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РОССИЙСКОЯ ФЕДЕРАЦИИ
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ПРОБЛЕМЫ ЭКОЛОГИИ В ЭНЕРГЕТИКЕ

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Цель данного пособия – выработать у студентов навыки чтения и перевода текстов экологической тематики. Данное учебное пособие предусматривает представление материала по тематическому принципу на базе современных научно-популярных текстов.

Данное пособие может быть использовано в качестве основного или дополнительного при обучении студентов по специальностям «Инженерная защита окружающей среды (в энергетика, энергоснабжении)» и «Водные ресурсы и аквакультура».

ПРЕДИСЛОВИЕ

Данное учебное пособие ставит целью выработку у студентов навыков чтения и перевода текстов по специальности «Инженер по защите окружающей среды». Современные тексты научно-популярного характера, подвергнутые незначительной адаптации, взяты из тематических изданий современных авторов.

Пособие состоит из трех разделов. Первые два раздела отражают современные проблемы экологии в энергетике. Третий раздел посвящен грамматике и содержит как теоретический материал, так и практический.

Каждый раздел включает тексты, словари к текстам, задания после текстов, позволяющие определить уровень понимания, не прибегая к переводу. Специальные упражнения на перевод терминов обеспечивают адекватность их последующего употребления в речи.

Приложение в конце пособия предоставляет возможность самостоятельного изучения дополнительных текстов по каждому разделу.

Данное пособие может быть использовано в качестве основного или дополнительного при обучении студентов по специальности «Инженерная защита окружающей среды (в энергетика, энергоснабжении)» и «Водные ресурсы и аквакультура».

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Unit 1. Energy today

Text A. Energy today

Prosperity for everyone on Earth by 2050 will require a sustainable source of electricity equivalent to 3 to 5 times the commercial power currently produced. Because of the low average incomes in developing countries, however, this energy must be provided at one-tenth the present total cost per kilowatt-hour. Solar-power stations constructed on the moon from common lunar materials could provide the clean, safe, low-cost commercial electric energy needed on Earth.

Currently, commercial energy production on Earth raises concerns about pollution, safety, reliability of supply, and cost. These concerns grow as the world's nations begin to expand existing systems to power a more prosperous world. Such growth could exhaust coal, oil, and natural gas reserves in less than a century, while the production and burning of these fossil fuels pollute the biosphere. Expanding nuclear fission power would require breeder reactors, but there is intense political resistance to that idea because of concerns about proliferation, nuclear contamination of the environment, and cost. Thousands of large commercial fusion reactors are highly unlikely to be built by 2050. Terrestrial renewable systems (hydroelectric, geothermal, ocean thermal, waves, and tides) cannot dependably provide adequate power. Using wind power would require capturing one-third of the power of the low-level winds over all the continents.

Although energy coming directly to Earth from the sun is renewable, weather makes the supply variable. Very advanced technologies, such as 30 % efficient solar cells coupled with superconducting power transmission and storage, imply solar arrays that would occupy selected regions totaling 20 % of the area of the United States. Studies funded by the World Energy Council project that terrestrial solar energy will provide less than 15 % of the electric power needed for global prosperity by 2050.

Vocabulary

Prosperity	Процветание, успех
Sustainable source	Устойчивый источник
Currently	В настоящее время, теперь
Provide	Обеспечивать
To expand	Расширять, распространять

Exhaust	Исчерпывать, истощать
Fossil fuel	Ископаемое топливо
Proliferation	Распространение
Nuclear contamination	Ядерное загрязнение
Terrestrial renewable systems	Наземные системы возобновляемых источников
Provide	Обеспечивать
Renewable	Возобновляемый

EXERCISE 1.

Выпишите дополнительные незнакомые слова и выучите их.

EXERCISE 2.

Переведите текст и составьте по одному вопросу к каждому абзацу.

EXERCISE 3.

Дайте названия абзацам.

EXERCISE 4.

Выделите главную идею каждого абзаца и прочтите предложение, которое является главным для каждого абзаца.

EXERCISE 5.

Перескажите текст.

Text B. Oil

In Canada, oil has been extracted from tar sands since 1978 and here the costs have dropped from \$28 per barrel to just \$11. For comparison the price of a barrel of oil was \$27 in 2000.

The US Energy Information Agency estimates that today it will be possible to produce about 550 billion barrels of oil from tar sands and shale oil at a price below \$30, i.e. that it is possible to increase the present global oil reserves by 50 percent.

And it is estimated that within 25 years we can commercially exploit twice as much in oil reserves as the world's present oil reserves. Should the oil price increase to \$40 per barrel we will probably be able to exploit about five times the present reserves.

The total size of shale oil resources is quite numbing. It is estimated that globally there is about 242 times more shale oil than the conventional petroleum resources. There is more than eight times more energy in shale oil than in all other energy resources combined – oil, gas, coal, peat and tar sands. This stunning amount of energy is the equivalent of our present total energy consumption for more than 5,000 years.

Consequently, there is no need for any immediate worry about running out of fossil fuels. A proportion of the fossil fuels, however, are probably only accessible at a higher price. Still, there is good reason to believe that the total energy share of our budget – even if we continue to depend solely on fossil fuels – will be dropping. Today the global price for energy constitutes less than 2 percent of the gross domestic product (GDP), and yet if we assume only a moderate continued growth in GDP this share will in all likelihood continue to drop. Even assuming truly dramatic price increases on energy of 100 percent, by the year 2030 the share of income spent on energy will have dropped slightly.

Vocabulary

Extract	Извлекать, добывать
Tar sands	Битуминозные пески
Estimate	Оценивать
Shale oil	Сланцевое масло
Exploit	Эксплуатировать, разрабатывать
Accessible	Доступный
Drop	Падать, снижаться
Gross domestic product (GDP)	Валовый внутренний продукт

EXERCISE 1.

Выпишите дополнительные незнакомые слова и выучите их.

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Переведите текст и составьте по одному вопросу к каждому абзацу.

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Выделите главную идею каждого абзаца и прочтите предложение, которое является главным для каждого абзаца.

EXERCISE 5.

Перескажите текст.

Text C. Nuclear energy

Nuclear energy constitutes six percent of global energy production and 20 percent in the countries that have nuclear power. Despite growth in Asia, the prospects for this sector spell stagnation until 2010 and a minor recession after that. This recession is mainly caused by perceived problems of security as stressed by the accidents at Three Mile Island and Chernobyl which undermined many people's confidence in this energy source.

Ordinary nuclear power exploits the energy of fission by cleaving the molecules of uranium-235 and reaping the heat energy. The energy of one gram of uranium-235 is equivalent to almost three tons of coal. Nuclear power is also a very clean energy source which during normal operation, almost does not pollute. It produces no carbon dioxide and radioactive emissions are actually lower than the radioactivity caused by coal-fueled power plants.

At the same time nuclear power also produces waste materials that remain radioactive for many years to come (some beyond 100,000 years). This has given rise to great political debates on waste deposit placement and the reasonable of leaving future generations such an inheritance. Additionally, waste from civilian nuclear reactors can be used to produce plutonium for nuclear weapons. Consequently, the use of nuclear power in many countries also poses a potential security problem.

For the moment there is enough uranium-235 for about 100 years. However, a special type of reactor – the so-called fast-breeder reactor – can use the much more common uranium-238 which constitutes over 99 percent of all uranium. The idea is that while uranium-238 cannot be used directly in energy production it can be placed in the same reactor core with uranium-235. The uranium-235 produces energy as in ordinary reactors, while the radiation transforms uranium-238 to plutonium-239 which can then be used as new fuel for the reactor. It sounds a bit like magic, but fast-

breeder reactors can actually produce more fuel than they consume. Thus it is estimated that with these reactors there will be sufficient uranium for up to 14,000 years. Unfortunately these reactors are more technologically vulnerable and they produce large amounts of plutonium that can be used for nuclear weapons production, thus adding to the security concerns.

Nuclear power, however, has barely been efficient in the production of energy and this is probably the major reason why its use has not been more widespread. It is difficult to find unequivocal estimates of the total costs since there are so many different variables that can affect the calculations, but typically the price hovers around 11-13 cents for one kilowatt-hour (kWh) in 1999 prices. This should be compared with an average energy price for fossil fuels of 6.23 cents.

In the longer run, the primary focus is no longer on fission energy but rather on fusion energy. This technology aims at fusing two hydrogen atoms into a single atom of helium. A single gram of fuel can develop the same energy as 45 barrels of oil. Fuel comes basically from ordinary sea water and thus supply is virtually infinite. Moreover, there will be very little radioactive waste or emissions. However, fusion demands astronomical temperatures and despite investments above \$20 billion we have still only managed to achieve 10 percent of the laser power necessary for producing energy. Consequently, it is supposed that fusion energy will be commercially available only after 2030 or perhaps only well into the twenty-second century.

Vocabulary

Stagnation	Застой	Sufficient	Достаточный
Undermine	Подрывать, разрушать	Vulnerable	Уязвимый, ранимый
Confidence	Уверенность	Hover	Колебаться
To cleave	Раскалывать	Average	Средний
Emissions	Выбросы	In the longer run	В более долгосрочной перспективе
Remain	Оставаться	fission	расщепление
inheritance	Наследие	fusion	слияние
Consume	Потреблять	Consequently	следовательно

EXERCISE 1.

Выпишите дополнительные незнакомые слова и выучите их.

EXERCISE 2.

Переведите текст и составьте по одному вопросу к каждому абзацу.

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Дайте названия абзацам.

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Выделите главную идею каждого абзаца и прочтите предложение, которое является главным для каждого абзаца.

EXERCISE 5.

Перескажите текст.

Unit 2. SAFE ENERGY

Text A. Energy problems

EXERCISE 1: Is it cheaper to use solar energy or wind energy?

Renewable energy sources, unlike fossil fuel, can be used without ever being used up. These are typically sources such as sun, wind, water and Earth's internal heat.

It is important to focus on the fact that the difference in cost between traditional fossil fuels and some of the cheapest: renewable energy sources is so relatively slight. Moreover, these economic costs do not include the negative social cost of fossil fuel use on the environment. Energy from a coal-fired power plant may still be 20-50 percent cheaper than the energy produced by a windmill, but if the effects on environment and humans from coal pollution and waste products exceed the price difference then society ought to choose wind energy.

Recently, one European and two American large-scale projects have attempted to examine all costs associated with electricity production, all the way from the mortal risks of mining coal, the traffic hazards of transportation and occupational hazards of production including consequences of acid rain, particles, sulfur dioxide, nitrogen

oxides and ozone on lakes, crops, buildings, children and old people and up to the consequences of tax codes and occupation plus a long, long list of similar considerations and costs. Altogether these studies find that the extra social cost of new coal-fired power plants is around 0.16-0.59 cents per kWh. None of the three studies, however, quantifies the costs of carbon dioxide which probably means an additional 0.64 cents per kWh. Consequently renewable energy actually has to drop somewhat in price before it will be competitive, even including social costs. Nevertheless, it is estimated that the price of renewable energy will fall faster than the price for conventional energy. It should however also be added that there is still quite a bit of uncertainty about the predictions of such prices, because early predictions in hindsight have seemed rather optimistic. In 1991 the Union of Concerned Scientists predicted that solar power today would drop below 10 cents per kWh, but unfortunately it has still only dropped to about 50 cents per kWh.

Thus, it is unclear whether it is necessary to support renewable energy with subsidies and tax exemptions. In Denmark this subsidy is as much as 5 cents per kWh for wind energy, and in the US, subsidy for wind power is estimated at about 1.5 cents per kWh. It would still be much more effective to tax energy such that its actual price would adequately reflect the social costs in production and emissions.

VOCABULARY

Cost	Стоимость	Conventional	Традиционный
Ought	Должен (модальный глагол)	Should	Следует (модальный глагол)
Renewable	Возобновляемый	Hindsight	Взгляд в прошлое, оценка прошлых событий
Waste	Отходы	Subsidy	Субсидии
Fossil fuel	Ископаемое топливо	Exemption	Освобождение от налогов
Mortal	Смертельный	To tax	Облагать налогом
Mining	Добыча	Emission	Выпуск
Hazard	Несчастный случай	Similar	Подобный
Tax code	Налоговый кодекс	To quantify	Подсчитывать
Competitive	Конкурентный	Adequately	Адекватно

EXERCISE 2.

Найдите правильные переводы выражений на английском языке, приведенных в правой колонке:

1. To focus on the fact	1. Отходы
2. Negative social cost	2. Смертельный риск
3. Fossil fuel use	3. Несчастные случаи на производстве
4. Waste product	4. Весь путь начиная от
5. The mortal risks	5. Обратит внимание на тот факт
6. Occupational hazards of production	6. Стоимость негативного социального воздействия
7. All the way from	7. Использование ископаемого топлива
8. Tax codes	8. Налоговый кодекс
9. Similar considerations	9. Подобные соображения
10. To drop somewhat in price	10. Тем не менее по оценкам
11. It should however also be added	11. До
12. There is still quite a bit of uncertainty	12. Расходы на производство и выпуск продукции
13. Nevertheless, it is estimated	13. Было бы намного эффективнее
14. It is unclear whether it is necessary	14. Есть еще небольшая доля сомнения
15. It would still be much more effective	15. Снизить стоимость чего-либо
16. Costs in production and emissions	16. Неясно необходимо ли
17. Up to	17. Следовало бы однако также добавить

EXERCISE 3.

Согласны ли вы с кратким выводом по содержанию предыдущего текста: The most important point in this text on energy is to stress not only that there are ample reserves of fossil fuels but also that potentially unlimited renewable energy resources definitely are within economic reach.

EXERCISE 4.

Ответьте на вопросы: 1. Which kind of energy is cheaper? 2. Why can't we agree that coal-fired energy is cheaper? 3. How many projects have been realized to examine all costs associated with electricity production? 4. How much do these studies evaluate the extra social cost of a new coal-fired plant? 5. What is it necessary to do in order to make renewable energy competitive? 6. Does the renewable energy fall in price fast? 7. How is it possible to support the development of renewable energy?

Text B. Solar energy

The largest part of the energy on Earth comes from the sun. Only a small part comes from radioactive processes within the Earth itself. The sun gives off so much energy that it is equivalent to a 180-watt bulb perpetually lighting up every single square meter on Earth. Of course energy is not distributed equally - the tropics receive more than 250 watts whereas the polar regions get only about 100 watts.

The solar energy influx is equivalent to about 7,000 times our present global energy consumption. The yearly solar energy by far exceeds any other energy resource. Or put in a different way: even with our relatively ineffective solar cells, a square area in the tropics 469 km (291 miles) on each side - 0.15 percent of Earth's land mass - could supply all our current energy requirements. In principle this area could be placed in the Sahara Desert (of which it would take up 2.6 percent) or at sea. In reality, of course, one would not build a single, central power plant, but the example underscores partly how little space really is necessary to cover our energy needs, partly that the area can be placed somewhere of little or no biological or commercial value.

The remote Indonesian village of Sukatani was changed literally overnight when solar cells were installed in 1989. The equatorial nights, which last 12 hours all year round, previously left little to do. But today, children can do their homework after supper, the village sports a new motorized well pump providing a steady supply of water for better sanitation, and now some of the local waning (shops) are open after sunset and television sets provide entertainment and a window on the wider world.

Solar energy can also be exploited directly through heating and indirectly by growing plants, later to be burnt (biomass). In Denmark it is estimated that direct solar energy can provide about 10-12 percent of our energy. In the US also, biomass is predicted to have substantial growth. The US Energy Information Agency

estimates that solar energy could cover the entire American energy requirements more than 3.5 times over. But for this to become reality a lot of ingenuity is required.

Japan has started integrating solar cells in building materials, letting them become part of roofs and walls. Others have produced watertight thin-film ceramic solar cells to replace typical roofing materials. In Wales an experimental center open to visitors has chosen solar cells not only to supply the building with electricity, but also because it can save costs for traditional roofing.

VOCABULARY

Radioactive	Радиоактивный	Pump	Насос
Bulb	Лампочка	Steady	Постепенно
Perpetually	Бесконечно	Supply	Снабжение
Influx	Приток	Sanitation	Санитария
Cell	Элемент	To exploit	Эксплуатировать
To exceed	Превышать	Biomass	Биомасса
By far	Безусловно	Ingenuity	Изобретательность
To illustrate	Иллюстрировать	Watertight	Водонепроницаемый
Requirement	Потребности	Thin-film	Тонкопленочная
To underscore	Подчеркивать	Ceramic	Керамика
Indonesian	Индонезийский	Literally	Буквально
To sport	Использовать	Roof	Крыша

EXERCISE 1.

Ответьте на вопросы: 1. Where does the largest part of the energy come from? 2. How much energy does the sun give off? 3. How is the sun energy distributed on the Earth? 4. Does the solar energy influx cover our present global energy consumption? 5. How much area in the tropics is required to cover all our current energy consumption? 6. How did the Indonesian village change when solar cells were installed in 1982? 7. How solar energy can be exploited? 8. How are solar cells used in Japan? 9. What is done in Wales for using solar cells?

EXERCISE 2.

Соедините переводы с соответствующими словосочетаниями на английском языке:

1. To leave little to do	1. Распространять равномерно
2. The example underscores partly	2. Поток солнечной энергии
3. Watertight thin-film ceramic cells	3. Пример частично подчеркивает
4. For this to become reality	4. Не представляющий коммерческого интереса

5. To change literally overnight	5. Масштаб взаимоотношений
6. To illustrate clearly	6. Ясно показывать
7. The solar energy influx	7. Тотально измениться за одну ночь
8. To be of no commercial value	8. Оставляя мало времени для жизнедеятельности
9. To let to become the part	9. Позволить стать частью
10. To distribute equally	10. Чтобы это стало реальностью
11. Or put in different way	11. Водонепроницаемые тонкопленочные керамические фотоэлементы
12. A steady water supply for better sanitation	12. Постоянное водоснабжение для создания лучших санитарных условий
13. The scale of these relationships	13. Или пойти другим путем

Text C. Wind energy

Wind energy has been exploited through millennia. Long before the Current Era, ancient Civilizations in China, India and Persia used wind to pump up water and to mill grain. Already in early medieval times windmills were a known technology throughout Europe, and the windmill remained the primary energy source till the arrival of the steam engine. In countries such as Denmark that did not have their own coal supply, the windmill continued to have a central position. In 1916 alone Denmark built more than 1,300 new windmills.

