a society

II. Reading

1. Read the text and answer the questions that follow.

Evolution of Animal Behavior

To the extent that behaviors are controlled by genes, they may evolve through natural selection. If behaviors increase fitness, they are likely to become more common over time. If they decrease fitness, they are likely to become less common.

Nature vs. Nurture

Some behaviors seem to be controlled solely by genes. Others appear to be due to experiences in a given environment. Whether behaviors are controlled mainly by genes or by the environment is often a matter of debate. This is called the nature-nurture debate. Nature refers to the genes an animal inherits. Nurture refers to the environment that the animal experiences.

In reality, most animal behaviors are not controlled by nature or nurture alone. Instead, they are influenced by both nature and nurture. In dogs, for example, the tendency to behave toward other dogs in a certain way is probably controlled by genes.

It's easy to see how many common types of behavior evolve. That's because they obviously increase the fitness of the animal performing them. For example, when wolves hunt together in a pack, they are more likely to catch prey. Therefore,

hunting with others increases a wolf's fitness. The wolf is more likely to survive and pass its genes to the next generation by behaving this way.

The evolution of certain other types of behavior is not as easy to explain. An example is a squirrel chattering loudly to warn other squirrels that a predator is near. This is likely to help the other squirrels avoid the predator. Therefore, it could increase their fitness. But what about the squirrel that raises the alarm? This squirrel is more likely to be noticed by the predator. How could such a behavior evolve through natural selection?

One possible answer is that helping others often means helping close relatives. Close relatives share many of the same genes that they inherited from their common ancestor. As a result, helping a close relative may actually increase the chances that copies of one's own genes will be passed to the next generation. In this way, a behavior that puts oneself at risk could actually increase through natural selection. This form of natural selection is called kin selection.

1. Is behavior controlled by genes? If a behavior is controlled by a gene, does that behavior evolve?
2. What is the nature-nurture debate?
3. How do many common types of behavior evolve in animals? Give an example.
4. "Helping others often means helping close relatives." What does this statement refer to?
5. What is "kin selection"?

III. Write true if the statement is true or false if the statement is false. Use the Internet to find necessary information.

_____1. The branch of biology that studies animal behavior is called psychology.
_____2. Some behaviors are controlled by genes.
_____3. Hunting in packs is an adaptive behavior because it increases the chances of killing prey and obtaining food.
_____4. A spider spinning a web is a learned behavior.
_____5. Innate behaviors must be practiced to be learned.
_____6. Innate behaviors involve basic life functions, such as finding food.
_____7. A society forms from all the different species that live together.
_____8. Animals can communicate with sounds, chemicals, or visual cues.
_____9. Social animals live and work together for the good of the group.
_____10. Ants communicate with sounds while frogs communicate with chemicals.
_____11. Circadian rhythms are regular changes in biology or behavior that occur in a daytime-nighttime cycle.
_____12. Aggression is behavior that is intended to cause harm or pain.
_____13. Two male deer competing for mates is an example of interspecific competition.
_____14. In most species of mammals, parents provide little care to their offspring.
_____15. In many mammals, females are more selective than males in choosing mates.

IV. Reading

1. Read and translate the text.

Types of behavior

Animals are different from one another in their behavior. They are born with certain behaviors, and they learn others. Behavior is the way an organism interacts with other organism and its environment. Anything in the environment that cause a reaction is called a stimulus. A stimulus can be external, such as a rival male entering another male's territory; or internal, such as hunger or thirst. You are the stimulus that causes your dog to bark and wag its tail. Your dog's reaction to you is a response.

A behavior that an organism is born with is called an **innate behavior**. These types of behaviors are inherited. They don't have to be learned. Innate behavior patterns occur the first time an animal responds to a particular internal or external stimulus.

The simplest innate behaviors are **reflex** actions. A reflex is an automatic response that does not involve a message from the brain.

An **instinct** is a complex pattern of innate behavior. Spinning a web is complicated, yet spiders spin webs correctly on the first try. Unlike reflexes, instinctive behaviors can take weeks to complete. Instinctive behavior begins when the animal recognizes a stimulus and continues until all parts of the behavior have been performed.

Learned behavior develops during an animal's lifetime. Learning is important for animals because it allows them to respond to changing situations. In changing environments, animals that have the ability to learn a new behavior are more likely to survive. Learning also can modify instincts. Learned behavior includes **imprinting**, **trial and error**, **conditioning**, and **insight**.

Imprinting occurs when an animal forms a social attachment to another organism within a specific time period after birth or hatching.

Behavior that is modified by experience is called **trial-and-error** learning. Many animals learn by trial and error. When baby chicks first try to feed themselves, they peck at many stones before they get any food. As a result of trial and error, they learn to peck only at food particles.

Animals often learn new behaviors by **conditioning**. In conditioning, behavior is modified so that a response to one stimulus becomes associated with a different stimulus. There are two types of conditioning. One type introduces a new stimulus before the usual stimulus. In the second type of conditioning, the new stimulus is given after the affected behavior

Insight is a form of reasoning that allows animals to use past experiences to solve new problems.

In summary, animals are born with certain behaviors, while other behaviors are learned. A stimulus is anything in the environment that causes a reaction. Innate behaviors are those behaviors an organism inherits, such as reflexes and instincts. Learned behavior allows animals to respond to changing situations. Imprinting, trial and error, conditioning, and insight are examples of learned behavior.

2. Read and translate the text.

Behavioral Interactions

Complex interactions of innate behaviors between organisms result in many types of animal behavior.

Social behavior

Interactions among organisms of the same species are examples of social behavior. Social behaviors include courtship and mating, caring for the young, claiming territories, protecting each other, and getting food. These inherited behaviors provide advantages that promote survival of the species.

A **society** is a group of animals of the same species living and working together in an organized way. Each member has a certain role. Usually a specific female lays eggs, and a male fertilizes them. Workers do all the other jobs in the society.

Territorial Behavior

Many animals set up territories for feeding, mating, and raising young. A territory is an area that an animal defends from other members of the same species. Ownership of a territory occurs in different ways. Songbirds sing, sea lions bellow, and squirrels chatter to claim territories. Other animals leave scent marks. Some animals, like the tiger, patrol an area and attack other animals of the same species who enter their territory. Why do animals defend their territories? Territories contain food, shelter, and potential mates. If an animal has a territory, it will be able to mate and produce offspring. Defending territories is an instinctive behavior.

Aggression is a forceful behavior used to dominate or control another animal. Fighting and threatening are aggressive behaviors animals use to defend their territories, protect their young, or to get food.

To avoid being attacked and injured by an individual of its own species, an animal shows **submission**. Postures that make an animal appear smaller often are used to communicate surrender. In some animal groups, one individual is usually dominant. Members of the group show submissive behavior toward the dominant individual.

Communication

In all social behavior, communication is important. Communication is an action by a sender that influences the behavior of a receiver.

Courtship behaviors allow male and female members of a species to recognize each other. These behaviors also stimulate males and females so they are ready to mate at the same time. This helps ensure reproductive success.

Ants are sometimes seen moving single file toward a piece of food. Male dogs frequently urinate on objects and plants. Both behaviors are based on chemical communication.

Vertebrates use a number of different forms of **sound communication**. Rabbits thump the ground, gorillas pound their chests, beavers slap the water with their flat tails, and frogs croak.

Certain kinds of flies, marine organisms, and beetles have a special form of communication called **bioluminescence**. Bioluminescence is the ability of certain living things to give off light.

Cyclic Behavior

A cyclic behavior is innate behavior that occurs in a repeating pattern. It often is repeated in response to changes in the environment. Behavior that is based on a 24-hour cycle is called a circadian rhythm. Most animals come close to this 24-hour cycle of sleeping and wakefulness. Experiments show that even if animals can't tell whether it is night or day, they continue to behave in a 24-hour cycle. Animals that are active during the day are diurnal (dy UR nul). Animals that are active at night are nocturnal. Owls are nocturnal. They have round heads, big eyes, and flat faces. Their flat faces reflect sound and help them navigate at night. Owls also have soft feathers that make them almost silent while flying.

Some cyclic behaviors also occur over long periods of time. **Hibernation** is a cyclic response to cold temperatures and limited food supplies. During hibernation, an animal's body temperature drops to near that of its surroundings, and its breathing rate is greatly reduced. Animals in hibernation, such as the bats, survive on stored body fat. The animal remains inactive until the weather becomes warm in the spring. Some mammals and many amphibians and reptiles hibernate. Animals that live in desert like environments also go into a state of reduced activity. This period of inactivity is called estivation. Desert animals sometimes estivate due to extreme heat, lack of food, or periods of drought.

Instead of hibernating, many animals move to new locations when the seasons change. This instinctive seasonal movement of animals is called **migration**. Most animals migrate to find food or to reproduce in environments that are more favorable for the survival of offspring. Many bird species fly for hours or days without stopping. The blackpoll warbler flies more than 4,000 km, nearly 90 hours nonstop from North America to its winter home in South America. Monarch butterflies can migrate as far as 2,900 km. Gray whales swim from arctic waters to the waters off the coast of northern Mexico. After the young are born, they make the return trip.

In summary, instinctive behavior patterns are inherited. Courtship and mating are instinctive for most animal groups. Interactions among organisms of a group are examples of social behavior. Many animals protect a territory for feeding, mating, and raising young. Species can communicate with each other using behavior, chemicals, sound, or bioluminescence. Cyclic behaviors occur in response to environmental changes.

V. Speaking.

Using the vocabulary of the texts:

1. Describe some examples of courtship behavior and how this behavior helps organisms survive.
2. Identify and explain two reasons that animals migrate.
3. Compare and contrast hibernation and migration.
4. Think Critically Suppose a species of frog lives close to a loud waterfall. It often waves a bright blue foot in the air. What might the frog be doing?

VI. Fill in the blank with the appropriate term.

1. Animal _____ includes all the ways that animals interact with each other and the environment.
2. _____ the branch of biology that studies animal behavior,
3. _____ behaviors are closely controlled by genes with little or no environmental influence.
4. A dog drooling when exposed to food is an _____.
5. _____ is a change in behavior that occurs as a result of experience.
6. A reflex is a response that always occurs when a certain _____ is present.
7. _____ animals live together in a society.
8. _____ rhythms are regular changes in biology or behavior that occur in a 24-hour cycle.
9. Animals can _____ with sounds, chemicals, or visual cues.
10. _____ is behavior that is intended to cause harm or pain.
11. Parental care is generally longest and most involved in _____.
12. _____ refers to seasonal movements of animals from one area to another.

VII. Writing.

Thoroughly answer the question below. Use appropriate academic vocabulary and clear and complete sentences.

Define innate behavior. Give an example.

Define learned behavior. Give an example.

VIII. Translation.

Translate the following extract.

Чи можуть тварини спілкуватися одна з одною? Як окремим із них вдається, не збиваючись зі шляху, переміщатися на великі відстані? Як, на перший погляд, беззахисні тварини захищаються від ворогів?

Усі ці та інші питання здавна цікавлять людей. Частину загадок порівняно нещодавно вже вирішили, проте багато ще чого залишається таємницею.

Наука про поведінку тварин називається етологією. Вона займається такими проблеми, як, наприклад, скільки часу й як тварини сплять, як вони будують нори чи гнізда, яким чином спілкуються між собою, здобувають їжу, і т. п.

Вчені намагаються знайти відповіді і на такі питання, як, наприклад, чому деяким тваринам є притаманний сильно розвинений материнський інстинкт, а інші залишають своїх дитинчат невдовзі після народження; чому частина тварин занурюється у зимову сплячку, а інші - ні, та інше.

Тварини переміщаються у різні способи - вони можуть бігати, плазувати, стрибати, плавати чи літати. Давши відповідь на ті чи інші запитання, ми краще дізнаємося про тварин і краще будемо їх розуміти.

VIII. The problems of environmental protection

I. Lead in.

Discuss this quotation and make short comments.

"Mankind won't die in a nuclear nightmare, it will suffocate in their own waste."

Nils Boor.

II. Vocabulary.

1. Consult a dictionary and practice the pronunciation of the following words and phrases. Memorize them.

acid rain - *кислотний дощ*
aerosol - *аерозоль*
animal welfare - *охорона диких тварин*
carbon monoxide - *окис вуглецю*
climate - *клімат*
endangered species - *вимираючі види*
energy - *енергія*
nuclear energy - *ядерна енергія*
solar energy - *сонячна енергія*
exhaust fumes- *вихлопні гази*
fertilizers - *добрива*
forest fires - *лісові пожежі*
global warming - *глобальне потепління*
greenhouse effect - *парниковий ефект*
(non)-renewable resources - *(не) відновлювані ресурси*
nuclear - *ядерний, атомний*
nuclear fallout - *радіоактивні опади*
nuclear reactor - *ядерний реактор*
oil-slick - *нафтова пляма*
ozone layer - *озоновий шар*
pesticide - *отрутохімікат, пестицид*
pollution *забруднення*
protected animals - *тварини під захистом*
rain forest - *тропічні ліса*
unleaded petrol - *неетилований бензин*
waste - *відходи виробництва*
nuclear waste - *ядерні відходи*
wildlife- *дика природа, тваринний світ*

Natural Disasters

drought - *посуха*
earthquake - *землетрус*
flood - *повінь*
tidal wave - *приливна хвиля*
typhoon - *тайфун*
volcanic eruption - *виверження вулкану*

Environment - Politics

environmental group - *група захисників навколишнього середовища*
green issues - *питання, що стосуються природи*
pressure group - *впливова група*

Verbs

cut down - *скорочувати, зменшувати,*
destroy - *знищувати*
dispose (of) - *ліквідувати, позбутися, утилізувати*
dump - *звалювати, викидати*
protect - *захищати*
pollute - *забруднювати*
recycle - *переробляти, повторно обробляти*
save - *зберегти*
throw away - *викидати*
use up - *виснажувати, вичерпувати, витрачати*

2. Chose the words from the topical vocabulary to match the definitions:

1. the gradual rise in the earth's temperature caused by high levels of carbon dioxide and other gases in the atmosphere;
2. unwanted or unusable materials, substances or by-products;
3. a substance used for destroying insects or other organisms harmful to cultivated plants or to animals;
4. a long period of time during which no rains fall;
5. the problem caused by increased quantities of gases such as carbon dioxide in the air;
6. a chemical or natural substance added to soil or land to increase its fertility.

3. Give the synonyms to the following words:

to reduce, to ruin, power, plants and animals, to preserve, to make dirty

III. Speaking.

Rank the following in the order of importance in terms of danger to the citizen.

a) Pesticide residue on foods eaten by humans.
b) Hazardous waste sites (in use).
c) The greenhouse warming effect.
d) Radiation from nuclear power plant accidents.
e) Hazardous waste sites (abandoned).
f) Radiation from x-rays.
g) Industrial accidents releasing pollutants into the air, water, or soil.
h) Exposure to toxic chemicals in the workplace.
i) Destruction of protective ozone layer.
j) Non-hazardous wastes, like trash disposal.
k) Underground storage tanks leaking gasoline and other substances.
1) Pesticides harming farmers, farm workers, and consumers who work with them.

IV. Reading.
1. Read the text and answer the questions.

What really threatens the environment?

The poisoning of the world's land, air, and water is the fastest-spreading disease of civilization. It probably produces fewer headlines than wars, earthquakes and floods, but it is potentially one of history's greatest dangers to human life on earth. If present trends continue for the next several decades, our planet will become uninhabitable.

Overpopulation, pollution and energy consumption have created such planet wide problems as massive deforestation, ozone depletion, acid rains and the global warming that is believed to be caused by the greenhouse effect.

The seas are in danger. They are filled with poison: industrial and nuclear waste, chemical fertilizers and pesticides. The Mediterranean is already nearly dead; the North Sea is following. The Aral Sea is on the brink of extinction. If nothing is done about it, one day nothing will be able to live in the seas.

Every ten minutes one kind of animal, plant or insect dies out for ever. If nothing is done about it, one million species that are alive today will have become extinct twenty years from now.

Air pollution is a very serious problem. In Cairo just breathing the air is life threatening — equivalent to smoking two packs of cigarettes a day. The same holds true for Mexico City and 600 cities of the former Soviet Union.

Industrial enterprises emit tons of harmful substances. These emissions have disastrous consequences for our planet. They are the main reason for the greenhouse effect and acid rains.

An even greater environmental threat are nuclear power stations. We all know how tragic the consequences of the Chernobyl disaster are.

People are beginning to realize that environmental problems are not somebody else's. They join and support various international organizations and green parties. If governments wake up to what is happening — perhaps we'll be able to avoid the disaster that threatens the natural world and all of us with it.

1. What is the fastest-spreading disease of civilization?
2. What planet-wide problems have overpopulation, pollution and energy consumption created?
3. What will happen to our planet if present trends continue
4. What is happening to the seas and rivers?
5. The Aral Sea is on the brink of extinction. Do you think it's possible to save it?
6. A lot of animals are dying out. But people wear fur coats, crocodile handbags, leather shoes, etc. Are you for or against hunting?
7. Is air pollution a serious problem? Why?
8. What were the tragic consequences of the Chernobyl disaster?
9. Are nuclear power stations dangerous? Why?

2. Study the information. And pick out the words and phrases defining causes of the ecological disaster and consequences.

Environmental hazards

Computers project that between now and the year of 2030 we are going to have an increase of the average temperature between 1,5 – 4,5 Cº. Sea levels would rise by several metres, flooding coastal areas and ruining vast tracts of farmland. Huge areas would be infertile and become uninhabitable. Water contamination could lead to shortages of safe drinking water. It looks like the end of civilization on the Earth.

We have upset nature's sensitive equilibrium releasing harmful substances into the air, polluting rivers and oceans with industrial waste and tearing up the countryside to accommodate our rubbish. These are the consequences of the development of civilization.

The range of environmental problems is wide. But the matters of people's great concern nowadays are atmosphere and climate changes (global warming), depletion of the ozone layer, freshwater resources, oceans and coastal areas, deforestation and desertification, biological diversity, biotechnology, health and chemical and nuclear safety.

