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ENVIRONMENTAL PROBLEMS AND SOLUTIONS

Учебное пособие

Нижний Новгород
2025

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«Нижегородский государственный архитектурно-строительный университет»

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Учебное пособие реализует требования программы, предъявляемые к дисциплине «Иностранный язык» для студентов-бакалавров, обучающихся по направлению подготовки 05.03.06 Экология и природопользование. Основной целью пособия является развитие профессионально-иноязычной компетенции студентов в сфере их будущей профессиональной деятельности, а также формирование профессионально-важных качеств современного инженера-эколога.

Пособие основано на материале аутентичных текстов интернет-сайтов и журналов (США, Великобритания) и состоит из разнообразных по форме и содержанию заданий как для аудиторной, так и для самостоятельной работы. Упражнения разработаны с учетом современных методических принципов и направлены на активизацию изученного материала.

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UNIT 1

Environmental Issues

GETTING STARTED

Do the quiz and decide *How Green You Are.*

Read the questions and choose answers a, b or c.

1. Do you turn off the lights when leaving a room?
    a) Yes, always
    b) Sometimes
    c) Never

2. Do you recycle paper, plastic, glass, and metal?
    a) Yes, always
    b) Sometimes
    c) Never

3. Do you use public transportation or walk / cycle when possible?
    a) Yes, always
    b) Sometimes
    c) Never

4. Do you buy local food?
    a) Yes, always
    b) Sometimes
    c) Never

5. Do you have showers instead of baths?
    a) Yes, always
    b) Sometimes
    c) Never

Are your answers mostly *a, b* or c? See the key to find out how green you are.

Mostly **a's**: Well done! You're really green! We need more people like you to help us save our environment!

Mostly **b's**: You're trying to be more green, but you don't always get it right. Learn more about the environment and think before you act.

Mostly **c's**: You're not very green, are you? Please look after our world before it's too late!

Discuss in pairs the following questions.

- What do you know about the environmental problems? Which of them worry you most? Why?
- Why do young people show much interest in the environmental matters?

Learn and revise the words

Threat *(n, v)*, release *(n, v)*, biodiversity *(n)*, poisonous chemicals, pollution *(n)*, global warming, extinction*(n)*, waste*(n, v)*, damage *(n, v),* recycle *(v)*, acid rain, harmful effect, human health, water shortage, environmentally friendly, agriculture*(n)*, urban area, climate change, lead to *(v),* supply *(n, v)*

Ex.1 Match English expressions with their Russian equivalents.

1. biodiversity	a) кислотный дождь
2. waste	b) угроза
3. acid rain	c) ядовитые химикаты
4. human health	d) биоразнообразие
5. global warming	e) отходы
6. threat	f) здоровье человека
7. poisonous chemicals	g) глобальное потепление
8. damage	h) разрушать

Ex.2 Read the following texts, match the pictures and descriptions with the global environmental problems.

Threat to Biodiversity

Water Shortage

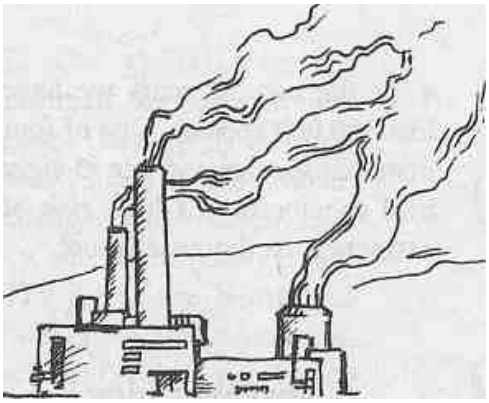
Pollution of sea, rivers

Global Warming

Acid Rain

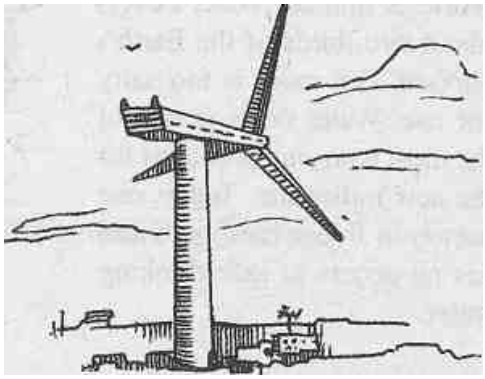
Environmentally Unfriendly Energy Sources

An Increasing Human Population



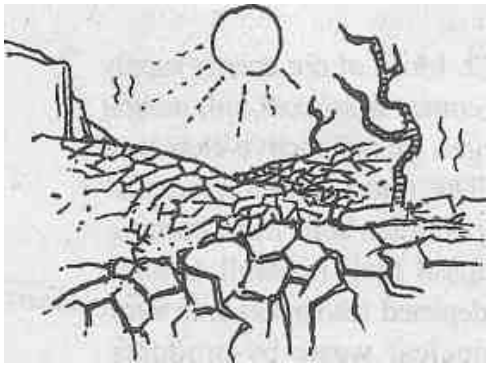
1. Factories and cars release poisonous chemicals into the air, the polluted rain that forms later damages trees, water sources, has a harmful effect on human health.

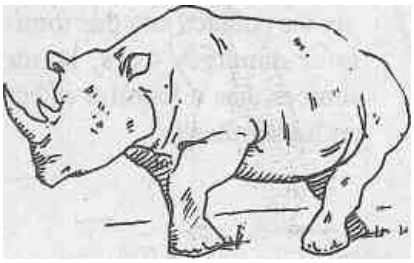
2. Much of our energy supply comes from coal, oil, natural gas, or radioactive elements. The undesirable effects of pollution both from burning fossil fuels (as well as their depleted resources) and from nuclear waste by-products encourage using renewable energy sources (solar, wind, geothermal power and others).



3. There is less and less wilderness in the world. An increasing human population is taking up ever more land for agriculture and urban area.

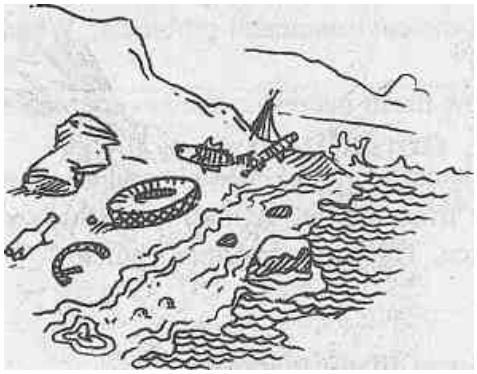
4. The amount of water in the world is limited. Water covers about two-thirds of the Earth's surface. But most is too salty for use. Water crisis is one of the most worrying problems for the new millenium. Today, one person in five across the world has no access to safe drinking water.

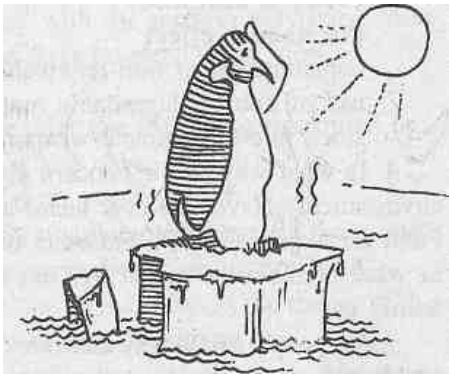




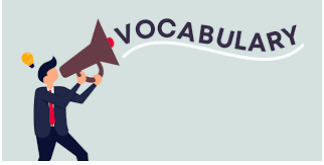
5. In the last 50 years we have lost 300,000 species. Unique animals and plants are getting less. One of four mammal species and one in eight bird species face a high risk of extinction in the near future.

6. Water in sea, rivers and lakes is polluted by wastes and *toxic* chemicals. Sea animals, fish and birds are killed by oil spills.





7. The global warming induced by greenhouse gases (largely by burning fuels) leads to the climate change. The weather is getting warmer. The area covered by sea ice is decreasing. The ice at the North and South Pole can melt causing serious floods in many parts of the world and turning into deserts others. Some scientists think that there is a definite link between the global warming and the hurricanes, the number of which has considerably increased recently.



Ex.3 Find English equivalents to the following Russian words in the text and use them in your own sentences:

водные ресурсы, ядовитые химические вещества, вредное воздействие, ископаемое топливо, истощенные ресурсы, возобновляемые источники энергии, дикая местность, сельское хозяйство, количество воды, вымирание, отходы, наводнение, пустыня, ураган.

Ex.4 Match the words to make phrases, find them in the text and translate.

1. drinking	a. health
2. energy	b. chemicals
3. poisonous	c. crisis
4. human	d. species
5. water	e. spills
6. mammal	f. sources
7. oil	g. water
8. fossil	h. warming
9. climate	i. fuel
10. global	j. change

Ex.5 Put the words from the box in the correct columns according to the pronunciation of the letters in bold.

harm**ful**, h**u**man, m**u**ch, s**u**pply , nat**u**ral, poll**u**tion ,f**u**el, n**u**clear, agric**u**lture, **u**se, f**u**ture, introd**u**ce, h**u**rricane, n**u**mber, j**u**stify**,** ind**u**strial, destr**u**ction, cons**u**mption

as in cl**u**b	as in **u**se	as in s**u**ccess

Ex.6 There are a lot of similar words, which carry different meanings. Learn their correct pronunciation. Mind the stress. Give Russian equivalents to the words:

“ec`ology”

“ecol`ogical”

“ec`ologist”

Write down some sentences using these words and read them to your partner.

Focus on Grammar

Present Simple (Настоящее простое время)

We use the Present Simple for things that are true in general or for things that happen sometimes or all the time. (see page 101)

V / V (e)s)

- *We know about the environmental problems*
- *The Earth goes round the Sun.*

Ex.7 Find the examples of Present Simple and Present Continuous in the text.

Ex.8 Put the verbs in brackets into the Present Continuous.

Model: *She is drinking water now.*

1. Family life (change) rapidly.
2. I can't understand what he (talk) about.
3. She (feel) guilty. Forgive her.
4. We (not get) younger.
5. Today in this country we (face) a lot of problems.
6. These days many people (complain) that life is too tough.
7. You (look) strange, Teddy. What's the matter?

Ex.9 Translate into English.

1. Где Майкл? – Он играет в теннис.
2. Он хорошо играет в футбол? – Нет, он играет плохо.
3. Я не знаю человека, который не любит природу.
4. Я часто разговариваю с моим приятелем о школе.
5. Смотрите, в небе летает воздушный змей.

6. Он не видит, что я на него смотрю, т.к. он читает что-то с большим интересом.

7. Посмотрите на человека, который сидит у окна. Это наш учитель химии.

Speaking

Ex.10 Discuss major industrially created dangers effecting the environment. Choose them from the list below. Rank them in accordance with their importance. Try to justify your choice.

- nuclear reactors
- industrial emissions
- destruction of the rain forest (deforestation)
- industrial wastes
- nuclear wastes
- carbon monoxide fumes from vehicles
- marine oil spills
- chemical effluence
- greenhouse effect
- consumption of non-renewable energy
- use of non-biodegradable materials
- stock pile of chemical weapons

Ex.11 Discuss in pairs the following questions.

- What can you say about the environmental problems in your city (country)?
- What problems can be considered as the most urgent?

Ex.12 Presentation.

A large number of environmental disasters occur in the world every day.

Prepare and make a presentation about one of them. Use a supplementary material in speaking file p.96.

See Language Box to help you to agree and disagree in speaking file p.97

UNIT 2

Traffic and Air Pollution

GETTING STARTED

- What are the main sources of air pollution?
- What substances are major air pollutants?
- Which of them are the most dangerous? In what connection would you put bad health problems and poor air quality?

Learn and revise the words

exhaust fumes, escalate *(v)*, increase *(v)*, combustion *(n)*, efficiently *(adv)*, hydrocarbons *(n)*, especially *(adv)*, sulphur *(n)*, carbon monoxide *(n)*, nitrogen *(n)*, vehicle *(n)*, allergy *(n)*, performance *(n)*, ozone *(n)*, accumulate *(v)*, emit *(v)*, dangerous substances, bad air quality, nitrogen oxides, lead *(n)*.

Ex.1 Match words from column A to B. Translate all word combinations into Russian.

A	B
1. exhaust	a. oxides
2. main	b. cities
3. nitrogen	c. smog
4. overcrowded	d. countries
5. photochemical	e. particles
6. developing	f. fumes
7. tiny	g. petrol
8. toxic	h. cause
9. unleaded	i. compounds

Ex. 2 Read the text and find in the text the words from Ex.1 and translate the sentences with them.

Traffic and Air Pollution

1. Cars free us from here and now; they turn the difficulties of a journey into the pleasures of a trip. Sure, they have their downside -pollution, noise, - but no amount of environmental damage can ever take the sweetness out of a ride. However, a continuous increase in-the number of cars leads to serious congestion and escalate pollution caused by cars. Governments build new roads trying to improve the situation- but this means that they cut down trees and destroy more of the countryside.

2. The car is one of the biggest polluters today. Exhaust fumes from cars are the main cause of bad air quality, which can make people feel ill and have difficulty breathing. The problem is especially bad in some cities, where on days, when there is not much wind; a brown layer smog (mixture of fog and smoke) hangs in the air. The relatively inefficient

combustion of fuel in a car engine cause many hydrocarbon fragments to be left unburned. These fragments (mainly methane) help to form smog and are believed to be carcinogenic.

The incomplete combustion of fuel produces also carbon monoxide (CO). It is poisonous and at moderate concentrations can cause drowsiness and impair mental and physical alertness. Carbon monoxide emissions largely come from cars exhaust. Nitrogen oxides (NO) are formed within the cylinders of an engine during fuel combustion. They are major components of smog.

3. Hydrocarbons and nitrogen oxides in vehicle exhausts combine with one another in sunlight to produce ozone. The ground level ozone is major air pollutant. The photochemical smog is worst in traffic-congested cities on dry, hot summers, whereas sulphur based smog occurs on cold winter days. Photochemical smog is common when the vehicle engines are old and poorly maintained, as often occurs in developing countries. In some overpopulated cities such as Mexico-City and San Paulo almost all children suffer from coughs and wheezing, different forms of allergies. This is mainly due to the effect of ozone and other motor vehicle pollutants.