Being the world leader in wind power, windmills in Denmark still produced only about 9 percent of all Danish electricity in 1998. In the US, windmills produced just 0.1 percent of the total electricity production in 1998.

But problems will arise if a significant part of a nation's electricity requirements are to be met by wind power. Close to inhabited areas windmill noise can be a nuisance. Moreover, to be effective, windmills need to be placed in open environments, and here they easily mar the scenery. The only long-term solution is placing windmills far out to sea. Not only will there be few if any esthetic problems but windmills are typically 50 percent more effective here.

Critics of windmills often point out that they are still not profitable, that they require much energy to produce, and that they kill birds. As we saw above, windmills are still not fully competitive, although they are probably no more than 30-50 percent more expensive, and even less when including the social and environmental costs of continued use of fossil fuels. In the longer run, they will undoubtedly be competitive or even cheaper.

It is also objected that windmills themselves demand quite a bit of energy to be produced: the steel has to be mined, smelted and rolled, and the windmill itself has to be transported and in the end disposed of. However, going over the extended energy account, it turns out that a modern windmill can produce the energy used for its own production within just three months.

It is true that windmills kill birds, although the problem will be much smaller at sea. In Denmark it is estimated that about 30,000 birds die in collisions with windmills each year. In the US the number is about 70,000.

VOCABULARY

To mill	Молоть	Undoubtedly	Несомненно
Grain	Зерно	Steel	Сталь
Steam engine	Паровой двигатель	To mine	Добывать
Inhabited	Населенный	To smelt	Расплавлять
Noise	Шум	To roll	Прокатывать
Nuisance	Помеха	To go over	Внимательно изучать
To mar	Портить	Account	Счет
Scenery	Пейзаж	Collision	Столкновения
Esthetic	Эстетический	Extended	Расширенный

EXERCISE 1.

Соедините переводы с соответствующими выражениями на английском языке:

1. Задолго до нашей эры	1. A technology known throughout Europe
-------------------------	---

2. В начале средневековья	2. In the end of disposal
3. Известная во всей Европе технология	3. It is also objected
4. Продолжает занимать центральное положение	4. Not to be still fully competitive
5. Будучи мировым лидером в чем-то	5. Long before the current era
6. Значительная часть национальных потребностей в электричестве	6. In early medieval times
7. Долгосрочное решение	7. To continue to have a central position
8. В долгосрочной перспективе	8. Being the world leader
9. Еще не быть до конца конкурентоспособным	9. In the long run
10. Также выдвигаются возражения	10. The only long-term solution
11. Конечный пункт назначения	11. A significant part of a nation's electricity requirements
12. Иметь собственные запасы угля	12. Quite a bit of energy to be produced
13. Удовлетворить требования	13. To have own coal supply
14. Не только из-за каких-то эстетических соображений	14. Not only will there be few if any esthetic problems
15. Дальнейшее использование угля	15. Continued use of coal
16. Производиться достаточно мало энергии	16. The requirements are to be met by
17. Взглянув на расширенный расчет стоимости энергии	17. Going over the extended energy account

EXERCISE 2

Ответьте на вопросы: 1. How long has the wind energy been exploited? 2. How was the wind used by ancient civilizations? 3. When did first windmills appear? 4. Where did the windmill continue to have a central position? 5. How much energy do windmills produce in Denmark? 6. How many windmills were built in Denmark in 1916? 7. What problems do the modern windmills have today? 8. What do critics of windmills often point out?

Unit 3. GLOBAL WARMING

Text A. Global warming

Climate change and especially global warming has become the overriding environmental concern since the 1990s. Most discussions about the environment end up pointing out that, despite all other indicators that may show us doing better and better, we still have to change our current lifestyle dramatically because our way of life is now changing the climate and causing global warming.

The consequence is that we must change our industrial ways. Worldwatch Institute tells us that “the only feasible alternative is a solar/hydrogen-based economy.” Greenpeace equivalently tells us that although we may have lost of oil, global warming prevents us from using it – “we are in a second world oil crisis. But in the 1970s the problem was a shortage of oil. This time round the problem is that we have too much.” The only solution is choosing “a fundamentally new energy direction based on clean renewable energy, like wind or solar power.”

In this way, climate change has become the environmental trump card - possibly we are not running out of raw materials, possibly we are actually doing better and better on almost any objective indicator, but if global warming demands a change, all other arguments will be of lesser import. Worldwatch Institute actually envisions how in the twenty-first century “the climate battle may assume the kind of strategic importance that wars - both hot and cold - have had during” the twentieth century. Backed up by a number of leading scientists writing in *Nature*, Worldwach Institute asserts that to develop the necessary technologies to combat climate change will require a monumental research effort, conducted with the urgency of the Manhattan Project or the Apollo space program.

These drastic efforts are justified by a general understanding of the severe consequences of global warming. In many people’s view, climate change is linked to drastic increases in temperature and catastrophic climatic shifts. We fear that global warming could result in the destruction of our ecosystems, widespread famine, more and more powerful hurricanes, the melting of the ice caps and the oceans flooding the Maldives, Bangladesh and other low-lying areas on Earth.

This is no wonder, given the constant media barrage of possible greenhouse related catastrophes. Almost any weather event is now linked to climate change. In Leonardo DiCaprio’s March 2000 interview of the President, Clinton told that if we do not change our ways, what will happen is “ the polar ice caps will melt more

rapidly; sea levels will rise; you will have the danger of flooding the sugarcane fields of Louisiana ; island nations could literally be buried. The whole climate of the United States, for example, could be changed where you would have more flooding, more heat waves, more storms, more extreme weather events generally”.

VOCABULARY

Overriding	Важнейший	To assert	Утверждать
Concern	Забота	To conduct	Проводить
Feasible	Реальный	Urgency	Безотлагательность
Equivalently	То же самое	Drastic	Решительный
Shortage	Недостаток, дефицит	Widespread	Широко распространенный
Trump card	Козырная карта	Shift	Изменения
Objective	Цель	Famine	Голод
Indicator	Индикатор	Hurricane	Ураган
To envision	Предвидеть	To assume	Принимать форму
Barrage	Заграждение, плотина	Sugarcane	Сахарный тростник
Literally	Без преувеличения	To bury	Хоронить

EXERCISE 1.

Ответьте на вопросы: 1. When has the climate change become the environmental concern? 2. What do we have to change in order to avoid global warming? 3. What must future energy direction be based on? 4. Is the problem of global warming explained by shortage of oil? 5. Does the climate battle assume the kind of war? 6. What is important to develop the necessary technologies to combat climate? 7. What is climate change linked to from the point of many people’s view? 8. What are the real consequences of global warming?

EXERCISE 2.

Найдите эквиваленты: важная проблема экологии, приводит к указанию, жить все лучше и лучше, стиль жизни, пути развития производства, основанная на гидроисточниках энергии экономика, иметь расход энергии, находится в условиях второго мирового кризиса потребления нефти, дефицит нефти, основное направление энергетики, израсходовать, практически по

любому объективному показателю, иметь меньшее значение, обрести стратегическое значение, всеобъемлющие усилия по исследованию, жестокие последствия, с точки зрения многих людей.

EXERCISE 3.

Расставьте в правильном порядке названия абзацев:

- Our fears about global warming
- A new energy direction
- Our lifestyle threatens the climate
- Third world war

EXERCISE 4.

Выделите в каждом абзаце предложение, наиболее полно отражающее основное содержание абзаца.

EXERCISE 5.

Составьте фразы, соответствующие содержанию текста:

1. Climate change and especially global warming has become the overriding environmental concern since	the 1990s.
	the 1980s.
	the 1960s.
2. The only solution of avoiding climate change is choosing	a fundamentally new energy direction.
	a new life style.
	a new methods of oil combustion.
3. To develop the necessary technologies to combat climate change will require	a monumental research effort.
	a new way of life.
	a new technologies.
4. In many people's view, climate change is linked to	drastic increases in temperature.
	to new technologies.
	to new climate.

Text B. The basic greenhouse effect

The main concern of climate change is global warming and the predicted warming is based on the so called greenhouse effect. The fundamental principle of the greenhouse effect is really quite simple and entirely uncontroversial. Several types of gases can reflect or trap heat, including water vapor, carbon dioxide (CO₂), methane (CH₄), laughing gas (N₂O), chlorofluorocarbons (CFC) gases and ozone. Together they are known as greenhouse gases.

The greenhouse gases trap some of the heat emitted by the Earth, rather like having a blanket wrapped around the globe. The basic greenhouse effect is good - if the atmosphere did not contain greenhouse gases the average temperature on the Earth would be approximately 33° C (59 °F) colder and it is unlikely that life as we know it would be able to exist.

The problem is that man has increased the quantity of greenhouse gases, CO₂ in particular, in the atmosphere. About 80 percent of the extra CO₂ comes from the combustion of oil, coal and gas whereas the other 20 percent comes from deforestation and other land changes in the tropics. About 55 percent of the released CO₂ is absorbed again by the oceans, by northern forest regrowth, and generally by increased plant growth (plants use CO₂ as fertilizer), but the rest is added to the atmosphere, such that the concentration of CO₂ has increased by 31 percent from preindustrial times to the present day.

If the extra greenhouse gases, and among them CO₂ reflect heat, more greenhouse gases in the atmosphere will (everything else being equal) lead to an increase in the temperature on Earth. This is the so called anthropogenic greenhouse effect, the extra, man-made greenhouse effect. This effect is our main interest. We will in the following just call it the greenhouse effect.

VOCABULARY

Uncontroversial	Неоспоримый	Laughing gas	Веселящий газ
To trap	Удерживать	To wrap	Заворачивать
Vapor	Пар	Antropogenic	Антропогенный
Methane	Метан	Main	Основной

EXERCISE 1.

Ответьте на вопросы: 1. What are the predictions about future warming based on? 2. What is the fundamental principle of green house effect? 3. Is the basic green

effect really good? 4. Why has the greenhouse effect become to affect the climate negatively? 5. Where does extra carbon dioxide come from? 6. What part of the released carbon dioxide is added to the atmosphere? 7. Explain please what does the so called anthropogenic greenhouse effect mean?

EXERCISE 2.

Найдите эквиваленты: предсказываемое потепление, так называемый, быть известным как, основной принцип, средняя температура, известная нам форма жизни, способная к существованию, возобновление роста, представляющая для нас основной интерес, другие изменения состояния земель, дополнительные газы, в дальнейшем.

EXERCISE 3.

Составьте фразы, соответствующие содержанию текста:

1. More greenhouse gases in the atmosphere will lead to	an increase	in the temperature on Earth.
	a decrease	
	the stability	

2. About 80 percent of the extra CO ₂ comes from	combustion of oil, coal and gas.
	deforestation.
	other land changes in the tropics.

3. The considerable part of the released CO ₂ is absorbed again, and generally	by the oceans.
	by northern forest regrowth.
	by increased plant growth (plants use CO ₂ as fertilizer).

4. Several types of gases, including water vapor, carbon dioxide (CO ₂), methane (CH ₂), laughing gas (N ₂ O), CFC gases and ozone are known	as greenhouse gases.
	as climate change gases.
	as easy gases.

	trap	some of the heat emitted
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5. The greenhouse gases	reflect	by the Earth.
	absorb	

6. The main concern of climate change is	global warming.
	global cooling.
	global stability.

Text C. The long-term development of the climate

In order to understand what will happen_with the global temperature, it is necessary first to look at what has happened. We have only used thermometers systematically and globally over the past century and a half (the world's longest record in Central England only goes back to 1659). If we want to know about the long-term development of the climate, we have to look for other ways of measuring temperature.

We can get a grip on the development of temperature by studying how it has affected other objects that we can measure today – the so called proxy indicators. For instance, temperature has in many ways affected the ice that has accumulated in polar regions. When we drill out an ice core, we can count the layers backwards in time and measure the fraction of melted ice, the concentration of salts and acids, the load of pollen or trace gases trapped in air bubbles. Equally, we can estimate temperature by looking at tree rings (because trees grow wider rings in warm weather), corals (measuring growth rings or trace elements), lake and ocean sediments, boreholes etc.

Throughout the past one million years there has occurred a series of eight glacial/interglacial cycles, driven by the changes in earth's orbit around the sun. The last interglacial period – the Holocene, which we still live in – began about 10,000 years ago. The melting ice caused the sea to rise some 120 m while the early temperatures were generally warmer than the twentieth century. The records seem to indicate substantial temperature swings throughout the Holocene on a millennial scale. Some indicators even show changes of 5 to 8 degrees C over 1,500 years. When looking over the long 400,000 years of ice cores, the Holocene appears the longest warm and stable period, which has naturally had profound implications for the development of civilization.

Basically, there is no disagreement that the centuries before 1900 were much colder. This phenomenon is well known in history as the “Little Ice Age,” broadly

stretching from 1400-1900. Evidence from a wide range of sources shows colder continents where glaciers advanced rapidly in Greenland, Iceland, Scandinavia, and the Alps. Many European springs and summers were outstandingly cold and wet. Crop practices changed throughout Europe to adapt to a shortened and less reliable growing season, causing recurrent famines. Likewise in China, warm weather crops, such as oranges, were abandoned in the Kiangsi Province, and in North America the early European settlers reported exceptionally severe winters.

Summing up, there is no doubt that the temperature of the late twentieth century is greater than many previous centuries. However, this cannot be taken as a simple indication of overwhelming global warming as we are also coming out of a Little Ice Age. The temperature is higher now than at any time throughout the past 1000 years. This claim seems less well substantiated, as the data essentially exclude ocean temperatures, night temperatures and winter temperatures and are based almost exclusively on North American data.

VOCABULARY

Thermometer	Термометр	Borehole	Скважина
To get a grip	Ухватить	Interglacial	Межледниковый
Proxy indicator	Заслуживающий доверия	Recurrent	Периодически повторяющийся
To accumulate	Накапливать	Substantial	Сильный
To drill out	Бурить	Swing	Колебание
Core	Среднюю часть	Millennial	Тысячелетний
Backwards	Назад	Scale	Масштаб
Fraction	Крупница	Profound	Глубокое
Pollen	Пыльца	Implication	Последствие
Trace	След	Stretching	Растянувшийся
Bubble	Пузырек	Broadly	Широко
Sediment	Осадок	Holocene	Голоцен
Overwhelming	Огромный	To substantiate	Делать реальным
Driven	Управляемый	Evidence	Свидетельства

EXERCISE 1.

Ответьте на вопросы: 1. What is it necessary in order to understand what will happen to the global climate? 2. When did people use thermometers systematically and globally? 3. What are the other ways of measuring temperatures? 4. What objects did the temperatures development affect? 5. How many glacial/interglacial cycles have occurred throughout past one million years? 6. Which interglacial period do we still live in? 7. Which are the main characteristics of the Holocene? 8. Were the centuries before 1900 colder or warmer? 9. Why did the crop practices change throughout Europe? 10. What phenomenon is known in history as the Little Ice Age? 11. Why does the claim that the temperature is higher now than at any time throughout the past 1000 years seem less substantiated?

EXERCISE 2.

Найдите эквиваленты: для понимания, в течение прошлых полутора веков, долгосрочное изменение температуры, влиять на другие объекты, так называемые проверенные индикаторы, вызванный изменениями, значительные колебания температуры, в масштабе тысячелетия, естественно имевший глубокие последствия, не иметь разногласий, известный в истории как, нельзя рассматривать как простой показатель, не включать в эти данные, практика ведения земледелия, вегетативный период.

EXERCISE 3.

Составьте фразы, соответствующие содержанию текста:

1. We have only used thermometers systematically and globally	over the past century and a half.
	many centuries ago.
	over past 20 years.

2. We can get a grip on the development of temperature by studying how it has affected other objects that we can measure today	– the so called proxy indicators.
	– the main indicators.
	– the unimportant indicators.

3. For instance, temperature has in many ways affected	the ice.
	the pollen.
	the land.

4. Equally, we can estimate	wider rings in warm weather.
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temperature by looking at tree rings, because trees grow	wider rings in cold weather.
	more narrow rings in warm weather.

5. Throughout the past one million years there has occurred a series of	eight.	glacial/interglacial cycles, driven by the changes in earth's orbit around the sun.
	five	
	twenty	

6. We still live in the last interglacial period which began about 10,000 years ago	– the Holocene.
	– the Homo Sapience.
	– the Homoclimate.

7. When looking over the long 400,000 years of ice cores, the Holocene appears	the longest warm and stable period.
	the longest cold and stable period.
	the longest warm and unstable period.

Text D. The ozone hole

Following the publication of an article in the British reputable science journal *Nature* in 1985 a new environmental problem was suddenly on everybody's lips – there was a hole in the ozone layer above the Antarctic. At ground level, ozone is a pollutant, but in the upper atmosphere a thin ozone layer protect people, animals and plants from the sun's harmful ultraviolet (UV-B). Ozone depletion is also linked in several ways to climate change, but the links are fairly weak and can be disregarded here.

Although the ozone hole of 1985 appeared over an essentially uninhabited area, its finding marked a crucial turning point in public awareness, because observations for the first time confirmed what had until then only been theoretical speculations. Since then, it has been unequivocally corroborated that the ozone layer over the inhabited mid-latitude also has declined – 1998 by about 3-6-percent below 1979 levels. This is important since a thinner ozone layer lets more UV-B rays through increasing eye disease (cataracts), skin cancer and photoaging (wrinkling and premature aging of skin).

The ozone depletion was caused by man. Already in 1974, two researchers at the University of California, Irvine, who later earned a Nobel Prize for their work, had

suggested that the so - called chlorofluorocarbons (CFCs) could be breaking down the ozone layer. Much research has later confirmed this basic link. CFCs had become ubiquitous since the 1930s, because they were cheap chemically stable and completely non-toxic. During the 1960s the use of CFCs exploded; they were used among other things in refrigerators, spray cans and air-conditioners and as foam blowing agents and solvents. CFCs are mixed into the atmosphere, some reaching the stratosphere, where they are broken down by high-energy solar ultraviolet radiation into free chlorine. Through complex interactions, these chlorine atoms react with ozone, essentially breaking down thousands of ozone molecules for each chlorine atom.

The shocking prospect of increasing skin cancer and cataracts caused politicians to react quickly. The Montreal protocol was signed in 1987, followed by the London (1990), Copenhagen (1992), Vienna (1995), another Montreal (1997) and Beijing (1999) protocols. The aim of these international agreements was initially to halve the consumption of the five main CFC gases in relation to 1986 figures and later to ban them almost entirely.