POLLUTION

Acid Rains

One of the most alarming forms of air and water pollution is acid rain. It results from the release into the atmosphere of sulphur and nitrogen oxides that react with water droplets and return to earth in the form of acid rain, mist or snow. Acid rain is killing forests in Canada, the USA, and central and northern Europe. It has acidified lakes and streams and they can't support fish, wildlife, plants or insects. (In the USA 1 in 5 lakes suffer from this type of pollution).

Stratospheric Ozone Depletion

The ozone shield that protects the Earth from the Sun's harmful UV (ultraviolet) radiation is being damaged by CFCs (chlorofluorocarbons). They are released by the daily use of industrial and household products: refrigerators, air conditioners, foam insulation, cleaning chemicals, food packaging. They attack the ozone molecules making a "hole". This "hole" allows more UV rays to penetrate to the Earth. It increases the risk of skin cancer, weakens the immune system of people. Besides, UV rays influence the oceans, the growth of plankton, an essential part of the marine-life food chain in the negative way, reduce economically important crops (rice, cotton, soy beans). The life cycle is going to be undermined by the ozone.

Destruction of the Tropical Forest

It's generally agreed that the destruction of the tropical forest has a major impact on the world's climate. The tropical rain forest is a natural recycler, provider and protector for our planet. It recycles carbon, nitrogen and oxygen, helps determine temperature, rainfall and other climatic conditions and supports the most diverse ecosystem in the world. Deforestation could cause one forth of all species on earth to vanish in the next 25 years. These forests in Amazonia, South-East Asia and West and Central Africa are being destroyed at an alarming rate of 42 million acres per year.

CONSUMPTION

Nuclear Energy The Ukrainian government does not think it can close Chernobyl without developing alternative energy sources, and it wants assistance from Western nations to finish building five Russian-designed reactors whose safety standards are questioned by the IAEA (International Atomic Energy Agency). The $1.5 billion in aid offered by Western nations and the World Bank in 1994 does not approach the estimated $14 billion sought by Ukraine. Apparently Ukraine will take no safety measures nor develop new energy without the aid, putting the West in the position of either providing the needed funds somehow or continuing to face the prospect of another possible nuclear accident.

3. Compile a chart using the information from

Causes	Consequences

V. Speaking.

Questions for thought and discussion:

1. They say that our planet is our common home. Agree or disagree.
2. Which formula do you prefer: “Man is a master of nature”, or “Man is a son of nature”? Give your reasons.
3. Nowadays a lot of ecologists are speaking about “the ecology of our soul”. What do they mean?
4. “We can’t wait for favours from nature, our task is to take them from it.” This motto was very popular a few years ago. Do you think it can work wonders and make all of us happy?
5. What’s to be done about dying-out or endangered animals?
6. How would you comment on the saying: “We are all in one boat?”
7. Why are “the Greens” green?
8. Read the poem by William Blake; think it over and share your view: “To see a world in a grain of sand And Heaven in a wild flower; Hold infinity in the palm of your hand And Eternity in an hour.”

VI. Reading

1. Look through the abstracts below and discuss the following questions in pairs.

1) What can people do to change ecological situation for the better?
2) In what other ways could the pollutants coming from the automobile industry be reduced?
3) Can we dispense with public transport and cars?

Measures to Be Taken

We have only a few years to attempt to turn things around. We must review our wasteful, careless ways, we must consume less, recycle more, conserve wildlife and nature, act according to the dictum "think locally, think globally, act locally". To my mind, we are obliged to remove factories and plants from cities, use modern technologies, redesign and modify purifying systems for cleaning and trapping harmful substances, protect and increase the greenery and broaden ecological education. These are the main practical measures, which must be taken in order to improve the ecological situation.

Some progress has been already made in this direction. 159 countries-members of the UNO have set up environmental protection agencies. They hold conferences discussing ecological problems, set up environmental research centres and take practical urgent measures to avoid ecological catastrophe. There are numerous public organisations such as Greenpeace that are doing much to preserve environment.

Clean Cars, Clean Fuels

Performance and style have always been higher priorities for automobile manufacturers than reducing environmental pollutants. Concerned with an ever increasing number of automobiles on California's congested highways — automobiles that burn too much gasoline and spew noxious emissions — California decided to legislate a clean, efficient car.

What are some of the fuels being considered by carmakers? An engine that runs on electricity is much cleaner and quieter than a gasoline engine. However, electric cars are cleaner than gasoline-powered cars only when the source of their electricity is natural gas or solar energy. If electricity comes from a coal-fired power plant, electric cars actually produce more emissions than gasoline-powered cars.

Methanol and ethanol are alcohol fuels that burn much cleaner than gasoline and can be made from renewable resources such as agricultural waste. Other possibilities are to reformulate gasoline so it burns with fewer emissions and to improve the design of the conventional gasoline-powered internal-combustion engine so it is more efficient.

Liquid hydrogen is an extremely clean fuel, and some car designs have fuel cells that combine stored hydrogen with oxygen from the air to produce electricity. Mercedes-Benz unveiled a prototype fuel cell-powered minivan in 1995, and BMW displayed hydrogen-fuelled cars at the 1996 World Hydrogen Energy Conference in Stuttgart. Other manufacturers are expected to follow the German car industry.

Futurists look ahead to the time in the not-so-distant future when solar hydrogen will power vehicles. Solar hydrogen fuel is produced when solar energy splits water molecules to produce hydrogen. Cars powered by solar hydrogen will require such extensive modification of existing designs, however, that they could not be available alternative until well into the 21 st century.

2. Study the following set expressions and try to find Ukrainian equivalents.

Think Globally, Act Locally — was reportedly coined by David Brower, founder of Friends of the Earth, as the slogan for FOE when it was founded in 1969,

although others have stated it was originated by Rene Dubos as an advisor to the United Nations Conference on the Human Environment in 1972.

Environmentally friendly — is used to refer to goods or services considered to inflict little harm on the environment. The phrase has been in common usage for at least 20 years and is often added to product advertising or packaging to promote a sale.

It also means “being friendly to the environment”. For example, you can be environmentally friendly by recycling, or by being “green”, as people call it. There are also many organisations that associate themselves with the term, such as Greenpeace.

Leave No Trace — a philosophy of hiking and backpacking. Proponents of Leave No Trace believe that individual actions in the backcountry accumulate to degrade the wilderness experience. Therefore, any individual in the backcountry should behave in such a way that future visitors cannot tell that anyone was there before. The slogan "Leave no trace" (LNT) summarises a trend among hikers to address concerns about conservation of the ecosystems and scenery that often motivate hikes.

1. Match the sayings and their Russian equivalents.

1) Good deed is never lost.	Не будь швидкий на обіцянки, будь швидкий на виконання.
2) A sound mind in a sound body	Добре діло не пропаде даром. Добра справа без нагороди не залишається.
3) Actions speak louder than words	Після нас хоч потоп.
4) After us the deluge	Вчинки говорять голосніше, ніж слова. Не по словам судят, а по справах.
5) Be slow to promise and quick to perform	У здоровому тілі здоровий дух.

4. Read and translate the text. Fill in the blanks of the diagram with your ideas of environmental protection.

How you can help the environment

Global warming is something that we are all made very much aware of in the media. It describes the process of the world heating up (climate change) to temperatures that could damage the ecosystem and threaten life on Earth as a result. Scientists generally concur that the Earth has heated up by 1 degree Fahrenheit in the last thousand years, and this has resulted in the destruction of some of the coral reefs, the melting of the ice caps and more severe weather. It is believed (though not proven), that humanity has largely contributed to this state through a range of activities and behaviours that are bad for the environment such as driving, flying and wasting important materials.

If this is the case, then it stands to reason that avoiding such behaviours – and replacing them with more conducive ones – could help the environment. And if each person were to make such lifestyle changes this could contribute a huge amount to the state of the climate and the atmosphere. Here then we will look at some of the things you can do to 'do your bit' and help improve the environment and prevent climate change.

What Causes Global Warming? Before we look at how to do your bit to prevent and slow down global warming it helps to have an understanding of what it is and why it works in the first place.

The clue to how global warming works is in the name of one of its aspects, namely the 'greenhouse effect'. The reason for this is that a greenhouse offers an almost perfect analogy for how global warming works – just like a greenhouse global warming means that heat gets in but can not get back out. This means that the temperature gradually rises faster than it drops meaning that the overall temperature continues to increase exponentially. In the case of a greenhouse this is of course caused by the glass ceiling and walls, whereas in the case of the Earth it is caused by the 'greenhouse gasses' which are the thick gasses that build up in the atmosphere and then trap the heat in.

These greenhouse gasses include fuel emissions from vehicles and all fossil fuels, but also carbon dioxide (which we breathe out), methane and water vapour. Thus, in order to reduce global warming and its effects, we need to reduce these emissions through the way we live. There are many ways we can cut our own 'carbon footprint' by creating fewer carbon emissions, but we can also pro-actively reduce carbon through our actions. Here are some things you can do:

Ways to Reduce Your Carbon Footprint

Plant Trees

Trees and plants convert carbon dioxide (which damaged the environment) into oxygen (which we breathe and is good for the environment). As such it is important to try and prevent the destruction of rainforests and other greenery. However you can contribute to the repair of the environment a little yourself just by planting trees and plants in your garden. If you own some land, then tending for a garden is a great way to help the environment. It is said that if we planted one tree each year, that would be enough to negate any of our carbon footprints.

Do Not Use Unnecessary Electricity

One of the ways we are often told we can help the environment and limit global warming is to conserve energy. For many this is confusing – how can saving electricity help the environment? The reason though is simple – because the majority of your electricity comes from fossil fuels and these being burned releases emissions into the atmosphere that result in more trapped heat. Following are some ways you can prevent wasting electricity.

• Use energy saving light bulbs
• Fill the kettle with only as much water as you need
• Do not leave things on standby – it can use as much electricity as having it on in some cases

• If you have a rechargeable device, do not just keep it plugged in when using it
• Do not leave sockets on or plugs in when you are not using them
• Do not have lights on when you are not in the room
• Do not leave the heating on during the day
• Only wash full loads in the dishwasher, washing machine etc

Avoid Driving

Driving creates a lot of exhaust fumes as everyone knows, so traffic is one of the biggest contributors to global warming. Thus if you can reduce the amount you drive you can reduce those emissions and your carbon footprint. Opt to ride a bike then, walk, or take public transport when possible. Surprisingly, those who live in and near cities actually have a smaller carbon footprint than those in rural areas – the reason for this being that they do not have to travel as far to get into work and elsewhere.

Look for Fuel Efficient Vehicles

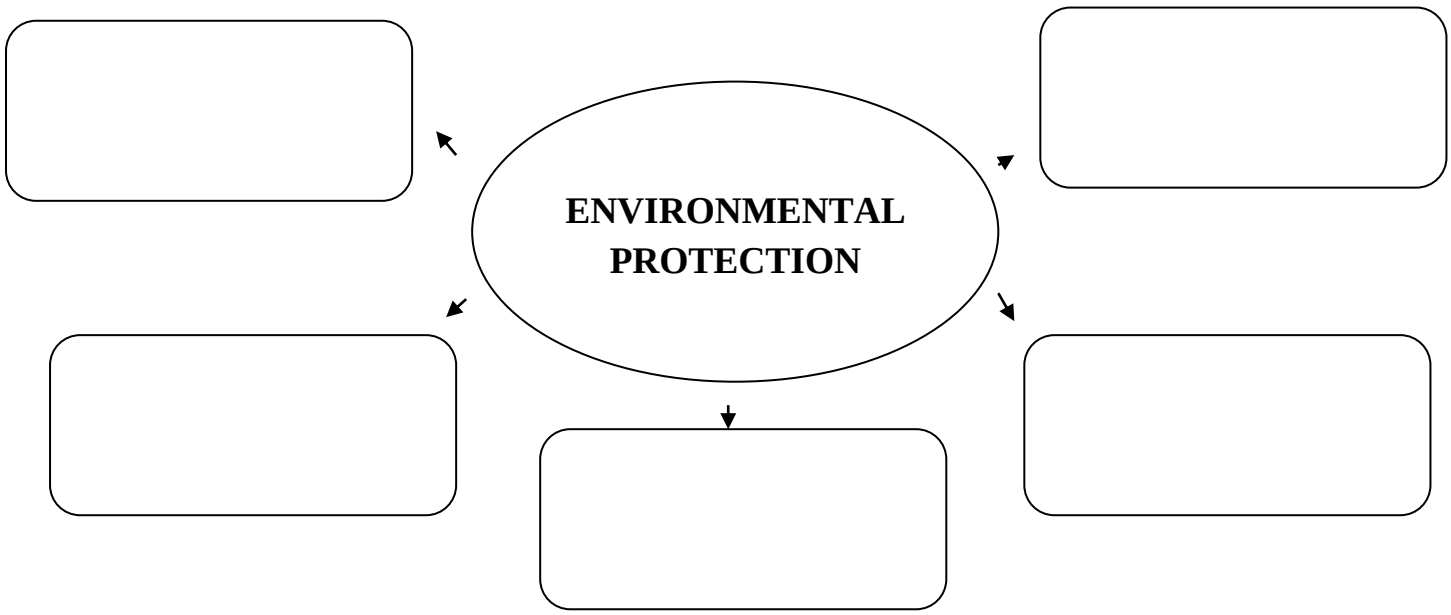
Sometimes you can not avoid driving and for the time being we do not all live in built up areas. In the meantime then ensure that you vehicle is highly fuel efficient. The most conscious of us will even buy electric cars and motors or hybrids.

Recycle

Recycling means that fewer trees need to be chopped down and fewer fossil fuels need to be burned. It also means less decomposing which can cause methane. Recycle by placing your items in recycling bins then, but also around your own home by re-using old items and making your own things. When you buy items try to buy things made from recycled materials.

Vote for Parties With Green Policies

One way everyone can have a tremendous impact on global warming is to try and ensure that we support the parties and politicians who intend to make big positive changes. We all have a vote and that is a very powerful thing when it comes to the environment.



VII. Revision Translation.
Translate the given sentences:
1. Причиною занепокоєння багатьох людей є те, що забруднення навколишнього середовища позначається на їх станові здоров'я.
2. Занепокоєння щодо захисту природи від забруднення обмежених природних ресурсів стало причиною появи могутнього руху по всьому світові.
3. 159 країн-членів Організації Об'єднаних націй заснували агентства із захисту навколишнього середовища.
4. Для вирішення цієї важливої проблеми людям необхідно об'єднати зусилля, підвищити стандарти техніки безпеки на усіх промислових підприємствах, адекватно обробляти побічні продукти промисловості.
5. Проблема захисту навколишнього середовища викликає велике занепокоєння в уряді України, особливо після аварії на Чорнобильській атомній електростанції у квітні 1986 року.
6. Українська екологічна газета "Зелений світ" закликає захищати природне багатство і використовувати його обережніше і економніше на користь сучасного і майбутніх поколінь.
7. Організації із захисту навколишнього середовища допомагають контролювати забруднення, намагаючись вплинути на законодавців та обирати на виборах таких політичних лідерів, яким не байдужі екологічні проблеми.
8. Деякі екологічні групи досліджують вплив забруднення на навколишнє середовище, збирають гроші, засновують фонди з метою переконати уряд та промисловців запобігти забрудненню або зменшити його.
9. «Грінпіс» (Зелений Світ) – це міжнародна екологічна організація.
10. «Грінпіс» привертає увагу до небезпек для оточуючого середовища таких процесів, як кітобійний промисел, забруднення води і повітря, видобування нафти у морі, ядерні випробування, довільне скидання радіоактивних або небезпечних відходів.

VIII. Writing.
Write an essay. You should give a clear personal opinion with persuasive supporting arguments and evidence.

1. While some people consider global warming to be the most pressing environmental problem which we have at the moment, others believe that deforestation is a much more important problem. Discuss both sides and give your opinion.

2. With increasing populations and ever growing urban centers, many countries are losing their natural beauty spots. What benefits are there to protecting places of natural beauty? How can this issue be solved?

3.Many animals are being hunted in order to fulfill the demand and greed of mankind for different reasons. How can this issue be tackled?

IX. Agriculture

I. Lead in.

Work in small groups. Choose one question and discuss it. Then represent your answer to the rest of the groups.

1. What costs does the farmer have in order to farm? Can you find evidence of what the farmer needs to buy from elsewhere in order to assist him in his job?
2. The day in the life of the farmer. Can you find evidence of what the farmer does from day to day in order to earn a living?
3. How does the farmer make his money? Can you find evidence of what the farmer sells in order to make money?
4. Are there any other ways in which the farmer earns his living?
5. Can you identify any other jobs that the farmer does which do not earn him money but when he is perhaps managing the countryside?

II. Vocabulary.

Match the words with their definitions.

1. Agriculture	**a.** cows and bulls kept on a farm for their meat or milk.
2. Animal husbandry	**b.** animals such as cows and sheep that are kept on a farm.
3. Agribusiness	**c.** the practice or business of growing crops or keeping animals on a farm.
4. Crop	**d.** farming that involves keeping animals and producing milk, meat etc.
5. Pesticides	**e.** a plant such as wheat, rice, or fruit that is grown by farmers and used as food.
6. Fodder	**f.** the crops that have been gathered, or the amount and quality of the crops gathered.
7. Livestock	**g.** to produce new plants or animals from existing ones, especially in order to produce plants or animals with particular characteristics.
8. Farming	**h.** the work, business, or study of farming.
9. Pasture	**i.** the business of operating a large farm to produce as much food and profit as possible, or one of the farms that operates in this way.
10. Harvest	**j.** a chemical substance used to kill insects and small animals that destroy crops.
11. Raw materials	**k.** land or a field that is covered with grass and is used for cattle, sheep etc to feed on.
12. Fertilizer	**l.** the preparation and use of land for growing crops.
13. Cultivation	**m.** food for farm animals.
14. Cattle	**n.** a substance that is used to make a product.
15. Breed	**o.** a substance that is put on the soil to make plants grow.

2. Make five sentences using the words from exercise 1.

3. Agriculture and Farm Idioms.
Match the idioms with their meanings.
Try to give the Ukrainian equivalents to the following idioms.