4. Air in large cities contains a great deal of dust – suspended in air minute solid particles. Some of them are toxic and can contain lead. Lead comes from petrol, it is emitted in tiny particles and if it is breathed in, can accumulate in the body and cause lead poisoning. Human being cannot excrete lead, so it accumulates lead in the body. Even in tiny concentrations, it can cause headaches, abdominal pains, and general tiredness. Today more cars are made to run on unleaded gasoline.

After Reading

Ex.3 Read the text more carefully and answer the questions.

1. What dangerous substances do car exhausts contain?
2. What process is CO produced by?
3. What part do car emissions play in formation of ground level ozone?
4. What can be done to reduce air pollution caused by cars?

Ex.4 Choose the statement that best expresses the main idea of each part.

Part 1

1. The car is the biggest polluter.
2. The number of cars is increasing every year and this leads to increasing air pollution.
3. Exhaust fumes are the main cause of bad health problems.

Part 2

1. Many dangerous substances, CO, lead are contained in car emissions.
2. Exhaust fumes from cars are the main source of bad air quality which can cause many human illnesses.
3. There are too many cars on the city roads.

Part 3

Write a sentence that will best reflect the main idea of the part.

Part 4

Write a sentence that will best reflect the main idea of the part.

Ex.5 Which word is different? Why?

1) automobile	venture	vehicle
2) breathing	combustion	burning
3) install	fit	dismantle
4) accelerate	speed up	maintain
5) capable to do sth well	inefficient	wasting (energy)
6) reduce	become bigger	decrease
7) emission	exhaust	absorption

Ex.6 Find synonyms to the following words or word combinations in the text and translate them.

1. disadvantage (1)
2. the condition of being so crowded with traffic that normal movement in area is impossible (1)
3. not to be able to breath easily (2)
4. burning (2)
5. tiredness (2)
6. stress (2)
7. an illness that you have when you eat, smell or touch a substance, which makes people sick (3)
8. gases discharged from the engine of motor vehicles (3)

Ex.7 Place the appropriate word from the list in each of the gaps below.

combustion	*traffic*	*photochemical smog*	*pollution*	*ozone*

1. Concentrations of many dangerous substances in the air have crept up over recent years as streets have been congested with ... .
2. Carbon monoxide is produced by incomplete ... of fuel.
3. Ground level ... has harmful effect.
4. ... is a complex chemical mixture.
5. Air ... problem crosses national boundaries.

FOCUS ON GRAMMAR

Infinitive

The *to* – infinitive is used
to express purpose
• *He went to London to study English.*
after certain verbs that refer to the future (agree, appear, decide, expect, hope, promise, refuse, want)
• *Tom promised to come.*
After would like, would prefer, would love
• *I would like to go to the cinema.*
After adjectives which describe feelings, emotions, willingness or unwillingness, person's character: happy, glad, sad, clever, kind, eager
• *I am happy to meet you.*

Ex.8 Find and translate the examples of the infinitive of purpose in the text Traffic and Air Pollution.

Ex.9 Match parts of the sentences from left and the right columns.

1. A water resources engineer deals with such issues as the quality and quantity of water	a. to solve problems.
2. Environmental engineers use logic and reasoning …	b. to identify the strengths and weaknesses of alternative solutions and conclusions.
3. Environmental engineers need to study chemistry …	c. to identify engineering problems and assess the potential impact of projects.
4. One of environmental engineers' specific tasks is to conduct studies of environmental condition ….	d. to prevent floods and supplies water for cities, industry and irrigation.

Round Table

Ex.10 Working in groups of three or four, considers the questions below. After that share your ideas with the class.

1) What are the main air pollutants in your city? Where do they come from?
2) How are people affected by the bad air quality?
3) What kinds of actions are needed to limit air pollution?
4) What have been done and what measures are now underway in other countries to improve the air quality in big cities?
5) What should be done in our city to clean up the air?
6) Can individuals do anything?

Using the Net

Ex.11 Surf the Net, prepare the report on this problem:

What are the main sources of transportation air pollution? Try to find solutions for transportation air pollution.

Unit 3

Water Pollution

"Water, water everywhere,

nor any drop to drink"

The Rime of Ancient Mariner

Samuel Taylor Coleridge

GETTING STARTED

- **What forms does water come to us?**
- **What is chemical formula of water?**
- **What is the total amount of water in the world?**

Learn and revise the words

urgent *(adj)*, shortage *(n)*, per capita, consumption *(n)*, oil spills, variety *(n),* effluent *(n),* sewage *(n),* aquatic *(adj),* accident *(n)*, pipeline, priority *(n),* keep pace with, promote *(v),* degradation *(n),* pump out *(v),* damage *(n, v),* contamination *(n),* disrupt (*v)*, escalate *(v),* waste *(n, v),* regression *(n),* livelihood *(n),* unsafe *(adj),* demand *(n, v),* supply *(n,v),* average *(adj),* split in *(v)*

TEXT I

Word Study

Ex.1 Translate the word combinations into Russian.

1. urgent problems
2. unsafe water
3. to keep pace
4. water-borne diseases
5. differences in per capita water consumption
6. to run out of something
7. a rich variety
8. rare species

Ex.2 Read the first part of the text and say if the following statements are true or false.

1) Accessibility to safe water has become a major challenge to the world as fresh water supplies are stretched to meet the demands of the population, industries and agriculture.

2) Worldwide demand is getting twice as much every ten years.

3) Diseases due to unsafe water account for 60% of infections in the developing world.

4) An average American uses 1000 liters of water a day.

The Water Crisis

1. One of the most urgent problems in the world today is the shortage of the clean water. Access to clean water is the basic human right. But acid rain, industrial pollution and sewage dumping, oil spills have made water undrinkable.

According to the UN, nowadays 40 per cent of the world have no access to clean water or sanitation, and as industrial and agricultural development everywhere in the world escalates, the situation is deteriorating. Worldwide demand for water is doubling every 21 years, more in some regions. Supply can't keep pace with demand, because of growing population, especially in the third world countries. Water-borne diseases account for 80% of infections in the developing world. More than 3 mln people die every year from unsafe water. The demand for water in many countries simply outruns the supply. Water is likely to become a growing source of tension and competition between nations. There are large differences in per capita water consumption between different countries. In some countries people are surviving on the daily ration equal to or less than a bucket of water, while average American uses 1000 litres of water a day.

2. According to the UN Commission on Water for 21st century more than half of the world's major rivers are going dry or are polluted. They are posing a threat to the health and livelihood of the people who depend upon them for irrigation, drinking and industrial water. Of the major rivers in the world the Amazon in South America and the Congo in the sub-Saharan Africa are the healthiest. The Yellow River in China is severely polluted.

Lake Baikal in Siberia with a depth more than a mile, contains one-fifth of the world's fresh water resources. The local people call it the Holy sea. It contains a rich variety of animals and plants, including 1.300 rare species that do not exist anywhere else in the world. Now the environment around Lake Baikal is endangered not only because of massive volumes of industrial effluents, but also because of forest fires which release significant amounts of pollutants into the air and impact water quality. In addition deforestation, especially in the surrounding watersheds, can increase soil erosion, sedimentation in the lake, and reduce water quality.

After Reading

Ex.3 Read the text more carefully and answer the questions.

1. What made many water resources unsafe?
2. Why cannot water supply keep pace with the demand?
3. What can you say about per capita water consumption in different countries of the world?
4. What can you say about the extent to which world's major rivers are polluted?
5. Why is preservation of the largest resource of fresh water in the world under threat?

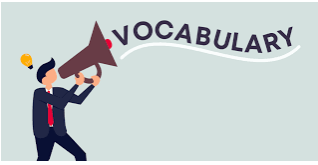
Ex.4 Choose the statement that best expresses the main idea of each part.

Part 1

1. Access to clean water is a basic human right.
2. We are running out of drinking water.
3. One of the most urgent environmental problems in the world is the shortage of clean water.
4. The world faces water crisis.

Part 2

Write a sentence that expresses the main idea of the paragraph.



Ex.5 Find English equivalents to the following Russian phrases in the text:

болезни, вызванные плохим качеством воды; источники напряжения между народами; потребление на душу населения; ежедневный рацион; угроза здоровью и существованию людей; сильно загрязненный; богатое разнообразие.

Ex.6 Match the words opposite in their meaning.

1. drinkable water	a. industrial water
2. escalate	b. rare species
3. drinking water	c. unsafe water
4. health	d. disease
5. polluted	e. deteriorate
6. rich variety of animals	f. clean

TEXT II

Ex.1 Match words from column A to B to make phrases. Translate the word combinations into Russian.

A	B
1. industrial	a) life
2. rich	b) problem
3. urgent	c) effluents
4. heavy	d) spills
5. major	e) consumption
6. toxic	f) leakage
7. aquatic	g) variety
8. oil	h) threat
9. water	i) metals

Ex.2 Before you read the text in detail skim through it quickly and choose 5-6 sentences that express the main ideas. Discuss them with the whole class. Then read the text carefully.

The Major Water Pollutants and the Main Ways of Water Pollution

1. There is a growing concern over the safety and quality of drinking water as it could be contaminated by wide range of chemicals, microbial and physical hazards that pose threat to health. The most important factor influencing the quality of water is the nature of wastes reaching water sources from domestic and industrial effluents. Dangerous substances are substances, which are persistent, toxic and accumulate in living tissues causing chronic intoxication. A list of dangerous substances includes heavy metals as mercury and cadmium, certain pesticides, chlorinated industrial chemicals and solvents. It is only comparatively recently that we have become fully aware of implications of dioxin poisoning. Dioxins (TCDD) are formed by presence of carbon, oxygen, hydrogen and chlorine; in most cases heat is also a contributor. TCDD is one of the most toxic and mutagenic substances known to man. It now appears that its trace amounts can cause cancer, genetic deformities in man and animals.

Mercury which is one of the most dangerous substances has the ability to accumulate in sea plants and fish. Mercury poisoning from fish is not considered to be a risk, but fish from some fresh water lakes, is not considered suitable for human consumption. Many countries of the world, that tried to replace surface water contaminated with sewage by ground water as a safe reliable source of drinking water, may be now drinking water containing arsenic. People are at serious risk in 17 countries around the world - including China, Vietnam, Argentina and the US, where limits set by the World Health Organization are exceeded.

2. In many cases, sewage is treated and broken down in sewage plants before it is pumped back into lakes, rivers and seas. But it is often returned untreated. Water can

usually clean itself of organic waste, but this process takes a long time. In some areas, too much untreated sewage is pumped out and the water never gets clean. Modern agriculture relies on large inputs of a wide range of synthetic chemicals to improve and sustain high agricultural yields. Fertilizers and pesticides washed off in the rain get into rivers, some pesticides fall into water through air drift from aerial spraying. Pollution also travels through (under) ground water. Organic and chemical pollutants kill fish and aquatic life.

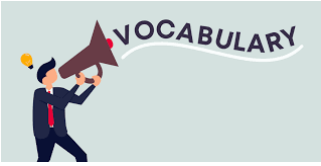
3. Technological catastrophes are among extremely appalling sources of water pollution. The oil spill also has a less visible toxic effect: it reduces the level of oxygen dissolved in the water. As well as the fish and sea gulls, oil kills millions of tiny plants and animals on the deeper layers of the ocean. Contamination of water with oil occurs when water is injected into oil wells to increase production, in production of oil from oil shale and tar sands. Bulk transport of oil by sea is the most efficient way of distributing the large amounts needed by many countries. Besides that many countries use offshore oil production and bring oil ashore by submarine pipelines.

4. Water is life, we should take care about keeping it clean. Business culture should be changed and the environment should be given a higher priority. In the long turn a living river is more profitable than a dead one. And some say if they wanted to, the commerce powers could stop environment degradation. United Nations report on the state of the world's water resources declares that they will continue to diminish because of population growth and climatic changes.

After Reading

Ex.3 Answer the following questions.

1. What factors influence the quality of water?
2. How are dangerous substances defined in the text?
3. How can TCDD affect human health?
4. How do fertilizers and pesticides get into rivers?



Ex.4 Which word is different? Why?

1) storing	throwing away	dumping
2) disrupt	create	destroy
3) contaminate	purify	pollute
4) effluent	waste	raw materials
5) acquire	come to an end	run out of
6) poison	food	nutrients

Ex.5 Place the appropriate word from the box in each of the blanks below:

efficient *spills* *aquatic* *sewage* *pollutes* *pollutants* *domestic*

1. Oil ... the coastal waters and endangers fishing in the North Sea.

2. Both industrial and ... effluents often include heavy metals, like lead and mercury.

3. Engineering and other industrial processes make extensive use of a range of cleaning solutions and chemical solvents, these solvents are now common ground water ... .

4. Bulk transport of oil by sea is the most ... way of distributing the large amounts of it needed by many countries, the risk of accidents involving oil ... cannot be totally eliminated.

5. Sewage and agricultural chemicals falling into rivers, lakes and seas pollute them causing eutrophication and disrupting of the ... ecosystem.

6. Many rivers are biologically dead due to ... and agricultural chemicals falling into them.

Ex. 6 Match the word/ phrase in Column A with its definition in Column B

1) effluent	a) to gather or collect
2) to accumulate	b) the cells and structures of living organisms
3) living tissues	c) waste matter, especially from toilets and drains
4) oil spills	d) a substance used to kill insects, weeds, or fungi
5) appalling	e) liquid waste released into the environment
6) sewage	f) the accidental escape of a substance
7) pesticide	g) accidental release of petroleum hydrocarbons into the sea
8) leakage	h) causing shock; very bad
9) tiny	i) very small

Focus on Grammar

Comparatives and superlatives

Ex.7 Complete the table with comparatives and superlatives from texts A and B. Revise the rules. Find more examples of adjectives in the texts and give their comparative and superlative forms.

	Adjective	Comparative	Superlative
One-syllable adj.	high	----------	the highest
Two or more syllable adj.	toxic profitable	more toxic ----------	---------- the most profitable
Two-syllable adj. ending in –y	healthy	healthier	----------

Irregular adjectives and their comparatives and superlatives

Adjective	Comparative	Superlative
Good	-----	-----
Bad	-----	-----
Little	-----	-----
Old	-----	-----
	-----	-----
Late	-----	-----
	-----	-----
Far	-----	-----
	-----	-----

Ex.8 Try to guess the comparative and superlative forms of the following irregular adjectives translate and remember them.