The international cooperation has rapidly born fruit: total production in 1996 was down below the production in 1960. At the same time, the total combined abundance of ozone-depleting compounds in the lower atmosphere peaked in about 1994 and is now slowly declining – actually faster than was predicted by the UN just four years earlier. The concentration of the ozone - depleting chlorine and bromide was predicted to peak in the stratosphere before the year 2000. The latest synthesis report of the UNEP ozone assessment predicts that “the ozone layer will slowly recover over the next 50 years. Likewise, the Antarctic ozone hole will slowly recover. Thus, today we have pretty much done what we can, ozone depletion is at its maximum and it will recover within the next 50 years.

Although the skin cancer rate has increased dramatically over the twentieth century, the long latency period means that the increases we see today are due to much more mundane causes.

That the ozone layer has damaged and now is at its lowest level, allowing in more UV-B radiation, is equivalent on the mid-latitudes to moving approximately 200 km (124 miles) closer to the equator – a move smaller than that from Manchester to London, Chicago to Indianapolis, Albany to New York, Lyons to Marseilles, Trento to Florence, Stuttgart to Düsseldorf or Christchurch to Wellington.

EXERCISE 1.

Выпишите незнакомые слова и составьте словарь, аналогичный предлагаемому в предыдущих уроках.

EXERCISE 2.

Переведите текст и составьте по одному вопросу к каждому абзацу.

EXERCISE 3.

Дайте названия абзацам.

EXERCISE 4.

Выделите главную идею каждого абзаца и прочтите предложение, которое является главным для каждого абзаца.

EXERCISE 5.

Перескажите текст.

Unit 4. AIR POLLUTION**Text A. Particles****Part 1**

It is only within the last decade that we have realized how dangerous airborne particles actually are. It has long been known that soot, particles and sulfur dioxide contribute to coughing and respiratory disease.

There have been two main problems. For one thing, it has been extremely difficult to differentiate between the effects of the various forms of pollution.

The second problem is that we do not know *how and why* particles cause people to die. It is thought that particles enter the lungs and gain a foothold.

Until the middle of the 1980s all particles were measured and classified as soot or smoke.

The smallest particles come from combustion in motor vehicle engines, power stations and industry as well as from fire-places and wood burning stoves. The slightly larger particles come from dust and mechanical wear and tear. Although only 10 percent of all particles are man-made they are the most common in our urban environment.

The emission of SO₂ causing much of the particle pollution has fallen dramatically - in the EU by about 50 percent since 1980 and in the US by about 37 percent since 1970. This has been achieved: 1) by reducing consumption of fossil fuels, especially high-sulfur coal; 2) by using smoke scrubbing equipment on power plant smokestacks; 3) by increasing energy efficiency.

The political decision to limit sulfur emissions is closely linked to the question of acid rain. The fear of acid rain proved to be grossly exaggerated. The SO reduction efforts turned out to be reasonable because they helped to reduce the particle pollution.

Part 2

However, reductions in urban areas have several other causes. Historically, a move away from sitting power plants in urban areas and the use of taller smokestacks were two of the primary causes of pollution reduction. At the same time we no longer use coke ovens and we have reduced our dependence on oil central heating, having instead changed to natural gas and district heating. Finally, cars pollute much less because of catalytic converters. The diesel vehicles now use low-sulfur diesel oil. However, compared to gasoline cars, diesel cars pollute much more. Although diesel cars make up only 6 percent of the total car park, they contribute 92 percent of all vehicle emissions. Thus, a marked increase in the use of diesel cars could slow the decline in particulate emissions.

Specialist literature has contained a lot of discussion about the degree to which legislation has been crucial to the reduction of air pollution. Many studies have not been able to document any noteworthy effect.

In a study of three US cities, it was found that the mandated pollution control had an effect, but that the effects of regulatory control “generally have been overshadowed by the effects of economic changes, weather and other factors.” Generally it is probably fair to say that regulation is one of the reasons for the reduction of pollution but that other, technological factors also play a major role.

In conclusion, it is worth emphasizing that particle pollution is the most important air pollutant, and consequently the most important pollutant of all.

VOCABULARY 1

Airborne	Воздушный	Urban	Городской
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Particle	Частица	Partly	Частично
Sulfur	Сера	Dramatically	Совершенно
Contribute	Способствовать	Consumption	Потребление
Coughing	Кашель	Fossil	Ископаемое
Respiratory	Дыхательный	Fuel	Топливо
Lang	Легкие	High-sulfur	Высокосернистый
To enter	Проникать	Coal	Уголь
Combustion	Горение	Smokestack	Дымовая труба
Stove	Печь	Decision	Решение
dust	Пыль	Fear	Опасения
although	Хотя	Grossly	Чрезвычайно
Man-made	Искусственный	To exaggerate	Преувеличивать
Reasonable	Разумный	To gain a foothold	Укрепить
Mechanical wear and tear	Износ	Smoke scrubbing	Воздухоочистительные

EXERCISE 1.

Найдите эквиваленты в тексте: различать оказываемое влияние, различные формы загрязнения, предполагается, весьма распространенные, значительное уменьшение, увеличение эффективности потребления энергии, полностью овладеть умами людей, ограничить выброс серы, рассмотреть позднее, оказаться разумными, намного больше.

EXERCISE 2.

Составьте список мер, принятых в защиту окружающей среды. Подтвердите словами из текста, насколько они оказались эффективными.

EXERCISE 3.

Составьте список источников загрязнения воздуха.

EXERCISE 4.

Ответьте на вопросы: 1. When have we understood how dangerous air pollution is? 2. What two main problems do we have today? 3. Where do air particles

come from? 4. What measures have been taken recently to reduce particle levels? 5. Did these reduction efforts turn out to be efficient?

EXERCISE 5.

Согласны ли вы с кратким выводом по содержанию предыдущего текста:
Air pollution is not a new problem getting worse, but an old problem getting ever better.

VOCABULARY 2

Area	Район	Crucial	Ключевой
Reduction	Уменьшение	Noteworthy effect	Заслуживающий внимания эффект
Cause	Причина	Mandate control	Полномочный контроль
A move away	Перемещение	To overshadow	Омрачать
Coke oven	Коксовая печь	To emphasize	Подчеркивать
Dependence	Зависимость	Consequently	Вследствие
Catalytic converter	Каталитический дожигатель	Benefit	Преимущество, польза
Diesel vehicle	Дизельные машины	Stem	Происходить
Gasoline car	Машины, использующие бензин	Unambiguously	Недвусмысленно
Emission	Выделение	Substantial	Основной, главный
Decline	Упадок	Drastically	Радикально
legislation	Законодательство	conclusion	Заключение

EXERCISE 1.

Найдите эквиваленты в тексте: быть вызванным рядом других причин, исторически сложиться, отказ от дальнейшего использования, система местного отопления, не быть больше зависимым настолько, система централизованного отопления, дизельное топливо с низким содержанием серы, отмеченный рост, замедлить снижение выброса частиц, специальная литература, изобиловать

спорами, степень значительности законодательства, не быть в состоянии зафиксировать, было бы справедливо отметить.

EXERCISE 2.

Перечислите другие меры, повлекшие снижение уровня частиц в атмосфере.

EXERCISE 3.

Изложите свое мнение об эффективности роли законодательства и правительства, используя слова текста. Насколько эффективно внедрение и осуществление полномочного обязательного регулярного контроля за уровнем загрязнения окружающей среды? Что же является решающим фактором в борьбе за экологию?

EXERCISE 4.

Составьте фразы, соответствующие содержанию текста.

	three	
1. There are have been	two	main problems of air pollution.
	one	

	small	
2. The	large	air pollution comes from dust, mechanical wear and tear.
	slightly large	

	lower	
3. The use of	taller	smokestacks was the cause of pollution reduction.
	medium-size	

		natural gas heating.
4. The cleanest type of heating is		oil central heating.
		district heating.

		gasoline cars.
5. The cleanest cars are		diesel cars.
		low-sulfur diesel cars.

The technological factor	
6. The mandated pollution control	plays a major role in pollution reduction.
The legislation	

Text B. Lead

Lead was widely used even in antiquity because it was so easy to shape or mould into vessels and pipes. The Romans used a lot of lead in their water supply systems, and women used pulverized lead as makeup. Throughout the Middle Ages, lead was also widely used, mostly as an additive to make sour wine drinkable - often with painful, sometimes even fatal after-effects. In modern times, lead has proven an extremely useful metal in crystal glass, ceramic glazing, white paints, ammunition and printer's type. When the motor car came on to the scene, lead batteries provided electrical power, and lead was added to petrol to increase its octane rating.

Unfortunately, lead is also extremely toxic. Several scientists believe that the Roman upper class suffered from permanent lead poisoning because they drank water from lead pipes and used lead-based mugs, vessels and beauty creams. This have led to birth defects and widespread physical impairment and consequently have contributed to the fall of the Roman Empire.

It has been known for a long time that high concentrations of lead in the bloodstream can cause cramps, coma and death.

Globally about 90 percent of lead emissions comes from lead added to petrol. The leaded petrol now represents 2.2 percent of total lead consumption. The US started phasing out lead in gasoline in 1973 and they essentially completed the task in 1986. In the UK, a reduction was started in 1981 and in 1985 the allowed lead contents in gasoline had been reduced by two-thirds. Today, all US gasoline is unleaded, and 75 percent of the gasoline sold in the UK is unleaded too. The consequence for lead concentrations has been enormous.

The US Environmental Protection Authority estimates considerable benefits from this dramatic decline in lead pollution. It is estimated that about 22,000 deaths are avoided every year, which is about 1 percent of all deaths.

These figures are surprisingly large and demonstrate the amazing air pollution improvement. For the second worst air pollutant, the last 15-20 years have seen lead concentration levels falling dramatically by 80-97 percent.

VOCABULARY

Lead	Свинец	Ammunition	Боеприпасы
To mould	Формовать	Battery	Аккумулятор
Vessel	Сосуд	Mug	Кружка
Pipe	Труба	Permanent	Постоянный
Pulverized	Порошкообразный	Impairment	Ухудшение
Additive	Добавка	Bloodstream	Кровообращение
Sour	Кислое	Cramp	Судорога
Crystal glass	Хрусталь	To phase out	Постепенно свертывать
Ceramic glazing	Гончарный обжиг	Complete	Полный
leaded	Освинцованный	Likewise	Подобно
To avoid	Избегать	Improvement	Улучшение
After-effect	Последствия	Octane rating	Октановое число

EXERCISE 1.

Найдите эквиваленты: система водоснабжения, широко используемый, в настоящее время, с появлением автомашин, проявить себя как чрезвычайно необходимый, легко принимающий форму, это привело, допустимое содержание, значительная польза, что составляет около одного процента, удивительное улучшение состояния воздуха.

EXERCISE 2.

Перечислите положительные свойства свинца.

EXERCISE 3.

Перечислите области применения свинца в античности, в средние века, в Римской империи, а также в настоящее время.

EXERCISE 4.

Найдите предложения в тексте, указывающие на токсичность свинца и степень его влияния на здоровье человека.

EXERCISE 5.

Насколько вредно использование свинца в составе бензина?

EXERCISE 6.

Найдите в тексте предложения, подтверждающие эффективность мер по снижению загрязнения воздуха частицами свинца.

EXERCISE 7.

Ответьте на вопросы: 1. What are advantages of lead as a metal? 2. Where and how is lead used today? 3. Why is it dangerous for our health? 4. Where does 90 % of lead emissions come from? 5. How effective were the efforts made against the second worst air pollutant?

EXERCISE 8.

Составьте фразы, соответствующие содержанию текста:

	in water supply system.
1. Pulverized lead is used	as make-up.
	to form vessels.

	to increase its octane rating.
2. Lead is added to petrol	to decrease its octane rating.
	to make it ecologically cleaner.

	coma and death.
3. The high concentration of lead in the bloodstream can cause	respiratory disease.
	heart disease.

	easy	
4. Lead is	difficult	to shape or mould.
	impossible	

Text C. Sulfur dioxide

The regulation of SO₂ emissions was primarily a consequence of the anxiety in the 1980s about acid rain and its effect on forests and lakes. Even though it later

proved that the effect on forests was extremely slight or even non-existent, regulation had the positive side-effect that it reduced particle emissions. When SO₂ is emitted during combustion, part of the gas will oxidize and condense around tiny, unburned condensation nuclei to form particles. The greatest advantage of SO₂ emission reductions lies in avoiding these particles.

In addition, SO₂ damages buildings and cultural objects such as statues. Metal corrodes much faster. Marble and sandstone are damaged because SO₂ is converted into sulfuric acid which gradually eats away the stone. In the major US study the overall effect was found to be relatively minor. Sulfur dioxide can also reduce visibility, either as a light mist or as a dense gray smog like the smog familiar to Londoners. The cost of the reduced visibility in 1990 can be estimated at \$12 per person in the US.

Finally, when SO₂ is deposited it actually makes a free contribution to the fertilization of forests and agricultural crops in particular. This contribution is estimated to be worth some \$500 million annually in the US. In Denmark, where sulfur pollution was the highest, crops needing lots of sulfur (such as oilseed rape and cabbage) had their requirements covered through pollution. It is today unnecessary to give these crops extra sulfur.

In 1979 the Long-Range Transboundary Air Pollution convention was adopted in Helsinki, coming into force in 1983. First, in 1985 a strict protocol was signed, obliging European governments to reduce their emissions by 30 percent by 1993. But European emissions had already been on the decrease since 1975. The reduction has been achieved by changing to other sources of energy, using less sulfurous coal and the general use of smoke cleansing. European Union emissions have been declining steadily since 1980. The emissions are expected to decline further, to a total reduction of more than 75 percent by 2010.

VOCABULARY

Anxiety	Тревога	Sandstone	Песчаник
Exposed	Беззащитный	Sulfuric acid	Серная кислота
Slight	Хрупкий	Sulfur dioxide	Диоксид серы
To oxidize	Окисляться	Visibility	Видимость
To condense	Конденсировать	Mist	Туман
Condensation	Конденсация	Roughly	Небрежно

Side-effect	Побочный эффект	To deposit	Образовывать налет, отлагаться
Nuclei	Ядро	Fertilization	Удобрение
To corrode	Ржаветь	Oilseed rape	Масличный рапс
Marble	Мрамор	Requirement	Требования
Cleansing	Очистительный	Steadily	Постоянно
Amendment	Поправка	Transboundary	Трансграничное

EXERCISE 1.

Найдите в тексте ответы на следующие вопросы: 1. Насколько важна роль диоксида серы в образовании кислотных дождей? 2. Как образуются частицы диоксида серы? 3. В результате чего было достигнуто снижение загрязнения диоксидом серы? 4. Назовите положительное последствие от загрязнения диоксидом серы? 5. Перечислите виды отрицательного воздействия диоксида серы на окружающую среду?

EXERCISE 2.

Найдите эквиваленты: вступить в силу, быть подписанным, другие источники энергии, иметь побочный эффект, образование частиц, бесплатное удобрение, быть оцененным стоимостью в, относительно маленький, удовлетворить потребности, незащищенные регионы, знакомый лондонцам, повсеместное использование оборудования по очистке дыма.

EXERCISE 3.

Найдите и переведите названия трех основных международных документов, принятых в защиту от данного загрязнителя?

EXERCISE 4.

Составьте фразы, соответствующие содержанию текста.

	the fertilization.
1. Sulfur dioxide makes a free contribution to	industry development.
	emission reduction.

	combustion.
2. Sulfur dioxide is emitted during	condensation.
	oxidization.

	sulfuric dioxide.
3. Sulfur dioxide is converted into	particles.
	gas.

	pollution.
4. Sulfur dioxide can reduce	visibility.
	fertilization.

Text D. OZONE

Ozone forms a vital layer in the stratosphere, which protects us against ultraviolet rays from the sun. However close to the Earth ozone is harmful to humans and affects plant growth. Ozone irritates the respiratory organs, causes rubber to disintegrate and negatively affects plant growth. Ozone is a secondary pollutant, because it is primarily created in a complex interplay between NO_x and hydrocarbons. Ozone and the NO_x are the major players in the formation of brown (photochemical) smog of the kind familiar in Los Angeles. This brown smog is seen today in many cities in the developing world.

Ozone is not believed to have any actual life-threatening effect. The UK experts on Air Quality Standards “found no evidence that exposure to the levels of ozone are likely to lead to long term damage to the respiratory system.” On the other hand, it has a substantial impact on agriculture and horticulture. It is believed that the most significant economic damage from pollution is experienced by these industries. Ozone can, however, also reduce the risk and effect of fungal attacks.

Ozone pollution is generally measured in peak concentrations the most dangerous for health and vegetation effects. In the US, maximal ozone concentrations have declined since 1977 by almost 30 percent. Ozone levels have not been consistently monitored at the national level in the UK. In the 1997 UK ozone review, it was concluded that there was clear evidence of a reduction in peak concentrations.

For agriculture, it is estimated that all 15 countries in the EU will experience a decrease in crop ozone exposure. On average, the exposure level will have decreased from 1990 to 2010 by about 25 percent.

VOCABULARY

SO ₂ sulfur dioxide	Двуокись серы	Evidence	Доказательство
Vital	Жизненный	Exposure	Выставление на солнце
Layer	Слой		
Ultraviolet	Ультрафиолетовый	Fungal attack	Грибковое поражение
Ray	Луч		
Hole	Дыра	Horticulture	Садоводство, огородничество
To irritate	Раздражать		
Rubber	Резина	To monitor	Советовать, рекомендовать
To disintegrate	Расщеплять		
Interplay	Взаимодействие	To encounter	Столкнуться

EXERCISE 1.

Найдите в тексте ответы на следующие вопросы: 1. Назовите отрасли экономики, испытывающие негативное влияние озонового загрязнения? 2. Может ли озон оказывать какое-либо воздействие на организм человека? 3. Назовите основные отрицательные последствия от влияния озона на окружающую среду? 4. Что представляет собой озоновый слой? 5. Наряду с двуокисью азота в образовании какого вида загрязнения городов принимает участие озон?

EXERCISE 2.

Найдите эквиваленты: значительный ущерб, очевидное доказательство, данные о максимальной концентрации, комплексное взаимодействие, долгосрочное нарушение деятельности, действительно угрожающее жизни воздействие, уменьшение воздействия озона на урожай.

