



### **Exercise 2. Give equivalents for:**

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

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

### **Exercise 3. Answer the questions:**

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

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

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

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

1. Неподалік від ферми буде збудовано новий хімічний завод.

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

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

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

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



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

**A. Choose the right answer.**

1. Which is NOT a source of soil pollution?

*hazardous wastes*

*use of harmful pesticides*

*smoke from factories*

2. Soil pollution is an urgent problem in \_\_\_\_\_ countries.

*industrial*                      *developing*                      *industrial and developing*

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

*food supply*                      *food shortage*                      *waste products*

4. \_\_\_\_\_ can face the health risks caused by soil pollution.

*poor regions*                      *the whole universe*                      *entire ecosystems*

5. Soil pollution decreases the area of \_\_\_\_\_.

*production facilities*                      *arable lands*                      *agricultural production*

6. Soil pollution can result in \_\_\_\_\_.

*global food shortages*                      *health benefits*                      *additional facilities*

7. The problem of soil pollution is also aggravated because of \_\_\_\_\_.

*spreading of infectious diseases*                      *catastrophes*  
*decreasing precipitations*

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

*escape weeding*                      *improve yields*                      *escape hunger*

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

*prices for fuel*                      *food supply*                      *arable lands*

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

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

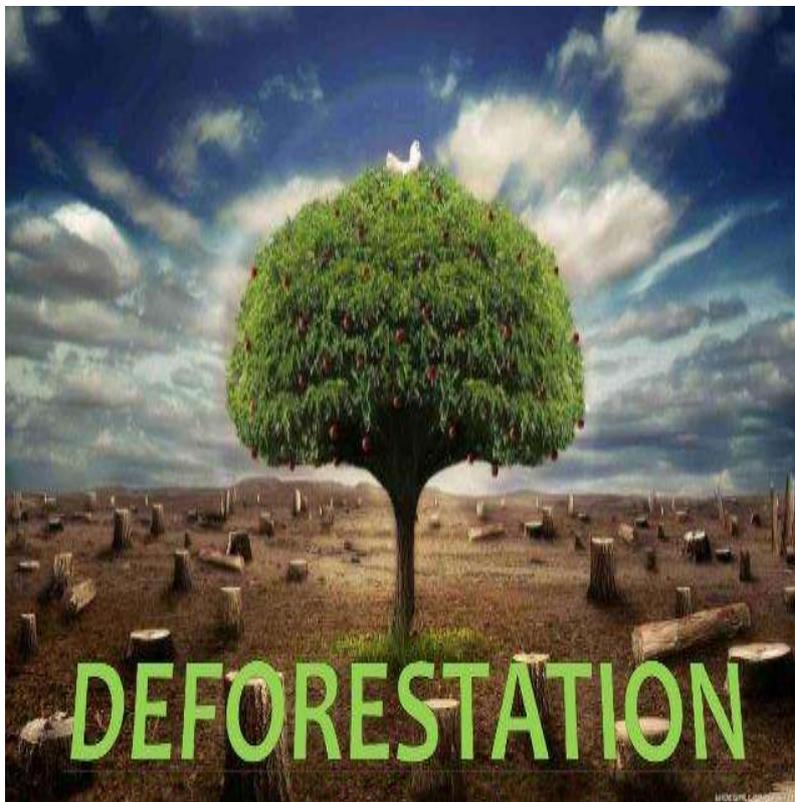
that more than 75% of the Earth's land has been already degraded. More than 90% could become degraded by 2050.

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

## UNIT 15.

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

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



throughout each year!

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

## **What Is Deforestation?**

Deforestation refers to the decrease in forest areas across the world that are lost for other uses such as agricultural croplands, urbanization, or mining activities. Deforestation has been negatively affecting natural ecosystems, biodiversity, and the climate as a result of accelerated human activity since 1960. The UN's Food and Agriculture Organization estimates the annual rate of deforestation to be around 1.3 million km<sup>2</sup> per decade.