Latter, farther, the least, the best, older, elder, the furthest, less, the farthest, further, the oldest, worse, later, better, the worst, the eldest, the last, the latest

Ex.9 Complete these sentences with the right form of adjectives.

1. The Pacific is ... than the Atlantic. (large)
2. Today the streets aren't as ... as they used to be. (clean)
3. It's … mistake people have ever made. (bad)
4. We should drink ... water. (healthy)
5. Water crisis is one of … problems today. (acute)
6. We should stop environment degradation to make the situation ... .(good)

Speaking

Ex.10 Working in groups of three or four, consider the question below. After you have reached some conclusion, share your ideas with the class.

- *What methods are usually used for purification of water?*

Using the Net

Ex.11 Find in the Internet the answers to the following questions. Make a report.

1. What is the best way to get rid of oil spills (consider different ways of removing oil spills, their advantages and disadvantages)?
2. What do you think is the average percent of oil removed from the surface of water in the case of collecting oil using floating barriers, special devices called skimmers?
3. Is there real possibility to pollute water and move oil into the deeper water by speeding up the natural process of oil decomposition using chemicals which break oil spills into little drops?
4. Why is it difficult to maintain tankers with special design such as tankers with double hull skin?
5. What is done to protect the tankers against corrosion?
6. Does the special construction guarantee the absolute protection from, oil spills when a tanker moves at a full speed?
7. Why does burning of oil on the water present a serious threat to sea organisms?

Ex.12 Imagine you are the members of university ecological club. You have to develop a plan of events for the students of your university to protect water resources in our region.

Work in small groups, describe possible events, discuss with your partners. Then choose one of them and design a leaflet. (see Writing File p.99)

UNIT 4

Population and the Environment

GETTING STARTED

In 2023, the global population reached 8 billion. 1 billion people is projected to be added to our human ranks by 2040 and an additional 1 billion more by 2060, reaching 10 billion.

More people inevitably put more demands on the planet. More people require more food, water, sanitation, homes, public services, and amenities. Population growth, along with increasing consumption, tends to increase emissions of climate-changing greenhouse gases.

In small groups of 3-4 use the Internet and consider the following questions, then share your ideas with the whole group.

1. What are the most heavily populated countries in the world?
2. What countries are characterized by high rate of birth?

Learn and revise the words

Natural resources, increasing pressure, impact *(n, v),* generate *(v)*, soil exhaustion, consume *(v),* currently *(adv),* damage *(v),* growth *(n),* urgent need, living standards, average, spread *(v),* urban areas, pollutant *(n),* conserve *(v),* deteriorate *(v),* value, challenge *(n),* disaster *(n)*

Ex.1 Match a word from list A to word from list B. Translate the word combinations into Russian.

A	B
1. natural	a. exhaustion
2. urgent	b. conditions
3. average	c. areas
4. soil	d. growth
5. water	e. impact
6. population	f. shortage
7. environment	g. citizen
8. urban	h. resources
9. living	i. need

Ex.2 Read the text and find the word combinations from the previous exercises.

Population and the Environment

1. As the century begins, natural resources are under increasing pressure, constituting a threat to public health and development. Water shortages, soil exhaustion, loss of forests, air and water pollution, and degradation of coastlines influence many areas. Most developed countries currently consume more resources, than they can regenerate. At the same time most developing countries with rapid population growth face the urgent need to improve their standards of living.

The link between population growth and the environmental impact seems obvious at first glance: more people consume more resources, damage more of the earth and generate more waste. This simple reasoning is true as far as it goes, but the larger

picture of the link is more complex. A very small proportion of the population consumes the majority of the world's resources. The richest fifth consumes 86% of all goods and services. An average American's environmental impact is 30 to 50 times that of the average citizen of a developing country such as India. Per capita consumption in all industrialized countries is permanently growing.

2. It should be mentioned that worldwide about three-quarters of all current population growth is urban. As cities grow ever larger, their impact on the environment grows exponentially. Millions people move from countryside to the city to seek a better place to live, but they often find that their lives become more difficult. In many cities 25% to 30% of the urban population live in poor shanty towns or squatter settlements or they live on the streets. Of Rio de Janeiro's 10.6 million residents, for example, 4 mln live in squatter settlements and shanty towns. Nevertheless, cities in the developing countries continue to attract more and more people. Cities occupy only 2% of the world's land surface, but city populations have a disproportional impact on the environment. For example, London requires roughly 60 times its land area to supply its 9 mln residents with food and forest products. Because commerce and trade have spread dramatically in recent years, city residents consume resources not just from the surrounding areas but, increasingly, from around the world. Urban areas also export their wastes and pollutants, affecting environmental and health conditions far from the cities themselves. The UN coined the term megacities in the 1970s to describe cities with 10 million or more residents. Currently, there are 37 megacities worldwide, of which 22 are situated in Asia, 6 in Latin America, 4 in Africa.

3. It is necessary to balance the requirements of growing population with the necessity of conserving earth’s natural assets. Improving living standards without destroying the environment is a global challenge. While the population growth has

slowed, the absolute number of people continues to increase. As population and demand for natural resources continue to grow environmental limits will become increasingly apparent. Slowing population growth would help improve living standards and would provide time to solve sustainability problems. Without practicing sustainable development humanity faces a deteriorating environment and may even invite ecological disaster.

After Reading

Ex.3 Read the text more carefully and answer the questions.

1. What is the link between the population growth and the environmental impact?
2. What can you say about the level of consumption in the different countries of the world? Is it possible to say that it is almost the same?
3. What part of all current population on the earth is urban?
4. What are the basic requirements for sustainable development?

Ex.4 Choose the statement that best expresses the main idea of each part.

Part 1

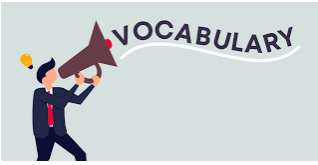
1. The world could support only 2 billion people if the entire world consumed at the rate Americans and Western Europeans do.
2. Although at first glance it seems that more people consume more resources, but on the other hand, one should take into consideration the inequality in the access to goods and services in the different parts of the world.
3. There is obvious link between population growth and the environmental impact.
4. A very small proportion of population consumes the majority of the world's resources.

Part 2

1. About three-quarters of all current population growth is urban.
2. As cities grow ever larger, their impact on the environment grows exponentially
3. The larger the city the greater its impact on the environment.

Part 3

1. As the population grows, living standards are getting worse.
2. It is necessary to limit consumption of earth's resources.
3. Slowing population growth would provide time to solve sustainability problems.



Ex.5 Fill in the gaps using the words from the box.

population *urban* *sustainability* *deteriorated* *consumption*

1. In the past decade in every environmental sector, conditions have ..., or they are worsening.
2. The ... has been growing faster than food supplies.
3. Per capita … in all industrialized countries is permanently growing.
4. According to the United Nations, the … population is set to increase by almost 800 million by the year 2035.
5. Less population growth will provide time to solve ... problems.

Ex.6 Make up sentences using these phrases.

1. urgent need (1)
2. at first glance (1)
3. disproportional impact on the environment (2)
4. earth's natural assets (3)

Ex.7 Which word (word combination) is different? Why?

1) at first glance	at first sight	in the first place
2) deficit	shortage	excess
3) uncommon	average	usual
4) change	conserve	transform
5) exploit	misuse	use
6) impact	access	effect
7) roughly	exactly	approximately
8) provide	restrict	supply
9) decrease	increase	deplete
10) tally (with)	match	deviate
11) per head	per annual	per capita

8. Say these numbers. Check with the teacher after each group (See page 103)**.**

1. 47 362 1,841 15,000 36,503 684,321 4,537,295
2. 3.5 2.89 9.875
3. $^{1}/_{3}$ $^{3}/_{8}$ $^{5}/_{7}$ $^{1}/_{2}$ $^{3}/_{4}$
4. 15% 50% 97% 100%

Answer these questions.

1. What is the population of your a) country? b) city?
2. How many people study at your university?
3. What percentage of people in your country uses the Internet?

Question types

1. General question (Общий вопрос).
Do you play computer games? – Ты играешь в компьютерные игры?
Is this his book? – Это его книга?
2. Special question (Специальный вопрос)
Where are you going to move? – Куда ты собираешься переехать?
3.*Alternative question* (Альтернативный вопрос) *Did they finish writing the article in the morning or at night? – Они закончили писать статью утром или вечером?*
4.Tag-question (Разделительный вопрос).
My mother prefers meat to fish, does not she? – Моя мать предпочитает рыбе мясо, не так ли?
5.Question to the subject (Вопрос к подлежащему).
What makes you feel upset? – Что заставляет тебя грустить?
Who invites guests for the party? – Кто приглашает гостей на вечеринку?

Ex.9 Write questions to which the words in bold are the answers. Begin with: *How many, What, Who, Why, Where, Which.*

1. Houses should be built **at a safe distance from factories**.
2. **The development of electro mobiles** will offer a key solution to the air pollution.

3. **Farmers** apply new methods of feeding the crops avoiding harmful fertilizers and pesticides.
4. **Developing** countries face the urgent need to improve their standards of living.
5. **4 mln** people live in squatter settlements and shanty towns.
6. The link between population growth and the environmental impact seems obvious at first glance **because more people consume more resources**.

Ex.10 Put all types of questions to these sentences.

1. Cities in the developing countries continue to attract more and more people.
2. Consumption of natural resources in all industrialized countries is growing.

Speaking

Ex.11 Discuss the following questions in pairs.

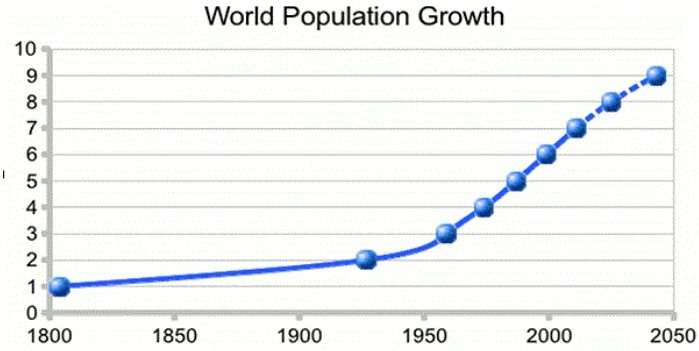
1. Why is the environment getting worse as the population grows? What ecological problems are connected to the population growth?
2. What can be done to reduce the impact of large cities on the environment?

Using the Net

Ex.12 Surf the Net and answer the questions:

➢ What economist was the first to put forward the theory of the overcrowded world? In what century did he live?

➢ How do you assess the implications of dramatic changes in the world's population?



Unit 5

Recycling

GETTING STARTED

1. What is rubbish?
2. Why is it one of the major environmental problems nowadays?
3. What measures should be taken to cope with this problem?

Ex.1 Read and compare this information with your ideas.

Rubbish is everything that you throw away or no longer have a use for.
Rubbish is anything from an empty crisp packet to a broken toy.
Rubbish can be solid, liquid or gas.
People usually talk about three different sorts of rubbish:

1. Domestic rubbish from households
2. Industrial and commercial rubbish from factories, offices, shops and schools
3. Hazardous rubbish which needs to be disposed of in a careful way to prevent pollution. For example, chemicals used to make paint.

Ex.2 People also use the word 'waste' when talking about rubbish. Do you know what is the difference between these words? Do you know any other similar words related to this topic?

Learn and revise the words

Rubbish *(n),* throw away *(v),* decompose *(v),* household *(n),* bury *(v),* prevent pollution, hazardous *(adj),* recycle *(v),* landfill *(n),* reduce *(v),* manufacture *(v),* harmful *(adj),* increase *(v),* annually *(adv),* dispose of *(v),* liquid *(adj),* domestic *(adj),* take measures.

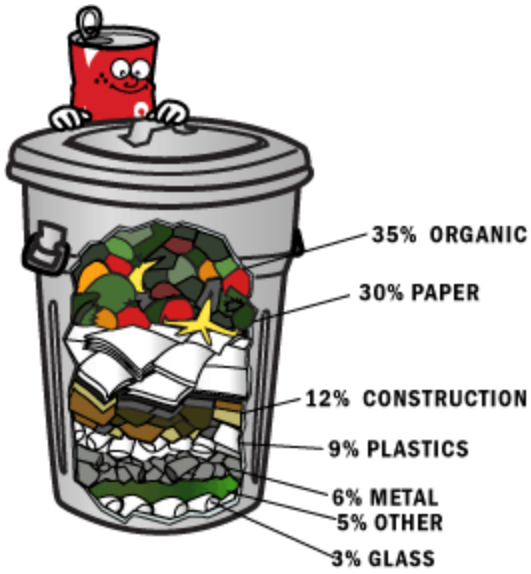
Ex.3 Match the words in columns that have similar meanings:

1. rubbish	a. dangerous
2. throw away	b. dispose of
3. hazardous	c. every year
4. recycle	d. manufacture
5. annually	e. use again
6. make	f. waste

Each household produces around 1 tonne of rubbish every year. The amount of rubbish we throw away is increasing due to lifestyle changes and an increasing population.

We need to increase the amount of rubbish that is recycled because we cannot continue to landfill or burn it forever.

What can we do? There is a popular concept of Reduce – Re-use – Recycle.



Ex.4 a) Have a look at the Reduce Diagram and say which of these things you do or might do.

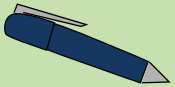
b) What do you think about Re-use and Recycle? Can you make similar diagrams? Work in groups and share your ideas about what can be re-used and recycled.

REDUCE

Buy only what you need, don't buy items that you won't use

Donate unwanted items, such as old clothes and toys, instead of throwing them in the rubbish bin

Buy long lasting products, instead of disposable ones, such as ink cartridge pens instead of biro pens



Drink from refillable bottles instead of paper cups or cans that would be thrown away after one use

Reduce paper waste by printing or writing on both sides of the paper

Reading

Ex.5 a) Read the first paragraph and find all the things that could be recycled. Can you add other things to the list?

b) Read the rest of the text and explain the reasons of recycling.

Recycling means turning the materials from waste into something new. Glass, paper, plastic, and metals such as aluminum and steel are all commonly recycled. Dead plants, fruit and vegetable scraps can be recycled through composting.

One reason that people give for recycling is that it reduces trash in landfills and incinerators. Another reason people recycle is to reduce the amount of raw materials and energy used in making things. Most of the time, it takes less energy to recycle trash than to throw it away. Recycling helps to minimize the whole size of landfills around the world.