1. a funny farm –	**a.** you can be certain of someone or something
2. to buy the farm –	**b.** to become angry, excited, or agitated
3. you can bet the farm –	**c.** a hospital for people who are mentally ill
4. to take the bull by the horns –	**d.** for a very long time
5. until the cows come home –	**e.** to die
6. to have a cow –	**f.** to be brave and confront difficult situations

III. Reading.
Read and translate the text.

The Importance of Agriculture

Agriculture is the backbone of the economic system of a given country. In addition to providing food and raw material, agriculture also provides employment opportunities to very large percentage of the population. Below are the importances of agriculture

Source of Livelihood

The main source livelihood of many people is agriculture. Approximately 70 % of the people directly rely on agriculture as a mean of living. This high percentage in agriculture is as a result of none development of non-agricultural activities to absorb the fast-growing population. However, most people in developed countries do not engage in agriculture.

Contribution to National revenue

Agriculture is the main source of national income for most developing countries. However, for the developed countries, agriculture contributes a smaller percentage to their national income.

Supply of Food as well as Fodder

Agricultural sector provides fodder for domestic animals. Cow provides people with milk which is a form of protective food. Moreover, livestock also meets people's food requirements.

Significance to the International Trade

Agricultural products like sugar, tea, rice, spices, tobacco, coffee etc. constitute the major items of exports of countries that rely on agriculture. If there is smooth development practice of agriculture, imports are reduced while export increases considerably. This helps to reduce countries unfavorable balance of payments as well as saving foreign exchange. This amount may be well used to import other essential inputs, machinery, raw-material, and other infrastructure that is helpful for the support of country's economic development.

Source of Raw Material

The main source of raw materials to major industries such as cotton and jute fabric, sugar, tobacco, edible as well as non-edible oils is agriculture. Moreover, many other industries such as processing of fruits as well as vegetables and rice husking get their raw material mainly from agriculture.

Significance in Transport

Bulks of agricultural products are transported by railways and roadways from farm to factories. Mostly, internal trade is in agricultural products. Moreover, the revenue of the government, to a larger extent, relies on the success of agricultural sector.

Foreign Exchange Resources

The nation's export trade depends largely on agricultural sector. For example, agricultural commodities such as jute, tobacco, spices, oilseeds, raw cotton, tea as well as coffee accounts for approximately 18 % of the entire value of exports of a country. This demonstrates that agriculture products also continue to be important source of earning a country foreign exchange.

Great Employment Opportunities

Construction of irrigation schemes, drainage system as well as other such activities in the agricultural sector is important as it provides larger employment opportunities. Agriculture sector provides more employment opportunities to the labor force that reduce the high rate of unemployment in developing countries caused by the fast growing population.

Economic Development

Since agriculture employs many people it contributes to economic development. As a result, the national income level as well as people's standard of living is improved. The fast rate of development in agriculture sector offers progressive outlook as well as increased motivation for development. Hence, it aids to create good atmosphere for overall economic development of a country. Therefore, economic development relies on the agricultural growth rate.

Source of Saving

Development in agriculture may also increase savings. The rich farmers we see today started saving particularly after green revolution. This surplus quantity may be invested further in the agriculture sector to develop the sector.

Food Security

A stable agricultural sector ensures a nation of food security. The main requirement of any country is food security. Food security prevents malnourishment that has traditionally been believed to be one of the major problems faced by the developing countries. Most countries rely on agricultural products as well as associated industries for their main source of income.

IV. Speaking.

1) How important is farming in your country?
2) Is farming in your country in a healthy condition?
3) What crops are farmed in your country?
4) What livestock is raised in your country?

5) Do you think farming offers a good quality of life?
6) How different is farming across the world?
7) What do you think of farming GM crops?
8) How can subsistence farming become more profitable?
9) What do you think of the intensive farming methods used in rich countries?
10) Do you think the farming of crops for biofuels is a good idea?

V. Reading.
Read and translate the text.

7 Different Types of Farms

When you hear someone talking about a farm, what do you think of? Is it big or small? What does the farmer grow or raise?

Not all farms are the same! A farmer could choose to grow one kind of crop, or many. He or she may raise one breed of animal or many kinds. Some farmers do both! Depending on what resources they have access to, farmers can choose to have a big or small farm. And, depending on how much space they have, they can have both crops and animals.

Here are seven different types of farms:

1. Subsistence farm — This is a type of farm that produces only enough food to feed the family with little or no surplus for sale. This type of farm is not meant to provide income, but would ideally produce all needed food, year-round. This is becoming increasingly popular among Americans who wish to live "off the grid."

2. Commercial farm — This is the opposite of a subsistence farm and is meant to provide income, often the sole form of income, for the farm family. It can consist of growing crops, raising animals for meat, eggs and dairy, raising fish, or a combination of these.

3. Crop farm — These farms grow fruits, vegetables, or grain. Most large-scale industrial farms are monoculture farms, meaning they grow only one type of crop at a time.

4. Fish farm — Also called aquaculture, fish farming is booming. It involves raising large quantities of fish in large tanks. Although farmed fish has a less-than-favorable reputation, well-managed fish farms are sustainable, clean, and can produce high-quality protein.

5. Dairy farm — This type of farm focuses on raising animals for milk. The milk can then be used to make other dairy products like yogurt and cheese. Most large dairy farms raise dairy cows, but some artisanal dairy farms may raise sheep or goats.

6. Poultry farm — Most poultry farms raise chickens and turkeys for meat consumption, but some raise chicken for eggs. Large-scale farms are the norm, but consumer demand for locally-produced, pastured, and humanely raised poultry is growing.

7. Meat farms — These farms exist solely to raise animals for slaughter and consumption. They can be divided into other categories like pig farms and cattle farms.

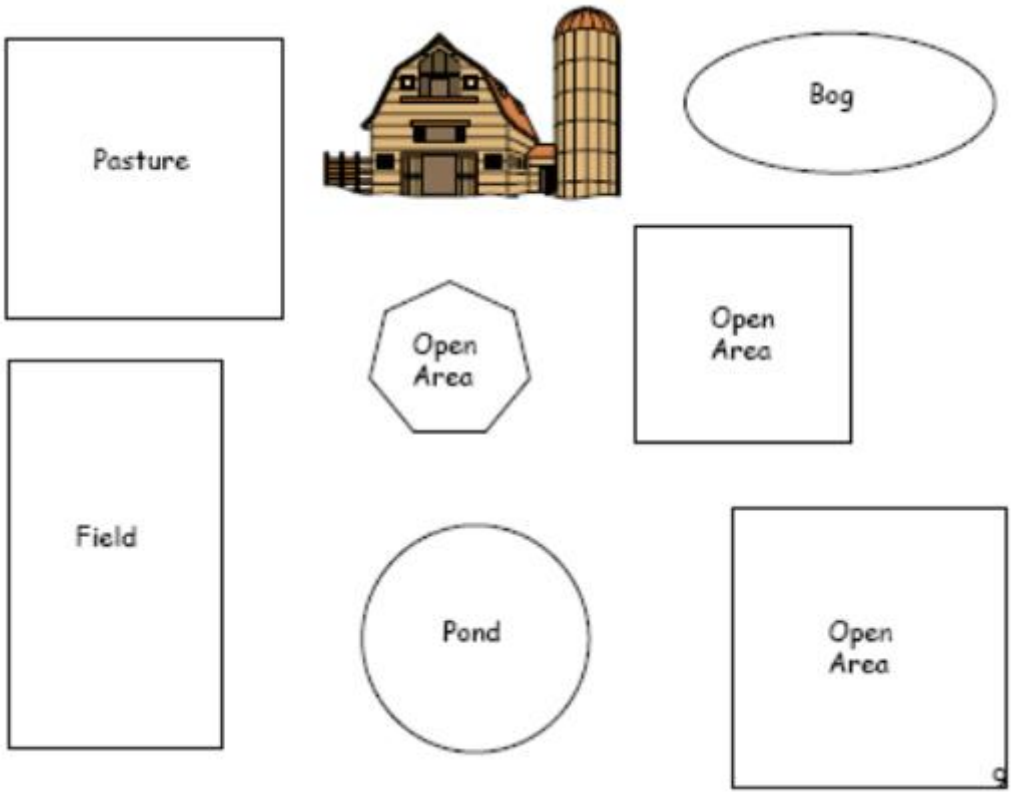
VI. Speaking

1) What are the challenges the farming industry faces today?
2) Does farming help or add to global warming?
3) Would you like to be a farmer?
4) Do you think we could save the world if we all went back to farming?
5) Are you interested in farming news?
6) Would you prefer to work in dairy farming or arable farming?
7) What do you know about factory farming?
8) Does farming help preserve the countryside?
9) Do you think governments should encourage more organic farming?
10) What do you understand by the term 'urban farming'?

VII. Project work.

Plan your own farm! Below is a bird's eye view of your farm. You have fields, pastures, a barn, a pond, a bog, and some open areas to build more animal homes or plant more crops. Look at the list of animals and crops and think about where they can be grown or raised on a farm. Color the area where you want to put a plant or animal according to the list. Most of the colors can go in more than one area, and most of the areas can have more than one color in them. Think carefully before you color! Add areas if you need to.

Corn (Yellow) Pumpkins (Orange) Cranberries (Red) Chickens (Pink)
Fish (Light Blue) Tomatoes (Dark Blue) Dairy Cows (Black) Wheat (Brown)
Honey Bees (Purple) Horses (Green)



X. The human anatomy

I. Lead in.

The human body consists of many interacting systems. What human body systems do you already know? Write a list of the systems in your journal or in a notebook. Then, write what you believe is the role or job of each system.

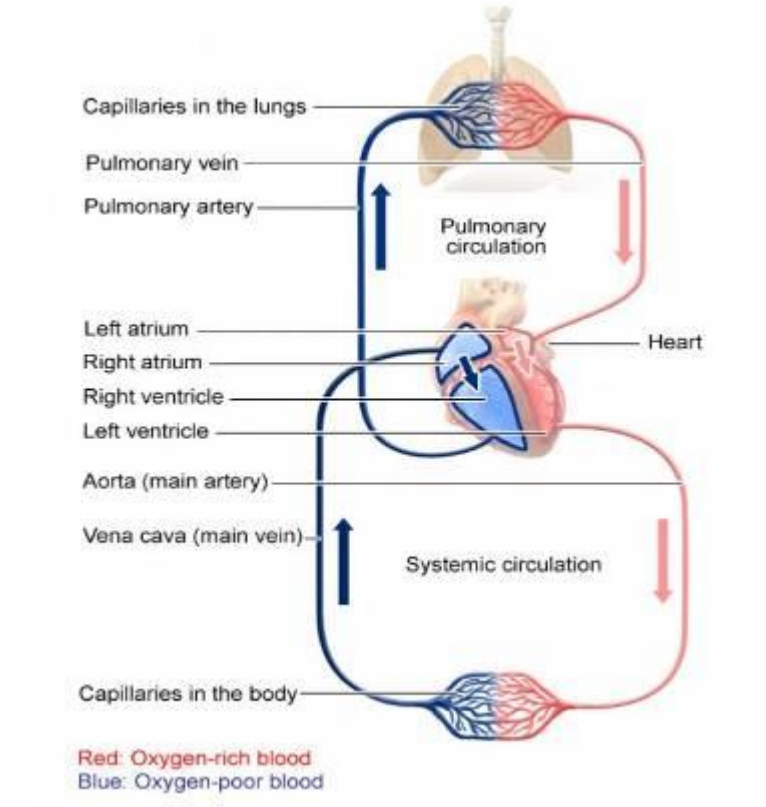
II. Reading.

Read and translate the text.

How does the blood circulatory system work?

The blood circulatory system (cardiovascular system) delivers nutrients and oxygen to all cells in the body. It consists of the heart and the blood vessels running through the entire body. The arteries carry blood away from the heart; the veins carry it back to the heart. The system of blood vessels resembles a tree: The "trunk," the main artery (aorta), branches into large arteries, which lead to smaller and smaller vessels. The smallest arteries end in a network of tiny vessels, the capillary network.

There is not only one blood circulatory system in the human body, but two, which are connected: The systemic circulation provides organs, tissues and cells with blood so that they get oxygen and other vital substances. The pulmonary circulation is where the fresh oxygen we breathe in enters the blood. At the same time, carbon dioxide is released from the blood.



Blood circulation starts when the heart relaxes between two heartbeats: blood flows from both atria (the upper two chambers of the heart) into the ventricles (the lower two chambers) which then expand. The following phase is called ejection period, which is when both ventricles pump the blood into the large arteries.

In the systemic circulation, the left ventricle pumps oxygen-rich blood into the main artery (aorta). The blood travels from the main artery to larger and smaller arteries into the capillary network. There the blood releases oxygen, nutrients and other important substances and takes on carbon dioxide and waste substances. The blood, which is now low in oxygen, is now collected in veinsand travels to the right atrium and into the right ventricle.

Now pulmonary circulation starts: The right ventricle pumps blood that carries little oxygen into the pulmonary artery, which branches off into smaller and smaller arteries and capillaries. The capillaries form a fine network around the pulmonary vesicles, grape-like air sacs at the end of the airways. This is where carbon dioxide is released from the blood into the air contained in the pulmonary vesicles and fresh oxygen enters the bloodstream. When we breathe out, carbon dioxide leaves our body. Oxygen-rich blood travels through the pulmonary vein and the left atrium into the left ventricle. The next heart beat starts a new cycle of systemic circulation.

III. Vocabulary practice.

1. Use the words in the box to fill in the blanks.

veins	transport	circulatory	blood
arteries	oxygen	lungs	heart
nutrients	energy	carbon dioxide	pumped
capillaries	dark	bright	intestine
away	heat	to	atmosphere

All people need to _____materials around to the different parts of their body. This is the job of the _____ system. The circulatory system consists of a liquid called _____, a pump called the _____ and a series of vessels called _____ and _____.

One thing that must be transported around is a gas called _____. Oxygen enters the blood through the _____. It is then _____ through the heart and around the body where it is used along with food to make _____. The body produces another gas called _____, which is a waste product. This gas is carried back to the heart and then to the lungs where it is released back into the _____.

The vessels that transport blood _____ from the heart are called arteries. The blood in arteries is _____ red because it is rich in oxygen. The vessels that transport blood _____ the heart are called veins. The blood in veins is _____red because it is low in oxygen. _____ are small vessels that join the arteries and veins. _____ from food are also transported around the body by the circulatory system. They enter the blood from the small _____. The circulatory system also helps to regulate temperature by transporting _____ around the body.

2. Find the circulatory system words and give their Ukrainian equivalents.

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

aorta	carbon dioxide	lungs	transport
artery	circulate	nutrients	valve
blood	dark red	oxygen	vein
bright red	four chambers	pump	water
capillary	heart	red blood cells	white blood cells

IV. Reading.

1. Read and translate the text.

The Respiratory System

The respiratory system of the human body is responsible for the distribution of the air inhaled and exhaled throughout a person's life. The respiratory system includes the nose, throat, voice box, wind pipe, and lungs.

Each time a person inhales, or breathes in air, several kinds of gases enter the body. The most important is oxygen because it keeps a person alive, and the cells of the body need it for energy and growth. The air enters through the nose and mouth and the lungs fill up and then empty out.

When the air is inhaled there are tiny hairs in the nose called cilia that filter the air. The air is also warmed and moistened as it travels through the nose. Cilia also protects other parts of the respiratory passages, filtering out dust and other particles.

The inhaled air travels through the windpipe, which is called the trachea. The human body contains two lungs. The lungs are pink, mushy, and like a sponge. The lungs are protected by the rib cage and keeps them protected and safe.

The lung on the left side of the body is smaller than the right lung, which allows room for a person's heart. Beneath the lungs is a muscle called the diaphragm. It works with the lungs to allow a person to inhale and exhale. When a person breathes in the diaphragm shrinks and levels out as the lungs fill up with air.

The end of the trachea is located between the two lungs. At the bottom of the trachea are a couple of large tubes called bronchi. The bronchi lead into the lungs. One tube sends air into the left lung, and the other tube sends air into the right lung.

Once the air travels through the bronchi, it will branch off into smaller tubes called bronchioles. The bronchioles are about the thickness of a hair, and there are about 30,000 in each lung. From the bronchioles the air then continues its journey to tiny air sacs located throughout the lungs. The tiny air sacs are called alveoli.

The 600 million alveoli are covered with very tiny blood vessels called capillaries. It is in this area of the lungs between the alveoli and capillaries the exchange of air takes place.

Alveoli allow the air to pass into the blood cells of the body, first traveling through the heart carried by red blood cells. The oxygen enters the blood through the tiny capillaries. The heart then takes the blood filled with oxygen and sends it out to all the cells of the body.

When a person exhales or breathes out everything will happen in reverse. The diaphragm relaxes and the lungs become smaller. The cells in the body have received the oxygen it needs, but carbon dioxide must leave the body. This time, wastes enter the alveoli through the capillaries, back through the bronchioles and bronchi, and then the trachea and out through the nose and mouth. The air is warm because it heats up as it travels through the body.

Finally, the lungs are also important for talking. The larynx is located above the trachea, which is often called the voice box. Vocal cords across the larynx open and close, and then vibrate, to create the sounds as air flows between them. The amount of air exhaled determines the loudness of a sound.

In summary, there are many parts of the respiratory system working together to distribute oxygen throughout the body, as well as the lungs being necessary for a person's ability to talk. It is important to keep the lungs healthy and strong.

2. Explain the meaning of the following words and phrases.

to be responsible for	to filter out	to distribute
to fill up	mushy	in reverse
to empty out	to shrink	the rib cage

3. Choose the correct item.

1) Which of the following are the tiny hairs that filter the air that is inhaled, or breathed into the body?

A. Alveoli
B. Cilia
C. Bronchioles
D. Bronchi

2) Which of the following is referred to as the windpipe, which the inhaled air travels through to reach the lungs?

A. Trachea
B. Diaphragm
C. Bronchi
D. Cilia

3) Which of the following parts of the lungs allows air to be exchanged and then sent to the heart for distribution to the cells of the body?

A. Bronchi and bronchioles
B. Cilia and trachea
C. Alveoli and capillaries
D. Larynx and windpipe

4) Which of the following is another term for the voice box, which has vocal cords that vibrate when a person speaks?