EXERCISE 3.

Составьте фразы, соответствующие содержанию текста:

	ultraviolet rays.	
1. Ozone protects against	X-rays.	
	violet rays.	

	will have decreased	from 1990 to 2010 by about 25 percent.
2. On average the ozone exposure level	will have increased	
	will have been constant	

	registered.
3. Ozone levels have been consistently	monitored.
	written.

	agriculture.
4. Ozone has a substantial impact on	textile.
	utility market.

	harmful	
5. Ozone is	good	to humans.
	useful	

Unit 5. FOREST DEATH**Text A. Acid rain**

Acid rain was the great horror of the 1980s. We saw the sick and dying trees on the TV news. It was told that acid rain was killing our forests. Looking at publications from the 1980s we will see that they did not spare their readers. Acid rain was the “invisible plague” which was creating an “ecological Hiroshima”. The UN Brundtland report stated that “in Europe, acid precipitation kills forests”. Several present-day ecology books repeat the charge. A popular book published in 1989 with the title *Acid Rain: Threats to life* told us:

“An acid plague is sweeping the Earth. The rain, snow, fog, and mist have become acid because of pollution from factories and cars all over the world, and it has been converted to acid rain.

Acid rain destroys our buildings and statues but it is also threatens the natural environment.

One third of the German forests have been attacked, so the trees are either dead or dying.

4000 Swedish lakes are dead and 14,000 are in the process of dying...

In cities all over the Earth, people are being suffocated – or - dying - because the smoke cannot escape...

Acid rain has become one of the most serious threats to life here on Earth”.

Today we know that acid rain wasn't so dangerous. “Acid rain” has typically been used as a collective term for damage to forests, lakes and buildings believed to be caused by emissions of NO or sulfur dioxide. In fact all rain, even before industrialization, has been naturally acidic. The expression acid rain is associated with the extra acid that arises when NO or sulfur dioxide reacted with water create sulfuric or nitric acid.

VOCABULARY

To spare	Беречь, жалеть	To suffocate	Задыхаться
Plague	Чума, бедствие напасть	A bit shrill	Немного резкий
To flat out	Изощряться	To make out	Различить, жить
Precipitation	Выпадение осадков	Nitric acid	Азотная кислота
To repeat the charge	Повторить обвинение	Fog	Туман, дымка, мгла, завеса
To sweep	Уничтожать	Mist	
To convert	Преобразовывать	Sulfuric acid	Серная кислота

EXERCISE 1.

Соответствуют ли следующие высказывания содержанию текста:

- Acid rain was the great horror of the 1990s.
- Acid rain was killing our animals.
- An acid plague is sweeping the Moon.
- People are enjoying because the smoke can't escape.

- NO or sulfur dioxide reacted with the water to create sulfuric or nitric acid.

EXERCISE 2.

Закончите предложения:

1. "Acid rain" has typically been used as a collective term	for damage to forests.
	for fertilization.
	for pollution.

2. "Acid rain" has typically been believed to be caused by emissions	of NO or sulfur dioxide.
	of lead.
	of oil and gas.

3. The extra acid could arise when NO or sulfur dioxide reacted	with water	to create sulfuric or nitric acid.
	with oxygen	
	with lead	

4. The expression acid rain has been associated	with the extra acid.
	with moderate acid.
	with average acid.

5.	The rain, snow, fog, and mist	have become acid because of pollution from factories and cars all over the world.
	The building and statues	
	The factories and the plants	

Text B. Forest Death

In the late seventies and early eighties, areas of central Europe were observed to be suffering extreme forest death. The hardest hit areas in Bavaria had up to 40 percent sick and dying trees. A group of German scientists predicted that Europe's forests were threatened by acid rain and 10 percent of all trees were at risk. Despite fierce criticism from other scientists, the images of the sick and dying trees reached all round the world, sowing anxiety both in other European countries and in the US.

The fear of and assertions about acid rain led to numerous scientific investigations. The official American acid rain project, the National Acid Precipitation Assessment Program (NAPAP), became the world's biggest, longest and most expensive; it spanned most of a decade, involved about 700 scientists, and cost half a billion dollars. A whole series of questions were looked into in order to expose links between acid rain and forests, lakes and buildings.

We examine the results of one of NAPAP's long-term controlled experiments, in which seedlings from three species of trees were exposed to various concentrations of acid rain over a period of almost three years. The trees were cultivated in relatively poor soil in order to maximize any negative effects of the acid rain. No acid rain effect was detected on any of the three species of tree. Even with precipitation almost ten times as acidic as the average acid rain in the eastern US (pH 4.2) the trees grew just as fast. In fact many of the NAPAP's studies showed that trees exposed to moderate acid rain grew faster. Some even longer controlled experiments were carried out in Norway, and here too the conclusion was that the predicted negative effects of acid rain "could not be demonstrated." For this reason NAPAP's conclusion was that "the vast majority of forests in the U.S. and Canada are not effected by decline... Moreover there is no case of forest decline in which acidic deposition is known to be a predominant cause."

VOCABULARY

Hit	Известный	To detect	Обнаруживать
To predict	Предсказывать	Precipitation	Выпадение осадков
Fierce	Жесткий, лютой	Moderate	Умеренный
criticism	Критика	Seedling	Саженец
To sow	Сеять	Decline	Упадок, гибель
Assertion	Утверждение	Deposition	Осадок
To span	Длиться, простираться	Predominant	Преобладающий
To expose	Подвергать воздействию	Vast majority	Подавляющее большинство

EXERCISE 1.

Расскажите об экологической программе NAPAP. Кто принимал в ней участие? На какой период времени она была рассчитана? Какие денежные средства были затрачены на ее реализацию? Проводились эксперименты по изучению вредного воздействия чего? Какова была их продолжительность? Проводилось изучение воздействия осадков какой концентрации?

EXERCISE 2.

Ответьте на следующие вопросы: 1. Когда опасность кислотных дождей стала восприниматься как первостепенная угроза лесам? 3. В каких странах проводились исследования по изучению вредного воздействия кислотных дождей? 4. Выскажите свою точку зрения о воздействии кислотных дождей на леса, используя факты из текста.

EXERCISE 3.

Найдите эквиваленты: умеренный кислотный дождь, в начале 70-х годов, подвергаться риску, нет ни одного случая, быть основной причиной, в конце 60-х годов, продолжаться более одного десятилетия, сеющий страх.

EXERCISE 4.

Составьте фразы, соответствующие содержанию текста:

1. The National Acid Precipitation Assessment Program (NAPAP) became	the world's biggest, longest and most expensive.
	the world's smallest, shortest and cheapest.
	the world's biggest and cheapest.

2. The National Acid Precipitation Assessment Program (NAPAP) spanned	most of a decade.
	most of the century.
	most of the month.

3. The National Acid Precipitation Assessment Program (NAPAP)	involved about 700 scientists and cost one thousand dollars.
	involved about 700 scientists and cost half a billion dollars.
	involved about 100 scientists and cost half a billion dollars.

4. The trees were cultivated in relatively	poor soil	in order to maximize any negative effects of the acid rain.
	rich soil	
	average soil	

5. The seedlings from three species	of trees	were exposed to various concentrations of acid rain over a period of almost three years.
	of animals	
	of flowers	

EXERCISE 5.

Согласны ли вы с краткими выводами по содержанию предыдущего текста:

- Unfortunately, the myth of forests killed by acid rains lives in many places.
- It is stated quite casually how personal health problems are turning into public environment issues.
- It is simple to write ‘Sulfur in the atmosphere produces acid rain. Acid rain kills forests. But not borne out by the evidence’.

Text C. Other causes of Forest Death

It has turned out that forest death never actually affected more than 0.5 percent of the overall European forest area. It also turns out that the substantial local forest death in Bavaria, Poland and the Czech Republic was due not to acid rain but to local pollution. Localized pollution has been regulated locally, unlike acid rain which crosses national boundaries. SO₂ emissions have been reduced 30 percent in Germany and 50 percent in both Poland and the Czech Republic. Local SO₂ concentrations decreased 50-70 percent over just seven years from 1989.

The growth of European forest has not been reduced, as the theories about acid rain had predicted. “During the past few decades, forest growth has strongly increased over large parts of Europe”, concludes a Dutch study. Since the 1950s trees have begun to grow faster and faster. It is due to the fact that part of the trees fertilization requirement is provided for by nitrogen pollution.

Large-scale reports are prepared now about the health of various species of trees in Europe. The proportion of trees with heavy foliage loss and the proportion of discolored trees is measured. This proportion grew dramatically from the first reports

in 1983 and led to panic. However, this was due to a change in the method of calculation.

Today, the proportion of trees showing heavy foliage loss is over 25 percent. Many people claim that our forests are in a bad state. According to frequently advanced theory, the pollution does not directly cause damage to the trees, but it weakens the trees' resistance, making them more susceptible to insect attack, frost and drought. The effect of this pollution can be indirect and delayed. However, there is very little or no correlation between the polluted areas and the forest death.

The European Environment Agency concludes that "a causal connection cannot... be established between an input of acid deposition... and observed foliage reduction». The monitoring results show an increasing defoliation, but it may be due to the aging of the monitored tree stands.

German scientist has analyzed photographs of forest areas taken 30-60 years ago and found that the proportion of damaged trees was the same. Foliage loss is a non-specific expression that applies to numerous specific, familiar diseases.

VOCABULARY

Substantial	Значительный	Correlation	Взаимоотношение
Nitrogen	Азот	Deposition	Осадок
Foliage	Листва	Defoliation	Опадение листвы
Understandably	Понятно	Aging=ageing	Старение
Drought	Засуха	Stand	Лесопосадка, лесонасаждение
Susceptible	Восприимчивый	To urge	Подстегивать,
To weaken	Ослаблять		подгонять

EXERCISE 1.

Найдите эквиваленты: контролируемый на местном уровне, локализованное загрязнение, не иметь ничего общего, значительно увеличиться, быть обеспеченным за счет, всеобъемлющий доклад, согласно одной часто выдвигаемой теории, истинность данной теории не так легко установить, часто выдвигаемые претензии, казаться поразительным.

EXERCISE 2.

Расставьте в правильном порядке названия следующих абзацев текста:

- Foliage loss is normal process.
- The trees continue to grow.
- The theory of acid rain damage.
- The panic reports.
- The natural death of forests.

EXERCISE 3.

Добавьте по одному предложению к каждому абзацу текста в соответствии с содержанием:

- The new methods show new results.
- Why do we consider these phenomena together?
- SO emissions have been reduced 34 percent in Bavaria.
- No more special fertilization is required.
- We carry out more detailed researches.
- This natural process is not taken into account.

EXERCISE 4.

Составьте предложения со следующими выражениями.

To increase up to ...%	Увеличить до ...%
Decrease of ...%	Уменьшение в ...%
By ...%	На ...%
The ...% increase	...% (процентное увеличение)
A guarantee for ...% of	Гарантия на ...% от
To increase it to ...%	Увеличить это до ...%

Unit 6. WATER POLLUTION

Text A. Oil pollution in the oceans

On the subject of ocean pollution, it is traditional to quote Thor Heyerdahl. In 1947, he traversed the Pacific on his Kon Tiki expedition, without catching sight of people, ships or rubbish for weeks. On his second expedition in 1970, when he crossed the Atlantic with his boat the Ra II, he saw “far more oil lumps than fish.” Heyerdahl concluded: “It became clear to all of us that man-kind really was in the

process of polluting its most vital wellspring, our planet's indispensable filtration plant, the ocean.”

But the oceans are so incredibly big that our impact on them has been astoundingly insignificant - the oceans contain more than 1,000 billion billion liters of water. The UN's overall evaluation of the oceans concludes: “The open sea is still relatively clean. Low levels of lead, synthetic organic compounds and artificial radionuclides, though widely detectable, are biologically insignificant. Oil slicks and litter are common along sea lanes, but they are a minor consequence to communities of organisms living in open-ocean waters”. The lumps of oil are numerous. It is estimated that in 1985: 1) about 60 percent of the marine sources of oil pollution came from the routine tanker transport operation; 2) about 20 percent came from regular oil spills of the kind we see on TV; 3) about 15 percent come from natural oil seepage at the bottom of the sea.

Routine oil pollution is due to the fact that tankers use sea water in their tanks as ballast when they sail without oil. The oil remnants get mixed into the ballast water, which on arrival gets flushed out into the harbor. Several international agreements have regulated and to a large degree reduced the extent of routine oil pollution. They demanded by law new techniques for the handling of ballast water, e.g. exploiting the fact that water and oil separate (ensuring that only the bottom layer of water is poured out on arrival), removing the last remnants of oil in the tanks (by cleaning the tanks with oil instead of water). They also demanded improved waste facilities in port and separate water ballast tanks.

Natural oil spills originate from cracks in the bottom of the sea above oil reserves. The mankind's exploitation of oil has relieved the pressure on many oil pockets and reduced the natural leak of oil. However, these two sources of oil pollution has not been documented over time.

Most tanker accidents occur close to land and the large spills affect the local fauna and flora. We are all familiar with the typical TV news scenario: oil-laden birds expiring before our eyes on the evening news, black-coated seals, the frantic cleanup efforts to avoid ecological catastrophe, and afterwards the massive bill. Several reports begin to question whether these efforts are worth the hefty price tag.

The oil is a naturally occurring substance. During a short period, most of the oil will evaporate, degrade biologically and chemically, or form relatively harmless lumps of tar. The British official monitoring program in 1993 found that “by 1994 the contamination levels had fallen to the levels observed at sites remote from contamination.”

VOCABULARY

To traverse	Пересекать	Oil slick	Пятно нефти
Rubbish	Мусор	Sea lane	Морской путь
Oil lump	Большое количество нефти	Consequence	Последствия
Wellspring	Устье скважины, самоизлив нефти	Community	Сообщество, группа
Indispensable	Необходимый	Oil spill	Разлив нефти
Filtration plant	Оборудование для фильтрации	Oil seepage	Просачивание, выход нефти
Impact	Влияние	Sediment erosion	Размывание осадочной породы
Astoundingly	Поразительно	Ballast	Балласт
Compound	Компонент	Oil remnant	Остаток нефти
detectable	Обнаруживаемый	Flushed out	Прогонять, сгонять
Harbor	Гавань, порт	Extent	Пространство, расширение
To exploit	Эксплуатировать	To pour out	Выливать
Waste facilities	Оборудование по переработке отходов	To originate	Давать начало, породить
To relieve	Помогать, освобождать	Leak	Утечка
Oil pocket	Нефтесборник	Presumably	Предположительно
Oil-laden	Отяжеленный нефтью	Frantic	Неистовый
To expire	Гибнуть	Price tag	Ценники на нефть
crack	Трещина	Hefty	Большой, огромный

EXERCISE 1.

Найдите переводы, соответствующие словосочетаниям на английском языке.

1. Sight of rubbish	A. Сливаться (быть слитым)
2. Routine tanker transport operation	B. Повседневная эксплуатация танкеров
3. To get flushed out	C. Остатки человеческой жизнедеятельности

4. Demanding by law	D. Потребовав от имени законодательства
5. To handle ballast water	E. утилизировать воду, использованную в качестве балласта
6. Exploiting the fact	F. Верхний слой
7. Extent of pollution	G. Расширение загрязнения
8. Bottom layer	H. Используя тот факт, что
9. Separate water ballast tanker	I. Танкер, спроектированный с отдельным размещением воды для балласта
10. Pressure on the oil pocket	J. Вымазанные нефтью тюлени
11. Natural leak	K. Естественная утечка
12. Black-coated seal	L. Давление на нефтесборники
13. Afterwards the massive bill	M. Огромные счета, получаемые впоследствии
14. Frantic cleanup efforts	N. Проникать из расщелин, образовавшихся на поверхности
15. To get mixed into	O. Вода и нефть не смешиваются друг с другом
16. Water and oil separate	P. Оправдывать высокую стоимость
17. To originate from cracks in the bottom	Q. Героические усилия по очистке
18. To be worth the hefty price tag	R. Смешиваться (быть смешанным)

EXERCISE 2.

Расставьте предложенные названия абзацев текста в правильном порядке:

- The natural properties of oil.
- Our impact on the ocean.
- Main sources of oil pollution.
- Tanker's operation and maintenance.
- The places of big oil pollution.

EXERCISE 3.

Добавьте в каждый абзац по предложению в соответствии с содержанием текста:

- It's an integral part of our planet life.

- We need new technologies to provide environmentally safe operation of tanker transport.
- Don't we pay too much for oil?
- We hope for the best.
- To sum up we can say that number of oil lumps increase.

EXERCISE 4.

Составьте фразы, соответствующие содержанию текста:

1. On the subject of ocean pollution, it is traditional to quote	Thor Heyerdahl.
	Charles Darwin.
	Jacques-Ives Cousteau.

2. The oceans are so incredibly big that our impact on them has been astoundingly	insignificant.
	important.
	considerable.

3. The lumps of oil are	numerous.
	insignificant..
	relatively few.

4. It is estimated that in 1985 about	60 percent	of the marine sources of oil pollution came from the routine tanker transport operation.
	40 percent	
	20 percent	

5. It is estimated that in 1985 about	40 percent	came from regular oil spills of the kind we see on TV.
	20 percent	
	5 percent	

6. It is estimated that in 1985 about	60 percent	come from natural oil seepage at the bottom of the sea.
	15 percent	
	80 percent	

EXERCISE 4.

Ответьте на следующие вопросы: 1. Please find and translate the opinion of Thor Heyerdahl. 2. What is the total picture of ocean pollution from different sources? 3. Please explain, how do the tankers pollute the ocean water? 4. What measures should be taken in order to avoid this pollution? 5. What are two main natural sources of oil pollution? 6. What consequences can the tankers' accidents result in? 7. Is oil a naturally occurring substance?

Text B. Pollution in coastal waters

As far as people are concerned, one of the most relevant indicators of coastal water quality is its health risk. Water contaminated with bacteria, viruses, protozoans, fungi and parasites can cause ear or skin infections on contact. The inhalation of contaminated water can cause respiratory diseases. These pathogens typically live in the intestines of warm-blooded animals and are shed in their feces.

It is often difficult to analyze the presence of the many possible pathogens. Most regulations use concentrations of easily analyzed fecal bacteria as indicators of contaminated water. Earlier, contaminated water often came from unregulated sewers. Today, with well-regulated sewage treatment, most contamination happens because of sewage overflows and polluted storm water runoff.