## **The Causes of Deforestation**

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

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

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

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

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

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

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

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

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

#### **Exercise 2. Give equivalents for:**

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

#### **Exercise 3. Tick the correct answer.**

The text is about:

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

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

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

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

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

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

**Exercise 5. Answer the questions:**

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

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

Event	Result
<b>The cutting of trees</b>	<p>.....</p> <p>.....</p> <p>.....</p>

<b>The burning of trees</b>	..... ..... .....
-----------------------------	-------------------------

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

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

### **Rainforest Deforestation**

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

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

### **Why are they being destroyed?**

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

## How can they be saved?

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

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

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

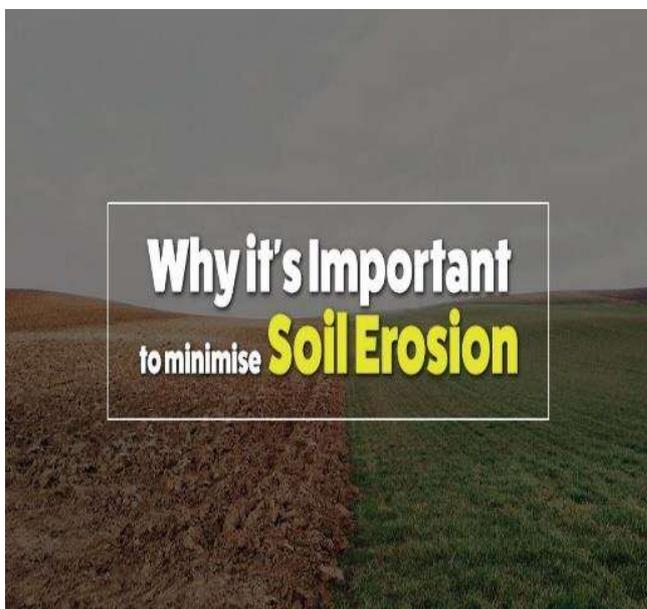
## Deforestation: For and Against

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

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

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

## UNIT 16.



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

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

***What causes erosion?***

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

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

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

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

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

### ***Effects of erosion***

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

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

### ***How to control erosion?***

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

### QUESTIONS

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

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

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

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



## SOIL EROSION QUIZ

**1. When something erodes, it \_\_\_\_\_.**

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

**2. What is soil erosion?**

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

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

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

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

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

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

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

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

**5. What is a soil horizon?**

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

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

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

## UNIT 17.

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

### *The Use of Resources*

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



Our planet is rich in the materials necessary to support life. People can live only by making use of the earth's natural resources. Resources include not only minerals, soil, water, forests, and wildlife, but also air and the energy of the sun when people know how to make use of them. People convert the things that nature provides into useful

machines, tools, and foods.

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

**Cultural differences.** People in different times and places may have different ideas about whether something supplied by nature is or is not a natural resource. Even people in the same culture may view and use resources differently. A farm family may see a forest as a source of winter warmth and cooking fuel. Loggers may see the forest as a place to find jobs. Campers may see the forest as a recreational area in which to spend vacations.

New technology also influences the way people value and use natural resources. Before tractors and trucks, farmers considered mules to be a highly valued resource because mules pulled plows and carried crops to market. Today as they are substituted by tractors and trucks, their value is reduced.

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

**Exercise 2. Give equivalents for:**

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

**Exercise 3. Match the terms with their meanings.**

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

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

**Exercise 4. Answer the questions:**

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

**Exercise 5. Complete the sentences:**

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

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

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

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

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

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

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

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

## UNIT 18.

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

### *Renewable Resources*

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



**Renewable resources.** For many years people thought that water was one of the most abundant natural resources. Scientists regard water as a renewable resource because it is constantly recirculated by the water cycle. However, water is a fragile resource. It often contains traces of

fertilizers, pesticides, industrial chemicals, and sewage. These contaminants pollute the water and can destroy its value as a resource.