A. Trachea
B. Throat
C. Diaphragm
D. Larynx

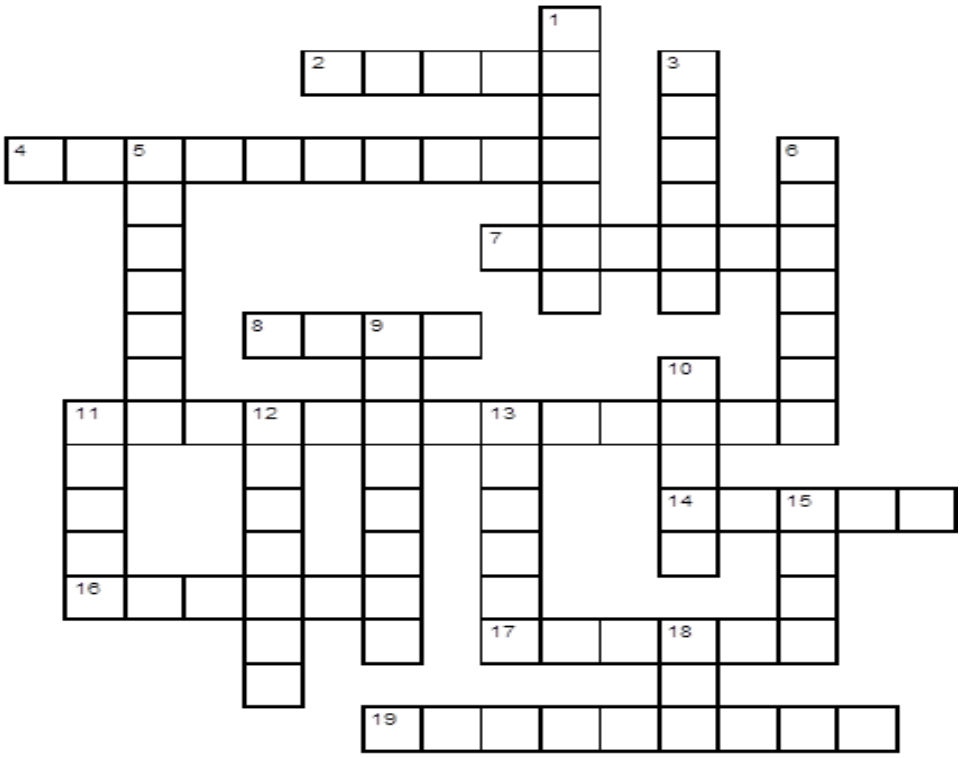
5) Which of the following are the tubes that enter the left lung and right lung, branching off from the trachea?

A. Bronchi
B. Bronchioles
C. Alveoli
D. Capillaries

6) Which of the following is the correct sequence for the air that travels from the nose or mouth, and eventually sending oxygen throughout the body?

A. Trachea, bronchioles, bronchi, alveoli, capillaries
B. Trachea, bronchi, bronchioles, alveoli, capillaries
C. Trachea, alveoli, capillaries, bronchi, bronchioles
D. Trachea, larynx, bronchi, bronchioles, alveoli

V. Do the crossword.



Across

2. One of two places where air enters your body.
4. When we exhale we breathe this plus carbon dioxide.
7. You do this when something irritates your nose.
8. You do this when you don't get enough oxygen to your blood.
11. A gas that you breathe out. It is a waste gas.
14. The place where oxygen enters the blood.
16. You do this when something irritates your diaphragm.
17. Breathe out.
19. Large muscle that controls the lungs.

Down

1. This prevents food from going down your lungs.
3. All animals need this gas to make energy from food.
5. Scientific name for the windpipe.
6. Inhale and exhale.
9. Common name for the trachea.
10. Fish have these instead of lungs.
11. You do this when something irritates your trachea or bronchi.
12. Two tubes that connect the trachea to the lungs.
13. Breathe in.
15. One of two places where air enters your body.
18. What we breathe.

VI. Reading.
1. Read and translate the text.

The Digestive System

Your digestive system starts as soon as you put food into your mouth. Saliva starts to soften the food and break it down ready to swallow. Your food starts its journey by being swallowed. It then enters the esophagus which is about 25 centimeters long on its way to your stomach. This process takes about 3 seconds.

Your stomach is attached to the end of your esophagus and is a stretchy sack. Your stomach mixes all the food you have eaten together using the strong muscles of the stomach. Your stomach produces gastric juices that break the food down further and help to kill any bacteria you may have eaten. Your food then enters the small intestines. Your small intestine is another amazing part of your body. In an adult it is about 22 feet long and is situated beneath your stomach.

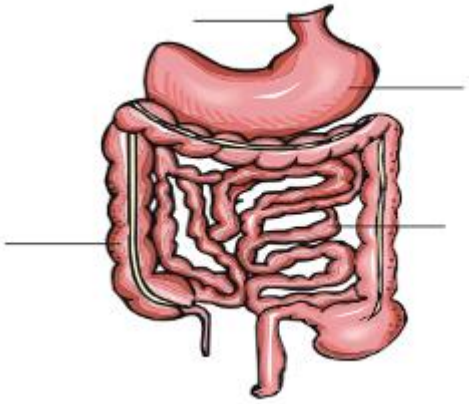
The small intestine breaks down your food even more so that your body can absorb the vitamins, fats, carbohydrates, proteins and minerals from the food you have eaten. The food you have eaten can spend up to 4 hours in the small intestine. After your body has absorbed all the nutrients from your food and all that is left is waste, it moves on to the large intestine.

The large intestine is fatter than the small intestine and about 5 feet long. Once the nutrients are removed from the food, your body is left with stuff it can't use. This waste has to be got rid of and leaves the large intestine when you go to the toilet.

To keep your digestive system working efficiently it is good to eat lots of fiber such as fruits, vegetables and whole grains. You should also drink plenty of water.

2.Answer these questions.

a) How does your food start its journey? _____
b) How long is your esophagus? _____
c) Is it true or false? Food takes about 10 seconds to reach your stomach_____
d) Underline the correct answer. What helps to kill any bacteria in your stomach?
1. esophagus 2. strong muscles 3. gastric juices 4. saliva
e) Where is the small intestine? _____
f) Name two foods that contain carbohydrates?_____
g) Name two foods that contain protein? _____
h) Label the diagram below.



3. Read and translate the text

The Endocrine System

The endocrine system is made up of a group of glands that produce the body's long-distance messengers, or hormones.

There are four major functions identified with hormones. Hormones regulate growth, development, behavior, and reproduction. Hormones coordinate the production, use and storage of energy. Hormones are involved in maintaining nutrition, metabolism, excretion, and water and salt balance. And finally, hormones react to stimuli from outside the body.

Hormones act as chemical messengers that carry instructions to other cells to change their activity. The heart beats faster as hormones carry instructions to the cells of the heart telling it to increase the heartbeat. It was once believed that hormones had to travel through the bloodstream, but scientists know today that that is not true. Some hormones act directly on adjacent cells without traveling through the blood.

The message that a hormone carries is determined by both the hormone itself and the cell it is carrying the message to. A hormone can instruct a cell to produce an enzyme or a specific protein. Simply put, hormones can instruct a muscle cell to relax and a nerve cell to fire.

Each hormone is specific to the cell it is traveling to. Each hormone acts like a key that opens a lock on or inside the cell. A hormone can only act on cells with the right lock.

Endocrine glands are important organs in the human body that hormones are secreted from. All of the endocrine glands together make up the endocrine system. The endocrine system coordinates the body's entire source of hormones.

There are several other organs that contain cells that secrete hormones. These organs include the brain, stomach, small intestine, kidney, liver, and heart.

The endocrine system and the nervous system interact to coordinate the overall activity of the body, and hormones play an important role. The chemical messengers for the nervous system are known as neurotransmitter while the chemical messengers for the endocrine system are known as hormones. There are some nerve cells that are able to secrete hormones. For example, epinephrine is both a neurotransmitter and a hormone.

Hormones are normally a slower-acting and longer-lived messenger whereas the neurotransmitters are usually fast-acting and short-lived. The effect of a hormone can last for days, weeks, or even years. After a hormone is released from the cell in which it is made, they bind and act on target cells. A target cell is a specific cell a hormone binds to and carries the message. If the hormone was not specific, all the cells in the body would react to a hormone resulting in uncoordinated activities.

Finally, there are two main hormone classifications. They are either amino-acid-based hormones or they are steroid-based hormones. Amino-acid-based hormones are water soluble and made up of amino acids. Steroid-based hormones are lipid hormones made from cholesterol and are fat soluble.

Since the human body makes more than 40 hormones, it is important that the release of them is regulated regardless of which hormone is being produced.

4. Choose the correct item.

1) How many hormones does the human body produce?
A: 2
B: 10
C: 25
D: 40

2) Which of the following is NOT regulated by hormones?
A: Growth
B: Development
C: Behavior
D: Hearing

3) Hormones coordinate the production, use, and storage of which of the following?
A: Energy
B: Emotions
C: Force
D: Balance

4) What do hormones carry to other cells that change their activity?
A: Protectors
B: Neurons
C: Instructions
D: Proteins

5) Amino-acid-based hormones are which of the following?
A: Fat soluble
B: Water soluble
C: Tissue soluble
D: Bone soluble

6) Which of the following times the time of the effects of hormone?
A: Seconds, minutes or even an hour
B: Minutes, hours, or even a day
C: Hours, days or even a week
D: Days, weeks or even a year

VII. Reading.

1. Read and translate the text.

The Nervous System and the Brain.

The brain is the main part of the body's nervous system constantly sending signals to the body. The brain has several different parts working together to help a person live their life each day. The five main parts of the brain include the cerebrum, cerebellum, brain stem, pituitary gland, and hypothalamus.

The largest part of the brain is the cerebrum, making up about 85% of the brain's weight. The cerebrum allows a person to think and control voluntary muscles, which a person is able to control. A person can kick a ball, walk down, the street, or jump in the air because they control the muscles and movements.

The cerebrum is active when a person is thinking during a test, making decisions, or playing a video game. Memory is a part of the cerebrum, including short-term memory, recalling a morning event, or long-term, a memory from several years ago.

The cerebrum has two halves, one on each side of the head. The right half helps a person think about abstract things like art, music, colors, shapes, and other parts of the imagination. The left half is more analytical, which helps a person speak, make logical decisions, do math problems, and reason. Scientists are unsure about which half of the brain controls the left or right side of the body.

The cerebellum controls a person's balance, movement, and coordination. This includes how a person stands, moves, and balances. The cerebellum is located in the back of the brain under the cerebrum, but it is only about one-eighth the size of the cerebrum, though it is a vital part of the brain. Without the cerebellum a person would not have very little ability to move.

The brain stem, also small, is responsible for all of the functions of the body for a person to remain alive, including breathing, food digestion, and blood circulation. Located below the cerebrum, in front of the cerebellum, it connects the rest of the brain to a person's spinal cord. The brain stem controls involuntary muscles, working on their own without the help or thought. The muscles are located in the heart, stomach or other parts of the body. It tells the heart to pump blood to the body, and stomach muscles to break food down. The brain stem is also the pipeline sending and receiving millions of messages back and forth between the brain and the body.

The pituitary gland controls the growth of a person's body by producing and releasing hormones into the body. The gland is only the size of a pea, but without it properly functioning, a person's body would not go through its changes as they get older. The gland also controls sugars and water in the body, as well as keeping the metabolism of the body going, which is related to the body's use of energy.

The final part of the brain is the hypothalamus, which basically controls the temperature of the body. When the body is too hot, this part of the brain tells the body to sweat; too cold, and it tells the body to shiver.

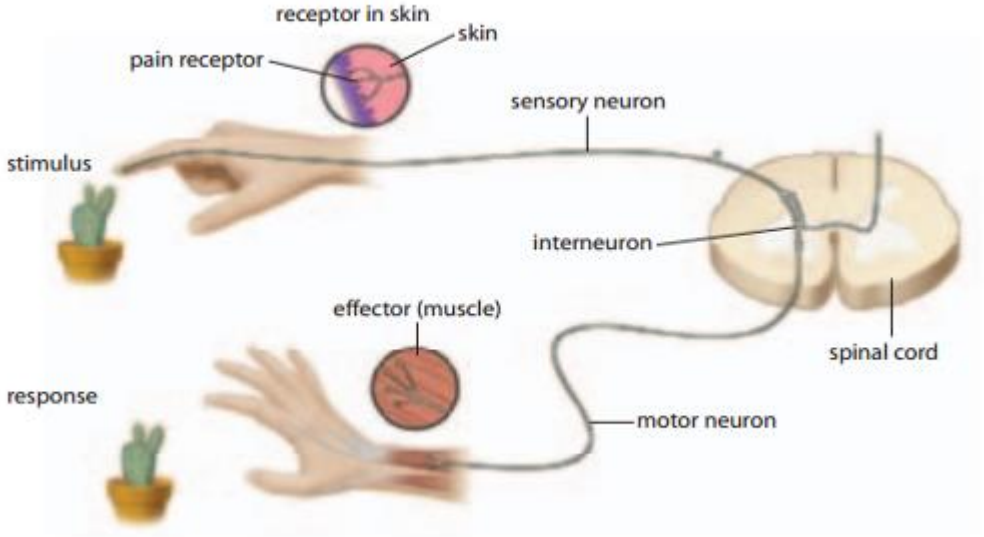
The five parts of the brain connect with the body's nervous system, made up of thousands of nerves that communicate information to and from the brain. The more messages sent to the brain, the stronger the connections become. This is how good, and bad, habits or skills are learned. The brain also is the control center for feelings. On each side of the brain there are a groups of cells called amygdala, which is responsible for emotions.

In conclusion, the brain is the control center of the body, and it must be treated well by eating healthy, being safe, and avoiding alcohol, drugs, and tobacco, but it's also important to challenge your mind.

2. Vocabulary. Consult a dictionary and practice the pronunciation of the following words and phrases. Memorize them.

homeostasis	гомеостаз
nervous system	нервова система
central nervous system	центральна нервова система
peripheral nervous system	периферична нервова система
neurons	нейрони
glial cells	гліальні клітини
nerves	нерви
reflex arcs	рефлекторні дуги
dendrites	дендрити
cell body	тіло клітини
synapse	синапс
neuromuscular junction	нервово-м'язове з'єднання

VIII. Speaking.
Describe the withdrawal reflex.



IX. Reading.
Read and translate the text.

Other types of human body systems

The Lymphatic System

The lymphatic system is also a defense system for the body. It filters out organisms that cause disease, produces white blood cells, and generates disease-fighting antibodies. It also distributes fluids and nutrients in the body and drains excess fluids and protein so that tissues do not swell. The lymphatic system is made up of a network of vessels that help circulate body fluids. These vessels carry excess fluid away from the spaces between tissues and organs and return it to the bloodstream.

The Muscular System

The muscular system is made up of tissues that work with the skeletal system to control movement of the body. Some muscles—like the ones in your arms and legs—are voluntary, meaning that you decide when to move them. Other muscles, like the ones in your stomach, heart, intestines and other organs, are involuntary. This means that they are controlled automatically by the nervous system and hormones—you often don't even realize they're at work.

The body is made up of three types of muscle tissue: skeletal, smooth and cardiac. Each of these has the ability to contract and expand, which allows the body to move and function. Skeletal muscles help the body move. Smooth muscles, which are involuntary, are located inside organs, such as the stomach and intestines. Cardiac muscle is found only in the heart. Its motion is involuntary

The Reproductive System

The reproductive system allows humans to produce children. Sperm from the male fertilizes the female's egg, or ovum, in the fallopian tube. The fertilized egg travels from the fallopian tube to the uterus, where the fetus develops over a period of nine months.

The Skeletal System

The skeletal system is made up of bones, ligaments and tendons. It shapes the body and protects organs. The skeletal system works with the muscular system to help the body move. Marrow, which is soft, fatty tissue that produces red blood cells, many white blood cells, and other immune system cells, is found inside bones.

The Urinary System

The urinary system eliminates waste from the body, in the form of urine. The kidneys remove waste from the blood. The waste combines with water to form urine. From the kidneys, urine travels down two thin tubes called ureters to the bladder. When the bladder is full, urine is discharged through the urethra.

X. Translation.

Translate into English.

Організм людини - єдине ціле. Людина з її складним анатомічною будовою, фізіологічними і психічними особливостями являє собою вищий етап еволюції органічного світу. Характерним для всякого організму є певна організація його структур.

Не можна уявити собі організм людини як набір окремих органів, що виконують свої власні функції і не піддаються впливу сусідніх. Наш організм являє собою єдине ціле, складові частини якого являють найбільш досконале та гармонійне створення з усіх тих, які тільки могла створити природа. Всі органи і їх призначення взаємопов'язані. Організм - біологічна система, що складається з взаємозалежних і супідрядних елементів, взаємовідносини яких і особливості їх будови підпорядковані їх функціонуванню як єдиного цілого. Організм людини складається з систем органів, які взаємодіють між собою. Кожен орган здійснює свою функцію. Тому від правильного функціонування всіх органів багато в чому залежить життєдіяльність всього організму.

XI. Immunology

I. Lead in.

Discussion Questions

1. How does the immune system work to protect us from disease and infection?
2. What are leukocytes and where are they produced and stored in the body? How do leukocytes travel around the body during the immune system's response to the invasion of a foreign substance?
3. Why are some people more immune than others to disease and infection? How do people develop immunity?
4. What can teens do to keep their immune systems strong and healthy?
5. What happens when your immune system fails? Is it possible to recover from this failure?

II. Reading.

1. Read and translate the text

The Immune System

The human body often takes care of itself without the person who owns the body knows what is happening. The immune system is in charge of keeping the body safe from invading germs that try to attack it every day. The immune system involves the different organs of the body and works together with the blood system.

The immune system defends the body against attacks by germs and bacteria. The system includes the skin, white blood cells, and the lymph system. The immune system works like a fort protecting the body and will increase it defenses when it is necessary.