Coastal waters are also the habitat for large populations of flora and fauna. The most conspicuous problem is oxygen depletion – so called hypoxia - and algae blooms that occur in many parts of the world. This condition was described as the UN's main worry about coasts in the world:

“The rate of introduction of nutrients, chiefly nitrates but sometimes also phosphates, is increasing”. The areas of eutrophication are expanding, along with enhanced frequency and scale of unusual plankton blooms and excessive growth. Two major sources of nutrients to coastal waters are sewage disposal and agricultural runoff from fertilizer-treated fields and from intensive stock raising.

VOCABULARY

Bacteria	Бактерия	Sewer	Сточная труба
Fungi	Грибки	Runoff	Наводнение
Protozoan	Простейшее животное	Sewage treatment	Обработка сточных вод

Parasite	Паразиты	Fecal	Фекальный
Inhalation	Ингаляция, вдыхание	Protein	Белок
Pathogen	Патогенный микроорганизм	Algae bloom	Цветение водорослей
Intestine	Кишечник	Conspicuous	Заметный
To shed	Сбрасывать	Depletion	Истощение
Feces	Фекалии	Hypoxia	Гипоксия
Eutrophication	Эутрофикация	Enhanced	Усовершенствованный

EXERCISE 1.

Ответьте на следующие вопросы: 1. What is the most relevant indicator of water quality? 2. What diseases can cause contaminated water? 3. What pathogens can be easily analyzed as indicators of contaminated water? 4. What do the contaminated water come from most often? 5. What is the importance of coastal waters? 6. What are the most conspicuous problems due to water contamination?

EXERCISE 2.

Найдите эквиваленты следующих выражений: что касается людей, передающаяся при контакте инфекция, трудно обнаружить присутствие, чаще всего происходит, переполнение стоков, затопление грязной водой в результате штормов, среда обитания больших популяций, легко исследуемые, большинство нормативных актов, основываться на показателе концентрации.

EXERCISE 3.

Составьте фразы, соответствующие содержанию текста:

1. As far as people are concerned, one of the most relevant indicators of coastal water quality is	its health risk.
	its chemical pollution.
	its clarity.

2. Most regulations use concentrations of easily analyzed	viruses	as indicators of contaminated water.
	fecal bacteria	
	protozoans	

3. The areas of eutrophication are	expanding.
	decreasing.
	the same.

Text C. Health effects from fertilizer

Synthetic fertilizer has allowed a vast increase in food production. The Swedish Academy of Sciences awarded the Nobel Prize for Chemistry to Fritz Haber in 1919. They argued that Haber had created “an exceedingly important means of improving the standards of agriculture and the well-being of mankind.”

Today, it is estimated that 40 percent of all crop nitrogen comes from synthetic fertilizer, and about one-third of human protein consumption depends on synthetic fertilizer. Moreover, fertilizer allows us to produce more food on less farmland. This is one of the reasons why the global population could double from 1960 to 2000 and get better fed, although farmland area only increased 12 percent. The extraordinary increase in fertilizer availability made possible to avoid a dramatic increase in human pressure on other natural habitats. If fertilizer use had remained at 1960 level, we would need at least 50 % more farmland than the present day use – the equivalent of covering almost a quarter of the global forests.

Fertilizer makes up the main part (about 75%) of the extra nitrogen release.

The two global nitrogen problems are nitrous oxide contributing to global warming and ozone depletion. However, nitrous oxide’s contribution to global warming is only about one-tenth that of CO₂. The latest nitrogen review concluded that “both fossil fuel burning and the direct impact of agricultural fertilization have been considered and rejected as the major source “of nitrous oxide.

In the 1980s nitrates in the groundwater came very much into focus. The Danish environment minister, Christian Christensen, stated flatly that nitrate pollution had serious consequences because:

“a clear relationship has been established between stomach cancer and high levels of nitrates in drinking water. And many infants are in direct danger because they get much of their water from their food. This can result in slow asphyxiation because excessive nitrate inhibits the blood’s absorption of oxygen. Internal organs can also break down so that the children become ill or have difficulty concentrating. For this reason I do not dare to drink nitrate-polluted water and I will not allow my child to do so either.”

Most of the nitrates we consume come from vegetables, especially beets, celery, lettuce and spinach, which can give us between 75 and 100 mg of nitrates a day – vegetarians get more than 250 mg.

The Hypoxia Assessment identifies two main “options to reduce the nitrogen load.” First, fertilizer usage on agricultural lands could be reduced, both by a general reduction and through better fertilizer application and management, alternative crops and wider spacing of drains. Second, the creation of riparian zones and wetlands would diminish the nitrogen load. When water and nitrogen compounds flow through these areas, several microbiological processes turn significant amounts of the compounds back into N₂, effectively making it unavailable for further plant use.

VOCABULARY

Nitrous	Азотистый	To dare	Решаться
Nitrogen	Азот	Celery	Сельдерей
Flatly	Категорически	Lettuce	Салат
Consequence	Последствие	Spinach	Шпинат
Infant	Ребенок	To space	Оставлять промежутки
Asphyxiation	Удушье	Riparian	Прибрежный
Excessive	Чрезмерный	Wetland	Заболоченная территория
To inhibit	Запрещать	Absorption	Поглощение

EXERCISE 1.

Переведите следующие выражения: to come into focus, to have difficulty concentrating, wide spacing the drains, to make it unavailable.

EXERCISE 2.

Ответьте на вопросы: 1. Who did the Swedish Academy of Science award to the Nobel Prize for Chemistry in 1914? 2. What were the arguments of Swedish Academy of Science? 3. What is the main source of nitrogen? 4. Is fertilizer useful? 5. What are the two global nitrogen problems? 6. When did nitrates come into focus? 7. What are the consequences of nitrate pollution for our health? 8. Where do we consume nitrates from? 9. Identify, please, the main options to reduce the nitrogen load?

EXERCISE 3.

Найдите эквиваленты: обширный прирост в производстве продуктов питания; чрезвычайно важные средства; потребление белка человеком; вырасти в два раза; начать лучше питаться; территория сельскохозяйственных земель; лучшее использование удобрений; лучшее руководство процессом внесения удобрений; сделать недоступным; альтернативные зерновые культуры; превратить обратно в; прямое воздействие; стать центром внимания; подвергаться прямой опасности; трудно сосредоточиться.

EXERCISE 4.

Составьте фразы, соответствующие содержанию текста:

1. Synthetic fertilizer has allowed	a vast increase	in food production.
	a decrease	
	a small increase	

2. The Swedish Academy of Sciences awarded the Nobel Prize for Chemistry to Fritz Haber	in 1914.
	in 1991.
	in 1999.

3. Today, it is estimated that 40 percent of all crop nitrogen comes from	synthetic fertilizer.
	fossil fuel burning.
	the direct impact of agriculture.

4. Most of the nitrates we consume come from	vegetables.
	fruit.
	beverages.
5. Nitrates in the groundwater came very much into focus.	in the 1980s.
	in the 1990s.
	in the 2000s.
6. Fertilizer allows us to produce more food on	less farmland.
	more farmland.
	the same farmland.
7. The Danish environment minister, Christian Christensen, stated flatly that nitrate pollution had	serious consequences.
	insignificant consequences.
	unimportant consequences.

EXERCISE 5.

Согласны ли вы с кратким выводом по содержанию предыдущего текста:

Of course, to a certain extent we can use our fertilizer better and in the developed part of the world pay our way to avoid eutrophication, but we also need to ask whether this is the best allocation of our scarce resources.

Text D. Pollution in rivers

From a global point of view, rivers are important because they are major suppliers of water for drinking, personal hygiene purposes, industry and agriculture. In as far as water is used to drink, it is absolutely vital that it does not contain too many coli bacteria, because this would indicate the presence of other, more serious bacteria and viruses.

The fecal pollution starts to increase. Rivers in Australia, Japan, and the US all have fairly high coliform levels. However, when countries get rich enough they use groundwater to a much greater extent. It diminishes the urgency and political inclination to push for ever lower fecal pollution levels. Nevertheless, the conclusion

remains true for the large majority of countries that depend on rivers for drinking water. At the outset richer means more polluted rivers, but beyond a fairly low level. Richer actually implies less fecal pollution in the rivers.

Biologically speaking, however, the level of oxygen is a much more important measure of water quality than fecal coliform. Dissolved oxygen is absolutely essential for the survival of all aquatic organisms - not only fish but also invertebrates such as crabs, clams, zooplankton, etc. Moreover, oxygen affects a vast number of other water indicators, not only biochemical but esthetic ones like odor, clarity and taste. Consequently, oxygen is perhaps the most well-established indicator of water quality.

We have only looked at typical pollution indicators, such as coliforms and oxygen. But equally important, we may want to look at the aquatic levels of chemical pollution. Here we see the same pattern as in the coastal areas. In the US, a National Contaminant Biomonitoring Program has examined the presence of long-lived toxic contaminants in the aquatic environment through analysis of fish. Fish were selected because they tend to accumulate pesticides. The European starling was chosen because of its varied diet and wide geographic distribution.

Summing up rivers probably experience better water quality as income increases. This tendency towards improved oxygen levels has also been confirmed when analyzing more than 200 European rivers. Moreover, general quality measures for both the UK and the US show better river water quality. Persistent pollutants in fresh waters have been decreasing dramatically. When measured nationally through fish in the US or through herring gull eggs in the Great Lakes, pollutant concentrations have declined 80-90 percent.

VOCABULARY

Fecal coliform	Фекальные коли-бактерии	Fairly	Довольно, в некоторой степени
Coli bacteria	Коли-бактерии	Hygiene	Гигиена
Virus	Вирус	Dissolved	Растворенный
Urgency	Безотлагательность	Aquatic	Водяной
Inclination	Склонность, тенденция	Contaminant	Загрязняющее вещество
To push for	Настаивать	Clam	Морской моллюск
Nevertheless	Тем не менее	Odor	Запах
At the outset	Вначале	Clarity	Прозрачность

Beyond	В пределах, вне	Pattern	Образец
Pesticide	Пестицид	Invertebrate	Беспозвоночные
Starling	Скворец	Herring gull	Серебристая чайка

EXERCISE 1

Переведите следующие выражения: lower fecal pollution levels, we may want to look.

EXERCISE 2.

Ответьте на вопросы: 1. Why are rivers important? 2. Why is it vital to determine the continece of coli bacteria in water? 3. Do the rich countries pollute less their rivers? 4. What are two important measures of water quality? 5. What is the second important measure of water quality? 6. Why does oxygen affect a vast number of water indicators? 7. What are esthetic indicators of water quality? 8. How can we determine the aquatic levels of chemical pollution? 9. How has a National contaminant Biomonitoring Program examined the presence of long-lived toxic in the aquatic environment? 10. What is the interconnection between the water quality ant the increased incomes? 11. What is the main tendency of the last decades?

EXERCISE 3.

Найдите эквиваленты: в большом масштабе, настаивать на, с мировой точки зрения, для целей личной гигиены, уровни загрязнения воды химикатами, основной поставщик, намного более важный, самый признанный, устойчивый, токсичные загрязнители, разнообразная диета, подводя итоги, постоянные загрязнители, иметь склонность к накоплению, говоря с биологической точки зрения, большое количество.

EXERCISE 4.

Составьте фразы, соответствующие содержанию текста:

1. It is absolutely vital that water does not contain too many	coli bacteria.
	viruses.
	oil.
2. Dissolved oxygen is absolutely essential	for the survival of all aquatic organisms.
	for our well-being.

	for coli bacteria.
3. Esthetic indicators of water quality are	odor, clarity and taste.
	dissolved oxygen.
	coli bacteria.
4. Fish were selected because they tend to accumulate	pesticides.
	nitrates.
	oxigen.

Part II

Environmental Impacts of Renewable Energy Technologies

All energy sources have some impact on our environment. Fossil fuels - coal, oil, and natural gas - do substantially more harm than renewable energy sources by most measures, including air and water pollution, damage to public health, wildlife and habitat loss, water use, land use, and global warming emissions.

It is still important, however, to understand the environmental impacts associated with producing power from renewable sources such as wind, solar, geothermal, biomass, and hydropower.

The exact type and intensity of environmental impacts varies depending on the specific technology used, the geographic location, and a number of other factors. By understanding the current and potential environmental issues associated with each renewable energy source, we can take steps to effectively avoid or minimize these impacts as they become a larger portion of our electric supply.

Vocabulary

1. Try to memorize the following words and phrases.

Impact	воздействие
Measure	мера
Substantially	по существу

Wildlife	живая природа
Habitat	среда обитания
Emission	выбросы
Issue	вопрос
To avoid	избежать
Portion	часть
Supply	поставка

UNIT 1. Wind Power

Harnessing power from the wind is one of the cleanest and most sustainable ways to generate electricity as it produces no toxic pollution or global warming emissions. Wind is also abundant, inexhaustible, and affordable, which makes it a viable and large-scale alternative to fossil fuels.

Despite its vast potential, there is a variety of environmental impacts associated with wind power generation that should be recognized and mitigated.

TEXT A. Land Use

The land use impact of wind power facilities varies substantially depending on the site: wind turbines placed in flat areas typically use more land than those located in hilly areas. However, wind turbines do not occupy all of this land; they must be spaced approximately 5 to 10 rotor diameters apart (a rotor diameter is the diameter of the wind turbine blades). Thus, the turbines themselves and the surrounding infrastructure (including roads and transmission lines) occupy a small portion of the total area of a wind facility.

A survey by the National Renewable Energy Laboratory of large wind facilities in the United States found that they use between 30 and 141 acres per megawatt of power output capacity (a typical new utility-scale wind turbine is about 2 megawatts). However, less than 1 acre per megawatt is disturbed permanently and less than 3.5 acres per megawatt are disturbed temporarily during construction. The remainder of the land can be used for a variety of other productive purposes, including livestock grazing, agriculture, highways, and hiking trails. Alternatively, wind facilities can be

sited on brownfields (abandoned or underused industrial land) or other commercial and industrial locations, which significantly reduces concerns about land use.

Offshore wind facilities, which are currently not in operation in the United States but may become more common, require larger amounts of space because the turbines and blades are bigger than their land-based counterparts. Depending on their location, such offshore installations may compete with a variety of other ocean activities, such as fishing, recreational activities, sand and gravel extraction, oil and gas extraction, navigation, and aquaculture. Employing best practices in planning and siting can help minimize potential land use impacts of offshore and land-based wind projects.

Vocabulary

1. Try to memorize the following words and phrases.

land use	землепользование
to facilitate	облегчить
hilly areas	холмистые районы
approximately	приблизительно
rotor diameter	диаметр ротора
wind turbine	ветровых турбин
blade	лезвие, лопасть
surrounding infrastructure	окружающая инфраструктура
transmission lines	линии электропередачи
to occupy	занять
wind facility	ветер центр.
power output	выходная мощность
permanently	постоянно
remainder	остаток
livestock grazing	выпас скота
hiking trails	пешеходные тропы
brownfield	неиспользуемые земли
offshore wind facilities	оффшорные ветровые объекты
to compete	конкурировать
recreational activities	развлекательные мероприятия
gravel extraction	добыча гравия

Comprehension Check

2. Answer the following questions and give examples.

1. Why does the land use impact of wind power facilities vary?
2. What does the land use impact of wind power facilities substantially depend?
3. Do wind turbines occupy all land?
4. How can the remainder of the land be used?
5. Where can wind facilities be sited?
6. May offshore wind facilities become more common?
7. May they compete with a variety of other ocean activities?

TEXT B. Wildlife and Habitat

The impact of wind turbines on wildlife, most notably on birds and bats, has been widely documented and studied. A recent National Wind Coordinating Committee (NWCC) review of peer-reviewed research found evidence of bird and bat deaths from collisions with wind turbines and due to changes in air pressure caused by the spinning turbines, as well as from habitat disruption. The NWCC concluded that these impacts are relatively low and do not pose a threat to species populations.

Additionally, research into wildlife behavior and advances in wind turbine technology have helped to reduce bird and bat deaths. For example, wildlife biologists have found that bats are most active when wind speeds are low. Using this information, the Bats and Wind Energy Cooperative concluded that keeping wind turbines motionless during times of low wind speeds could reduce bat deaths by more than half without significantly affecting power production. Other wildlife impacts can be mitigated through better siting of wind turbines. The U.S. Fish and Wildlife Services has played a leadership role in this effort by convening an advisory group including representatives from industry, state and tribal governments, and nonprofit organizations that made comprehensive recommendations on appropriate wind farm siting and best management practices.

Offshore wind turbines can have similar impacts on marine birds, but as with onshore wind turbines, the bird deaths associated with offshore wind are minimal. Wind farms located offshore will also impact fish and other marine wildlife. Some studies suggest that turbines may actually increase fish populations by acting as artificial reefs. The impact will vary from site to site, and therefore proper research and monitoring systems are needed for each offshore wind facility.

Vocabulary

1. Try to memorize the following words and phrases.

notably	особенно
review	обзор
peer-reviewed research	рецензируемое научное исследование
collisions	столкновения
air pressure	давление воздуха
spinning	вращение
habitat disruption	нарушение среды обитания
bat	летучая мышь
to mitigate	смягчить
siting	размещение
nonprofit organizations	некоммерческие организации
onshore wind turbines	береговые ветряные турбины
marine wildlife	морской флоры и фауны

Comprehension Check

2. Decide whether the following statements are true or false according to the text.

1. The impact of wind turbines on wildlife, most notably on birds and bats, hasn't been document and studied.
2. The bird and bat deaths from collisions with wind turbines and due to changes in air pressure caused by the spinning turbines.
3. Wildlife biologists have found that bats are least active when wind speeds are low.

4. Keeping wind turbines motionless during times of low wind speeds could reduce bat deaths by more than half without significantly affecting power production.
 5. Offshore wind turbines can't have similar impacts on marine birds.
 6. Wind farms located offshore will also impact fish and other marine wildlife.
3. *Find key words and phrases which best express the general meaning of each paragraph.*
4. *Write a summary of Text B.*

TEXT C. Public Health and Community

Sound and visual impact are the two main public health and community concerns associated with operating wind turbines. Most of the sound generated by wind turbines is aerodynamic, caused by the movement of turbine blades through the air. There is also mechanical sound generated by the turbine itself. Overall sound levels depend on turbine design and wind speed.