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

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

Clearing the land of its natural vegetation encourages soil erosion. Farming the same crops in the soil depletes it of valuable

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

**Exercise 2. Give equivalents for:**

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

**Exercise 3. Insert the necessary preposition:**

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

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

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

### **Exercise 5. Get ready to the classroom discussion.**

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

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

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

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



#### **Solar Energy**

Sunlight is one of our planet's most abundant and freely available energy resources. The amount of solar energy that reaches the earth's surface in one hour is more than the planet's total energy requirements for a whole year. Although it sounds like a perfect renewable energy source, the amount

of solar energy we can use varies according to the time of day and the season of the year as well as geographical location. In the UK, solar energy is an increasingly popular way to supplement your energy usage.

## Wind Energy



Wind is a plentiful source of clean energy.

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

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

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

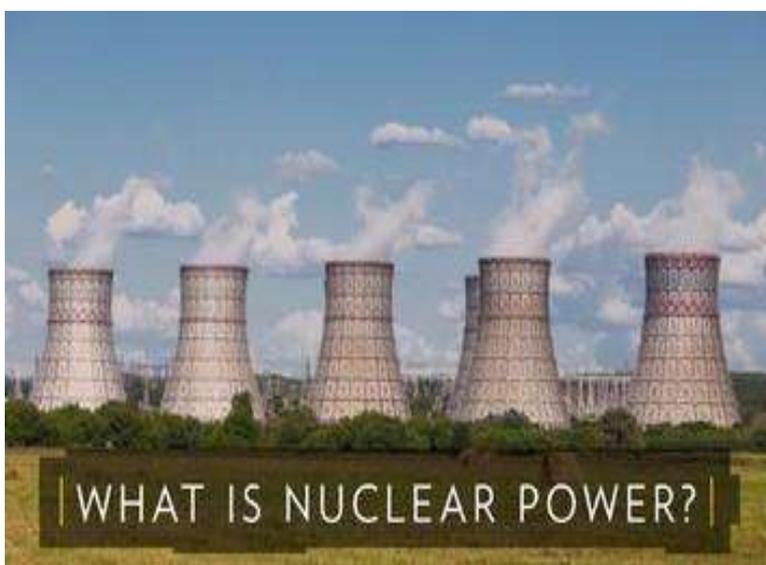
## UNIT 19.

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

### *Nuclear Energy and Other Sources of Energy*

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

Construction costs for a nuclear plant are high and a safe way to move and dispose of hazardous wastes from nuclear power plants has not been found yet.



What concerns most people about nuclear energy is that nuclear materials are extremely dangerous. A 1979 accident at Pennsylvania's Three Mile Island and a more devastating accident at Chernobyl in the former Soviet Union in 1986 illustrate the potential

danger of nuclear energy. In addition, by-products of nuclear energy can be used to make atomic bombs.

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

The Sun provides an inexpensive and virtually inexhaustible power source. Several devices have been built to use solar energy, but most remain experimental. However, some devices to collect the sun's energy have already become common. Various kinds of solar-heated houses have been built, especially in places that have a lot of sunshine. Scientists have made solar cells that change sunlight into a reliable

source of electricity. The cells are used on space satellites and even in small calculators.



People have long used energy of the winds. Perhaps the most familiar form of wind power is windmills. The main job of the early windmills was to grind grains. They were also used to pump water. Today different type of windmills is built. Their job is to generate electricity. Wind energy is widely available but is less reliable than other sources. Since winds vary from place

to place, windmills are more practical in some areas, although in other places they do not work at all.