Landfill

A landfill is a place where waste is kept. Landfills have a bad smell and look bad, therefore are usually located far away from where people live.

Once the waste is crushed into very small pieces, it is buried, but in the absence of oxygen, a dangerous gas called methane is created. This process is called anaerobic digestion. In some countries, the methane from landfills is used to generate energy.

Waste is usually buried in landfills, but it may first be sorted to remove any recyclable materials.

Battery recycling

Battery recycling is a name of the process of separately collecting such batteries so that they can be disposed of properly. Many batteries are thrown away in regular waste after they have been used. Batteries contain metals such as lead, copper or zinc. In the form that is used in the batteries, these metals are very harmful to the environment – most are toxic. Collecting the batteries allows to extract some of the metals, which can then be re-used - they are not thrown away. The part that cannot be extracted or re-used is disposed in a form that it is less harmful to the environment.

Plastic recycling

Most people make about two kilograms of waste every day, and about 7% of this waste is made up of plastic products that can be recycled. Today, plastic can be recycled into products like picnic tables, park benches, and chairs.

First, plastic is collected and taken to a recycling center, where it is sorted out. When plastic is sorted out, symbols have to be printed on every recyclable plastic product used. There are two types of plastic: polyethylene and polymer. There are two kinds of polyethylene plastic, too: high density polyethylene (HDPE), and low density polyethylene (LDPE). HDPE plastic is usually used to make furniture, and LDPE plastic are usually things like milk jugs, plastic and grocery bags.

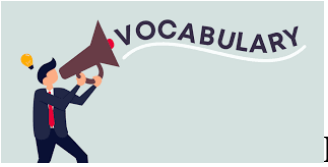
Recycling is an excellent way of saving energy and conserving the environment.

Ex.6 Mark the following sentences as True or False:

1. Paper and plastic are rarely recycled.
2. Composting is a way of recycling.
3. Recycling reduces a number of landfills.
4. It is impossible to sort rubbish before burying it at landfills.
5. Batteries contain substances that damage the environment.
6. HDPE and LDPE plastic are recycled to make useful things.

Ex.7 Look at the picture at the end of the text and find out what the symbols for types of plastic mean.

After Reading



Ex.8 Find in the text English equivalents to the following words and word combinations:

1. мусоросжигательная печь
2. сырьё
3. анаэробное расщепление
4. вырабатывать энергию
5. перерабатываемый материал
6. свинец, медь или цинк
7. собирать батарейки
8. полиэтилен высокой плотности
9. мебель
10. сохранять окружающую среду

Ex.9 Match the words in columns that have opposite meanings:

1. throw away	a. bury
2. solid	b. increase
3. recycle	c. industrial
4. reduce	d. liquid
5. domestic	e. low
6. hazardous	f. re-use
7. high (density)	g. safe

Focus on Grammar

Passive Voice

- We make passive verb forms with the verb to be + past participle.

Renault cars are made in France.

- We often choose a passive structure when we are not interested in or it is not necessary to know who performs an action.

Glass, paper, plastic and metals are all commonly recycled.

- If we want to mention who performed an action we can use by.

More materials should be collected in recycling bins by the citizens.

(See page 103)

Ex.10 Find examples of the Passive Voice in the Text.

Ex.11 Change these active sentences into the passive so that they sound more natural.

1. Most families throw away about 40 kg of plastic per year.
2. They manufacture electronic goods in China.
3. Somebody made this video game in Japan.

4. Each UK family uses an average of 500 glass bottles and jars annually.
5. Anybody can find lots of information on recycling by searching Google.
6. They will print the newspaper at 3 a.m.

Ex.12 Use either Active or Passive structures in the following sentences:

1. The use of plastic in Western Europe _____ (grow) about 4% each year.
2. 24 million of tonnes of aluminium _____ (produce) annually.
3. Glass that _____ (throw away) and ends up in landfills will never decompose.
4. Recycled paper _____ (produce) 73% less air pollution than if it was made from raw materials.
5. Up to 60% of the rubbish that ends up in the dustbin could _____ (recycle).
6. Plastic _____ (take up) to 500 years to decompose.

Watching a Video

Ex.13 Do you know when World Environment Day is celebrated?

a) Watch the United Nations Secretary-General António Guterres video message on World Environment Day 2018 and say what environmental problem he speaks about.

https://www.youtube.com/watch?v=3syYpQO7TFQ

b) Watch the video again and try to answer the questions:

1) Why is this problem so relevant nowadays?
2) Which parts of the Earth suffer from this problem?
3) What are the solutions to the problem?

Ex.14 Design a leaflet about the importance of recycling. (see page 99)

UNIT 6

Technologies for the Environment

In recent years, both companies and people have become more interested in what they can do to better protect the environment. The impressive innovations made by the tech industry in areas ranging from healthcare to transportation and more have given us hope that technology can play a significant role in helping us generate "green" energy, manage pollution and reduce waste.

Do you know any technologies that help people protect the environment?

Reduce *(v)*, renewable energy, generate electricity, fossil fuel, electric vehicle, grow crops, require *(v)*, prevent *(v)*, hydropower dams, energy consumption, algae *(n)*, abundant *(adj)*, deplete *(v)*, current *(n)*, harmless *(adj)*, convert *(v)*

Reading

Let's have a look at the most promising breakthroughs in renewable energy, sustainable materials, and eco-friendly solutions that could help save the planet.

1. Match the short texts about these technologies to the photos:

1. Solar Panels **Function**: Solar panels convert sunlight into renewable electricity, reducing reliance on non-renewable energy sources like coal and oil. **Inventor**: Russell Ohl created solar cells in 1941.	**2. Wind Turbines** **Function**: Wind turbines generate renewable electricity by using wind energy, one of the most efficient renewable energy sources. **Inventor**: Charles F. Brush built the first wind turbine to generate electricity in 1887.
3. Electric Vehicles (EVs) **Function**: EVs eliminate the need for fossil fuels by running on green electricity, significantly reducing greenhouse gas emissions. Inventor**:** Robert Anderson introduced the first crude electric carriage in the 1830s. Tesla, under Elon Musk, popularized modern EVs.	**4. Vertical Farming** **Function**: Vertical farms grow crops in stacked layers, requiring less water and land while reducing transportation emissions due to urban proximity. **Inventor**: Dr. Dickson Despommier pioneered modern vertical farming concepts in the early 2000s.
5. Biodegradable Plastics **Function**: These plastics decompose naturally, reducing landfill waste and preventing environmental pollution. **Inventor**: The team at BASF developed one of the first fully biodegradable plastics.	**6. Hydropower Dams** **Function**: Hydropower converts the kinetic energy of flowing water into renewable electricity. **Inventor**: Viktor Kaplan improved hydropower technology with his Kaplan turbine in 1913.

7. Solar-Powered Water Purification Systems **Function**: These systems purify water using solar energy, offering an eco-friendly solution to water shortage. **Inventor**: Engineer Ashok Gadgil innovated water purification using solar heat in resource-limited areas.	**8. Smart Thermostats** **Function**: Smart thermostats like Nest reduce energy consumption by learning user behaviors and optimizing heating and cooling patterns. **Inventor**: Nest Labs, co-founded by Tony Fadell, introduced the first commercial smart thermostat in 2011.
9. Algae Biofuel **Function**: Algae biofuel is an alternative fuel source derived from algae, offering a cleaner option than traditional fossil fuels. **Inventor**: Dr. Jonathan Trent advanced algae biofuel research in the 2010s.	**10. Plastic-Eating Microbes** **Function**: Engineered microbes break down plastics into harmless organic compounds, combatting plastic waste pollution. **Inventor**: Dr. Shosuke Yoshida and his team discovered a bacteria species capable of breaking down PET plastics in 2016.

A

B

C

D

E

F

G

H

I

J

(*https://iplawusa.com/top-10-green-inventions-that-can-help-save-the-planet/*)

2. Have you heard about these inventions?

Which of them are the most beneficial and environment-friendly?

After Reading

3. Match the words in columns to make phrases and translate them into Russian. Refer to the texts above:

1) reduce	a) a bacteria species
2) require	b) environmental pollution
3) generate	c) plastic waste pollution
4) prevent	d) renewable electricity
5) purify	e) transportation emissions
6) discover	f) water
7) combat	g) less water and land

Reading

Now let's have a closer look at different types of renewable energy.

1. Before reading the text match the English words and phrases to the Russian ones:

1. energy source	a) водохранилище, водоем
2. abundant resources	b) источник энергии
3. worsen the current state	c) истощать водные ресурсы
4. convert sunlight into energy	d) обильные ресурсы
5. reservoir	e) превращать солнечный свет в энергию
6. heated sidewalks	f) сжигать ископаемое топливо
7. deplete water resources	g) тротуары с подогревом
8. burn fossil fuels	h) ухудшать текущее состояние

2. Read the text:

What is Renewable Energy and Why is it Beneficial?

What is renewable energy?

Renewable energy is energy that is derived from a natural source instead of a source that causes further environmental damage. For instance, solar panels rely on energy from the sun and wind panels source their energy from the wind. The sun and wind are consistent, abundant resources that aren't going anywhere and don't pollute their environment as they are a part of nature.

Non-renewable energy resources like fossil fuels, coal, oil, and gas require centuries to form and therefore, aren't as abundant in nature as renewable energy is. Also, non-renewable energy sources are harmful to the environment – as burning fossil fuels emits harmful greenhouse gases and carbon dioxide emissions into the atmosphere which only worsen the current state of climate change.

What are some common sources of renewable energy?

Solar energy is the most plentiful and common renewable energy resource, as the sun is *always* there – and the sun's energy can even be extracted when it's cloudy outside. In fact, the sun provides the Earth with energy at a rate ten thousand times the rate of human energy consumption.

Solar energy is retrieved through solar panels that can convert sunlight into electrical energy. Technology powered by solar energy can help produce heat, cool air, electricity, and provide natural light.

Wind energy is another renewable energy resource that utilize the kinetic energy of air through the use of wind turbines methodically placed where wind is most prevalent and easily captured.

Wind energy might hold even more potential than solar energy does, as wind is abundant in nearly every region of the globe – whereas sunshine can be sparse in certain parts of the world, such as in Northern Europe.

Geothermal energy makes use of the thermal energy from the Earth's core. The heat used for this type of renewable energy is extracted from reservoirs. A popular example of geothermal energy usage is across the country of Iceland – known for the Blue Lagoon and heated sidewalks.

Hydropower seeks to use the energy from water in movement depending on its elevation, and like geothermal energy – can also be found in reservoirs.

Unlike wind or solar energy – hydropower can deplete water as a natural resource that can otherwise be used as drink water, maintain irrigation systems, or manage droughts. In other words, hydropower isn't as abundant as wind or solar energy.

Ocean energy is retrieved from technologies that determine the thermal energy of seawater, waves, and currents – and this energy can be used to create electricity or heat.

While the methods and systems to obtain usable renewable energy from the ocean are being finalized, ocean energy has a big potential to be one of the most used

renewable energy resources in the world – as nearly three quarters of the world is made up of ocean water.

Bioenergy, or biomass energy, is made from various organic substances, otherwise known as biomass – like wood or agricultural crops. Biomass is predominantly used in rural regions for simple, daily activities like cooking, space heating, and providing light.

Despite the innovative nature of biomass and bioenergy, it's important to note that in order to extract energy from biomass, the biomass has to be burned – and burning that biomass emits greenhouse gasses into the atmosphere, which aren't good for the environment.

Bioenergy isn't *the best* type of renewable energy – but it is still better than burning fossil fuels and emitting higher amounts of greenhouse gases and further polluting the planet.

Therefore, renewable energy helps to reduce excess carbon and greenhouse gas emissions, and has the potential to dramatically reduce rising global temperatures and finally, the negative effects of climate change.

*(*https://greenly.earth/en-us/blog/company-guide/what-is-renewable-energy-and-why-is-it-beneficial*)*

3. Choose the correct answer for each of the six multiple-choice questions:

1. **According to the text, which of these is NOT a common source of renewable energy?**
   a) Solar energy
   b) Wind energy
   c) Geothermal energy
   d) Coal
2. **The text mentions that the sun provides the Earth with energy at a rate:**

a) Equal to human energy consumption.

b) Ten times the rate of human energy consumption.

c) One thousand times the rate of human energy consumption.

d) Ten thousand times the rate of human energy consumption.

3. **What advantage does wind energy potentially have over solar energy, according to the text?**

a) Wind energy is cheaper to implement.

b) Wind is abundant in more regions globally than sunshine.

c) Wind energy is easier to store.

d) Wind energy is less harmful to the environment.

4. **The text states that a potential drawback of hydropower is that it:**

a) Emits greenhouse gasses.

b) Is only available in specific regions.

c) Can deplete water as a natural resource.

d) Requires the burning of fossil fuels.

5. **According to the text, ocean energy technologies aim to retrieve energy from which of the following?**

a) Rainfall, tsunamis, and marine life.

b) Thermal energy of seawater, waves, and currents.

c) Coastal winds, underwater volcanoes, and icebergs.

d) Deep-sea minerals, coral reefs, and tides.

6. **What is a notable drawback of bioenergy mentioned in the text?**

a) It requires expensive and complex technology.

b) It is not suitable for use in rural areas.

c) It emits greenhouse gases when burned.

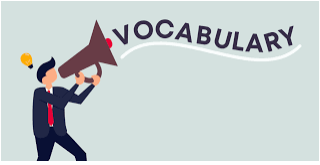
d) It is less efficient than solar and wind energy.

4. Answer the questions:

1. What is the main difference between renewable and non-renewable energy sources?
2. What are the common sources of renewable energy mentioned in the text?
3. Why is solar energy considered a plentiful renewable resource?
4. What is a potential drawback of hydropower compared to other renewable energy sources?

What are some common uses of biomass, particularly in rural regions?

After Reading



5. Choose the best word or phrase from the list below to complete each sentence.

Abundant, potential, biomass, deplete, emits, greenhouse gases, innovative, substances

1. The sun and wind are considered _____ resources because they are constantly available.
2. Burning fossil fuels _____ harmful pollutants into the atmosphere.
3. Carbon dioxide and methane are examples of _____ that contribute to climate change.
4. Hydropower can _____ water as a natural resource.
5. Bioenergy is made from various organic _____ like wood or agricultural crops.
6. _____ is predominantly used in rural regions for cooking and heating.
7. Despite the _____ nature of biomass and bioenergy, it still has its drawbacks.
8. Ocean energy has a big _____ to be widely used.