Some people living close to wind facilities have complained about sound and vibration issues, but industry and government-sponsored studies in Canada and Australia have found that these issues do not adversely impact public health. However, it is important for wind turbine developers to take these community concerns seriously by following “good neighbor” best practices for siting turbines and initiating open dialogue with affected community members. Additionally, technological advances, such as minimizing blade surface imperfections and using sound-absorbent materials can reduce wind turbine noise.

Under certain lighting conditions, wind turbines can create an effect known as shadow flicker. This annoyance can be minimized with careful siting, planting trees or installing window awnings, or curtailing wind turbine operations when certain lighting conditions exist.

The Federal Aviation Administration (FAA) requires that large wind turbines, like all structures over 200 feet high, have white or red lights for aviation safety. However, the FAA recently determined that as long as there are no gaps in lighting greater than

a half-mile, it is not necessary to light each tower in a multi-turbine wind project. Daytime lighting is unnecessary as long as the turbines are painted white.

When it comes to aesthetics, wind turbines can elicit strong reactions. To some people, they are graceful sculptures; to others, they are eyesores that compromise the natural landscape. Whether a community is willing to accept an altered skyline in return for cleaner power should be decided in an open public dialogue.

Vocabulary

1. Try to memorize the following words and phrases.

sound	звук
visual impact	визуальное воздействие
mechanical sound	механический звук
sound level	уровень звучания (звука)
turbine design	дизайн турбины
vibration issue	вопрос вибрации
public health	здравоохранение
imperfection	несовершенство
sound-absorbent materials	звукопоглощающие материалы
shadow flicker effect	эффект мерцания
window awnings	оконные навесы
curtailing	свертывание, укрывание
aviation	авиация
to elicit	выявить
graceful sculptures	изящные скульптуры
to compromise	скомпромитировать, испортить
natural landscape	природный ландшафт
altered skyline	измененная линия горизонта

Comprehension Check

2. Match the English and Russian equivalents.

sound and visual impact	Работа ветряной турбины
affected community members	Условия освещения

overall sound levels	Звуковое и зрительное воздействие
public health concerns	Забота о здоровье общества
operating wind turbine	Общий уровень шума
open dialogue	Технологические достижения
to impact public health	Проект турбины
government-sponsored studies	Безопасность авиаперевозок
wind speed	Испортить естественный ландшафт
turbine design	Скорость ветра
technological advances	Несовершенство поверхности лопасти
blade surface imperfections	Звукопоглощающие материалы
sound-absorbent materials	Шум от работы турбины
wind turbine noise	Оказывать воздействие на здоровье общества
lighting conditions	Финансируемые правительством исследования
aviation safety	Открытый диалог
to compromise the natural landscape	Члена сообщества, находящиеся в зоне действия

3. What parts of the text can you define? Do they correspond to the paragraphs? Name each part.

1. _____ 4. _____
2. _____ 5. _____
3. _____ ... _____

TEXT D. Global Warming Emissions

There is no water impact associated with the operation of wind turbines. As in all manufacturing processes, some water is used to manufacture steel and cement for wind turbines.

While there are no global warming emissions associated with operating wind turbines, there are emissions associated with other stages of a wind turbine's life-cycle, including materials production, materials transportation, on-site construction and assembly, operation and maintenance, and decommissioning and dismantlement.

Estimates of total global warming emissions depend on a number of factors, including wind speed, percent of time the wind is blowing, and the material composition of the wind turbine. Most estimates of wind turbine life-cycle global warming emissions are between 0.02 and 0.04 pounds of carbon dioxide equivalent per kilowatt-hour. To put this into context, estimates of life-cycle global warming emissions for natural gas generated electricity are between 0.6 and 2 pounds of carbon dioxide equivalent per kilowatt-hour and estimates for coal-generated electricity are 1.4 and 3.6 pounds of carbon dioxide equivalent per kilowatt-hour.

Vocabulary

1. Try to memorize the following words and phrases.

steel	сталь
cement	цемент
global warming	глобальное потепление
life-cycle	период эксплуатации
on-site construction	на месте строительства
assembly	сборка
operation and maintenance	эксплуатация и техническое обслуживание
decommissioning	снятие с эксплуатации
dismantlement.	демонтаж
estimates	оценки
carbon dioxide	диоксид углерода

Comprehension Check

1. Answer the following questions.

1. Is there any water impact associated with the operation of wind turbines?
2. Is some water used to manufacture steel and cement for wind turbines?

3. Are there any global warming emissions associated with operating wind turbines?
4. Are there any emissions associated with other stages of a wind turbine's life-cycle?
5. What are the stages of a wind turbine's life-cycle?
6. What factors do estimates of total global warming emissions depend on?
7. How much emissions are of wind turbine life-cycle global warming emissions?
8. How much emissions are of natural gas generated electricity?
9. How much emissions are of coal-generated electricity?

SAVING ENERGY

Какие правила Вы считаете приемлемыми для нас?

Fight the Light!

Don't leave lights on when no one is in the room. If you are going to be out of the room for more than five minutes, turn off the light.

If you know of a light that everyone forgets to turn off, make a sticker or a sign to hang next to the switch that says "Lights Out!" or "Don't Forget!"

Where possible, use compact fluorescent light bulbs. Those funny-looking bulbs produce the same amount of light by using 1/4 of the electricity. Plus, they last for years and years without burning out.

There's one light bulb that firefighters in Livermore, California, never turn off. It uses very little energy and has been burning for 101 years!

Don't Leave Things Turned On

Turn off the TV when no one is watching it. The same goes for computers, radios and stereos - if no one using it, turn it off. Turn off all the appliances at the surge protector/control strip - that four- or six-plug extension chord that you plug all your computer things into. Some devices, like modems or other networking boxes are drawing small amounts of power all the time. Check with your folks first, but the best thing to do is turn them ALL off at the surge protector.

UNIT 2. Solar Power

Like wind power, the sun provides a tremendous resource for generating clean and sustainable electricity.

The environmental impacts associated with solar power can include land use and habitat loss, water use, and the use of hazardous materials in manufacturing, though the types of impacts vary greatly depending on the scale of the system and the technology used - photovoltaic (PV) solar cells or concentrating solar thermal plants (CSP).

The scale of the system - ranging from small, distributed rooftop PV arrays to large utility-scale PV and CSP projects - also plays a significant role in the level of environmental impact.

Vocabulary

1. Try to memorize the following words and phrases.

tremendous	огромный
sustainable	устойчивое
habitat loss	потеря среды обитания
hazardous	опасный
photovoltaic	фотоэлектрический
cell	батарея
rooftop	поверхность крыши
array	массив, солнечная панель
large utility-scale	крупномасштабных устройств

Comprehension Check

2. Match the English and Russian equivalents.

tremendous resource	Воздействие на окружающую среду
sustainable electricity	Опасные материалы
environmental impact	Надежное электроснабжение
land use	Токсичное загрязнение
hazardous materials	Значительная роль
solar thermal plants (CSP)	Землепользование
toxic pollution	Фотогальванические солнечные батареи
scale of the system	Тепловые солнечные электростанции

photovoltaic (PV) solar cells	Неисчерпаемый источник
significant role	Параметры системы

TEXT A. Land Use

Depending on their location, larger utility-scale solar facilities can raise concerns about land degradation and habitat loss. Total land area requirements varies depending on the technology, the topography of the site, and the intensity of the solar resource. Estimates for utility-scale PV systems range from 3.5 to 10 acres per megawatt, while estimates for CSP facilities are between 4 and 16.5 acres per megawatt.

Unlike wind facilities, there is less opportunity for solar projects to share land with agricultural uses. However, land impacts from utility-scale solar systems can be minimized by siting them at lower-quality locations such as brownfields, abandoned mining land, or existing transportation and transmission corridors. Smaller scale solar PV arrays, which can be built on homes or commercial buildings, also have minimal land use impact.

Vocabulary

1. Try to memorize the following words and phrases.

facilities	средства, устройства
land degradation	деградация земель
intensity	интенсивность
opportunity	возможность
to share	поделиться
siting	размещение
brownfields	пустующие земли
abandoned	заброшенный
mining	добыча
transmission corridors	пути транспортировки

Comprehension Check

2. *Decide whether the following statements are true or false according to the text.*

1. Solar facilities can't raise concerns about land degradation and habitat loss.
2. Total land area requirements don't depend on the technology, the topography of the site, and the intensity of the solar resource.
3. There is more opportunity for solar projects to share land with agricultural uses.
4. Land impacts from utility-scale solar systems can be maximized by siting them at lower-quality locations.
5. Lower-quality locations are brownfields, abandoned mining land, or existing transportation and transmission corridors.
6. Smaller scale solar PV arrays have great land use impact.

TEXT B. Water Use

Solar PV cells do not use water for generating electricity. However, as in all manufacturing processes, some water is used to manufacture solar PV components.

Concentrating solar thermal plants (CSP), like all thermal electric plants, require water for cooling. Water use depends on the plant design, plant location, and the type of cooling system.

CSP plants that use wet-recirculating technology with cooling towers withdraw between 600 and 650 gallons of water per megawatt-hour of electricity produced. CSP plants with once-through cooling technology have higher levels of water withdrawal, but lower total water consumption (because water is not lost as steam). Dry-cooling technology can reduce water use at CSP plants by approximately 90 percent. However, the tradeoffs to these water savings are higher costs and lower efficiencies. In addition, dry-cooling technology is significantly less effective at temperatures above 100 degrees Fahrenheit.

Many of the regions in the United States that have the highest potential for solar energy also tend to be those with the driest climates, so careful consideration of these water tradeoffs is essential.

Vocabulary

1. Try to memorize the following words and phrases.

manufacturing processes	производственные процессы
cooling	охлаждение
wet-recirculating technology	технология рециркуляции воды
cooling towers	градирни
water withdrawal	водозабор
water consumption	расход воды
dry-cooling technology	технология сухого охлаждения
tradeoffs	компромиссы
water savings	экономия воды

Comprehension Check

1. Answer the following questions and give examples.

1. Do solar PV cells use water for generating electricity?
2. Is some water used to manufacture solar PV components?
3. Why do all thermal electric plants require water?
4. What does water use depend on?
5. How much water do CSP plants that use wet-recirculating technology with cooling towers withdraw?
6. How much water CSP plants that use dry-cooling technology withdraw?
7. Why is careful consideration of water tradeoffs essential?

TEXT C. Hazardous Materials

The PV cell manufacturing process includes a number of hazardous materials, most of which are used to clean and purify the semiconductor surface. These chemicals, similar to those used in the general semiconductor industry, include hydrochloric acid, sulfuric acid, nitric acid, hydrogen fluoride, 1,1,1-trichloroethane, and acetone. The amount and type of chemicals used depends on the type of cell, the amount of cleaning that is needed, and the size of silicon wafer. Workers also face

risks associated with inhaling silicon dust. Thus, PV manufactures must follow U.S. laws to ensure that workers are not harmed by exposure to these chemicals and that manufacturing waste products are disposed of properly.

Thin-film PV cells contain a number of more toxic materials than those used in traditional silicon photovoltaic cells, including gallium arsenide, copper-indium-gallium-diselenide, and cadmium-telluride. If not handled and disposed of properly, these materials could pose serious environmental or public health threats. However, manufacturers have a strong financial incentive to ensure that these highly valuable and often rare materials are recycled rather than thrown away.

Vocabulary

1. Try to memorize the following words and phrases.

to purify	очистить
semiconductor	полупроводник
surface	поверхность
hydrochloric acid	соляная кислота
sulfuric acid	серная кислота
nitric acid	азотная кислота
hydrogen fluoride	фтористый водород
trichloroethane	трихлорэтан
acetone	ацетон
silicon wafer	кремниевая пластина
to face risks	столкнуться с риском
inhaling	вдыхание
silicon dust	кремниевая пыль
to be harmed	причинить вред
exposure	экспозиция, воздействие
thin-film	тонкопленочный
gallium arsenide	арсенид галлия
copper-indium-gallium-diselenide	медно-индий-галлий-диселенид
cadmium-telluride	кадмия теллурид
threat	угроза
incentive	стимул
recycled	переработанный

Comprehension Check

2. Match the English and Russian equivalents.

manufacturing process	Важные финансовые стимулы
to clean the semiconductor surface	Представлять серьезную угрозу экологии
general semiconductor industry	Дорогостоящий
manufacturing waste products	Производственный процесс
traditional silicon photovoltaic cells	Очищать поверхность полупроводника
to pose serious environmental threats	Отрасль производства полупроводников
strong financial incentive	Обычные кремниевые батарейки
highly valuable	Переработка отходов

TEXT D. Life-Cycle Global Warming Emissions

While there are no global warming emissions associated with generating electricity from solar energy, there are emissions associated with other stages of the solar life-cycle, including manufacturing, materials transportation, installation, maintenance, and decommissioning and dismantlement. Most estimates of life-cycle emissions for photovoltaic systems are between 0.07 and 0.18 pounds of carbon dioxide equivalent per kilowatt-hour.

Most estimates for concentrating solar power range from 0.08 to 0.2 pounds of carbon dioxide equivalent per kilowatt-hour. In both cases, this is far less than the lifecycle emission rates for natural gas (0.6-2 lbs of CO₂E/kWh) and coal (1.4-3.6 lbs of CO₂E/kWh).

Comprehension Check

1. Answer the following questions and give examples.

1. Are there any global warming emissions associated with generating electricity from solar energy?
2. Are there any emissions associated with other stages of the solar life-cycle?
3. What are the stages of the solar life-cycle?
4. How much emissions are of photovoltaic systems?

3. *Find key words and phrases which best express the general meaning of each paragraph.*

4. *Write a summary of Text D.*

SAVING ENERGY

Какие правила Вы считаете приемлемыми для нас?

It's a Matter of Degrees!

In warm weather, the thermostat at home should be set at 78 degrees. (Don't do this, of course, if it will cause health problems for anyone in your family.) When no one is home, set the thermostat at 85 degrees. That way, you'll reduce the need for air conditioning and you will save energy. If you have ceiling fans or other fans, turn them on. The blowing air can make you feel 5 degrees cooler, without running the family's air conditioner. Fans use a lot less electricity than air conditioners!

In cold weather, wear warm clothing and have your thermostat set to 68 degrees or lower during the day and evening, health permitting. When you go to sleep at night, set the thermostat back to either 55 degrees, or turn it off. When you leave home for an extended time, set the thermostat at 55 degrees or turn it off, too. That way, your family can save from 5 percent to 20 percent on your heating costs. (Don't do this, of course, if it will cause health problems for anyone in your family.)

Don't Heat - or Cool - the Great Outdoors!

Americans use twice as much energy as necessary to heat their homes. That accounts for a lot of wasted energy!

If you have a fireplace, close the damper when you don't have a fire burning. An open fireplace damper can let 8 percent of heat from your furnace escape through the chimney! In the summer, an open fireplace damper can let cool air escape. It's like having a window open!

Make a map of your home, and mark all the windows, heating vents, and outside doors. Take a ribbon and hold it up to the edges of the doors and windows. If the

ribbon blows, you've found a leak! Ask Mom or Dad to seal the leak with caulk or weatherstripping.

Think about your curtains. Keeping the curtains closed on cold, cloudy days helps block the cold outside air from getting inside. Also, keeping the curtains closed on very hot days keeps the hot air out!

UNIT 3. Geothermal Energy

TEXT A. Environmental Impacts of Geothermal Energy

The most widely developed type of geothermal power plant (known as hydrothermal plants) are located near geologic “hot spots” where hot molten rock is close to the earth’s crust and produces hot water. In other regions enhanced geothermal systems (or hot dry rock geothermal), which involve drilling into Earth’s surface to reach deeper geothermal resources, can allow broader access to geothermal energy.

Geothermal plants also differ in terms of the technology they use to convert the resource to electricity (direct steam, flash, or binary) and the type of cooling technology they use (water-cooled and air-cooled). Environmental impacts will differ depending on the conversion and cooling technology used.

Vocabulary

1. Try to memorize the following words and phrases.

geothermal power plant	геотермальная электростанция
geologic	геологический
“hot spots”	"горячие точки"
molten rock	расплавленная порода
earth’s crust	земная кора
enhanced	повышенный
drilling	бурение
earth’s surface	земная поверхность
to reach	достичь
geothermal resources	геотермальные ресурсы

access to convert	доступ преобразовывать
----------------------	---------------------------

Comprehension Check

2. *Answer the following questions and give examples.*

1. Where are the most widely developed type of geothermal power plant (known as hydrothermal plants) located?
2. What does it mean “hot spots”?
3. What can allow broader access to geothermal energy?
4. How do geothermal plants differ?
5. What do environmental impacts depend on?

3. *Find key words and phrases which best express the general meaning of each paragraph.*

4. *Write a summary of Text A.*

TEXT B. Water Quality and Use

Geothermal power plants can have impacts on both water quality and consumption. Hot water pumped from underground reservoirs often contains high levels of sulfur, salt, and other minerals. Most geothermal facilities have closed-loop water systems, in which extracted water is pumped directly back into the geothermal reservoir after it has been used for heat or electricity production. In such systems, the water is contained within steel well casings cemented to the surrounding rock. There have been no reported cases of water contamination from geothermal sites in the United States.

Water is also used by geothermal plants for cooling and re-injection. All U.S. geothermal power facilities use wet-recirculating technology with cooling towers. Depending on the cooling technology used, geothermal plants can require between 1,700 and 4,000 gallons of water per megawatt-hour. However, most geothermal

plants can use either geothermal fluid or freshwater for cooling; the use of geothermal fluids rather than freshwater clearly reduces the plants overall water impact.

Most geothermal plants re-inject water into the reservoir after it has been used to prevent contamination and land subsidence (see Land Use below). In most cases, however, not all water removed from the reservoir is re-injected because some is lost as steam. In order to maintain a constant volume of water in the reservoir, outside water must be used. The amount of water needed depends on the size of the plant and the technology used; however, because reservoir water is “dirty,” it is often not necessary to use clean water for this purpose. For example, the Geysers geothermal site in California injects non-potable treated wastewater into its geothermal reservoir.