The skin is the first defense against germs entering the body and it covers like a guard against harmful bacteria. Keeping the body clean is quite important since it is the first place the germs attack. Doctors, nurses, and other health professionals take great care in washing their hands because they know the germs can easily spread through contact with the skin.

The white blood cells are the watchers of the blood. There are three types of white blood cells called lymphocytes, neutrophils, and macrophages. Each have their own roles. White blood cells are made constantly since they live for a few weeks. Other types of white blood cells attack germs and bacteria when they are detected in the body. A tiny drop of blood contains up to 25,000 white blood cells.

The lymphocytes are most vital because they attack two kinds of infections: viral and bacterial. T cells and B cells are two types of lymphocytes. T cells find hidden germs or unhealthy cells and destroy them. The B cells produce antibodies and are used for specific germs. It will attach itself to the germ and then other white blood cells know it needs to be destroyed.

The lymphocytes are part of the lymph system. Lymph fluid travels to different parts of the body where it will pick up bacteria and viruses. It carries them to lymph nodes, which are glands that collect and destroy it before it travels to the rest of the body.

Allergies are the result of the immune system attacking too often. The system falsely believes the food product or other item is a bacteria or virus so it begins to attack it, which causes symptoms such as sneezing, itching, runny nose, sore throat, hives, and stomach cramps.

In summary, the immune system is important for keeping the body healthy and strong.

2. Choose the correct item.

1) The immune system includes all of the following EXCEPT:
A: Bones
B: Skin
C: Lymph system
D: White blood cells

2) The first defense against germs entering the body is which of the following?
A: White blood cells
B: Skin
C: Bones
D: Lymph system

3) The most vital part of the white blood cells is which of the following?
A: Lymph nodes
B: Neutrophils
C: Macrophages
D: Lymphocytes

4) Which of the following is a result of the immune system attacking too often?
A: Auto immune disease
B: Germs
C: Allergies
D: All of the above

5) Which of the following are two kinds of lymphocytes?
A: A cells and D cells
B: B cells and T cells
C: A cells and T cells
D: D cells and B cells

6) Which of the following is helpful in strengthening the immune system?
A: Getting enough sleep
B: Avoiding stress
C: Both A and B
D: Neither A or B

III. Reading.

1. Read and translate the text

Nonspecific Defenses

The First Line of Defense

The body's first line of defense consists of different types of barriers that keep most pathogens out of the body. Pathogens are disease-causing agents, such as bacteria and viruses. Regardless of the type of pathogen, however, the first line of defense is always the same. Types of pathogens that commonly cause human diseases include bacteria, viruses, fungi, and protozoa.

Mechanical Barriers

Mechanical barriers physically block pathogens from entering the body. The skin is the most important mechanical barrier. In fact, it is the single most important defense the body has. The outer layer of the skin is tough and very difficult for pathogens to penetrate. Mucous membranes provide a mechanical barrier at body openings. They also line the respiratory, GI, urinary, and reproductive tracts. Mucous membranes secrete mucus, a slimy substance that traps pathogens. The membranes also have hair-like cilia. The cilia sweep mucus and pathogens toward body openings where they can be removed from the body. When you sneeze or cough, pathogens are removed from the nose and throat. Tears wash pathogens from the eyes, and urine flushes pathogens out of the urinary tract.

Chemical Barriers

Chemical barriers destroy pathogens on the outer body surface, at body openings, and on inner body linings. Sweat, mucus, tears, and saliva all contain enzymes that kill pathogens. Urine is too acidic for many pathogens, and semen contains zinc, which most pathogens cannot tolerate. In addition, stomach acid kills pathogens that enter the GI tract in food or water.

Biological Barriers

Biological barriers are living organisms that help protect the body. Millions of harmless bacteria live on the human skin. Many more live in the GI tract. The harmless bacteria use up food and space so harmful bacteria cannot grow.

2. Answer the questions.

1. What is a pathogen? Which type of pathogen causes the common cold?
2. What is meant by The First Line of Defense?
3. What is a mechanical barrier? Give an example.
4. What is a chemical barrier? Give an example.
5. What is a biological barrier? Give an example.

3.Write true if the statement is true or false if the statement is false.

_____ 1. The skin is the single most important defense the body has.

_____ 2. Sneezing removes pathogens from your nose.

_____ 3. Sweat, mucus, tears, and saliva are all types of mechanical barriers used to protect you.

_____ 4. The inflammatory response is part of the body's first line of defense.

_____ 5. Leukocytes are white blood cells that fight infections and get rid of debris.
_____ 6. Barriers that keep out pathogens are the body's first line of defense.
_____ 7. The second line of defense attacks pathogens that manage to enter the body.
_____ 8. The second line of defense includes mechanical, chemical, and biological barriers.
_____ 9. The first line of defense includes the inflammatory response and phagocytosis.
_____ 10. A nonspecific defense can be tailored to a particular pathogen.
_____ 11. Biological barriers include millions of harmless bacteria live on the human skin.

IV. Vocabulary practice.

1. Match the vocabulary word with the proper definition.

a. biological barriers	b. chemical barriers	c. cilia
d. immune system	e. inflammatory response	f. leukocyte
g. mechanical barriers	h. mucous membrane	i. mucus
j. pathogens	k. phagocytosis	l. skin

_____ 1. provide a mechanical barrier at body openings
_____ 2. disease-causing agents
_____ 3. a type of white blood cell
_____ 4. living organisms that help protect the body
_____ 5. the most important mechanical barrier
_____ 6. a slimy substance that traps pathogens
_____ 7. the process in which leukocytes engulf pathogens
_____ 8. destroy pathogens on the outer body surface, at body openings, and on inner body linings
_____ 9. the first reaction of the body to tissue damage or infection
_____ 10. physically block pathogens from entering the body
_____ 11. protects the body from worms, germs, and other agents of harm
_____ 12. sweep mucus and pathogens toward body openings

2. Fill in the blank with the appropriate term.

1. _____ are disease-causing agents, such as bacteria and viruses.
2. _____ is the process in which cells engulf and break down pathogens and debris.
3. The skin_____ is the single most important defense the body has.
4. The _____ response is the first reaction of the body to tissue damage or infection.
5. _____ membranes secrete mucus, a slimy substance that traps pathogens.
6. _____ barriers destroy pathogens on the outer body surface.
7. Leukocytes are _____ blood cells that fight infections and get rid of debris.
8. A _____ defense is tailored to a particular pathogen.

9. A _____ defense is the same no matter what type of pathogen is involved.
10. Millions of harmless _____ live on the human skin.
11. Mucous membranes provide a _____ barrier at body openings.
12. Sweat, mucus, tears, and saliva all contain _____ that kill pathogens.
13. The _____ line of defense attacks pathogens that manage to enter the body.
14. Barriers that keep out pathogens are the body's _____ line of defense.

V. Reading.

1. Read and translate the text

The immune response

The immune response mainly involves the lymphatic system. The lymphatic system is a major part of the immune system. It produces leukocytes called lymphocytes. Lymphocytes are the key cells involved in the immune response. They recognize and help destroy particular pathogens in body fluids and cells. They also destroy certain cancer cells.

Structures of the Lymphatic System

The structures of the lymphatic system include organs, lymph vessels, lymph, and lymph nodes. Organs of the lymphatic system are the bone marrow, thymus, spleen, and tonsils.

- Bone marrow is found inside many bones. It produces lymphocytes.
- The thymus is located in the upper chest behind the breast bone. It stores and matures lymphocytes.
- The spleen is in the upper abdomen. It filters pathogens and worn out red blood cells from the blood, and then lymphocytes in the spleen destroy them.
- The tonsils are located on either side of the pharynx in the throat. They trap pathogens, which are destroyed by lymphocytes in the tonsils.

Lymphocytes

The human body has as many as two trillion lymphocytes, and lymphocytes make up about 25% of all leukocytes. The majority of lymphocytes are found in the lymphatic system, where they are most likely to encounter pathogens. The rest are found in the blood. There are two major types of lymphocytes, called B cells and T cells. These cells get their names from the organs in which they mature. B cells mature in bone marrow, and T cells mature in the thymus. Both B and T cells recognize and respond to particular pathogens.

Antigen Recognition

B and T cells actually recognize and respond to antigens on pathogens. Antigens are molecules that the immune system recognizes as foreign to the body. Antigens are also found on cancer cells and the cells of transplanted organs. They trigger the immune system to react against the cells that carry them. This is why a transplanted organ may be rejected by the recipient's immune system. How do B and T cells recognize specific antigens? They have receptor molecules on their surface that bind only with particular antigens.

2. Answer the questions.

1. What are lymphocytes? What is their function?
2. List the organs of the lymphatic system. Describe the functions of two of these organs.
3. Define B cells and T cells.
4. What are antigens?
5. How do B and T cells recognize specific antigens?

VI. Write true if the statement is true or false if the statement is false.

_____ 1. The third line of defense is referred to as the immune response.
_____ 2. The lymphatic system produces leukocytes called lymphocytes.
_____ 3. Lymphocytes can destroy certain cancer cells.
_____ 4. Lymph is a fluid that leaks out of cells into spaces between capillaries.
_____ 5. The human body has as many as two billion lymphocytes.
_____ 6. Antigens trigger the immune system to react against the cells that carry them.
_____ 7. T cells mature in bone marrow, and B cells mature in the thymus.
_____ 8. B cells must be activated by an antigen before they can fight pathogens.
_____ 9. Antibodies are large, Y-shaped proteins that recognize and bind to antigens.
_____ 10. The cell-mediated immune response leads to the destruction of cells that are infected with
viruses.
_____ 11. Helper T cells destroy virus-infected cells and some cancer cells.
_____ 12. Cytotoxic T cells suppress other T cells that mistakenly react against self antigens.
_____ 13. Memory B and T cells help protect the body from re-infection by pathogens.
_____ 14. Since antibodies are such important proteins, they can recognize many types of antigens.
_____ 15. Immunization is a form of passive immunity.

VII. Vocabulary practice.
Match the vocabulary word with the proper definition.

a. anaphylaxis	b. antihistamines	c. AIDS	d.allergen
e. allergy	f. autoimmune disease	g. helper T cells	h. HIV
i. immunodeficiency	j. multiple sclerosis	k. rheumatoid arthritis	

_____ 1. occur when the immune system fails to recognize the body's own molecules as "self"
_____ 2. can treat mild allergy symptoms
_____ 3. occurs when the immune system is not working properly
_____ 4. autoimmune disease that attacks central nervous system
_____ 5. destroyed by HIV infections

_____ 6. the virus that attacks cells of the immune system and causes AIDS
_____ 7. any antigen that causes an allergy
_____ 8. the most severe allergic reaction
_____ 9. autoimmune disease that attacks tissues at joints
_____ 10. a disease in which the immune system makes an inflammatory response to a harmless antigen
_____ 11. a set of diseases that results from years of damage to the immune system by HIV

VIII. Reading.
1. Read and translate the text.

Immune System Diseases

Autoimmune Diseases

Autoimmune diseases occur when the immune system fails to recognize the body's own molecules as "self," or belonging to the person. Instead, it attacks body cells as though they were dangerous pathogens.
Some relatively common autoimmune diseases are listed in Table 1. These diseases cannot be cured, although they can be treated to relieve symptoms and prevent some of the long-term damage they cause.

Table 1: **Autoimmune Diseases**

Name of Disease	Tissues Attacked by Immune System	Results of Immune System Attack
Rheumatoid arthritis	tissues inside joints	joint damage and pain
Type 1 diabetes	insulin-producing cells of the pancreas	inability to produce insulin, high blood sugar
Multiple sclerosis	myelin sheaths of central nervous system neurons	muscle weakness, pain, fatigue
Systemic lupus erythematosus	joints, heart, other organs	joint and organ damage and pain

Why does the immune system attack body cells? In some cases, it's because of exposure to pathogens that have antigens similar to the body's own molecules. When this happens, the immune system not only attacks the pathogens. It also attacks body cells with the similar molecules.

Immunodeficiency

Immunodeficiency occurs when the immune system is not working properly. As a result, it cannot fight off pathogens that a normal immune system would be able to resist. Rarely, the problem is caused by a defective gene. More often, it is acquired during a person's lifetime. Immunodeficiency may occur for a variety of reasons:

- The immune system naturally becomes less effective as people get older. This is why older people are generally more susceptible to disease.
- The immune system may be damaged by other disorders, such as obesity or drug abuse.
- Certain medications can suppress the immune system. This is an intended effect of drugs given to people with transplanted organs. In many cases, however, it is an unwanted side effect of drugs used to treat other diseases.

• Some pathogens attack and destroy cells of the immune system. An example is the virus known as HIV. It is the most common cause of immunodeficiency in the world today.

2. Choose the correct item.

1. What is an allergy?
A. An allergy is a disease in which the immune system makes an inflammatory response to a harmless antibody.
B. An allergy is a disease in which the immune system makes an inflammatory response to a
harmless antigen.
C. An allergy is a disease in which the lymphatic system makes an inflammatory response to a
harmless antigen.
D. An allergy is a disease in which the immune system destroys harmless pathogens.

2. An autoimmune disease
A. occurs when the immune system initiates an immune response against foreign pathogens.
B. occurs when the immune system attacks the body's own pathogens.
C. occurs when the immune system fails to recognize the body's own molecules as belonging to the person.
D. occurs when the immune system fails to recognize foreign molecules as belonging to the person.

3. Type 1 diabetes
A. attacks the insulin-producing cells of the pancreas.
B. is an autoimmune disease.
C. results in high blood sugar levels.
D. all of the above

4. Causes of immunodeficiency include
A. damage of the immune system by other disorders.
B. suppression of the immune system by certain medications.
C. destruction of cells of the immune system by pathogens.
D. all of the above.

5. Which statement is true of the relationship between HIV and AIDS?
A. HIV causes AIDS.
B. AIDS causes HIV.
C. HIV and AIDS are the same disease.
D. HIV and AIDS are not related.

6. HIV transmission
A. can occur through saliva.
B. occurs through the direct contact of mucous membranes or some body fluids.
C. can occur through kissing.
D. all of the above

7. AIDS occurs
A. when helper T cells fall to a very low level.
B. about 3-5 years after an HIV infection.
C. when HIV levels match the level of helper T cells.
D. after years of damage to the immune system by helper T cells.

IX. Writing.
Answer the questions below. Use appropriate academic vocabulary and clear and complete sentences.
1. Describe the barriers that keep most pathogens out of the human body.
2. Define immunity, and distinguish between active and passive immunity.
3. Explain how HIV is transmitted and how it causes AIDS.

X. Translation.
Translate the article into English.

Як підвищити імунітет?

Організм людини — дуже складний, взаємопов'язаний і постійно взаємодіючий механізм. Всі деталі виконують свою унікальну функцію, дозволяючи нам жити, добре себе почувати і успішно захищатися від різних захворювань. А найголовніший наш союзник у боротьбі проти шкідливих мікроорганізмів — імунітет.

Імунітет виконує в організмі неймовірно важливу роль — оберігає нас від інфекцій, вірусів і мікробів. Це ціла система, що підтримує в нас здоров'я, бадьорість і витривалість. У одних людей імунітет міцніший з народження, і навіть у люті епідемії вони легко уникають хвороби. Деякі ж буквально з народження не припиняють хворіти, підхоплюючи будь-яку хворобу.

Свій імунітет можна і потрібно підтримувати в хорошій формі. Для цього необхідно дотримуватися ряду простих правил:

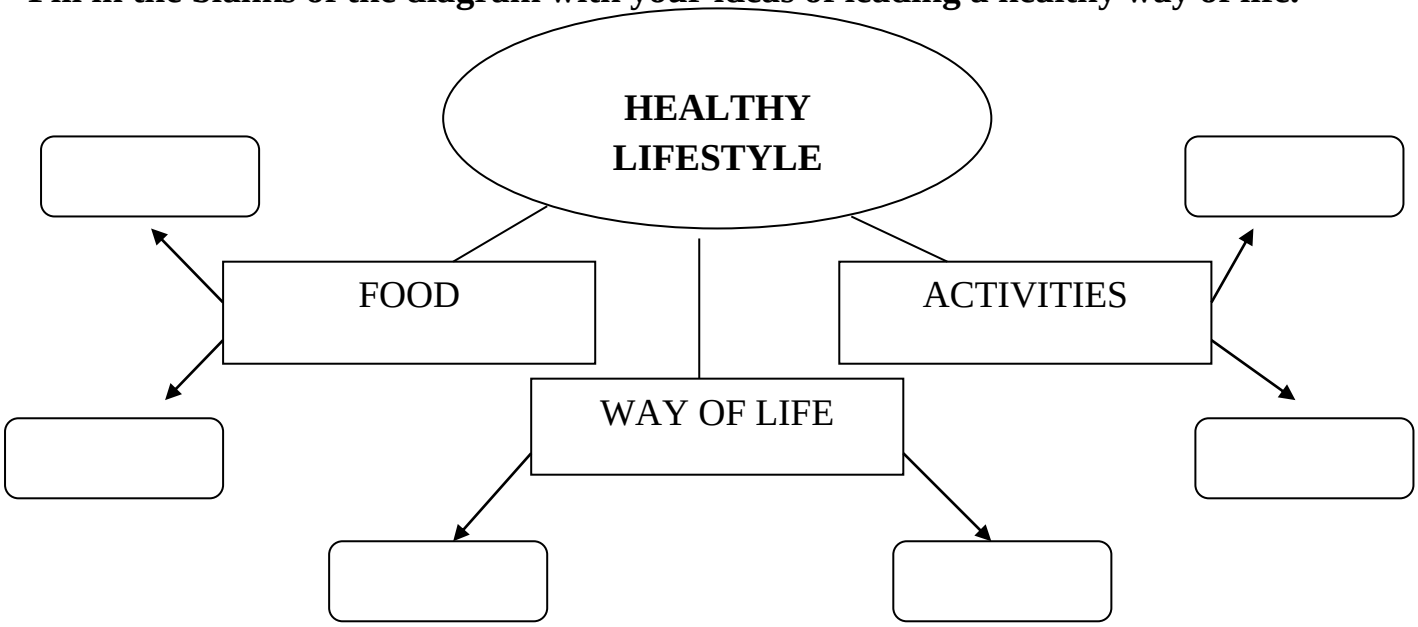
- Частіше бувати на свіжому повітрі, здійснювати прогулянки в лісі або в парку.
- Стежити за своїм раціоном — свіжі фрукти та овочі, а також каші повинні постійно бути присутніми в меню.
- Займатися фізичними навантаженнями.
- Уникати стресу.
- Мати здоровий сон.