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

### **Exercise 2. Give equivalents for:**

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

**Exercise 3. Answer the questions:**

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

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

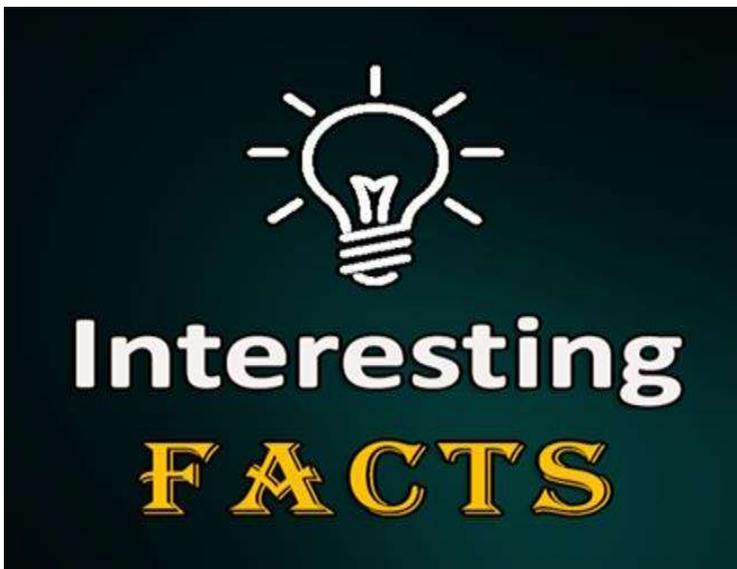
forest	bauxite	soil	wildlife
sun	wind	fossil	geothermal
iron ore	sun energy	copper	fossil fuel
overhunting	overfishing	overlapping	overgrazing
abundant	scarce	exhaustible	fragile
fertilizers	traces	sewage	pesticides

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

**Exercise 5. Supply the term that correctly completes each sentence.**

1. Materials people use to meet basic needs are called \_\_\_\_\_.
2. A \_\_\_\_\_ can be replaced naturally and can be used over and over again.

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



**Mineral waters.** As ground water seeps through the soil and rocks, it dissolves small amounts of mineral matter. In limestone regions, the water is “hard”, due to the dissolved lime, which it contains. Some waters contain enough iron to

make it noticeable to the taste. Sulfur waters have the disagreeable odor of bad eggs. In somewhat rare cases the waters of springs contain a quantity of dissolved salts which have medicinal value; such springs lead to the establishment of hospitals and watering places (health resorts), for example, Spa in Belgium, Bath in England, Karlovy Vary in Czech Republic, Baden in Austria. Besides, large quantities of mineral waters are bottled and sold.

**Hot springs.** Hot springs or thermal springs are continuous flows of hot water from the ground usually associated with present or former volcanic activity. Such waters are believed to rise from considerable depths — hundreds of meters — where they have been

in contact with heated rocks, due possibly to intrusions of lava. In some instances, beautiful formations are built around the mouths of the springs as the water cools and deposits its dissolved mineral matter. Few sights in nature are more beautiful than terraces formed by the hot springs. Warm mineral waters are very good for health and relieve aches and pains.

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

\*\*\*

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

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

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

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

For example, Old Faithful geyser in Yellowstone National Park emits about 50,00 liters of water to an average height of 50 m.

Although not the largest geyser in the park Old Faithful is the most predictable and well-known. Eruptions occur at 45 to 80 minute interval depending on the length of the previous eruption. Geysers are also found in Iceland, in New Zealand, in Russia and in Italy. In some places only hot gases are issued (emitted) from a vent. Such a feature is called a fumarole.

### **Wind Technologies**

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

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

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

For the best utilization of wind turbines, they should be placed



where wind speeds reach 16-20 mph and are at a height of 50m. It is also important that utility-scale power plants are located near existing power lines and in the windiest sites available.

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

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

### **Wind Energy Potential Assessment of Ukraine**

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

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

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

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

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

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

## UNIT 20.

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

### *Non-Renewable Resources*

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

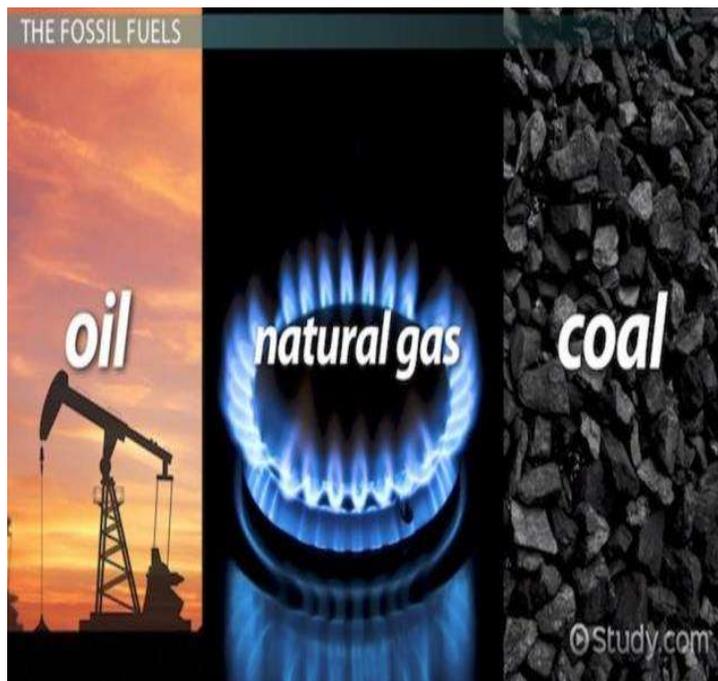
Humans extract non-renewable resources in the form of gas, liquid, or solids, and then convert them into convenient forms for easy consumption. Non-renewable resources, such as coal and oil,