Vocabulary

1. Try to memorize the following words and phrases.

pumped	закачивать
underground reservoirs	подземные резервуары
sulfur	сера
salt	соль
mineral	минерал
closed-loop	замкнутый контур
steel well casing	стальной корпус скважины
contamination	загрязнение
re-injection	обратная закачка
wet-recirculating technology	технология рециркуляции воды
geothermal fluid	геотермальная жидкость
freshwater	пресноводный
to prevent	предотвращать
land subsidence	оседание грунта
steam	пар
purpose	цель
to inject	вводить
non-potable	непригодный для питья
treated	переработанный
wastewater	сточные воды

Comprehension Check

2. Answer the following questions and give examples.

1. Can geothermal power plants have impacts on both water quality and consumption?
2. What does hot water pumped from underground reservoirs often contain?
3. What kind of water systems do most geothermal facilities have?
4. Are there any reported cases of water contamination from geothermal sites in the United States?
5. How is water also used by geothermal plants?
6. How much water can geothermal plants require?
7. Do most geothermal plants re-inject water into the reservoir after it has been used?
8. What does the amount of water needed depend on?

3. Find key words and phrases which best express the general meaning of each paragraph.

4. Write a summary of Text B.

TEXT C. Air Emissions

The distinction between open- and closed-loop systems is important with respect to air emissions. In closed-loop systems, gases removed from the well are not exposed to the atmosphere and are injected back into the ground after giving up their heat, so air emissions are minimal. In contrast, open-loop systems emit hydrogen sulfide, carbon dioxide, ammonia, methane, and boron. Hydrogen sulfide, which has a distinctive “rotten egg” smell, is the most common emission.

Once in the atmosphere, hydrogen sulfide changes into sulfur dioxide (SO₂). This contributes to the formation of small acidic particulates that can be absorbed by the bloodstream and cause heart and lung disease. Sulfur dioxide also causes acid rain, which damages crops, forests, and soils, and acidifies lakes and streams. However, SO₂ emissions from geothermal plants are approximately 30 times lower per megawatt-hour than from coal plants, which is the nation's largest SO₂ source.

Some geothermal plants also produce small amounts of mercury emissions, which must be mitigated using mercury filter technology. Scrubbers can reduce air emissions, but they produce a watery sludge composed of the captured materials, including sulfur, vanadium, silica compounds, chlorides, arsenic, mercury, nickel, and other heavy metals. This toxic sludge often must be disposed of at hazardous waste sites.

Vocabulary

1. Try to memorize the following words and phrases.

distinction	различие
air emission	выбросы в атмосферу
well	скважина
hydrogen sulfide	сероводород
carbon dioxide	диоксид углерода
ammonia	аммиак
methane	метан
boron	бор
"rotten egg" smell	запах "тухлых яиц"
acidic particulates	кислотные частицы
to absorb	поглощать
bloodstream	кровеносный ток
heart	сердце
lung	легкое
disease	болезнь
acid rain	кислотный дождь
to acidify	подкислять
mercury emissions	выбросы ртути
filter technology	технология фильтрации
scrubber	скруббер, газопромыватель, водный газоочиститель
watery sludge	водянистый шлам

captured materials	уловленные (задержанные) отходы
vanadium	ванадий
silica compounds	соединения кремнезема
chlorides	хлориды
arsenic	мышьяк
nickel	никель
heavy metals	тяжелые металлы

Comprehension Check

1. Match the English and Russian equivalents

closed-loop system	Резкий запах «тухлых яиц»
exposed to the atmosphere	Замкнутая система
giving up the heat	Самый распространенный вид отходов
most common emission	Отдача тепла
distinctive “rotten egg” smell	Поглощаться кровеносной системой
to be absorbed by the bloodstream	Технологи очистки ртутью
mercury filter technology	Площадки для хранения отходов
hazardous waste sites	Выделяемый в атмосферу

2. What parts of the text can you define? Do they correspond to the paragraphs? Name each part.

- | | |
|----------|-----------|
| 1. _____ | 4. _____ |
| 2. _____ | 5. _____ |
| 3. _____ | ... _____ |

TEXT D. Land Use

The amount of land required by a geothermal plant varies depending on the properties of the resource reservoir, the amount of power capacity, the type of energy conversion system, the type of cooling system, the arrangement of wells and piping systems, and the substation and auxiliary building needs. The Geysers, the largest

geothermal plant in the world, has a capacity of approximately 1,517 megawatts and the area of the plant is approximately 78 square kilometers, which translates to approximately 13 acres per megawatt. Like the Geysers, many geothermal sites are located in remote and sensitive ecological areas, so project developers must take this into account in their planning processes.

Land subsidence, a phenomenon in which the land surface sinks, is sometimes caused by the removal of water from geothermal reservoirs. Most geothermal facilities address this risk by re-injecting wastewater back into geothermal reservoirs after the water's heat has been captured.

Hydrothermal plants are sited on geological "hot spots," which tend to have higher levels of earthquake risk. There is evidence that hydrothermal plants can lead to an even greater earthquake frequency. Enhanced geothermal systems (hot dry rock) can also increase the risk of small earthquakes. In this process, water is pumped at high pressures to fracture underground hot rock reservoirs similar to technology used in natural gas hydraulic fracturing. Earthquake risk associated with enhanced geothermal systems can be minimized by siting plants an appropriate distance away from major fault lines. When a geothermal system is sited near a heavily populated area, constant monitoring and transparent communication with local communities is also necessary.

Vocabulary

1. Try to memorize the following words and phrases.

power capacity	мощность
energy conversion system	система преобразования энергии
pipng system	система трубопроводов
auxiliary	вспомогательный
remote	удаленный
sensitive ecological areas	восприимчивые к загрязнению области
land subsidence	оседание грунта
earthquake	землетрясение
frequency	частота
hydraulic fracturing	гидро разрыв
constant monitoring	постоянный мониторинг
communication	связь, коммуникация, общение

Comprehension Check

2. Answer the following questions and give examples.

1. What does the amount of land required by a geothermal plant depend?
2. What is the largest geothermal plant in the world?
3. What capacity does it have?
4. Where are many geothermal sites located?
5. What is land subsidence?
6. What is it caused by?
7. Where are hydrothermal plants sited?
8. Is there any evidence that hydrothermal plants can lead to an even greater earthquake frequency?
9. Can enhanced geothermal systems increase the risk of small earthquakes?
10. What is necessary when a geothermal system is sited near a heavily populated area?

3. Find key words and phrases which best express the general meaning of each paragraph.

4. Write a summary of Text C.

TEXT D. Warming Emissions

In open-loop geothermal systems, approximately 10 percent of the air emissions is carbon dioxide, and a smaller amount of emissions is methane, a more potent global warming gas. Estimates of global warming emissions for open-loop systems are approximately 0.1 pounds of carbon dioxide equivalent per kilowatt-hour. In closed-loop systems, these gases are not released into the atmosphere, but there are a still some emissions associated with plant construction and surrounding infrastructure.

Enhanced geothermal systems, which require energy to drill and pump water into hot rock reservoirs, have life-cycle global warming emission of approximately 0.2 pounds of carbon dioxide equivalent per kilowatt-hour.

To put this into context, estimates of life-cycle global warming emissions for natural gas generated electricity are between 0.6 and 2 pounds of carbon dioxide equivalent per kilowatt-hour and estimates for coal-generated electricity are 1.4 and 3.6 pounds of carbon dioxide equivalent per kilowatt-hour.

Vocabulary

1. Try to memorize the following words and phrases.

potent	МОЩНЫЙ
to release	ОСВОБОДИТЬ
construction	СТРОИТЕЛЬСТВО
surrounding infrastructure	ОКРУЖАЮЩАЯ ИНФРАСТРУКТУРА
to drill	СВЕРЛИТЬ, БУРИТЬ

Comprehension Check

2. Find key words and phrases which best express the general meaning of each paragraph.

SAVING ENERGY

Какие правила Вы считаете приемлемыми для нас?

In the Bedroom

Turn off your electric blanket when you aren't in bed.

Don't leave on your computer, TVs, radios or games that use electricity when you're not using them.

In the Bathroom

Wasting water wastes electricity. Why? Because the biggest use of electricity in most cities is supplying water and cleaning it up after it's been used!

About 75 percent of the water we use in our homes is used in the bathroom. Unless you have a low flush toilet, for example, you use about five gallons to seven

gallons of water with every flush! A leaky toilet can waste more than 10,000 gallons of water a year. Wow!

Drippy faucets are bad, too. A faucet that leaks enough water to fill a soda bottle every 30 minutes will waste 2,192 gallons of water a year.

Another simple way to save water and energy is to take shorter showers. You'll use less hot water - and water heaters account for nearly 1/4 of your home's energy use.

UNIT 4. Biomass for Electricity

TEXT A. Environmental Impacts of Biomass for Electricity

Biomass power plants share some similarities with fossil fuel power plants: both involve the combustion of a feedstock to generate electricity. Thus, biomass plants raise similar, but not identical, concerns about air emissions and water use as fossil fuel plants. However, the feedstock of biomass plants can be sustainably produced, while fossil fuels are non-renewable.

Sources of biomass resources for producing electricity are diverse, including energy crops (like switchgrass), agricultural waste, manure, forest products and waste, and urban waste. Both the type of feedstock and the manner in which it is developed and harvested significantly affect land use and life-cycle global warming emissions impacts of producing power from biomass.

Vocabulary

1. Try to memorize the following words and phrases.

similarities	сходство
fossil fuel power plant	ТЭЦ, работающие на ископаемом топливе
combustion	горение
feedstock	сырье
to generate	генерировать
identical	идентичный
non-renewable	невозобновляемый
diverse	разнообразный
energy crops	энергетические культуры

switchgrass	просо
agricultural waste	сельскохозяйственные отходы
manure	навоз
to harvest	собирать

Comprehension Check

2. Match the English and Russian equivalents.

To share some similarities with	Быть постоянно воспроизводимым
fossil fuel power plant	Оказывать значительное влияние на землепользование
to generate electricity	Собранное сырье
to be sustainably produced	Иметь те же особенности, что у...
to raise similar concerns	Вызывать те же опасения
urban waste	Вырабатывать электричество
harvested feedstock	Городские отходы
to significantly affect land use	ТЭЦ, работающая на ископаемом топливе

3. What parts of the text can you define? Do they correspond to the paragraphs? Name each part.

- | | |
|----------|-----------|
| 1. _____ | 4. _____ |
| 2. _____ | 5. _____ |
| 3. _____ | ... _____ |

TEXT B. Water Use

Biomass power plants require approximately the same amount of water for cooling as coal power plants, but actual water withdrawals and consumption depends on the facility's cooling technology. For biomass plants with once-through cooling systems- which take water from nearby sources, circulate it through the plants cooling system, and then discharge it- water withdrawals range between 20,000 and 50,000 gallons

per megawatt-hour with consumption of 300 gallons per megawatt-hour. Biomass facilities that use wet-recirculating cooling systems - which reuse cooling water in a second cycle rather than immediately discharging it - withdraw between 500 and 900 gallons per megawatt-hour and consume approximately 480 gallons per megawatt-hour.

Approximately 75% of existing biomass plants that require cooling use wet-recirculating technology, while 25% of plants use once-through cooling technology. In either case, when withdrawn cooling water is returned to its source, it is much warmer than when it was withdrawn, which often has a negative impact on plant and animal life. As in all thermal plants, this impact must be closely monitored. Dry-cooling systems do not withdraw or consume any water, but the tradeoffs to these water savings are higher costs and lower efficiencies- meaning more fuel is needed per unit of electricity.

Water is also needed to produce some biomass feedstocks. While some feedstock sources- such as agricultural, forest, and urban waste- require no additional water, others- such as energy crops- can be very water intensive. Different energy crops vary in terms of how much water they require. Miscanthus, one type of perennial grass, requires a large amount of water, while switchgrass, another perennial grass, generally requires much less. Water use efficiency of a given crop depends on a number of factors, including soil quality and temperature.

In regions with sufficient rainfall where irrigation is not required, water use for producing energy crops may be less of a concern. However, even in water-rich areas, the increased cultivation of energy crops may harm regional water quality as a result of soil tillage and nutrient runoff. Such water quality impacts can be managed through proper harvesting techniques. Many of these same issues arise in the cultivation of energy crops for biofuels.

Vocabulary

1. Try to memorize the following words and phrases.

nearby sources	близкие источники
to circulate	циркулировать
negative impact	отрицательное влияние
thermal plant	тепловая электростанция
water saving	водосбережение
miscanthus	мискантус

perennial grass	многолетние травы
soil quality	качество почвы
rainfall	количество осадков
irrigation	орошение
soil tillage	обработка почвы
nutrient runoff	стоки питательных веществ
biofuel	биотопливо

Comprehension Check

2. Answer the following questions and give examples.

1. How much water do biomass power plants require?
2. What is biomass plant with once-through cooling system?
3. What are biomass facilities with wet-recirculating cooling system?
4. Do dry-cooling systems withdraw or consume any water?
5. Why is water needed?
6. How do different energy crops vary?
7. What factors does water use efficiency of a given crop depend on?
8. Why is water use less of a concern in regions with sufficient rainfall?

3. Find key words and phrases which best express the general meaning of each paragraph.

4. Write a summary of Text B.

TEXT C. Air Emissions

Burning biomass to produce electricity can impact air quality. The level of air emissions associated with biomass power plants varies depending on the feedstock, combustion technology, and types of installed pollution controls, but the most common pollutants include nitrogen oxides (NO_x), sulfur dioxide (SO₂), carbon

monoxide, and particulate matter. It's possible to compare air emissions from different types of biomass, coal, and natural gas power facilities with pollution control equipment. In general, biomass facilities emit less SO₂ and mercury (a neurotoxin) than coal.

Nitrogen oxides from biomass are lower than those from coal but higher than natural gas. NO_x emissions causes ground-level ozone, or smog, which can burn lung tissue and can make people more susceptible to asthma, bronchitis, and other chronic respiratory diseases. Like SO₂, NO_x also contributes to acid rain and the formations of harmful particulate matter. Biomass power plants also emit high levels of particulates (soot and ash) and carbon monoxide. Readily available technologies, such as fluidized bed or gasification systems, and electrostatic precipitators, can help reduce NO_x, CO, and particulate emissions associated with biomass power.

Vocabulary

1. Try to memorize the following words and phrases.

combustion technology	технологии сжигания
installed pollution control	установленный контроль загрязнения
nitrogen oxide (NO _x)	оксид азота (NO _x)
sulfur dioxide (SO ₂)	диоксид серы (SO ₂)
carbon monoxide	окись углерода
natural gas power facilities	энергообъекты, использующие природный газ
ground-level ozone	приземный слой озона
smog	смог
lung tissue	легочная ткань
susceptible	восприимчивый
chronic respiratory disease	хронические заболевания органов дыхания
to emit	испускать
soot	сажа
ash	пепел
fluidized bed system	система со слоем кипения
gasification system	система газификации
electrostatic precipitators	электрофильтры

Comprehension Check

1. Match the English and Russian equivalents.

the level of air emissions	Оборудование контроля загрязнения
particulate matter	Твердые частицы
readily available technologies	Самые распространенные загрязнители
formation of harmful particulate	Установленный мониторинг загрязнения
to burn lung tissue	Различные типы биомассы
pollution control equipment	Уровень воздушных выбросов
different types of biomass	Поражать легочную ткань
the most common pollutants	Готовые к применению технологии
installed pollution control	Образование вредных частиц

**2. What parts of the text can you define? Do they correspond to the paragraphs?
Name each part.**

1. _____ 4. _____
 2. _____ 5. _____
 3. _____ ... _____

TEXT D. Land Use

Land use impacts from biomass power production are driven primarily by the type of feedstock: either a waste stream or an energy crop that is grown specifically for generating electricity. Because waste streams are only secondarily available as a result of another activity that would have otherwise occurred- such as logging or farming- there is no marginal increase in land use. However, if not collected properly, using agriculture and forest waste streams for biomass power could lead to land or habitat degradation.

Important safeguards and best practices for removal are needed to ensure that sufficient crop residues are left behind to improve soil carbon storage, maintain nutrient levels, and prevent erosion. Similarly, harvesting of forest waste products can be done sustainably, but proper forest management practices need to be followed to ensure that wildlife habitat is not destroyed and the forest remains healthy.

Impacts associated with the use of energy crops depends greatly on whether the planting leads to land use change or displaced food production. If energy crops are planted on a large scale and displace food production, then new lands may need to be

cleared to maintain food supplies. As a result, this could potentially change U.S. or global land use patterns and lead to habitat destruction or increases in food prices. However, it is possible to sustainably increase agricultural efficiency and reduce the land required for food production while also improving soil health, erosion, and eutrophication. Doing so could free up land for energy crops while minimizing food displacement and other land use changes.

Energy crops present many of the same environmental challenges as food crops, and therefore the same principles of sustainable agriculture apply: crop rotation, integrated pest management, and proper soil husbandry to prevent soil erosion. Many energy crops use less fertilizer and pesticides than typical food crops, and perennial grasses do not require annual tilling and planting. These crops can even be advantageous for some farmers; alternating the planting of food and energy crops can help stabilize the soil and provide supplemental farm income.

Vocabulary

1. Try to memorize the following words and phrases.

waste streams	ПОТОКИ ОТХОДОВ
available	ДОСТУПНЫЙ
safeguards	меры защиты
soil carbon storage	хранения углерода в почве
nutrient level	уровень питательных веществ
erosion	эрозия
eutrophication	эвтрофикации
crop rotation	севооборот
integrated pest management	комплексная борьба с вредителями
proper soil husbandry	землепользование
fertilizer	удобрение
pesticides	пестициды
annual tilling	ежегодная вспашка
supplemental farm income	дополнительный фермерский доход

Comprehension Check

1. Match the English and Russian equivalents.

to be grown specifically	Ежегодная вспашка и посев
supplemental farm income	Комплексная борьба с вредителями
annual tilling and planting	Выращивать для специальных целей
perennial grasses	Многолетние травы
integrated pest management	Дополнительный доход фермера
crop rotation	Повышение цен на продовольствие
to increase agricultural efficiency	Надлежащая практика ведения лесного хозяйства
to displace food production	Севооборот
proper forest management practices	Увеличить эффективность сельского хозяйства
increases in food prices	Вытеснять производство продуктов питания
to maintain food supplies	Поддерживать запасы продовольствия
to maintain nutrient levels	Предотвращать эрозию
to prevent erosion	Поддерживать уровень питательных веществ
to improve soil carbon storage to secondarily available	Важные гарантии
	Достаточное количество растительных остатков
to lead to habitat degradation	Привести к деградации среды обитания
marginal increase in land use	Незначительное увеличение землепользования
important safeguards	Повысить удержание углерода почвой
sufficient crop residues	Вторично доступный

2. What parts of the text can you define? Do they correspond to the paragraphs? Name each part.

1. _____

4. _____

2. _____

5. _____

3. _____

... _____

TEXT F. Life-cycle Global Warming Emissions

There are global warming emissions associated with growing and harvesting biomass feedstock, transporting feedstock to the power plant, and burning or gasifying the feedstock. Transportation and combustion emissions are roughly equivalent for all types of biomass. However, global warming emissions from the sourcing of biomass feedstock vary widely. It was once commonly thought that biomass had net zero global warming emissions, because the growing biomass absorbed an equal amount of carbon as the amount released through combustion. It is now understood that some biomass feedstock sources are associated with substantial global warming emissions. Thus, it is important to distinguish between biomass resources that are beneficial in reducing net carbon emissions, those that have an ambiguous impact, and those that increase net emissions.