Дотримуючись цих нехитрих рекомендацій, ми допоможемо повноцінно виконувати свої функції не тільки імунній системі, а й організму в цілому.

XII. Stay Healthy

I. Lead in.

Fill in the blanks of the diagram with your ideas of leading a healthy way of life.



II. Vocabulary.

Read and translate this list of vocabulary items related to health and health care.

How to say you are ill

- I'm **ill**.
- I feel **really rough.**
- I'm **shattered** (meaning *tired out or exhausted*)
- I'm **on my last legs** (to be very tired, especially after a lot of physical activity). I feel / look **poorly / peaky / rough / bloody awful**.
- I feel / look **like death warmed up** (very ill or appearing very sickly).

How to say you are feeling OK

- I am **alive and kicking** (to continue to be well, healthy or successful - *Don't worry about your grandfather; he is alive and kicking)*
- I feel **good** (used to talk about emotional state)
- I **feel great** / **well**
- He is **a picture of (good) health** (to be in a very healthy condition - *The doctor told him that he is a picture of good health)*
- She is **hale and hearty** (to be in a good health - *In spite of her old age, she looks hale and hearty*)

Health problems

- I have a **headache** / **toothache** / **backache** / **stomachache / earache**...
- I have a pain in my back / tooth / head...
- I have **a broken / sprained** / **twist** an ankle / wrist.
- I have a flu / cold / runny nose / fever / high temperature / sore throat
- I feel **sick**. I'm feeling **nauseous**.

- I have a bruise / cut / graze / wound.

Health advice:

- Exercise regularly.
- Eat healthy food.
- Brush your teeth regularly.
- Sleep early (= don't stay up late!)
- Have regular medical check up.
- Go on a diet.

III. Speaking.

Do you agree or not? Comment on the following statements.

1. Health is not valued till sickness comes.
2. Prevention is better than cure.
3. Eat to live, not live to eat.
4. You are what you eat.
5. A healthy man is a successful man.
6. He, who has health, has hope; and he who has hope has everything.

IV. Reading.

Read and translate the text.

Six health tips

The context in which an individual lives is of great importance on health status and quality of life. Health is maintained and improved not only through the advancement and application of health science, but also through the efforts and intelligent lifestyle choices of the individual and society. Here are some basic tips for maintaining a good health.

1. **Eat healthy**

Reduce fat intake, cut down on sugar and opt for fruits and vegetables. This helps reduce cholesterol and blood pressure. Healthy food will also lead to better blood sugar control.

2. **Exercise**

You don't have to belong to a gym club. Thirty minutes walk every day will prevent weight gain and encourage moderate weight loss.

3. **Reduce stress**

Not everything we want we get. We have to accept that there are things that we cannot control. Managing time is also of great importance too. We must allow ourselves enough time to get things done. Set a time during the day for relaxation.

4. **Improve sleep**

Avoid caffeine, alcohol, nicotine, and other chemicals that interfere with sleep. Equip your bedroom with a comfortable mattress and pillows. Sleep in a dark clean and quiet environment.

5. **Meditation**

Meditation has been linked to a variety of health benefits. It has been linked to changes in metabolism, blood pressure, brain activation, and other bodily processes.

6. Positive thinking

People who think positively have an optimistic view of life that affects their health and well-being. Optimism has been shown to explain between 5–10% of the variation in the likelihood of developing some health conditions, notably including cardiovascular disease, stroke, depression, and cancer.

Eat Healthy

1. Before reading answer these questions:

1. Do you know how to stay healthy?
2. Think about the exercise that you do and the food that you eat.
3. What advice about healthy life would you give to other students?
4. Why many people don't do much exercise outdoors?
5. In what ways can computer be harmful for your health?

For a healthy life, you need to protect your body. Your body needs exercise and the right food. Most people can do some exercise. Some people have disabilities, but they can do exercise, too. You don't need lots of time or equipment to do exercise. Things that you do every day can help you to stay healthy, like walking to the supermarket or to the university.

Some people need medicines every day to stay healthy. A long time ago, there were no medicines for sick people. Today, there are medicines, but there's a new problem - people are getting fatter. Many people eat too much. A lot of food today is unhealthy, for example, fast food. Many people don't do much exercise outdoors. They watch television, use the computer, and play computer games. They travel by car a lot, too.

You need to eat the right food. Carbohydrates give your body energy. Fiber helps to move food through your stomach and intestines. Brown bread and brown rice have lots of fiber. Fruit and vegetables also have fiber, and vitamins that help you to stay healthy. Proteins help your muscles to grow. Meat, fish, and eggs have proteins. Dairy food like milk, yogurt, and cheese have proteins, fat, and calcium. You need calcium for healthy bones. You need iron for healthy blood. Meat, eggs, and green vegetables have iron.

Don't eat too much food with sugar, fat, and salt. You need a little fat to stay healthy, but too much fat can make you fat! Too much sugar and salt is unhealthy, too. Sugar is also bad for your teeth.

Healthy way of life concerns our body, mind and soul. Healthy people live longer, they are more successful and they enjoy their life.

2. Read the sentences. Then circle T (True) or F (False)

1.	You need a great amount of time and equipment to do exercise.	T	F
2.	People are getting fatter because of medicines.	T	F
3.	Some people need medicines every day to stay healthy	T	F
4.	Carbohydrates help to move food through your stomach.	T	F
5.	Right food is very important for your health.	T	F
6.	Calcium helps your bones to stay healthy.	T	F

3. Match the words with their definitions:

a) disability	1. a substance, which provides your body with heat and energy and which consists of oxygen, hydrogen, and carbon;
b) equipment	2. causing physical harm – used especially about things that cause harm to your health, the environment etc;
c) medicine	3. a physical or mental condition that makes it difficult for someone to use a part of their body properly;
d) protein	4. the parts of plants that you eat but cannot digest, helps to keep you healthy by moving food quickly through your body;
e) carbohydrate	5. one of several natural substances that exist in food such as meat, eggs, and beans, your body needs it to grow and remain strong and healthy;
f) harmful	6. a substance used for treating illness, especially a liquid you drink, usually prescribed by doctors in a hospital;
g) fibers	7. the tools, machines etc that you need to do a particular job or activity.

Exercise for everyone

1. Before reading answer these questions:

1 Why do you breathe faster when you do exercise?
2 What does sweat do?
3 What do your muscles need to work for a long time?
4 What happens when your body works very hard?
5 What exercises can you do for a long time?
6 What exercise can you only do for a short time?

Why is exercise good?

Why is exercise good? It helps to make your bones and muscles stronger. It also protects you from health problems. It makes you feel good, and it even helps you to work better at your study! Everyone needs to do exercise to stay healthy.

Exercise isn't only for young, healthy people. Older people and people with health problems or disabilities need exercise, too. Everyone can find an exercise that they can do. What exercise do you do?

It's good to do some exercise every day, but you don't need to go to the sports center all the time. You can play sports in the park and help with jobs at home. Swimming is a good exercise, and most people can do it.

Many people with disabilities can do team sports and athletics, too. Some of the world's most amazing sports people have disabilities.

When you do exercise, you breathe faster. Your lungs take in more air to give your body more oxygen. Your heart beats faster, so it moves blood to your muscles faster. The blood takes oxygen and food for the muscles to use.

Your body gets hotter when you do exercise. Your skin feels hot, and you make water called sweat. When your skin dries, you cool down.

Your muscles need oxygen to work well for a long time. When you walk, jog, cycle, or swim, you breathe faster to give your muscles the oxygen that they need. This exercise makes you healthier.

When your body works very hard, your muscles can't get all the oxygen that they need. So you can only do exercise like running fast for a short time. This type of exercise makes your muscles bigger and stronger.

Before you start your exercise, it's good to warm up your muscles, so that you don't damage them. When you warm up your muscles, they move more easily. Walk, jog, or skip for a few minutes. You should also do some stretching exercises. These help you to move your arms and legs easily.

Think about how you breathe when you do exercise. When you don't breathe well, your brain and muscles don't get all the oxygen that they need. You should breathe slowly and deeply.

After you finish your exercise, it's good to cool down your muscles, so that they don't get sore. Run slowly or walk for a few minutes. Then do more stretching exercises. You also need to put back the water that you lose in your sweat, so it's important to drink after you do exercise.

Stay safe when you do exercise. Use the right equipment to protect your head and body. When you are doing exercise outdoors in the dark, people need to see you. Wear bright clothes and use lights when you cycle.

2. Read the sentences. Then circle T (True) or F (False)

1. Your muscles don't need oxygen to work well for a long time.	T	F
2. When you swim, you breathe slower.	T	F
1. Running fast makes your muscles bigger.	T	F
2. Warming up helps to prepare your muscles.	T	F
3. You make water called sweat when you get cold.	T	F
4. After you finish your exercise, it's good to drink some water.	T	F
5. Breathing is not very important when you do exercises.	T	F

3. Complete the charge.

drink warm up your muscles do stretching exercises cool down your muscles breathe slowly and deeply do more stretching exercises

	What should you do?
Before exercise	
When you do exercise	
After exercise	

3. The Effects of Stress

1) Why do many people feel stressed at work?
2) What kind of situation can be called stressful?
3) How do many people cope with stress? What mistakes do they usually make?
4) Why is stress dangerous not only to our health but to the health of those around us?
5) Why do people react to stress in different ways?
6) How can we avoid or minimize stress?
7) Why are anti-anxiety medications and anti-depressants dangerous to our health?
8) Do you know any effective ways to cope with stress? Say a few words about them.

There is a famous expression in English: "Stop the world, I want to get off!" This expression refers to a feeling of panic, or stress, that makes a person want to stop whatever they are doing, try to relax, and become calm again. 'Stress' means pressure or tension. It is one of the most common causes of health problems in modern life. Too much stress results in physical, emotional, and mental health problems.

There are numerous physical effects of stress. Stress can affect the heart. It can increase the pulse rate, make the heart miss beats, and can cause high blood pressure. Stress can affect the respiratory system. It can lead to asthma. It can cause a person to breathe too fast, resulting in a loss of important carbon dioxide. Stress can affect the stomach. It can cause stomach aches and problems digesting food. These are only a few examples of the wide range of illnesses and symptoms resulting from stress.

Emotions are also easily affected by stress. People suffering from stress often feel anxious. They may have panic attacks. They may feel tired all the time. When people are under stress, they often overreact to little problems. For example, a normally gentle parent under a lot of stress at work may yell at a child for dropping a glass of juice. Stress can make people angry, moody, or nervous.

Long-term stress can lead to a variety of serious mental illnesses. Depression, an extreme feeling of sadness and hopelessness, can be the result of continued and increasing stress. Alcoholism and other addictions often develop as a result of overuse of alcohol or drugs to try to relieve stress. Eating disorders, such as anorexia, are sometimes caused by stress and are often made worse by stress. If stress is allowed to continue, then one's mental health is put at risk.

It is obvious that stress is a serious problem. It attacks the body. It affects the emotions. Untreated, it may eventually result in mental illness. Stress has a great influence on the health and well-being of our bodies, our feelings, and our minds. So, reduce stress: stop the world and rest for a while.

1. Choose the right item.

1. Which of the following is not a common problem caused by stress?
   a) physical problems
   b) anecdotal problems
   c) mental problems
   d) emotional problems

2. According to the article, which of the following parts of the body does not have physical problems caused by stress?
   a) the arms
   b) the stomach
   c) the lungs
   d) the heart
3. Which of the following show how stress can affect the emotions?
   a) it can make people feel nervous
   b) it can cause panic attacks
   c) it can make people feel elated
   d) it can make people feel angry
4. Which of the following can result from long-term stress?
   a) bliss
   b) depression
   c) alcoholism
   d) whimsy
5. Choose the best answer to explain how alcoholism is caused by stress.
   a) alcohol is used to relieve stress
   b) alcohol is popular
   c) alcohol is a chemical
   d) alcohol is similar to medicine
6. Which of the following is not caused by long-term stress?
   a) addiction
   b) bloating
   c) anorexia
   d) alcoholism
7. Choose all of the answers that can complete this sentence: Stress can affect the respiratory system by _____.
   a) causing stomach problems
   b) causing asthma
   c) a loss of carbon dioxide
   d) causing breathing problems
8. Symptoms of emotional stress include _____.
   a) feeling joyous
   b) feeling hungry
   c) feeling thirsty
   d) feeling tired

2. Choose a situation which is the most stressful to your mind. Say what you would do in this situation to cope with stress. Describe the situation from your own life experience when you felt stressed

1. You are being asked to speak in public. But you don't know much about the subject discussed by the participants. Everybody is looking at you. You are

terrified and don't know what to say. You feel your hands shaking and your cheeks blushing.

2. You are the first-year student of the University. You are taking your first exam. You are absolutely calm and self-confident as you know the subject very well. You are taking a question card and feel a cramp in the stomach. You don't remember the answer to the question.
3. Your best friend has fallen ill and he has asked you to go to the chemist's to buy some medicine. You've gladly agreed to help him. Standing in the queue you suddenly realize that you've lost your friend's purse with a considerable sum of money in it. You are shocked and don't know what to do.
4. You've seen your brother's girlfriend kissing some other guy. You don't know whether you should tell your brother about it. You are afraid that he won't believe you if you tell the truth. But on the other hand he will never forgive you if he learns that you have concealed this unpleasant fact.
5. You've been asked to baby-sit your 5-year-old nephew. Your sister has promised that he will be sleeping the whole evening so you will have no trouble with him. And now when she has left you are locked in her house with a shrieking child who is having a fit of hysterics and you don't know what to do to calm him down.

Sleep Well, Stay Well

1. How do you sleep?
2. How much does it take you to fall asleep?
3. Do you ever wake up during the night?
4. Do you have difficulty falling asleep or getting back to asleep if you wake up?
5. Are you an insomniac? Insomniac - a person who has difficulty with sleep

Getting a good night's sleep is very important for your health. Not getting enough sleep makes you feel tired during the day and can have negative effects on your health. So what can you do to get a good night's sleep? Read on to find out.

One important thing in getting a good night's sleep is to make sure your bedroom is conducive to sleep. It is important to keep your bedroom dark. Research has shown that even a small amount of light in your bedroom can prevent a good night's sleep. Your bedroom should also be the right temperature. Most people sleep well in a room that is around 18° C (65° F). If your bedroom is too hot or too cold, this can interfere with a good night's sleep.

Another important factor in getting a good night's sleep is staying on a sleep schedule. This means going to bed and waking up at the same time each day. This includes weekends and holidays. Going to sleep and waking up at irregular times disrupts your body's sleep clock and this can lead to poor quality sleep.

People who exercise regularly often generally sleep better. This is because your body uses sleep to rest and recover. If there is nothing for your body to recover from, this can lead to a lower quality of sleep. The time you exercise is important. Morning and afternoon are the best. If you exercise too close to bedtime, you will make

yourself more awake and then have trouble getting to sleep and staying asleep. It is best to refrain from exercise 3-4 hours before bed.

Eating a snack before bed can also help you sleep better. Tryptophan is a chemical that can help you sleep better. It is found in foods such as egg whites, cod (a type of fish), soybeans, pumpkin seeds, cheddar cheese, turkey, and wheat. Combining these foods with carbohydrates (bread, potatoes, cereals, etc) in a pre-bedtime snack, can help you fall asleep.

You should avoid nicotine and caffeine before bedtime. This means no smoking before bed. The drug nicotine, which is found in cigarettes, is a stimulant and it will keep you awake. You should also avoid caffeine. Caffeine is found in foods such as chocolate, tea, and coffee. There are also some drugs, such as pain killers, that contain caffeine. Some experts think that it is a good idea to avoid caffeine completely because it can stay in your body for up to 12 hours.

Sleeping well is essential for a happy and healthy life. Not sleeping well can negatively affect your energy levels and your health. So if you find yourself not getting a good night's sleep, follow some of this advice and you'll be sleeping well in no time.

3. Match the words with their definitions:

a) conducive	1. to prevent something from continuing in its usual way by causing problems
b) prevent	2. smth that provides conditions that make it easy for you to work etc
c) interfere	3. to not do something that you want to do
d) disrupt	4. a drug or substance that makes you feel more active and full of energy
e) recover	5. to get better after an illness, accident, shock etc
f) refrain	6. to stop something from happening, or stop someone from doing something
g) stimulant	7. to deliberately get involved in a situation where you are not wanted or needed

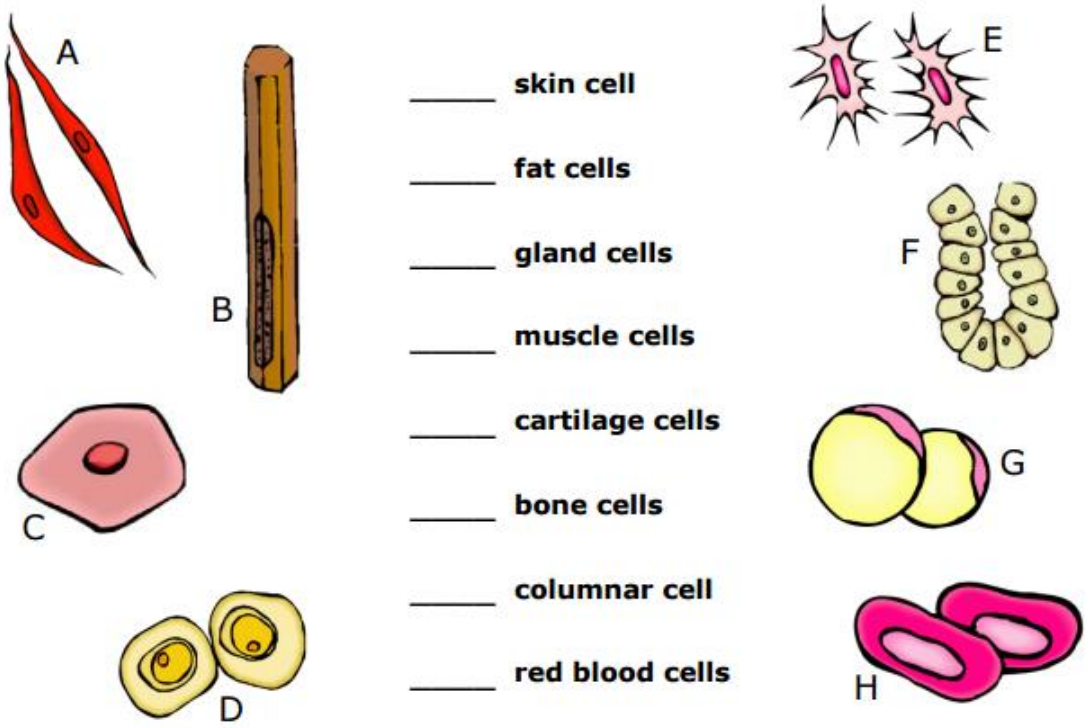
V. Project work

Create a page “Healthy Lifestyle. To lead or not to lead?” for your group magazine.