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

### **Types of Non-Renewable Resources**

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

#### **1. Fossil fuels**



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

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

#### **2. Nuclear energy (Uranium)**

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

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

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

**Exercise 2. Give equivalents for:**

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

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

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

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

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

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

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

discarded can be reused. (5) \_\_\_\_\_, people who work to protect natural resources and natural environments, support recycling because it slows the use of the earth's resources. Paper, which is made from trees, is one of the most (6) \_\_\_\_\_ recycled materials. Youth groups and (7) \_\_\_\_\_ organizations often collect newspapers and other paper products to sell to recycling factories. The factories (8) \_\_\_\_\_ the old paper and make it into new paper. Many greeting cards, for example, are printed on recycled paper. Recycling paper saves millions of trees each year.

1	A	important	B	impossible	C	immerge	D	immense
2	A	loose	B	leech	C	locked	D	lessen
3	A	owe	B	ore	C	owl	D	own
4	A	recognition	B	ignition	C	depletion	D	ammunition
5	A	Resurrectionists	B	Conservationists	C	Receptionists	D	Philanthropists
6	A	commonly	B	recently	C	rarely	D	kindly
7	A	comfortable	B	capable	C	valuable	D	charitable
8	A	grind up	B	make up	C	keep up	D	set up

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

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

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

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

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

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

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

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

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

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

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

**Table 1**

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

**Table 2**

<b>Advantages of nuclear power</b>	<b>Disadvantages of nuclear power</b>

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

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

## UNIT 21.

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

### *Difference between Renewable resources and Non-Renewable resources*

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

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

## RENEWABLE RESOURCES

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

### *Examples*

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

## NON-RENEWABLE RESOURCES

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

### *Examples*

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

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

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

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

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

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

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

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

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

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

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

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

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

How do solar panels work?

Does solar power work at night?

Do solar panels overheat?

How many panels are needed to run a house?

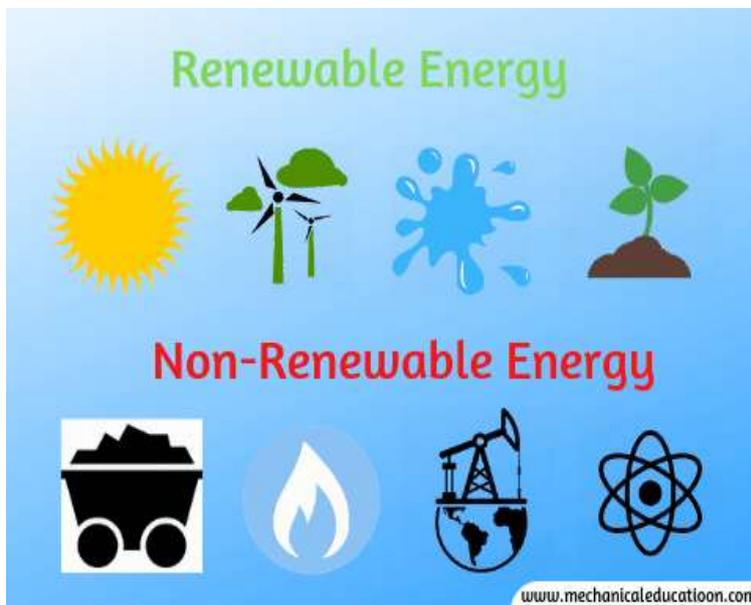
Can solar panels be recycled?