6. Match the word/ phrase in Column A with its definition in Column B.

1. Agricultural crops 2. Atmosphere 3. Carbon dioxide emissions 4. Currents 5. Fossil fuels 6. Heating 7. Natural light 8. Solar panels 9. Wind turbines	a) devices that convert sunlight into electrical energy. b) fuels like coal, oil, and gas that take centuries to form. c) machines placed where wind is most prevalent and easily captured. d) gases released into the atmosphere, contributing to global warming. e) the illumination from the sun f) continuous, directed movement of water. g) plants cultivated for food, fiber, or other economic purposes. h) raising the temperature of a space or object. i) the layer of gases surrounding the Earth.

7. To learn more about advantages and disadvantages of different types of renewable energy go to page 106

? **What is your opinion about nuclear energy?** **Is it a renewable energy source?**	Nuclear energy isn't on the list of types of renewable energy seeing as the materials used in nuclear power plants aren't considered renewable and can produce radioactive waste. However, nuclear energy in itself is clean and this energy mix can at times prove more eco-friendly than the energy generated from coal and other fossil fuels.

Passive Voice Revision

Important Notes about Passive Voice:

- **When to Use:** The passive voice is useful when the action is more important than the actor, or when the actor is unknown, unimportant, or obvious.
- **"By" Phrase:** You only need to include the "by + agent" phrase (e.g., "by the government") if it adds important information. If it's obvious who performed the action, you can omit it.
- **Tense Consistency:** Make sure to keep the verb tense consistent when changing from active to passive.

(for more information go to page 103)

1. Fill in the blanks with the Passive Voice.

is generated, should be reduced, will be depleted, is encouraged, be worsened, is purified, are **being discovered**

1. If we don't act now, the situation will continue to _____.
2. The use of alternative energy source like solar and wind power _____.
3. Water in the reservoir _____ before it enters the city's water system.
4. New methods to combat air pollution _____.
5. To protect the environment, waste _____ by at least 20% by next year.
6. Electricity _____ by wind turbines on hilltops.
7. If not managed properly, **water resources** _____ (deplete water resources) due to high water usage.

2. Rewrite the following sentences into the Passive Voice.

1. We should **reduce energy consumption** to protect the environment.
2. People **grow crops** on fertile land near rivers.
3. **Hydropower dams generate electricity** using the **current** of water.
4. Burning **fossil fuels deplete** our natural resources.
5. The government **require** businesses to invest in **renewable energy**.
6. F**ossil fuels** damage the environment so they should be no longer **burned**.
7. In the future new technologies will **convert abundant resources into energy.**

Writing. Which type of renewable energy should be used in your region?

Write a report recommending a certain type of energy. Use the ideas from the previous exercise.

To learn how to write a report go to page 98 and study the example.

UNIT 7

Nuclear energy: pros and cons

GETTING STARTED

- What energy sources do you know?
- Which of them are the safest in your opinion?
- Have you ever heard of nuclear energy?

For centuries, the industrialisation of economies around the world was made possible by fossil fuels like coal, natural gas, and petroleum and only in recent years countries opened up to alternative, renewable sources

Learn and revise the words

fossil fuel, power station, nucleus *(n)*, generate *(v)* fission*(n)*, nuclear fusion, hidden danger, amount*(n)*, release *(v)* deadliest weapons, responsible for (adj.), advantage *(n)*, decarbonisation *(n)*, relatively low, disaster*(n),* energy crisis

Reading

Ex.1 Before reading the text match the English words and phrases to the Russian ones:

1. nuclear power	a. обезуглероживание
2. oil prices	b. конкурентоспособность
3. nuclear fusion	c. количество энергии
4. energy crisis	d. цены на нефть
5. generate electricity	e. энергетический кризис
6. spin turbines	f. опасные для жизни последствия
7. decarbonisation	g. вращение турбин
8. amount of energy	h. ядерная энергетика
9. competitiveness	i. ядерный синтез
10. life-threatening consequences	j. производство электроэнергии

Ex.2 You are going to read the text about Nuclear energy. Before reading decide whether you think statements are true (T) or false (F).

1. Nuclear energy is responsible for the slowest decarbonisation effort in history.
2. The text claims that no nuclear waste can be recycled.
3. Fossil fuels are responsible for fewer deaths worldwide per year than nuclear energy.
4. Nuclear power plants require more maintenance than wind and solar plants.
5. Nuclear power plants are cheap to build and quick to construct.
6. The text concludes that fossil fuels represent a smaller threat than nuclear energy.

Ex.3 Read the text.

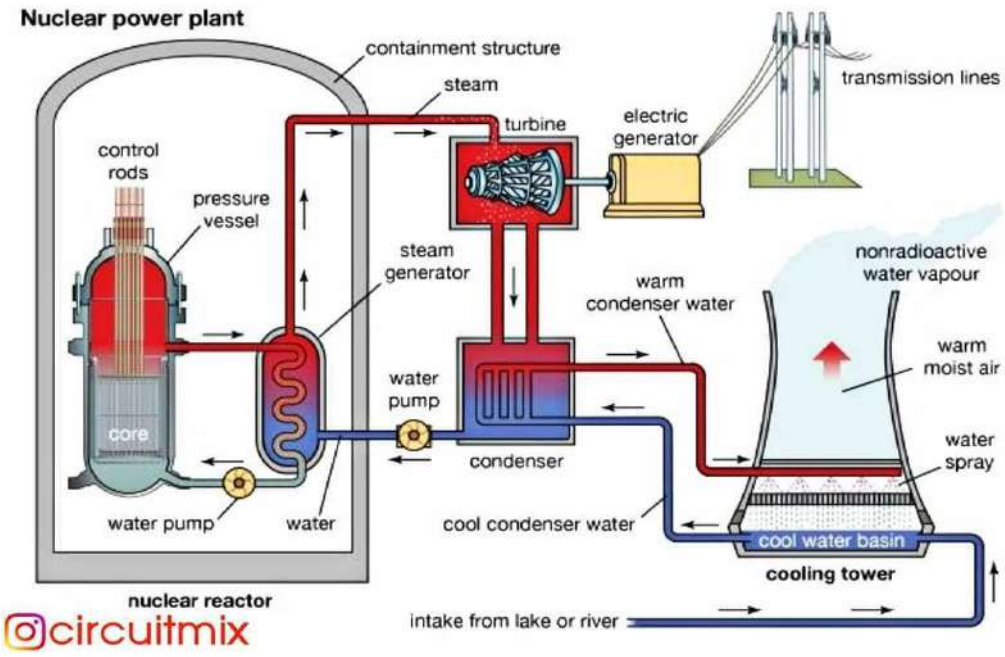
Nuclear energy: A Bridge to A Better Future?

In the 1950s, early commercial nuclear power stations started operations, offering to many countries around the world an alternative to oil and gas import dependency and a far less polluting energy source than fossil fuels. Following the 1970s energy crisis and the dramatic increase of oil prices that resulted from it, more and more countries decided to embark on nuclear power programmes.

What Is Nuclear Energy?

Nuclear energy is the energy source found in an atom's nucleus, or core. Once extracted, this energy can be used to produce electricity by creating nuclear fission in a reactor through two kinds of atomic reaction: nuclear fusion and nuclear fission. During the latter, uranium used as fuel causes atoms to split into two or more nuclei. The energy released from fission generates heat that brings a cooling agent, usually water, to boil. The steam deriving from boiling or pressurised water is then channelled to spin turbines to generate electricity. To produce nuclear fission, reactors make use of uranium as fuel.

Basic diagram of a nuclear plant



- **Consider a diagram showing the operation and components of a nuclear power plan**

Since the first nuclear plant started operations in the 1950s, the world has been highly divided on nuclear as a source of energy. While it is a cleaner alternative to fossil fuels, this type of power is also associated with some of the world's most dangerous and deadliest weapons, not to mention nuclear disasters. We take a look at the advantages and disadvantages of nuclear energy.

Nuclear energy is clean and provides pollution-free power with no greenhouse gas emissions. Contrary to what many believe, cooling towers in nuclear plants only emit water vapour and are thus not releasing any pollutant or radioactive substance into the atmosphere. Compared to all the energy alternatives we currently have on hand, nuclear is indeed one of the cleanest sources.

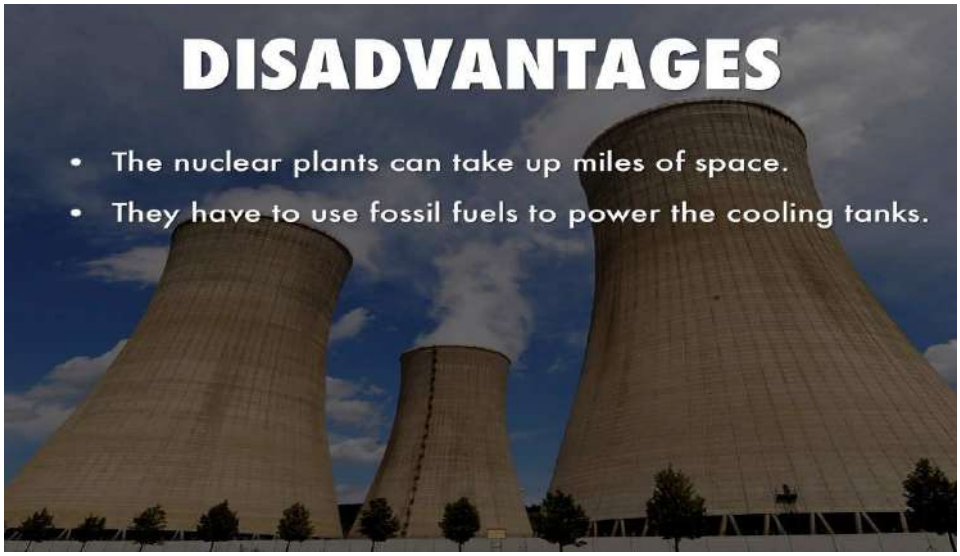
Nuclear power is responsible for the fastest decarbonisation effort in history. big nuclear players like France, Saudi Arabia, Canada, and South Korea being among the countries that recorded the fastest decline in carbon intensity and experienced a clean energy transition by building nuclear reactors and hydroelectric dams.

Nuclear energy may be clean and its production emission-free, experts highlight a hidden danger of this power: nuclear waste. However, 90% of the nuclear waste generated by the production of nuclear energy can be recycled. Indeed, the fuel used

in a reactor, typically uranium, can be treated and put into another reactor as only a small amount of energy in their fuel is extracted in the fission process.

A rather important advantage of nuclear energy is that it is much safer than fossil fuels from a public health perspective. Nuclear waste is not as dangerous as the toxic chemicals coming from fossil fuels. Indeed, coal and oil act as 'invisible killers' and are responsible for 1 in 5 deaths worldwide. Fossil fuels killed about 9 million people a year globally. In contrast, in nearly 70 years since the beginning of nuclear power, only three accidents have raised public alarm: the 1979 Three Mile Island accident, the 1986 Chernobyl disaster and the 2011 Fukushima nuclear disaster. Of these, only the accident at the Chernobyl nuclear plant in Ukraine directly caused any deaths.

Finally, nuclear energy has some advantages compared to some of the most popular renewable energy sources. According to the US Office of Nuclear Energy, nuclear power has by far the highest capacity factor, with plants requiring less maintenance, capable to operate for up to two years before refuelling and able to produce maximum power more than 93% of the time during the year, making them three times more reliable than wind and solar plants.



Opposers of this energy source still see nuclear energy as being deeply connected with nuclear weapons technologies and believe that, with nuclear

technologies becoming globally available, the risk of them falling into the wrong hands is high, especially in countries with high levels of corruption and instability. nuclear energy is clean. However, radioactive nuclear waste contains highly poisonous chemicals like plutonium and the uranium pellets used as fuel. These materials can be extremely toxic for tens of thousands of years and for this reason, they need to be meticulously and permanently disposed of. Since the 1950s, a stockpile of 250,000 tonnes of highly radioactive nuclear waste has been accumulated and distributed across the world, with 90,000 metric tons stored in the US alone. Knowing the dangers of nuclear waste, many oppose nuclear energy for fears of accidents, despite these being extremely unlikely to happen.

Lastly, if compared to other sources of energy, nuclear power is one of the most expensive and time-consuming forms of energy. Nuclear plants cost billions of dollars to build and they take much longer than any other infrastructure for renewable energy, sometimes even more than a decade. However, while nuclear power plants are expensive to build, they are relatively cheap to run, a factor that improves its competitiveness. Still, the long building process is considered a significant obstacle in the run to net-zero emissions that countries around the world have committed to.

Nuclear power can be a highly destructive weapon, but the risks of a nuclear catastrophe are relatively low. While historic nuclear disasters can be counted on the fingers of a single hand, they are remembered for their devastating impact and the life-threatening consequences they sparked (or almost sparked). However, it is important to remember that fossil fuels like coal and oil represent a much bigger threat and silently kill millions of people every year worldwide.

Another big aspect to take into account, and one that is currently discussed by global leaders, is the dependence of some of the world's largest economies on countries like Russia, Saudi Arabia, and Iraq for fossil fuels. Nuclear supporters argue that relying on nuclear energy would decrease the energy dependency from third countries. However, raw materials such as the uranium needed to make plants

function would still need to be imported from countries like Canada, Kazakhstan, and Australia.

There are a multitude of advantages and disadvantages of nuclear energy and the debate on whether to keep this technology or find other alternatives is destined to continue in the years to come.

https://earth.org/the-advantages-and-disadvantages-of-nuclear-energy/

After Reading

Ex.4 Read the text more carefully and answer the questions.

1. What are the primary fossil fuels that have historically powered industrialization?
2. What are the two types of atomic reactions used to produce electricity in a nuclear reactor?
3. What is the main argument in favor of nuclear energy related to greenhouse gas emissions?
4. What are the main disadvantages of nuclear energy in terms of cost and construction time compared to other energy sources?
5. What is the main advantage of nuclear energy compared to renewable energy sources in terms of reliability?

Ex.5 Choose the correct answer for each of the five multiple-choice questions.