XIII. Cytology

I. Lead in.

Do you know how do the cells look like? Match the cells with the pictures. Use the Internet if you need to.



II. Reading.

Read and translate the text.

Cytology as a science

Cytology, more commonly known as cell biology, studies cell structure, cell composition, and the interaction of cells with other cells and the larger environment in which they exist. The term "cytology" can also refer to cytopathology, which analyzes cell structure to diagnose disease. Microscopic and molecular studies of cells can focus on either multi-celled or single-celled organisms.

That fact that we as humans are made up of millions of tiny cells, and that other life forms around us are similarly constituted, now barely needs explanation. The concept of the cell is relatively new, however. The scientific community did not accept the idea of the existence of cells until the late 18th century.

Recognizing the similarities and differences of cells is of the utmost importance in cytology. Microscopic examination can help identify different types of cells. Looking at the molecules which form a cell, sometimes called molecular biology, helps in further description and identification. All fields of biology depend on the understanding of cellular structure. The field of genetics exists because we understand cell structure and components.

Another important aspect in the discipline of cytology is examining cell interaction. By studying how cells relate to other cells or to the environment,

cytologists can predict problems or examine environmental dangers to cells, such as toxic or cancer-causing substances. In humans and other multi-cellular structures, cytology can examine the presence of too many of one kind of cell, or the lack of enough of a certain kind of cell. In a simple test like a complete blood count, a laboratory can look at white blood cells and identify the presence of an infection, or it may examine a low level of certain types of red blood cells and diagnose anemia.

These are the main branches of cytology:

1. Cytotaxonomy
2. Cytogenetics
3. Cell Physiology
4. Cytochemistry
5. Cytopathology
6. Cytoecology

Because cells are the 'basic unit of life', the study of cells, cytology, can be considered one of the most important areas of biological research. Almost every day on the evening news, we are told about new discoveries in cell biology, such as cancer research, cloning, and embryology.

Though we have known about cells for over three centuries, we are still discovering new structures and molecules in cells. The genetic engineering of cells to behave in a way that is beneficial to humans is the fastest growing area of scientific research today. There is no sign that this research will be slowing down any time soon.

III. Vocabulary

Match the branches of cytology with their definitions.

1. Cytotaxonomy	a. is the biochemistry of cells, especially that of the macromolecules responsible for cell structure and function.
2. Cytogenetics	b. studies and diagnoses diseases on the cellular level.
3. Cell Physiology	c. a branch that is concerned with how the chromosomes relate to cell.
4. Cytochemistry	d. studies the activities which take place in a cell to keep it alive.
5. Cytopathology	e. deals with the relationships and classification of organisms using comparative studies of chromosomes.
6. Cytoecology	f. the study combining cytology and ecology

IV. Reading.
Read and translate the text.

Organelles and Their Functions

The **nucleus** is the control center, telling all of the other organelles what to do and when to do it. The nucleus also contains all of the cell's genetic material, or its DNA. This material has all the instructions the cell needs for making proteins and many other important molecules.

Within the nucleus of eukaryotic cells is a structure called the **nucleolus**. This is the site of ribosome formation. Prokaryotic cells lack a nucleus. In these organisms the genetic material is free-floating within the cell membrane.

Outside of the nucleus but within the cell membrane is a gel-like substance called **cytoplasm**. It is made mostly of water and dissolved salts. It bathes the organelles and keeps them healthy. Within the cytoplasm is a network of tiny tubes called the **cytoskeleton**. These tubes are used to give the cell structure and also to support the organelles by holding them into place.

Making proteins is a very important job for a cell. **Ribosomes** are small pieces of RNA found throughout the cytoplasm and on some other organelles. Their only job is to assemble proteins.

The **endoplasmic reticulum** (E.R.) is a collection of lipid membranes that work to move the proteins from one area of the cell to another. It comes in two different forms - rough and smooth. **Rough E.R.** has ribosomes attached to it. These ribosomes make proteins. The E.R. transports these proteins to another organelle that will package them up and ship them out. The **smooth E.R.** does not have any ribosomes on its surface. This is where the lipid part of the cell membrane is assembled. Once the ribosomes have made the proteins, they need to be packaged in such a way that they can leave the cell and be taken in by the parts of the body that need them. The organelle responsible for this is called the **Golgi apparatus.**

Cell parts wear out and die. These pieces of 'garbage' need to be disposed.That is the job of the **lysosomes.** These structures are filled with digestive enzymes that break down those items that would become toxic if they were left in the cell.

Mitochondria are known as the powerhouses of the cell. They are organelles that act like a digestive system which takes in nutrients, breaks them down, and creates energy rich molecules for the cell.

Chloroplasts are organelles present in plant cells and some eukaryotic organisms. Chloroplasts are the most important plastids found in plant cells. It is the structure in a green plant cell in which photosynthesis occurs.

As the genetic material passes from parents to child, the **chromosomes** are responsible for containing the instructions that make the offspring unique while still carrying traits from the parent.

Vacuoles are storage bubbles found in cells. They are found much larger in plant cells. Vacuoles might store food or any variety of nutrients a cell might need to survive.

Organelles work together to carry out specific functions that support the life of the cell.

V. Vocabulary practice.

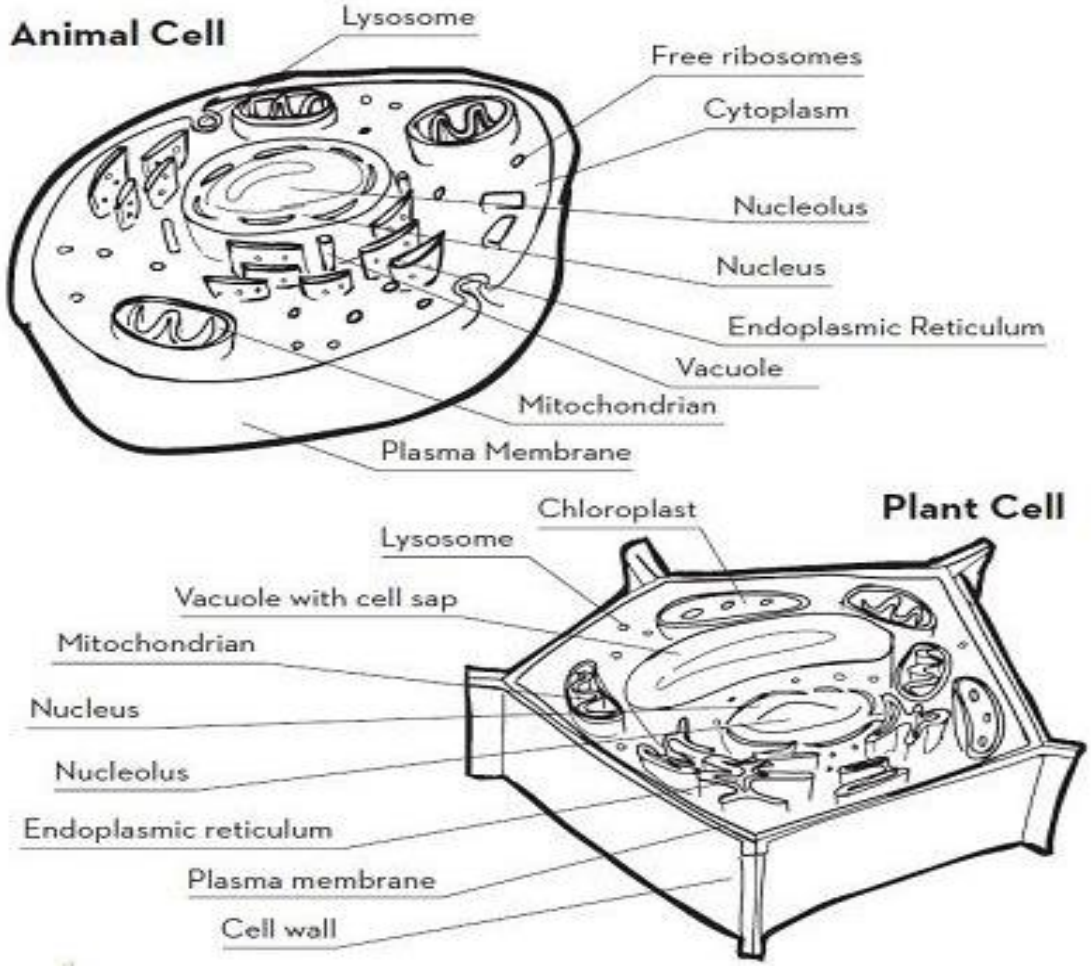
1. Relate the function to the organelle

Organelle	**Function**
1. lysosome	a. photosynthesis
2. ribosome	b. packaging and secretion of proteins
3. RER	c. storage
4. Golgi bodies/apparatus	d. filled with nutrients and water
5. chloroplast	e. control centre of cell
6. cytoplasm	f. steroid synthesis
7. chromosomes	g. vesicle production
8. nucleolus	h. protein synthesis
9. nucleus	i. cell respiration
10.mitochondria	j. location of ribosome production
11.SER	k. intracellular digestion
12.vacuole	l. determine cell features

2. Multiple choice

1. Which organelles will give off oxygen and use up carbon dioxide?
A. Lysosomes.
B. Mitochondria.
C. Endoplasmic reticulum.
D. Chloroplasts.
2. Which of the following BEST describes a function of endoplasmic reticulum?
A. Intracellular transport.
B. Communication.
C. Energy distribution.
D. Protein storage.
3. Which of the following structures is present in a prokaryotic cell?
A. Mitochondria.
B. Nucleus.
C. Ribosome.
D. Endoplasmic reticulum.
4. Which of the following is true for both prokaryotic and eukaryotic cells?
A. Manufacture enzymes.
B. Form vesicles for exocytosis.
C. Have nuclear membranes.
D. Have chromosomes composed of DNA.
5. To which organelles would microtubules be most closely associated?
A. Chloroplasts.
B. Mitochondria.
C. Cilia.
D. Rough endoplasmic reticulum.

VI. Speaking.
Compare the structure on the animal cell with the structure of the plant cell.



VII. Translation.
Translate into English.

Розмір клітин

Клітини різного походження характеризуються спільністю структурної організації і принциповою схожістю фізіологічних, біохімічних та репродуктивних процесів, які лежать в основі їх життєдіяльності і зумовлюють безперервність існування живої матерії в часі.

Спільність структурної організації клітин виявляється в єдиному плані їх будови. Як правило, клітини мають мікроскопічні розміри. Діаметр більшості клітин становить від 0.01 до 0.1 мм. Величина клітин значною мірою залежить від функцій, які вона виконує. Так, яйцеклітини через нагромадження в них поживних речовин досягають великих розмірів.

Розміри клітин не зв'язані із розмірами організмів. Розміри організмів рослин і тварин залежать від числа клітин.

Форма клітин значною мірою зумовлюється їх функціями.

Кількість клітин організму коливається від однієї (в одноклітинних) до багатьох мільярдів (у багатоклітинних).

XIV. Molecular biology

I. Lead in.
Discuss the following items.

1. Scientists use the unit kilocalorie (kcal) to measure the energy stored in food. A kilocalorie is commonly known as a Calorie with a capital "C" on food labels. One gram of carbohydrate provides your body with roughly four kcal. One gram of lipid provides your body with roughly nine kcal. Why do you think your body stores excess energy as fat?

2. The third major macromolecule from foods that your body can digest is proteins. Proteins are found in most foods, but are especially abundant in meat and dairy products. One gram of protein provides your body with roughly the same amount of energy as one gram of carbohydrate. How many kcal does one gram of protein provide?

3. One Big Mac contains 44 grams of carbohydrates, 33 grams of fat, and 26 grams of protein. How many kilocalories or calories would this hamburger provide?

II. Reading.
1. Read and translate the text.

The history of molecular biology

Molecular biology is the name which was coined by Warren Weaver in 1938. It was an ideal of physical and chemical explanations of life, rather than a discipline. Following the Mendelian-chromosome theory of heredity in the 1910s and the maturation of atomic theory and quantum mechanics in the 1920s, such explanations seemed within reach. Weaver and others encouraged (and funded) research at the intersection of biology, chemistry and physics, while prominent physicists such as However, in the 1930s and 1940s it was by no means clear which – if any – cross-disciplinary research would bear fruit. Between the molecules studied by chemists and the tiny structures visible under the optical microscope, such as the cellular nucleus or the chromosomes, there was an obscure zone, "the world of the ignored dimensions," as it was called by the chemical-physicist Wolfgang Ostwald.

1929 – Phoebus Levene at the Rockefeller Institute identified the components and he showed that the components of DNA were linked in the order phosphate-sugar-base.

1940 – George Beadle and Edward Tatum demonstrated the existence of a relationship between genes and proteins.

1944 – Oswald Avery demonstrated that genes are made up of DNA.

1952 – Alfred Hershey and Martha Chase confirmed that the genetic material of the bacteriophage, the virus which infects bacteria, is made up of DNA.

1953 – James Watson and Francis Crick discovered the double helical structure of the DNA molecule.

1957 – In an influential presentation, Crick laid out the “Central Dogma”, which foretold the relationship between DNA, RNA, and proteins.

1961 – Francois Jacob and Jacques Monod hypothesized the existence of an intermediary between DNA and its protein products, which they called messenger RNA.

At the beginning of the 1960s, Monod and Jacob also demonstrated how certain specific proteins, called regulative proteins, latch onto DNA at the edges of the genes and control the transcription of these genes into messenger RNA; they direct the “expression” of the genes.

This chronology really gets at the basic science underpinning molecular biology as a field of study. At it’s core is the so-called Central Dogma of Molecular Biology, where genetic material is transcribed into RNA and then translated into protein, despite being an oversimplified picture of molecular biology, still provides a good starting point for understanding the field. This picture, however, is undergoing revision in light of emerging novel roles for RNA. But aside from a few footnotes, the Central Dogma has become the basis for a revolution in the biological sciences.

2. Read and translate the text.

What is a Macromolecule?

When you were younger, you probably enjoyed building things with blocks or stringing beads into a necklace. You were using small units to make a larger object using these small units over and over until you got the bigger item you wanted to construct.

A macromolecule is constructed in exactly the same way. The term macromolecule means very big molecule. As you know, a molecule is a substance that is made up of more than one atom. The prefix macro- means 'large,' and it is an antonym of the prefix micro- which means 'very small.' Macromolecules are huge! They are made up of 10,000 or more atoms!

Another term for a macromolecule is a polymer. You probably know from math classes that the prefix poly- means 'many,' as in a polygon, or a figure with many sides. Because macromolecules are made of many building blocks, called monomers, you can see why these terms are synonymous. Think of a monomer as being a brick, and a polymer, or macromolecule, as being the whole brick wall composed of the building blocks. The brick wall is composed of smaller units (the bricks) just as a macromolecule is composed of monomer 'building blocks.'

The four main types of macromolecules are nucleic acids, proteins, carbohydrates and lipids. They are complicated combinations of smaller molecules, and their importance to every aspect of cell function, and therefore every aspect of an organism, cannot be overestimated.

Lipids are composed of carbon, hydrogen and oxygen. Storage lipids include fats, oils and waxes. Chemically, they are monocarboxylic acids with long hydrocarbon side chains attached to them. The composition of the hydrocarbon chain and its length are important and differentiate one lipid from the next. If the hydrocarbon bonds are double bonds, then the lipid is an unsaturated fatty acid.

Unsaturated fatty acids are oils and remain in a liquid state at room temperature. The kinks in the double bonds prevent the molecules from binding tightly enough to solidify. Saturated fatty acids do not have double bonds. When a product, such as peanut butter or margarine, has been hydrogenated, it means that hydrogen has been added to unsaturated fats, turning them into saturated fats. This prevents the oils in peanut butter and similar products from separating from the rest of the product.

The main function of lipids is energy storage. They are much better at storing energy than carbohydrates. One gram of lipid contains twice as much energy as a gram of a starch. Phospholipids contain two fatty acids, a glycerol and a phosphate group. They are a major component of cell membranes. Lipids with a carbon skeleton composed of four fused rings are called steroids. Different functional groups attached to the rings create the diversity of steroids. Cholesterol is a steroid. It`s also an essential part of all animal cell membranes and a precursor to all the other steroids.

Carbohydrates are made up of carbon, hydrogen and oxygen in the basic formula of CnH2nOn. There are three basic types of carbohydrates. Monosaccharides are simple sugars such as glucose, galactose and fructose. Disaccharides are formed from two sugars and include lactose (a galactose and a glucose combined) and sucrose (a glucose combined with a fructose molecule). When there are more than two sugar molecules in the polymer, it is called a polysaccharide. Examples of polysaccharides include glycogen, starch, dextrin, cellulose and pectin. Animal glycogen is considered an important aspect of energy storage in the cell. Cellulose is involved in structural support in plant cells. In general, sugars provide a cellular energy source.