Are solar panels expensive to maintain?

Do solar panels really save you money?

What are the advantages and disadvantages of using solar panels?

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



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

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

Their location on Earth.

The way they are used in our everyday lives.

The time needed for their regeneration.

The period of time during which they can be stored.

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

Water            Coal            Fish            Wind

**3. Why is recycling so important to the environment?**

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

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

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

It prevents the waste of non-renewable resources only.

**4. What are renewable resources?**

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

Saved energy.

Coal, oil, and natural gas.

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

**5. Wood is...**

a renewable resource.

a nonrenewable resource.

used to make oil.

used to make plastic and glass.

**6. What does a 'finite resource' mean?**

The supply is renewable.

The resource will continue forever.

There is a limited supply.

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

Fossil fuels    Nuclear power    None of the above

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

Fossils    Energy    Resources    Fossil fuels

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

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

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

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

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

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

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

Nuclear Energy.  
A nonrenewable resource

16. \_\_\_\_\_ is the efficient use of resources.

- |              |                   |
|--------------|-------------------|
| Fossil Fuels | Conservation      |
| Recycling    | Natural Resources |

## UNIT 22.

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

### *Energy Resources Support Industrialization*

Muscle power was once the chief source of energy. The muscles of men, women, children, and animals provided the energy needed



to plow fields, raise crops, move goods, and manufacture finished products. Today the industrialized countries of the world largely use fuels instead of muscles for energy. To produce the fuels needed, these countries constantly search for energy resources.

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

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

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

**Exercise 2. Give equivalents for:**

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

**Exercise 3. Answer the questions:**

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

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

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

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

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

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

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

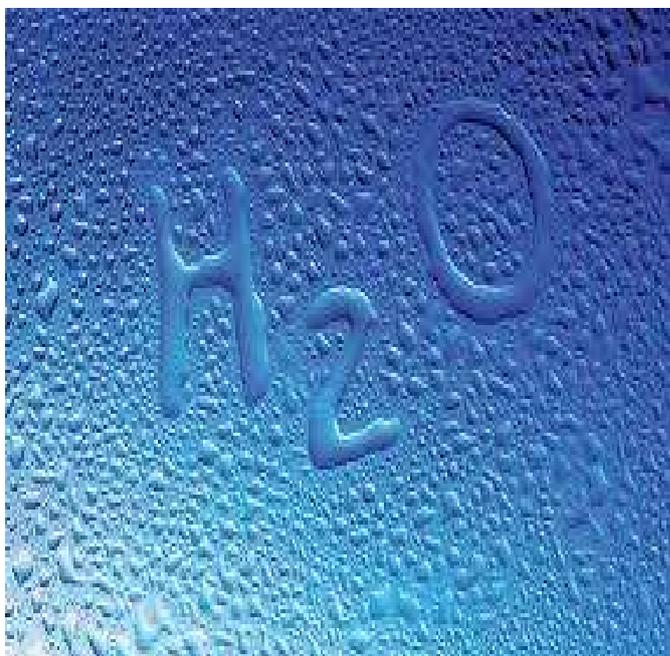
## UNIT 23.

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

### *Water in Our Life*

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

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



Water shapes and reshapes the crust of the earth. It does this whether it falls as rain, flows in rivers, collects in deep and shallow places, or freezes into ice. Water plays an important role in determining climate, in weathering rock and forming soil, and in making other natural resources usable. Water does all these things because it has special

qualities that few other materials on the earth have. These special qualities make water a wonder on the earth and the earth a fit place

on which to live. Water is present on the earth not only as a liquid — its most abundant form — but also as a gas and as a solid.

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

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

**Exercise 2. Give equivalents for:**

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

**Exercise 3. Answer the questions:**

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

**Exercise 4. Complete the sentences:**

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

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

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

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

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

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

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

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

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

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

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

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

**1. essential**

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

**2. liquid**

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

**3. glacier**

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

**4. ancestors**

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

**5. divine**

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

**6. purpose**

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

**7. dam**

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

**8. livelihood**

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

**9. tiny**

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