1. **In what decade did the first commercial nuclear power stations begin operations?**

a) 1940s

b) 1950s

c) 1970s

d) 2000s

2. Which process is used to generate energy in a nuclear reactor, involving the splitting of atoms?

a) Nuclear fusion

b) Thermal generation

c) Nuclear fission

d) Chemical combustion

3. According to the text, what do cooling towers in nuclear plants emit, which is *not* a pollutant or radioactive substance?

a) Carbon dioxide

b) Sulfur oxides

c) Water vapor

d) Radioactive dust

4. Despite the possibility of recycling, what issue is highlighted as a major disadvantage regarding nuclear waste?

a) It is very expensive to transport.

b) It requires meticulous and permanent disposal because it remains toxic for tens of thousands of years.

c) It releases greenhouse gases during storage.

d) It decomposes quickly, releasing heat.

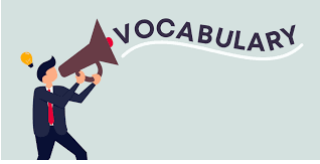
5. According to the US Office of Nuclear Energy, in what way does nuclear energy have an advantage over wind and solar plants in terms of reliability?

a) It requires lower initial investment.

b) It has the highest capacity factor, able to produce maximum power more than 93% of the time during the year.

c) Its fuel is cheaper than wind and solar.

d) It doesn’t require maintenance.



Ex. 6 Match the words in columns to make phrases and translate them into Russian. Refer to the texts above.

1.	nuclear	a. energy
2.	power	b. obstacle
3.	**f**ossil	c. source
4.	energy	d. electricity
5.	to spin	e. fuel
6.	to generate	f. station
7.	significant	g. turbines

Ex.7 Find English equivalents to the following Russian words in the text and use them in your own sentences:

альтернативные источники энергии, ядерные отходы, принять во внимание, энергия, не загрязняющая окружающую среду, выбросы парниковых газов, разрушительное оружие, обслуживание, ветряные и солнечные электростанции

Ex. 8 Put the words from the box in the correct column, according to the pronunciation of the letters in bold. Which word doesn't belong to any column?

soc**ie**ty, **ai**rport, prov**i**de, m**ai**nt**ai**n, env**i**ronment, fac**i**l**i**ty, incr**ea**se, d**i**sposal, sat**i**sfy, **i**nnovation, ach**ie**vement, civil**i**zed, **i**rr**i**gation, commun**i**ty, qual**i**ty, **i**dea, un**i**mag**i**ned, electr**i**city, f**i**ssion, k**i**nd, h**i**ghly, div**i**de, d**i**alogue

/aɪ /	/ɪ /	/ɪː /	/aɪə /	/ɛa /
	irrigation			

Ex. 9 Put the words below in the correct column of the table according to their word stress:

require, non-hazardous, produce, nuclear, **analysis,** properties, access, pipelines, coordinate, fusion, substances, supplies, project, eliminate, technology, off-shore, identify, conduct, contaminants, quantify, power, station

●‥	‧●	‧●‥	●‧
		analysis	

Linking words and phrases

Linking words and phrases are essential for creating well-structured text.

They help to show the relationship between ideas, sentences, and paragraphs.

- To Add Information / To Introduce Further Points:

and, also, in addition, furthermore, moreover, what's more

- To Show Contrast / Opposition:

but, however, although, on the other hand, in contrast

- To Show Cause and Effect / Result:

Because, since, as, therefore, thus, consequently, as a result

- To Give Examples:

for example, for instance, such as

- To Summarize / Conclude:

In conclusion, To conclude , In summary, Overall

- To Emphasize:

Indeed, in fact, significantly

- To Sequence / Order:

First / Firstly, Second / Second Third / Thirdly, next, then, Finally

Ex. 10 Fill in the gaps in the follow sentences with the appropriate linking word / phrase

1. Nuclear energy provides a reliable base load;……, it produces very little waste per unit of energy.

2. The debate around nuclear energy is complex; ……, the long-term disposal of waste remains a challenge.

3. Nuclear power is a carbon-free energy source;……, it has a small land footprint.

4. Wind and solar power are renewable. ..…, their energy generation is intermittent.

5. Nuclear power is a clean energy source ..… it doesn't burn fossil fuels.

6. Fossil fuels have historically powered industrialization; ..… they contribute significantly to climate change.

7. The demand for energy is increasing; ..…, all energy sources are being evaluated.

8. …, nuclear power plants don't emit greenhouse gases. ..…, they have a high capacity factor. …, they produce less waste than fossil fuels.

9. Renewable energy sources, ….. solar and wind, are often discussed alongside nuclear power.

10. Nuclear power plants produce very little waste, …, compared to coal-fired power stations.

11. ..…, nuclear energy presents a compelling case for decarbonization, though challenges remain.

12. The process of nuclear fission is initiated. ..…, the heat generated is used to produce steam.

13. Nuclear power is a significant source of energy, ..… it does not emit greenhouse gases.

14. Fossil fuels have powered our world for centuries. ….., their environmental impact is undeniable.

Ex. 11 Read the text and choose the best word or phrase from the list below to complete the text.

therefore However such as In fact Firstly Moreover In addition On the other hand thus In conclusion Finally Furthermore consequently Although

Nuclear Energy: A Double-Edged Sword in the Quest for Clean Power

Historically, industrialization has been heavily reliant on fossil fuels. **….**, the significant environmental consequences, **…** increased greenhouse gas emissions and climate change, have prompted a global search for cleaner energy alternatives. Among these alternatives, nuclear energy stands out as a powerful, yet controversial, option.

…, the primary advantage of nuclear energy is its carbon-free nature. Unlike coal or natural gas, nuclear power plants do not burn fossil fuels; **…**, they do not release pollutants or greenhouse gases into the atmosphere. **…**, nuclear power has been instrumental in achieving some of the fastest decarbonisation efforts in history, as seen in countries like France. **…**, nuclear power plants have a remarkably high capacity factor, meaning they can operate at maximum power for over 93% of the year, thus providing a reliable and consistent source of electricity. **…**, nuclear energy has a relatively small land footprint compared to many renewable energy sources**….**

…, the use of nuclear energy is not without its challenges. Perhaps the most significant concern revolves around the disposal of nuclear waste. **…** a portion of nuclear waste can be recycled, the remaining radioactive material remains toxic and hazardous for tens of thousands of years, **…** requiring meticulous and permanent disposal solutions. **….**, the potential for accidents, while rare, can have devastating long-term consequences, as evidenced by incidents like Chernobyl and Fukushima. Another significant drawback is the high initial cost and long construction times

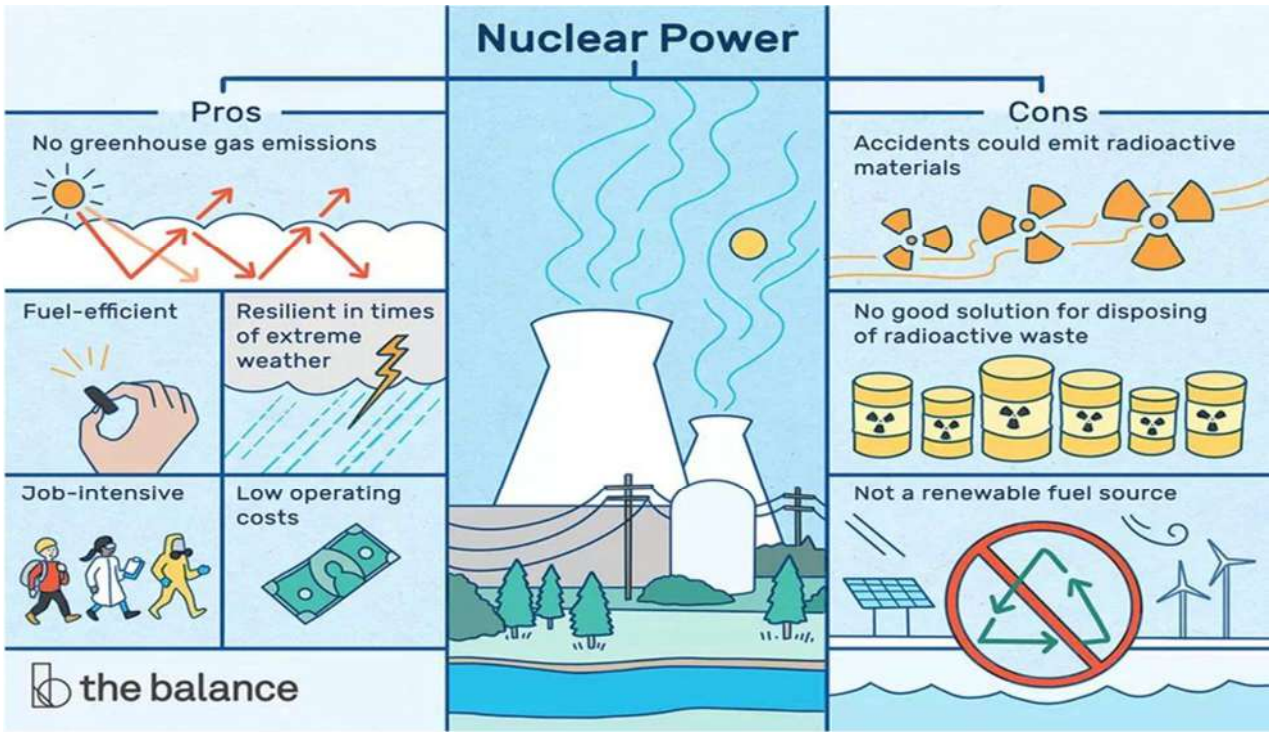
associated with nuclear power plants, making them less immediately attractive than some other energy sources…., concerns persist about the proliferation of nuclear weapons technology, raising questions about security and international oversight.

…, nuclear energy presents a complex dilemma. It offers a potent solution for reducing carbon emissions and ensuring energy security. The inherent risks associated with waste disposal, safety and distribution require careful consideration and the creation of a regulatory framework. As we move forward, a balanced approach that weighs the substantial benefits against these considerable risks will be crucial in determining the role of nuclear power in a sustainable energy future.

Speaking

Ex. 12 Working in groups of three or four try to prove your opinion about advantages or disadvantages of nuclear energy. Share your ideas with the class.

(See page 97)



Ex. 13 Presentation

Using the Net find the information and give a presentation about the most significant incidents at nuclear power plants, their causes and consequences.

(See page 96)

Unit 8

Global Climate Change

GETTING STARTED

In recent years, the climate on the Earth has changed greatly: some countries suffer from abnormal hot summers, others from harsh and snowy winters, unusual for these places. Environmentalists talk about global climate change.

Do you know what the difference among global warming, climate change or climate crisis is?

Increase *(n)*, average annual temperature, greenhouse gas emissions, human activity, determine *(v)*, climate conditions, occur *(v)*, involve *(v)*, act *(v)*, slow down *(v)*, weather anomalies, extreme precipitation, decrease *(n)*, disease *(n)*, ecosystem *(n)*, species *(n)*, disaster *(n)*, international organization, emphasize *(v)*, simultaneously *(adv)*

Reading

May 2024 was the 12th hottest month in a row on record, that is, since the 1850s. Over the past 12 months, from June 2023 to May 2024, the temperature was 1.63℃ higher than the same period in 1850-1900. This seems to be global warming. Or is it? Here's how to correctly describe the current climate situation.

1. Before reading the text match the English words and phrases to the Russian ones:

1) a long-term increase	a) возвращение забытых заболеваний
2) average annual temperature	b) срочная мера
3) atmospheric currents	c) долгосрочный рост
4) sea level	d) исчезновение видов
5) mass of glaciers	f) погодные явления
6) the return of forgotten diseases	g) масса ледников
7) disappearance of species	h) среднегодовая температура
8) the threat of climate change	i) уровень моря
9) urgent action	j) атмосферные течения
10) weather events	k) угроза изменения климата

2. Read the text:

What is Global Warming, Global Climate Change and Climate Crisis?

The terms "global warming" and "global climate change" are sometimes used interchangeably, but the latter has a broader meaning. Global warming is a long-term increase in the average annual temperature on the planet. Climate change, in turn, includes global warming and simultaneously defines a wider range of changes that are occurring on our planet due to the growth of greenhouse gas emissions from human activity – since the mid-19th century.

The climate system is extremely complex. It simultaneously involves a huge number of factors and mechanisms that together determine the climate conditions on the planet as a whole and in specific regions in particular. These factors can act in different directions. Some of them enhance the effect of warming, while others, on the contrary, slow down this warming.

Among the signs of climate change are the increase in the frequency and intensity of weather anomalies (hurricanes, floods, droughts, heat waves and cold waves, extreme precipitation, etc.), changes in ocean and atmospheric currents, rising sea levels, a decrease in the mass of glaciers, the acceleration of ice melting in Greenland, Antarctica and the Arctic, the return of forgotten diseases, the disappearance of some species of animals and plants and the death of entire ecosystems, human migration and other problems.

In Russia, 2023 was a record year for the number of dangerous weather events. These events led to many disasters, including extreme cold, heat waves, floods, abnormal precipitation and other cataclysms.

There is another term – “climate crisis”. It was first used by activists, international organizations and the media to emphasize the threat of climate change and the need for urgent action.

Scientists also primarily use the phrase “climate crisis,” as they share the position that the climate change situation has become critical.

3. Now you are ready to answer the question in the title. Give the definitions of global warming, global climate change and climate crisis.