Proteins involve carbon, nitrogen, hydrogen and oxygen atoms. They are composed of amino acids. There are twenty different amino acids which are, in turn, made up of an amino group, a carboxyl group, a central carbon and hydrogen, and an R group. Variations in the R group are what differentiate one amino acid from another. More than 50 percent of the dry mass of a cell is proteins. They are involved in almost every aspect of the cell. Proteins are involved in the synthesis of enzymes and the transportation of molecules within the cell and through the cell membrane. They catalyze chemical reactions, defend the cell and maintain the cell structure.

Nucleic acids involve carbon, hydrogen, nitrogen and phosphates. They are a composite of nucleotides, each of which has a nitrogenous base, a phosphate group and a sugar. Nucleic acids form two very important products: deoxyribonucleic acid (DNA) and ribonucleic acid (RNA). There are five nucleotides: adenine, guanine, cytosine, thymine (used in DNA only) and uracil (used in RNA only). DNA is a long, linear, double-stranded molecule while RNA is a single-stranded, shorter molecule. The DNA contains the genetic coding for every aspect of the cell. It contains not only the instructions for its own replication but also the code to synthesize RNA. In turn, RNA contains the codes to produce proteins.

All of them are absolutely necessary to a healthy, functioning body. Although you often think of proteins, carbohydrates, and lipids in terms of what you ingest and try to limit them in accordance with dietary fads, it is very important to realize that they all have a role to play in the body.

III. Vocabulary practice.

1. Fill in the Sentences.

mass, bounding site, polypeptides, covalent, water

1. The most abundant compound in most living things is_____.
2. The region on an enzyme to which a substrate binds is called the _____.
3. A chemical bond in which two atoms share a pair of electrons is referred to as a _____ bond.
4. All matter occupies space and has _____.
5. Proteins are synthesized from amino acids in long chains called _____.

2. Classify each as a carbohydrate, protein, or lipid.

Starch		Polysaccharide	
Cholesterol		Phospholipid	
Steroid		Glycerol	
Glucose		Monosaccharide	
Enzyme		Cellulose	
Saturated fat		amino acid	
Polypeptide chain		unsaturated fatty acid	

3. Identify the specific molecule from each description.

Lipids (4), carbohydrate (5), protein (3).

_____provides long-term energy storage for animals
_____ provides immediate energy
_____sex hormones
_____provides short-term energy storage for plants
_____animal and plant structures
_____forms the cell membrane of all cells
_____speeds up chemical reactions by lowering activation energy
_____monomer of proteins
_____ steroid that makes up part of the cell membranes
_____provides short-term energy storage for animals
_____many sugars
_____forms the cell wall of plant cells

IV. Translation.

Молекулярна біологія, наука, що ставить своїм завданням пізнання природи явищ життєдіяльності шляхом вивчення біологічних об'єктів і систем на рівні, що наближається до молекулярного, а у ряді випадків і що досягає цієї межі. Кінцевою метою при цьому є з'ясування того, яким чином і якою мірою характерні прояви життя, такі, як спадковість, відтворення собі подібного, біосинтез білків, збудливість, зростання і розвиток, зберігання і передача інформації, перетворення енергії, рухливість і т. д., обумовлені структурою, властивостями і взаємодією молекул біологічно важливих речовин, в першу чергу двох головних класів високомолекулярних біополімерів — білків і нуклеїнових кислот.

XV. Genetics

I. Lead in.

Discuss the following items.

1. DNA neither cares nor knows. DNA just is. And we dance to its music.

Richard Dawkins

2. If we didn't have genetic mutations, we wouldn't have us. You need error to open the door to the adjacent possible.

Steven Johnson

3. Genetic engineering is a result of science advancement, so I don't think that in itself is bad. If used wisely, genetics can be beneficial, but they can be abused, too.

Hideo Kojima

II. Vocabulary.

Match the words with their definitions. Give their Ukrainian equivalents.

1.Genetics	a . a segment of DNA
2.Trait	b. all genetic material in an organism
3.Genotype	c. two different alleles (Rr)
4.Phenotype	d. two of the same alleles
5.Allele	e. a graphic used to predict the results of a genetic cross
6.Heredity	f. the allele that is fully expressed whenever the allele is present in an individual
7.Gene	g. the study of heredity
8.Homozygous	h. a change in the structure or amount of the genetic material of an organism
9.Heterozygous	i. the combination of genes for one or more specific traits
10. Genome	j. a characteristic that can be passed from parent to offspring
11. Recessive	k. one of two or more alternative forms of a gene that governs a chacteristic
12. Dominant	l. a set of traits that an organism receives from its parents
13. Punnett Square	m. an inherited disease or disorder that is caused by a mutation in a gene or by chromosomal defect
14. Genetic disorder	n. a trait or allele that is expressed only when there is no dominant allele present in an individual, when only two recessive alleles for the same characteristic are inherited
15. Mutation	o. an organism's physical appearance or other detectable characteristic that results from the organism's genotype and the environment

III. Reading.
1. Read and translate the text.

Genetics

Genetics is the science of heredity, or how genes (and traits) are passed from one generation to the next. For centuries, even before we understood the molecular basis for heredity, humans have exploited genetic principles in an effort to breed crops and livestock with specific desirable traits.

Gregor Mendel is considered to be the "Father of Genetics". Mendel was an Austrian monk who described the pattern of inheritance of traits (heredity) in pea plants. He determined that traits are controlled by factors (now called alleles) and that some traits can be masked (recessive). These alleles can be either be identical (homozygous or purebred) or mixed (heterozygous or hybrid). By carefully recording the observable traits (phenotypes), Mendel was able to determine the genetic composition (genotype) of the plants in each generation. Using these inheritance patterns, he was further able to predict the outcome of genetic crosses.

His research involved using pea plants of different types. He used smooth, yellow peas and wrinkly green peas. By transferring pollen to and from the flowers of the plants with a small paintbrush, he found out that certain characteristics of the pea plants were dominant and others recessive. From these experiments, Mendel was able to describe the way genetic traits are passed down from parents to children.

During the last fifty years, scientists have begun to understand how genetics works on the molecular level. Recently, scientists and physicians have been using molecular biology techniques to not only study genes, but to manipulate them as well. In 2001, the first draft of DNA sequences from the human genome was published by the Human Genome Project and Celera Genomics. These and subsequent publications provide a wealth of information from which we can increase our basic understanding of human genetics and apply this to finding cures and treatments for many genetically-based diseases.

If you examine DNA from any two humans, you will find it to be 99.9% identical. However, if you visit any WalMart you will clearly see many differences in appearance and behavior. These differences are the result of variation in only 0.1% of our DNA. On the molecular level, this 0.1% variation means that approximately 1 out of every 1000 DNA bases is different in each human.

Inherited (genetic) traits are determined by genes that are acquired from parents (e.g., eye color and dimples). Acquired traits are characteristics that we are not born with, but that are acquired through life experiences (e.g., pierced ears, dyed hair, and scars). Inherited and acquired traits are both influenced by the environment and personal choice. For example, although a person's DNA might contain genes that code for brown hair, exposure to hair dyes or extensive sunlight might result in that person having blond hair. Other traits like intelligence and body shape can also be influenced by both genetics and life experience.

2. Answer the questions.

1. What do you know about DNA, genetics, and heredity?
2. Name three examples of genetic traits that you inherited from your parents.
3. Name two traits that you acquire during your life.

IV. Reading.

1. Read and translate the text.

Heredity

Everyone gets certain traits or characteristics from his parents. Heredity is the passing on of these specific characteristics from one generation to the next. These traits are passed on by genes in our DNA.

DNA is a material found in chromosomes. Chromosomes are located in the nucleus of every cell in the human body. Humans have 23 pairs of chromosomes in each cell. Each child receives one-half of its chromosomes (23) from each parent, for a total of 46. Therefore, each child inherits one-half of its DNA from his father and one-half from his mother.

Pieces of information inside a DNA molecule are called genes. A gene gives instructions about making a certain protein to determine a trait for the person, like color of eyes or hair. A person has a hair color gene, but inside the gene is a specific pattern which makes the hair black, brown or blonde, for example. This is called an allele.

Each child inherits two genes for each trait, like hair color or eye color. Some genes are more dominant than others. That means they win out over the other gene which is called recessive. Brown-eyed genes win out over blue-eyed genes, unless a person inherits two blue-eyes genes, one from each parent. Sometimes genes have codominance, meaning that neither gene is dominant over the other. An example of this is blood type. If one parent has type A and the other has type B, the child will have type AB blood. A trait may not show up in an individual but can still pass on to the next generation.

A mutation is a change which occurs in a DNA sequence in a chromosome. This change may be due to the effects of smoking, alcohol or other environmental effects or mistakes within the cell itself. The results may be damaging to the body. A mutation can be passed down to a child.

The passing down of genetic material from one generation to another can be seen by looking at children and their parents. Many traits can be similar, such as size and shape of nose, hair color, eye color, height or shape of an ear. Sometimes it is easy to spot family traits, and sometimes children don't have many characteristics of their parents at all.

In summary, every person inherits certain characteristics from his parents. Heredity is the passing on of these traits. Genes in our DNA are responsible for controlling what traits each person inherits. A child receives two genes for each trait, one from his father and one from his mother. The dominant trait will win out unless the two genes are the same.

2. Choose the correct item.

1) Which of the following are responsible for the traits which a person inherits?
A: Nucleus
B: Genes
C: Cell
D: Molecule

2) How many genes for each trait does a child inherit?
A: Two
B: Three
C: Four
D: One

3) How many pairs of chromosomes does a child receive from each parent?
A: 46
B: 23
C: 44
D: 21

4) Which of the following is true about a mutation?
A: It is always damaging to a person.
B: It never harms the next generation.
C: It may harm the next generation.
D: It never passes down diseases.

5) What is the specific pattern inside a gene which determines exactly what color eyes or hair a person has called?
A: Allele
B: DNA
C: Nucleus
D: Chromosome

V. Speaking

Discuss the following questions.

1) What do you know about genes?
2) Do you think genetic engineering is playing God and that we should leave life as it was created?
3) What do you think of the idea of genetically engineering new bodily organs to replace yours when you are old?
4) What do you think would happen if a GM crop or animal started causing major harm to the environment / us?
5) Genetic engineering might allow parents to ‘design’ their children before their birth – What do you think of this?

6) Should genetic engineering go ahead to eliminate human flaws, such as violence, jealousy, hate, etc?
7) What if scientists create a monster human?
8) What do you understand by the term ‘genetic aristocracy’?
9) If someone’s genes are changed a lot, are they the same person?
10) Does the government have the right to limit how far we modify ourselves?

VI. Vocabulary.
Give the Ukrainian equivalents to the following terms.

1. biotechnology	
2. recombinant DNA technology	
3. plasmid	
4. restriction enzymes	
5. restriction site	
6. sticky end	
7. blunt end	
8. vector	
9. DNA ligase	
10. genetic transformation	
11. transgenic	
12. genetically modified organism	
13. gene therapy	
14. gel electrophoresis	
15. DNA fingerprinting	

VII. Reading.
1. Read and translate the text.

Genetic engineering

The development of genetic engineering has increased notably in the last few years. Some people support the investment in this field whereas others are against to.

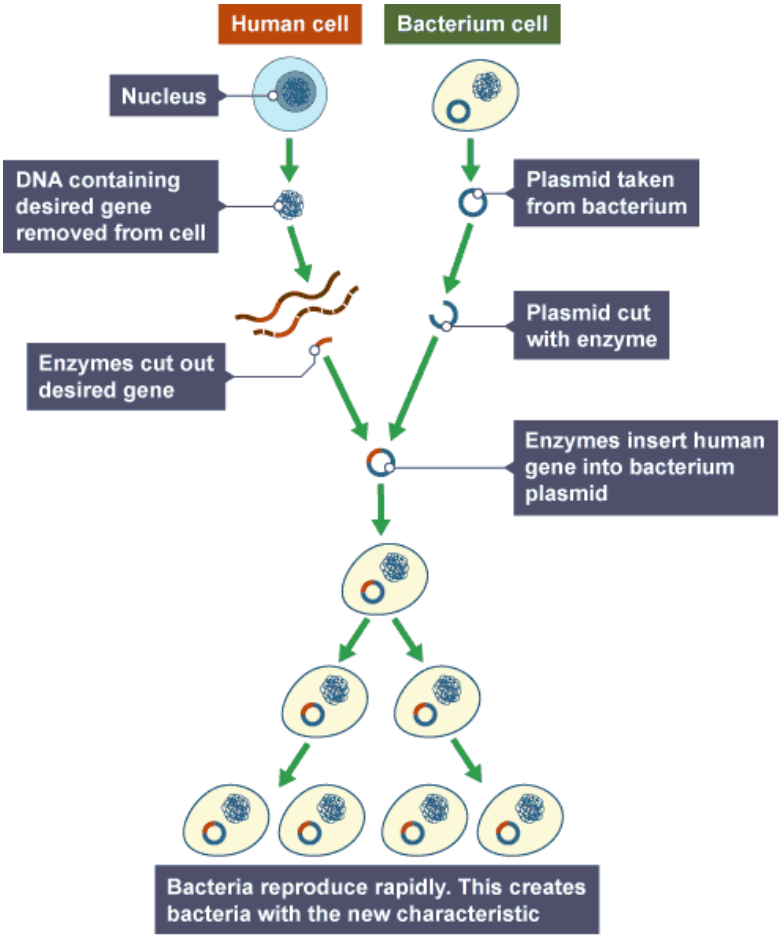
Genetic engineering is the process by which scientists modify the genome of an organism. Creation of genetically modified organisms requires recombinant DNA. Recombinant DNA is a combination of DNA from different organisms or different locations in a given genome that would not normally be found in nature.

In most cases, use of recombinant DNA means that you have added an extra gene to an organism to alter a trait or add a new trait. Some uses of genetic engineering include improving the nutritional quality of food, creating pest-resistant crops, and creating infection-resistant livestock.

Genetic engineering involves these steps:

1. selection of the desired characteristic
2. isolation of the gene responsible for the characteristic
3. insertion of the gene into another organism
4. replication of the transgenic organism

This diagram shows how it works:



People supporting it use argue that for instance farmers could have crops more resistant to insects and diseases, and many genetically modified crops can grow faster. These advantages can be extremely positive for food production in developing nations where people starve. Faster growing cereals, fruits and vegetables would mean more profit. Moreover, some medicines and vaccines are obtained throw genetic engineering process. An important breakthrough that genetic engineering can bring to society is that some inherited diseases would no longer exist. Some genes can be modified before a baby is born improving its life expectancy. It could be said then that genetic engineering might cure some diseases.

However there are ethical concerns about it use. Some ecologists warn about the disaster consequences to the Earth. They say that genetically modified crops can affect seriously whole ecosystems as the food chain can be broken if crops are more resistant to predators. Furthermore, some people are strongly against to human genetic engineering as parents might want to choose their children's characteristics. They support this argument saying that it would be unnatural and in some religions would be unacceptable. Society and human evolution would change completely.

To sum up, both sides have strong arguments to support their opinions. Genetic engineering can bring to humans longer and healthier lives. However there is a thin line between what is ethical and what not

2. Complete the table.

Genetic engineering is **ACCEPTABLE** because...	Genetic engineering is **NOT ACCEPTABLE** because...

EXTENSION: Can you add in any EXAMPLES to expand those points?

VIII. Reading.

1. Read and translate the text.

The Debate over Genetically Modified Foods

- A tomato that softens more slowly, allowing it to keep longer on the shelf;
- Potatoes that absorb less fat when fried; changing French fries from junk food into a more nutritional one;
- Strawberry crops that can survive frost.

These are just some of the benefits promised by biotechnology. The debate over its advantages and safety, however, continues.

Benefits: one side of the debate

Economical. GM supporters tell farmers that they stand to reap enormous profits from growing GM crops. Initially, considerable investments are needed since to produce them, modern biotechnology is used which requires highly skilled people and sophisticated equipment. This is why GM crops are more expensive for farmers than traditional crops. However, GM crops, farmers are told, are a far better option since it takes a shorter time to produce the desired product.

Herbicide-resistant. GM crops can be produced to resist herbicide. This means that farmers could spray these crops with herbicide and kill the weeds, without affecting the crop. In effect, the amount of herbicide used would be reduced.

Biotechnology companies are even experimenting with crops that can be genetically modified to be drought and salt-tolerant, opening up new areas to be farmed and leading to increased productivity. However, the claims of less herbicide usage with GM crops have till now not been independently supported by facts.

Better quality foods. Even animals can be genetically modified to grow faster and need less food. They could be modified to have special traits, such as greater milk production in cows.

Risks: the other side of the debate

Environmental impact. Little is known about the impact that GM crops will have on the environment. The genetic structure of any living organism is complex and GM crop tests focus on short-term effects only. There is not enough research yet into their long-term risks or impact on biodiversity.

Dangers of herbicide resistance. In Europe, a strain of sugar beet that was genetically modified to be resistant to a particular herbicide has inadvertently acquired the genes to resist another. This was discovered when farmers attempted to destroy the crop in Britain, France and the Netherlands, where it was being tested, and 0.5% of the crop survived. Farmers had to use more noxious herbicides to remove the remainder of the plantation.

Allergies and toxins. Very little scientific information exists about the risk of GM food on human health. One major report explains how GM foods could trigger new allergies and contain toxins that may be harmful. Another concern is disease. Since some crops are modified using the DNA from viruses and bacteria, will we see new diseases emerge?

2. Match the parts according to the text.

1. Food can be genetically modified 2. Despite the initial cost, 3. Using herbicides on GM crops 4. It may be possible to grow GM crops 5. Whether GM crops need less herbicide 6. Herbicide-resistant crops may change 7. To eliminate a crop completely,	a) and become resistant to other herbicides. b) will only affect the weeds. c) in harsh environments. d) to stay fresh longer and have more nutritional value. e) farmers had to use more deadly chemicals. f) has yet to be proved. g) GM crops are seen as a good investment for farmers.

3. Find evidence in the text for the following.

1. A GM fruit can endure very cold temperatures.
2. Farmers can make a lot of money from GM crops.
3. These crops grow much faster than traditional crops.
4. It is believed that GM crops would require less herbicide.

IX. Writing.

In about 200 words, write an opinion essay on the following.

What are the possible implications of cloning to society? Are there more benefits or risks?

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