4. What weather related words can you find in the text? What other words describing weather do you know?

5. Choose the correct answer:

1. According to the text, which term has a broader meaning?

a) Global warming

b) Climate crisis

c) Climate change

d) Human activity

2. Global warming is defined as:

a) A complex system of factors influencing weather

b) A long-term increase in the average annual temperature on the planet

c) A wider range of changes occurring on our planet due to human activity

d) The return of forgotten diseases

3. Climate change, as defined in the text, includes global warming and:

a) A decrease in the mass of glaciers

b) The acceleration of ice melting

c) A wider range of changes occurring on our planet

d) A record number of dangerous weather events

4. Which of the following is NOT mentioned as a sign of climate change in the text?

a) Increase in the frequency and intensity of weather anomalies

b) Changes in ocean and atmospheric currents

c) An increase in the number of species of animals and plants

d) The return of forgotten diseases

5. The term “climate crisis” was first used by:

a) Scientists primarily

b) International organizations and the media

c) Activists, international organizations, and the media

d) Governments and policymakers

6. Why do scientists primarily use the phrase “climate crisis”?

a) To highlight the slow and gradual nature of climate change

b) Because they believe that the situation has become critical and requires urgent action

c) To differentiate it from the broader concept of climate change

d) To emphasize the positive aspects of changing weather patterns

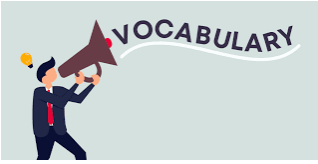
7. The text mentions that in Russia, 2023 was a record year for:

a) Extreme cold events

b) The disappearance of entire ecosystems

c) The number of dangerous weather events

d) Human migration due to climate change



6. Fill in the gapped sentences with the following words:

Green house emissions, weather anomalies, sea levels, glaciers, climate crisis, ocean and atmospheric currents

1. A decrease in the mass of _____ is one of the observable signs of climate change.
2. Examples of _____ include hurricanes, floods, droughts, and heat waves.
3. The term _____ was introduced to highlight the urgency and serious threat posed by climate change.
4. Climate change includes global warming and defines a wider range of changes happening on our planet due to the increase of _____ .
5. Changes in _____ are identified as signs of climate change.
6. Besides weather anomalies, rising _____ are also listed as a consequence of climate change.

7. Answer the questions:

1. What is the fundamental difference between "global warming" and "global climate change" as described in the text?

2. What are some of the specific signs of climate change mentioned in the text, beyond rising temperatures?

3. According to the text, what is the primary cause of the wider range of changes encompassed by global climate change since the mid-19th century?

5. How has Russia experienced climate change in recent years, according to the provided information?

Focus on Grammar

Use the First Conditional to talk about a possible situation in the future.

If + Present Simple, will + verb

Example: *If we **do not change** our philosophy of "live now; pay later", our children **will pay** for our throwaway lifestyle.*

Use the Second Conditional to talk about unlikely or imagined situations in the present/future.

If + Past Simple, would + infinitive

Example: *If I **won** some money, I **would build** more national parks.*

8. Use the correct form of the subjunctive mood.

1. If the ozone layer (protect) us, we (not feel) harmful rays from the sun.

2. We (prevent) an irreversible environmental crisis, if we (change) our attitude to the environment.

3. If some years ago people (explore) the atmosphere more carefully, they (understand) the seriousness of the situation.

4. Air quality (improve), if we (not cut down) trees to build new roads.

5. If we (reduce) the emission of carbon dioxide, we (stop) the greenhouse effect

from getting worse.

6. If we (not take) action to protect the earth's atmosphere, it (be unable) to protect us.

9. Complete the conditional sentences.

1. People would suffer from many diseases, if ...
2. If the greenhouse effect increases, ...
3. Large expanses of ice would melt, if ...
4. If some populated regions were flooded, …
5. It will be more difficult to protect our world in some years, if …

10. Presentation.

Climate change is a global emergency that goes beyond national borders. It is an issue that requires international cooperation and coordinated solutions at all levels.

To tackle climate change and its negative impacts, world leaders in Paris signed **"Paris Climate Agreement"** on 12 December 2015. The Agreement sets long-term goals to guide all nations to…

Find the information and give a presentation about this agreement.

Causes of Global Climate Change

GETTING STARTED

The study of climate change is the science of paleoclimatology. Climate change is caused by dynamic processes on the Earth, external influences such as fluctuations in solar radiation intensity, and, more recently, human activity.

There are climatic factors, non-climatic factors and anthropogenic impacts on global climate change.

Can you give the examples of climatic and non-climatic factors influencing the climate change? For example, change in solar luminosity, glaciations, etc.

Paleoclimatology *(n)*, non-climatic factor, anthropogenic impact, solar luminosity, glaciation *(n)*, include *(v)*, alter *(v)*, effect *(n),* irrigation *(n),* humidity *(n),* manufacturing of goods, energy supply, deforestation *(n),* consumption *(n),* carbon dioxide *(n),* nitrous oxide *(n),* mining *(n),* construction *(n),* absorb *(v),* destruction *(n),* contribute *(v),* crop yield, threaten *(v)*, consume *(v),* emit *(v)*

Reading

1. Before reading the text match the English words and phrases to the Russian ones:

1) fluctuation in solar radiation intensity 2) the cause-and-effect relationship 3) livestock 4) internal combustion engine 5) production and application of fertilizers 6) food security 7) renewable sources 8) private household 9) residential and commercial buildings 10) manure	a) домашний скот b) продовольственная безопасность c) производство и применение удобрений d) колебания интенсивности солнечного излучения f) возобновляемые источники g) жилые и коммерческие здания h) причинно-следственная связь i) двигатель внутреннего сгорания j) навоз k) частное домохозяйство

Let's consider anthropogenic impacts on global climate change. Anthropogenic factors include human activities that alter the environment. In some cases, the cause-and-effect relationship is direct, such as the effect of irrigation on temperature and humidity; in others, the connection is less clear.

2. Read the text "What anthropogenic factors are influencing global climate change?" and match the paragraphs to the right headings.

Electricity production Food production Use of transport Energy supply for buildings Manufacturing of goods Deforestation Too much consumption

What Anthropogenic Factors Are Influencing Global Climate Change?

1 _____

Most _____ is produced by burning coal, oil, or gas. This produces carbon dioxide and nitrous oxide, which lead to a significant share of global emissions. Worldwide, just over a quarter of _____ is generated by wind, solar, and other renewable sources.

2 _____

_____ and other industries produce emissions by burning fossil fuels for the energy that is needed to make cement, iron, steel, electronics, plastics, clothing and other products. Mining and industrial processes also emit gases, as construction does.

3 _____

Trees absorb carbon dioxide, their destruction limits nature's ability to store emissions in the atmosphere. _____, along with agriculture and other land-use changes, are responsible for about a quarter of global greenhouse gas emissions. About 12 million hectares of _____ are destroyed each year.

4 _____

_____ is one of the largest sources of greenhouse gas emissions due to the combustion of petroleum products such as gasoline in internal combustion engines. Emissions from ships, aircraft and road vehicles continue to increase. Current trends indicate that energy consumption in the _____ sector is likely to increase significantly in the coming years.

5 _____

_____ contributes to climate change by emitting carbon dioxide, methane, and greenhouse gases through agriculture, the production and application of fertilizers, manure to grow crops. Climate change, in turn, threatens food security and safety through extreme weather, declining crop yields, and impacts on livestock and fishing.

6 _____

Residential and commercial _____ consume more than half of all electricity worldwide. In recent years, the _____ is in demand for heating and cooling because of the rise of air conditioner ownership, increased electricity consumption for lighting, appliances, and devices.

7 _____

A significant portion of global greenhouse gas emissions comes from private households. The richest 1 percent of the world's population collectively emits more greenhouse gases than the poorest 50 percent.

3. Choose the correct answer:

1. According to the paragraph, what percentage of the world's electricity is generated by renewable sources like wind and solar?

a) Less than a quarter
b) Exactly a quarter
c) Just over a quarter
d) Significantly more than a quarter

2. Which of the following is NOT mentioned as a product of manufacturing that requires energy from burning fossil fuels in the 2nd paragraph?

a) Steel
b) Electronics
c) Paper
d) Cement

3. What is the primary role of trees in relation to atmospheric emissions, as described in the text?

a) They release carbon dioxide
b) They absorb carbon dioxide
c) They produce nitrous oxide

d) They are a source of fossil fuels.

4. The paragraph identifies the primary reason for transport being a large source of greenhouse gas emissions as:

a) The use of electric vehicles

b) The combustion of petroleum products

c) The production of aircraft

d) The development of new shipping routes.

5. Besides carbon dioxide, what other greenhouse gas is specifically mentioned as being emitted by food production?

a) Sulfur dioxide

b) Methane

c) Ozone

d) Nitrogen

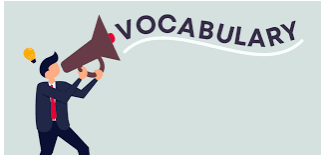
6. Which of the following is NOT listed as an industrial activity that contributes to emissions in the 2nd paragraph?

a) Construction

b) Agriculture

c) Mining

d) Manufacturing



4. Name the materials you can see in the photos below. Find all the other words that can be described as material from the text above.

5. Give antonyms to the following words:

Internal influence –

Climatic factors –

Emit –

Production –

Increase –

6. Fill in the gap sentences with the following verbs. Change the form of the verb if necessary:

emit	contribute	threaten	store
lead to	absorb	consume	

1. Forests _____ vast amounts of carbon, helping to slow down global warming.
2. Oceans _____ much of the excess heat and carbon dioxide produced by human activities.
3. Burning fossil fuels _____ greenhouse gases that trap heat in the atmosphere.
4. Developed countries _____ too much energy, driving higher global emissions.
5. Deforestation and industrial agriculture _____ significantly to rising greenhouse gas levels.
6. Rising temperatures _____ coastal communities through sea-level rise and more intense storms.
7. If current situation doesn't improve, continued emissions could _____ irreversible damage of the climate system.

7. Answer the questions:

1. What are the primary fossil fuels used to generate most electricity, and what greenhouse gases do they produce?

2. Besides burning fossil fuels, what other industrial activities emit gases?

3. How do trees help with emissions, and what is the consequence of their destruction?

4. What types of transport are contributing to increasing emissions?

5. How does climate change, in turn, impact food security and safety?

6. What factors are increasing energy demand for heating and cooling in buildings?

Focus on Grammar

We often use passive verb forms to say what happens to things or people or what was done to them.

Example: *The sun's rays in the stratosphere generate ozone. (Active)*

Ozone is generated by the sun's rays in the stratosphere. (Passive)

8. Change the following sentences into the Active Voice.

1. A new study of climate change was led by British University.

2. Some powerful greenhouse gases are released by agriculture.

3. Now, in Central Russia, drought is being observed.

4. Many heavily populated regions will be flooded by the World Ocean.

5. The increase in the average temperature is being produced by global warming.

6. We are protected from different damaging effects by the ozone layer.

9. Change the following sentences into the Passive Voice.

1. Some gases transmit short-wave radiation.

2. The general warming is pushing up humidity levels.

3. All fossil fuels produce carbon dioxide.

4. Far East Development programme includes technological, social and economic changes.

5. Governments in developed countries should prohibit the export of toxic substances.

10. Presentation.

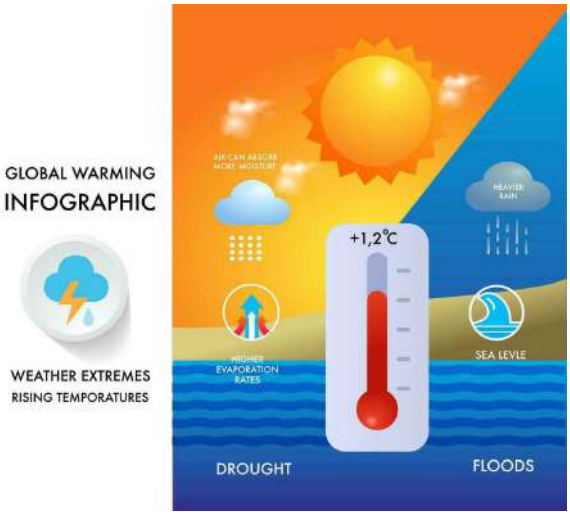
Find the information about climatic or non-climatic factors influencing global climate change.

Present the facts to the group in a form of a presentation.

(See page 96)

Consequences of Global Climate Change

Drought *(n),* food shortage, extinction of species, poverty *(n),* displacement *(n),* wildfires *(n),* spread *(v),* affect *(v),* vulnerable *(adj),* shift *(v),* refugee *(n),* evaporate *(v),* surface *(n),* cause *(v)*



Reading

1. Before reading the text match the English words and phrases to the Russian ones:

1) heat-related illness	a) уничтожить городские трущобы
2) to work outdoors	b) представлять риск для
3) loss of life	c) усугублять нехватку воды
4) availability of water	d) регионы с дефицитом воды
5) scarce resource	f) способствовать
6) exacerbate water shortage	g) доступность/наличие воды
7) water-stressed regions	h) ввергнуть в нищету
8) pose risk to	i) работать на открытом воздухе
9) survival of species	j) заболевание, вызванное жарой
10) invasive pests	k) ограниченный ресурс
11) contribute to	l) выживание видов
12) hunger and malnutrition	m) потеря жизни
13) pasture availability	n) инвазивные вредители
14) push into poverty	o) голод и недоедание
15) wipe out urban slums	p) наличие пастбищ

2. Read the text "The consequences of global climate change" and match the paragraphs to the right headings.

Increasing drought Food shortage Extinction of species
Intensification of storms Increased health risks
Global warming and rising sea levels Poverty and Displacement
Temperature increase

The Consequences of Global Climate Change

1 _____

Since the 1980s, each decade has been warmer than the previous one. There is an increase in hot days and heat waves. Rising temperatures increase heat-related illnesses and make it more difficult to work outdoors. Wildfires start more easily and spread faster. Temperatures in the Arctic have risen at least twice as fast as the global average.

2 _____

As temperatures rise, more moisture evaporates, increasing heavy rainfall and flooding, causing storms. Cyclones, hurricanes, and typhoons form in warm waters near the ocean's surface. These storms often destroy homes and communities, causing loss of life and enormous economic losses.

3 _____

Climate change is affecting the availability of water, making it a scarcer resource. Global warming is exacerbating water shortages in already water-stressed regions and increasing the risk of agricultural droughts that affect crop yields and environmental droughts that make ecosystems more vulnerable. Droughts can also trigger devastating sand and dust storms. Deserts are expanding, reducing the amount of land available for growing food.

4 _____

The rate at which the ocean has warmed has increased dramatically. As the ocean warms, its volume increases. Melting ice sheets also cause sea levels to rise, threatening coastal and island communities. The ocean absorbs carbon dioxide from the atmosphere. It makes the ocean more acidic, threatening marine life and coral reefs.

5 _____

Climate change poses risks to the survival of species on land and in the ocean. The many threats posed by climate change include wildfires, extreme weather, and invasive pests and diseases. Some species will be able to shift habitat and survive, while others will not.

6 _____

Climate change is contributing to the global rise in hunger and malnutrition. Ocean acidification threatens the marine resources that feed billions of people. Heat stress can reduce water and pasture availability, reducing crop yields and affecting livestock numbers.

7 _____

Climate change effects are already harming health through air pollution, the spread of disease, extreme weather events, forced displacement, psychological stress. Environmental factors kill about 13 million people each year.

8 _____

Climate change is exacerbating the factors that push people into poverty and prevent them from getting out of their inevitable tough situation. Floods can wipe out urban slums, destroying homes and livelihoods. Most refugees come from the most vulnerable countries, the least prepared to adapt to the impacts of climate change.

3. Choose the correct answer:

1. In addition to increasing heat-related illnesses and making outdoor work more difficult, what other significant impact of rising temperatures is mentioned?

a) Decreased frequency of storms

b) Increased susceptibility to cold weather

c) Greater ease for wildfires to start and spread

d) Reduced evaporation rates

2. As temperatures rise, what effect does increased evaporation have on rainfall?

a) It decreases heavy rainfall and flooding

b) It increases heavy rainfall and flooding

c) It has no significant impact on rainfall patterns

d) It causes more snowfall

3. How is climate change affecting the availability of water?

a) It is making water more abundant

b) It is making water a scarcer resource

c) It is primarily affecting water quality, not quantity

d) It has no impact on water availability

4. Besides the expansion of water as it warms, what is another cause of sea level rise mentioned?

a) Increased rainfall in landlocked areas

b) Melting ice sheets

c) Decreased ocean currents

d) The absorption of atmospheric gases by the seafloor

5. What is a major consequence of climate change for species on land and in the ocean?

a) Increased reproductive rates for most species

b) Enhanced opportunities for adaptation to new environments

c) Poses risks to their survival

d) Guaranteed migration to cooler regions

6. Which of the following is directly linked to ocean acidification in this paragraph?

a) Reduced availability of fresh water

b) The threat to marine resources that feed billions

c) Increased heat stress on livestock

d) Greater ease for wildfires to start

7. Approximately how many people die each year due to environmental factors?

a) About 1 million people

b) About 13 million people

c) About 100 million people

d) About 1 billion people

8. How does climate change exacerbate poverty?

a) By creating more job opportunities in affected regions

b) By providing more resources for recovery after disasters

c) By destroying homes and livelihoods and pushing people into poverty

d) By increasing the ability of vulnerable populations to adapt

9. Where do most refugees come from in the context of climate change impacts?

a) From the most developed countries with advanced adaptation strategies

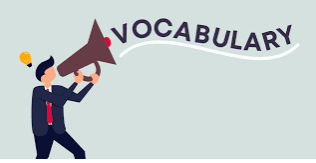
b) From countries that are most prepared to adapt to climate change

c) From the most vulnerable countries, least prepared to adapt to climate change

d) From countries with minimal exposure to extreme weather

4. Answer the following "Why" questions:

1. Why are hot days and heat waves increasing?
2. Why are heavy rainfall and flooding becoming more common?
3. Why are water shortages being exacerbated in certain regions?
4. Why are sea levels rising?
5. Why are many species at risk of extinction due to climate change?
6. Why is climate change contributing to a global rise in hunger and malnutrition?
7. Why is climate change exacerbating poverty?
8. Why is climate change harming human health?



5. Match the following consequences with the causes of global climate change. Use "lead to", "result in", "contribute to" to connect the parts:

Cause	Consequences
Rising global temperatures	ocean acidification, harming marine life and coral reefs.
Warmer ocean waters	increased risk to the survival of many plant and animal species.

Increased evaporation due to higher temperatures	increased frequency and intensity of heat waves.
Melting ice sheets and glaciers	formation of more powerful cyclones, hurricanes, and typhoons
Absorption of excess carbon dioxide by the ocean	displacement of populations and loss of homes and livelihoods.
Changes in precipitation patterns and increased	heavier rainfall and flooding in some regions.
Increased frequency of extreme weather events (like wildfires and floods)	sea levels rise, threatening coastal communities.
Ecosystem disruption and introduction of new pests/diseases due to changing climates	water scarcity and agricultural droughts in many areas.

6. Presentation.

Today, the climate crisis is one of the main threats to biodiversity. Approximately one million plant and animal species are at risk of extinction.

Choose any plant or animal and give a presentation. Identify clear causes of animal or plant extinctions: land-use change, animal exploitation, climate change, pollution, and the spread of other species that threaten biodiversity. Explain how and why living things are suffering from the climate crisis.

SPEAKING FILE

Guide to presentation

1. Make a plan of your talk. This should include at least three sections:
   - introduction
   - development
   - conclusion
2. Write detailed notes of what you will say:
   - key points and key words
   - the action points you will stress
3. Prepare visual aids
4. Practice your presentation :
   - use simple and clear language
   - don't read from your notes

Look at these expressions. In which part of a presentation would you expect them to be used?

.1. On this next slide you can see …

.2. To conclude, I want to tell you about …

.3. I'll be happy to answer questions at the end of the presentation.

.4. Let's have a look at some statistics/ figures.

.5. My name is … and I'm a …

.6. Finally, a few words about …

.7. This brings me to the next point …

.8. Thanks very much for listening to my talk.

.9. My main aim today is to tell you …/ I'm here today to tell you …

Expressing your opinion on the problem/ topic

Expressing your opinion	
As I see it…	In my view/ opinion…
I think…	From my point of view…
To my mind…	I must say that…
I (personally) believe that…	It seems to me that…

Expressing your agreement and disagreement

Agreeing		Disagreeing	
When you agree	When you agree but not strongly	When you disagree, but you want to be polite	When you disagree strongly
Absolutely/ Exactly I couldn't/ can't agree more I absolutely/ fully/ certainly/ quite agree with you Right/ That's right/ You are right	I suppose so, but… I guess so Yes, maybe/ perhaps, but…	Yes, but … I know, but… I take/see your point but… But don't you think…? I'm not so sure…	No, it isn't … That's not true I can't accept that… I don't think that's right That's not the way I see it

WRITING FILE

Sample report

Date: 12 April 2018

Report on: location of new assembly plant

Introduction

The purpose of this report is to assess the suitability of locating the new assembly plant in Hamburg, north Germany, and recommend a suitable site.

Findings

Hamburg has excellent transport links by sea, road and air. It is one of Europe's busiest ports, Germany's two main motorways pass through the city and it has a fast-growing international airport. It is also a gateway to Scandinavia and central Europe with a fast rail link to Berlin.

The region has an educated and skilled workforce with a strong engineering tradition.It will be possible to source many components locally.

Recommendation

It is suggested that the fast-developing business park north west of the city would be an ideal site because it is next to the motorway and 10 minutes from both the harbour and rail terminal. We recommend that the site should be studied in more detail immediately.

Amanda Jones

Research and Development Manager

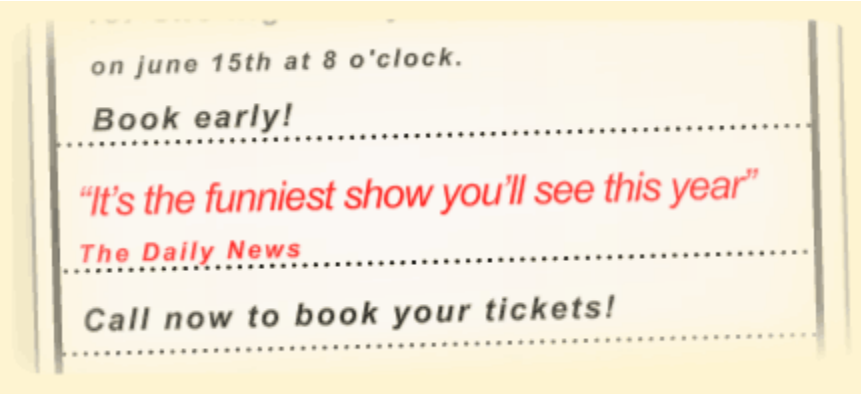
Leaflets

Leaflets come in all shapes and sizes, but they all have to tell the user as much as possible in a small space.

- The heading. Leaflets should have a clear, bold heading that catches the reader's attention and makes them want to read more.

- The message. You need to get as many facts as possible onto a leaflet – it needs to tell the reader everything they need to know and persuade them to do something, for example visit a restaurant or buy something.

- Features. Most leaflets have short messages that stand out and tell the reader what's special about the thing the leaflet is advertising. These could be prices, reviews or special offers.



- A call to action. This is a clear message telling the reader what to do next, for example, Buy it now! or Call this number now for more details!

- Contact details. If a leaflet is advertising an event or a shop, for example, it must tell people where to go (an address), and how to get in touch (telephone numbers, website details and e-mail addresses).

- The design. Leaflets have to catch the reader's attention, so they need to be bright and engaging.

GRAMMAR FILE

Present Continuous Tense

Form: to be + Ving

To be – am/is/are

+ I am doing He is doing They are doing	- I am not doing He is not doing They are not doing	? Am It doing? Is he doing? Are they doing?

Present Simple Tense

Form: V (V es)

+ I,/you/we/they do. He/she/it does.	- I don't do He doesn't do	? Do you do? Does he do?

Present Perfect Tense

Form: have /has + V + -ed (Participle II)

Use: There are two main uses of the Present Perfect

- to express an action in the past. We are interested in the experience as part of someone's life.

*They**'ve lived** all over the world.*

- to express an action or state which began in the past and continues to the present.

*I **have been** a student for a year.*

For and **since** are common with this use.

*We**'ve lived** here for six years.*

*I**'ve known** Alice since my childhood.*

Question forms

1. *General question* (Общий вопрос).
   Этот тип вопроса в английском языке еще именуют *yes* / *no question*. В данном вопросе обратный порядок слов и на первом месте вспомогательный (*do*, *does*, *is* и т.д.) или модальный глагол.

   Do you play computer games? – Ты играешь в компьютерные игры?

   Is this his book? – Это его книга?

2. S*pecial question* (Специальный вопрос)
   Этот тип вопроса может быть задан к любому члену предложения. Используется ряд вопросительных слов: *What*? – что?; *When*? – когда?; *Where*? – где?; *Why*? – почему?;*Which*? – который? и другие.

   Where are you going to move? – Куда ты собираешься переехать?

3. A*lternative question* (Альтернативный вопрос) Особенностью этого вопросительного предложения является выбор между двумя предметами, лицами, качествами, действиями и т.д.
   Did they finish writing the article in the morning or at night? – Они закончили писать статью утром или вечером?

4. T*ag-question* (Разделительный вопрос).
   Такой вопрос состоит из двух частей: первая – это само предложение целиком, с неизмененным порядком слов, и без тех частей речи, к которым собственно задается вопрос; вторая – краткий вопрос, в котором появится вспомогательный или модальный глагол, присутствующий в сказуемом первой части.

   My mother prefers meat to fish, does not she? – Моя мать предпочитает рыбе мясо, не так ли?

5. Q*uestion to the subject* (Вопрос к подлежащему).

В таком вопросительном предложении порядок слов прямой. Вопросительное слово: *Who*? *What*? (кто – что). В настоящем времени употребляем глагол в третьем лице и единственном числе. Примеры:

What makes you feel upset? – Что заставляет тебя грустить?

Who invites guests for the party? – Кто приглашает гостей на вечеринку

Passives

Form: to be + past participle / Ved

+ It**'s done.**	- It**'s not done.**	? **Is** it **done?**
It**'s being done.**	It**'s not being done.**	**Is** it **being done?**
It **was done.**	It **wasn't done.**	**Was** it **done?**
It **has been done.**	It **hasn't been done.**	**Has** it **been done?**
It **will be done.**	It **won't be done.**	**Will it be done?**

Passives can also be formed with modal verbs.

Can it **be done?** It **can't be done.** It **should be done.** It **must be done.** It **might be done**.

Dealing with numbers

Saying large numbers

For example, 912,757,250 = nine hundred and twelve million, seven hundred and fifty-seven thousand, two hundred and fifty.

British and American English differences

0 = nought / oh (BrE) 0 = zero (AmE)

Fractions	**Decimals**
$^{5}/_{7}$ = five-sevenths	1.25 = one point two five
$^{2}/_{5}$ = two-fifths	0.754 = nought point seven five four (BrE) zero point seven five four (AmE) point seven five four (BrE/AmE)
$^{1}/_{2}$ = a half	
$^{1}/_{4}$ = a quarter	

Percentages

65% = sixty-five percent

Keys

Unit 5

1. Синонимы, обозначающие мусор, отходы, отбросы – rubbish /garbage /trash.
2. Мусор, сор, находящийся в неположенном месте – litter.
3. Отходы, неиспользуемые или ненужные вещи – waste.
4. Хлам, рухлядь, вещи, не имеющие ценности – junk.
5. Обломки, осколки, крупный мусор – debris.

Unit 7

Comparison of Renewable Energy Types

Type of Renewable Energy	Pros	Cons
Wind Power Energy generated by converting wind currents into electricity using wind turbines.	• Clean and renewable • Low operational costs • Can be built on existing farms or ranches	• Intermittent energy source • Visual and noise pollution • Can impact local wildlife, particularly birds
Solar Power Energy harnessed from the sun using photovoltaic cells or solar thermal collectors.	• Abundant and renewable • Reduces electricity bills • Low maintenance costs	• High initial costs • Dependent on weather and daylight • Requires large areas for installation
Bioenergy Energy produced from organic materials (biomass) like plant and animal waste.	• Reduces waste • Can be continuously produced • Versatile and can be used for heat, electricity, and fuel	• Can contribute to deforestation • May compete with food production • Emits some greenhouse gases when burned
Ocean Energy Energy derived from the movement of water in the oceans – including tidal, wave, and ocean thermal energy.	• Predictable and reliable • Large energy potential • No greenhouse gas emissions during operation	• High construction and maintenance costs • Limited suitable locations • Can affect marine ecosystems

Geothermal Energy Energy extracted from heat stored within the earth.	• Reliable and constant supply • Low emissions • Small land footprint	• High initial costs • Location-specific • Potential for induced seismic activity
Hydropower Energy generated by the movement of water, typically from rivers or dams.	• Reliable and adjustable output • Low operational costs • Can provide recreational benefits	• High initial infrastructure costs • Can disrupt local ecosystems and fish populations • Potential for displacement of local communities

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ENVIRONMENTAL PROBLEMS AND SOLUTIONS

Учебное пособие

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