Beneficial biomass resources include energy crops that do not compete with food crops for land, portions of crop residues such as wheat straw or corn stover, sustainably-harvested wood and forest residues, and clean municipal and industrial wastes. The use of organic waste products for biomass energy is especially beneficial. When organic waste is disposed of in a landfill, it decomposes and releases methane, a potent global warming gas. Thus, diverting these wastes for electricity production reduces landfill volume and reduces methane emissions.

Harmful biomass resources and practices add net carbon to the atmosphere by either directly or indirectly decreasing the overall amount of carbon stored in plants and soils. Such practices include clearing forests, savannas, or grasslands to grow energy crops, and displacing food production for bioenergy production that ultimately leads to the clearing of carbon-rich ecosystems elsewhere to grow food.

For marginal biomass resources, the net carbon impact depends on the circumstances. For example, if grasslands are plowed up or forests cut down to make way for switchgrass farms, there will be an increase in net carbon emissions. This is because grasslands and forests contain large stores of carbon, and total carbon storage increases each year as these ecosystems mature. There could also be a net increase in global warming emissions associated with planting switchgrass on productive agricultural land. On a global level, as food crops are replaced with energy crops, the price of food increases, which gives farmers the incentive to clear more grasslands and forests to make way for food production. Thus, even if switchgrass does not directly displace grasslands and forest, the effect could be indirect. However, plants

like switchgrass can have zero or net negative emissions if they are planted in degraded or abandoned agricultural land. Research has shown that switchgrass, when planted in diverse mixtures with other perennial grasses and legumes, can help store carbon in degraded soils.

Forest feedstock is another example of a marginal biomass resource. The use of forest products for biomass feedstock can have net zero global warming emissions if forest managers harvest in a sustainable manner and replant with fast-growing tree species. However, even when following best practices, forest regeneration will not occur instantly, so there can be a long lag-time before the biomass resource achieves carbon neutrality.

Due to all of these factors, the range for estimates for lifecycle global warming emissions of biomass energy is wide. Excluding global warming emissions from land use changes, most estimates are between 0.04 and 0.2 pounds of CO₂ equivalent per kilowatt-hour. To put this into context, estimates of life-cycle global warming emissions for natural gas-generated electricity are between 0.6 and 2 pounds of carbon dioxide equivalent per kilowatt-hour and estimates for coal-generated electricity are 1.4 and 3.6 pounds of carbon dioxide equivalent per kilowatt-hour.

Vocabulary

1. Try to memorize the following words and phrases.

beneficial	выгодный
ambiguous	двусмысленный
net emission	чистый выброс
food crops	продовольственные культуры
crop residues	растительные остатки
wheat straw	пшеничная солома
corn stover	кукуруза Стовер
sustainably-harvested	постоянно собираемый урожай
organic waste products	органические отходы
landfill	полигон
to decompose	разлагаться
carbon-rich ecosystems	богатые углеродом экосистемы
marginal	маргинальный
circumstance	обстоятельство
grassland	луг

to plow up	распахивать
ecosystems mature	зрелые экосистемы
degraded	деградированный
abandoned	заброшенный
fast-growing tree species	быстрорастущие породы деревьев
lag-time	лаг-период
carbon neutrality	углеродная нейтральность

Comprehension Check

2. Answer the following questions and give examples.

1. Are there any global warming emissions associated with growing and harvesting biomass feedstock?
2. Do global warming emissions from the sourcing of biomass feedstock vary widely?
3. Did biomass have net zero global warming emissions?
4. Why is it commonly thought that biomass is ecologically friendly?
5. Are some biomass feedstock sources associated with substantial global warming emissions?
6. What are distinctions between biomass resources?
7. What do beneficial biomass resources include?
8. Why is the use of organic waste products for biomass energy beneficial?
9. What do harmful biomass resources and practices include?
10. What circumstances does the net carbon impact depend on for marginal biomass resources?
11. What has research shown?
12. What is another example of a marginal biomass resource?
13. Will forest regeneration occur instantly?

14. Why is the range for estimates for lifecycle global warming emissions of biomass energy wide?

3. *Find key words and phrases which best express the general meaning of each paragraph.*

4. *Write a summary of Text F.*

SAVING ENERGY

Какие правила Вы считаете приемлемыми для нас?

In the Kitchen

According to researchers who are paid to study such things, a load of dishes cleaned in a dishwasher uses 37 percent less water than washing dishes by hand! However, if you fill up one side of the sink with soapy water and the other side with rinse water - and if you don't let the faucet run - you'll use half as much water as a dishwasher does. Doing the dishes this way can save enough water for a five-minute shower!

If you need to warm up or defrost small amounts of food, use a microwave instead of the stove to save energy. Microwave ovens use around 50 percent less energy than conventional ovens do. For large meals, however, the stove is usually more efficient. In the summer, using a microwave causes less heat in the kitchen, which saves money on air conditioning.

Don't keep the refrigerator door open any longer than you need to. Close it to keep the cold air inside! Also, make sure the door closes securely. There is a rubber-like seal around the door that you can test. Just close the door on a dollar bill, and then see how easy it is to pull out. If the dollar slides out easily, the door is probably leaking cold air from inside.

Is there an old refrigerator sitting in the garage or someplace else at home? Old refrigerators are real energy hogs! An old refrigerator could be costing your family as much as \$120 a year to operate. Urge your parents to replace it if they don't need it, and remind them that one large refrigerator is cheaper to run than two smaller ones.

UNIT 5. Hydroelectric Power

TEXT A. Environmental Impacts of Hydroelectric Power

Hydroelectric power includes both massive hydroelectric dams and small run-of-the-river plants. Large-scale hydroelectric dams continue to be built in many parts of the world (including China and Brazil), but it is unlikely that new facilities will be added to the existing U.S. fleet in the future.

Instead, the future of hydroelectric power in the United States will likely involve increased capacity at current dams and new run-of-the-river projects. There are environmental impacts at both types of plants.

Active Vocabulary

1. *Try to memorize the following words and phrases.*

hydroelectric power	ГЭС
hydroelectric dam	гидроэлектростанция
run-of-the-river plant	ГЭС, работающая в естественном режиме течения реки

Comprehension Check

2. *Find key words and phrases which best express the general meaning of each paragraph.*

TEXT B. Land Use

The size of the reservoir created by a hydroelectric project can vary widely, depending largely on the size of the hydroelectric generators and the topography of the land. Hydroelectric plants in flat areas tend to require much more land than those in hilly areas or canyons where deeper reservoirs can hold more volume of water in a smaller space.

At one extreme, the large Balbina hydroelectric plant, which was built in a flat area of Brazil, flooded 2,360 square kilometers- an area the size of Delaware- and it only provides 250 MW of power generating capacity (equal to more than 2,000 acres

per MW). In contrast, a small 10 MW run-of-the-rive plant in a hilly location can use as little 2.5 acres (equal to a quarter of an acre per MW).

Flooding land for a hydroelectric reservoir has an extreme environmental impact: it destroys forest, wildlife habitat, agricultural land, and scenic lands. In many instances, such as the Three Gorges Dam in China, entire communities have also had to be relocated to make way for reservoirs.

Active Vocabulary

1. Try to memorize the following words and phrases.

reservoir	водохранилище
hydroelectric generator	гидротурбогенератор
topography	топография
flat area	равнинная территория
flooding land	затопленная земля
to destroy	уничтожить
scenic lands	живописные земли

Comprehension Check

2. Find key words and phrases which best express the general meaning of each paragraph.

TEXT C. Wildlife Impacts

Dammed reservoirs are used for multiple purposes, such as agricultural irrigation, flood control, and recreation, so not all wildlife impacts associated with dams can be directly attributed to hydroelectric power. However, hydroelectric facilities can still have a major impact on aquatic ecosystems. For example, though there are a variety of methods to minimize the impact (including fish ladders and in-take screens), fish and other organisms can be injured and killed by turbine blades.

Apart from direct contact, there can also be wildlife impacts both within the dammed reservoirs and downstream from the facility. Reservoir water is usually more stagnant than normal river water. As a result, the reservoir will have higher than normal amounts of sediments and nutrients, which can cultivate an excess of algae and other aquatic weeds. These weeds can crowd out other river animal and plant-life, and they must be controlled through manual harvesting or by introducing fish that eat these plants. In addition, water is lost through evaporation in dammed reservoirs at a much higher rate than in flowing rivers.

In addition, if too much water is stored behind the reservoir, segments of the river downstream from the reservoir can dry out. Thus, most hydroelectric operators are required to release a minimum amount of water at certain times of year. If not released appropriately, water levels downstream will drop and animal and plant life can be harmed. In addition, reservoir water is typically low in dissolved oxygen and colder than normal river water. When this water is released, it could have negative impacts on downstream plants and animals. To mitigate these impacts, aerating turbines can be installed to increase dissolved oxygen and multi-level water intakes can help ensure that water released from the reservoir comes from all levels of the reservoir, rather than just the bottom (which is the coldest and has the lowest dissolved oxygen).

Active Vocabulary

1. Try to memorize the following words and phrases.

dammed reservoir	плотины водохранилища
agricultural irrigation	орошение сельскохозяйственных земель
flood control	борьбы с наводнениями
aquatic ecosystem	водная экосистема
fish ladder	рыбоход, подъемники для рыбы
in-take screen	подъемный экран
downstream	вниз по течению
stagnant	застойный
sediments	отложения
to cultivate	культивировать
excess	избыток
algae	морские водоросли

aquatic weed	водные сорняки
to crowd out	вытеснять
manual harvesting	ручной сбор
evaporation	испарение
segment	сегмент
to dry out	иссыхать
dissolved oxygen	растворенный кислород
to mitigate	смягчать
multi-level	многоуровневый
water intake	водозабор
bottom	дно

Comprehension Check

2. *Decide whether the following statements are true or false according to the text.*

1. Dammed reservoirs are used for a single purpose.
2. Hydroelectric facilities can still have a minor impact on aquatic ecosystems.
3. There are a variety of methods to maximize the impact (including fish ladders and in-take screens), fish and other organisms can be injured and killed by turbine blades.
4. Apart from direct contact, there can also be wildlife impacts both within the dammed reservoirs and downstream from the facility.
5. Reservoir water is usually less stagnant than normal river water.
6. Water is lost through evaporation in dammed reservoirs at a much lower rate than in flowing rivers.
7. If too much water is stored behind the reservoir, segments of the river downstream from the reservoir can dry out.
8. Hydroelectric operators are required to release a maximum amount of water at certain times of year.
9. To mitigate these impacts, aerating turbines can be installed to increase dissolved oxygen.

TEXT D. Global Warming Emissions

Global warming emissions are produced during the installation and dismantling of hydroelectric power plants, but recent research suggests that emissions during a facility's operation can also be significant. Such emissions vary greatly depending on the size of the reservoir and the nature of the land that was flooded by the reservoir.

Small run-of-the-river plants emit between 0.01 and 0.03 pounds of carbon dioxide equivalent per kilowatt-hour. Life-cycle emissions from large-scale hydroelectric plants built in semi-arid regions are also modest: approximately 0.06 pounds of carbon dioxide equivalent per kilowatt-hour. However, estimates for life-cycle global warming emissions from hydroelectric plants built in tropical areas or temperate peatlands are much higher. After the area is flooded, the vegetation and soil in these areas decomposes and releases both carbon dioxide and methane. The exact amount of emissions depends greatly on site-specific characteristics. However, current estimates suggest that life-cycle emissions can be over 0.5 pounds of carbon dioxide equivalent per kilowatt-hour.

To put this into context, estimates of life-cycle global warming emissions for natural gas generated electricity are between 0.6 and 2 pounds of carbon dioxide equivalent per kilowatt-hour and estimates for coal-generated electricity are 1.4 and 3.6 pounds of carbon dioxide equivalent per kilowatt-hour.

Active Vocabulary

1. Try to memorize the following words and phrases.

installation	установка
dismantling	демонтаж
recent	недавний
research	исследование
significant	значительный
semi-arid region	полузасушливая область
modest	скромный
tropical area	тропическая область
temperate	умеренный
peatland	торфяник

vegetation site-specific	растительность специфической
-----------------------------	---------------------------------

Comprehension Check

2. *Decide whether the following statements are true or false according to the text.*

1. Global warming emissions are produced during the installation and dismantling of hydroelectric power plants.
2. Recent research suggests that emissions during a facility's operation can't be significant.
3. Emissions vary greatly depending on the size of the reservoir and the nature of the lake that was flooded by the reservoir.
4. Small run-of-the-river plants emit 0.31 pounds of carbon dioxide equivalent per kilowatt-hour.
5. Estimates for life-cycle global warming emissions from hydroelectric plants built in tropical areas or temperate peatlands are much lower.
6. The exact amount of emissions depends on parameters of the site.

SAVING ENERGY

Какие правила Вы считаете приемлемыми для нас?

Shocking News About Batteries

Did you know that Americans use an average of about eight batteries a year per person? Wow!

Batteries that are thrown away produce most of the heavy metals - dangerous substances like lead, arsenic, zinc, cadmium, copper, and mercury - that are found in household trash. These metals are toxic. They can be harmful to humans and wildlife.

When discarded batteries from our trash wind up in landfills, these dangerous metals can seep into the ground water and eventually into the food chain. So, instead of throwing batteries in the trash, we should all take them to a toxic waste disposal area, if at all possible.

Turn off the toys and games (like GameBoys™) that use batteries when you are not playing with them. That makes the batteries last longer, and you won't need as many of them.

Forty percent of all battery sales are made during the holiday season. Ask for holiday gifts that do not require batteries.

Ask your parents to buy rechargeable batteries and a recharger.

Outside the House

Remember how saving water saves energy? Use a broom instead of a hose to clean off the driveway, patio or deck - this will save hundreds of gallons of water each year.

If you only have a small lawn, consider getting a manual push mower. It doesn't use any energy except your own. Pushing the mower spins the rotating wheels, which spins the cutter. Consider it good exercise!

Don't use an electric or gasoline leaf blower. Instead, use a rake.

If you need to leave a security light on over night, change the incandescent bulb to a compact fluorescent. It will last months and maybe years and save you energy and money. Some compact fluorescent bulbs even come in yellow so they won't attract bugs.

UNIT 6. Hydrokinetic Energy

TEXT A. Environmental Impacts of Hydrokinetic Energy

Hydrokinetic energy, which includes wave and tidal power, encompasses an array of energy technologies, many of which are still in the experimental stages or in the early stages of deployment.

While actual impacts of large-scale operations have not been observed, a range of potential impacts can be projected. For example, wave energy installations can require large expanses of ocean space, which could compete with other uses- such as fishing and shipping- and cause damage to marine life and habitats. Some tidal energy technologies are located at the mouths of ecologically-sensitive estuary systems, which could cause changes in hydrology and salinity that negatively impact animal and plant life.

In addition, while estimates for life-cycle global warming emissions for wave and tidal power are preliminary, published research suggests that they would be below 0.05 pounds of carbon dioxide equivalent per kilowatt-hour. To put this into context, estimates of life-cycle global warming emissions for natural gas generated electricity are between 0.6 and 2 pounds of carbon dioxide equivalent per kilowatt-hour and estimates for coal-generated electricity are 1.4 and 3.6 pounds of carbon dioxide equivalent per kilowatt-hour.

Active Vocabulary

1. Try to memorize the following words and phrases.

hydrokinetic energy	гидрокинетическая энергии
wave power	энергия волн
tidal power	приливная электростанция
to encompass	охватить
experimental stage	экспериментальная стадия
deployment	развертывание
expanse	пространство
ocean space	океаническое пространство
estuary system	система устья реки
hydrology	гидрология
salinity	соленость
preliminary	предварительный

Comprehension Check

2. Decide whether the following statements are true or false according to the text.

1. Hydrokinetic energy includes wave power.

2. Many of energy technologies are widely used.
3. Wave energy installations require small expanses of ocean space.
4. Some tidal energy technologies are located at the mouths of ecologically-sensitive estuary systems.
5. Estimates for life-cycle global warming emissions for wave and tidal power are below 0.05 pounds of carbon dioxide equivalent per kilowatt-hour.

SAVING ENERGY

Какие правила Вы считаете приемлемыми для нас?

Think About What Your Family Buys

If you buy things that can be used over and over instead of buying disposable items that are used once and then thrown away, you will save precious natural resources. You'll also save energy used to make them, and you'll reduce the amount of landfill space we need when they are thrown away.

Those same savings happen you buy things that will last instead of breaking right away. Well-made items may cost a little more to begin with, but they are usually worth the money because they last for a long time, and you don't have to replace them.

When your family goes shopping, think about taking bags with you. Only about 700 paper bags can be made from one 15-year-old tree. A large grocery store can use that many bags before lunch! Plastic bags start out as either oil or natural gas. Oil and natural gas are non-renewable resources. This means they can't be reused, and when they are all gone, they are gone forever. And throw-away bags add a lot of pollution to the environment. If plastic and paper bags are used once and go to landfills, they stay there for hundreds of years. Some stores offer discounts for people who use their own bags. For every bag reused, they give money back - usually about five cents for each bag.

With your parents, pick a spot in your house to store bags that you get from the grocery store. These bags can be used to carry things to friends' houses or for trash linings. After bags wear out, recycle them.

Other Recycling Tips

Make a scrap-paper pad. Gather pieces of used paper the same size with the blank side up. Find a piece of cardboard the same size as the paper and put it at the back. Staple the whole thing together, and use it as a place to write down grocery lists or things to do.

If every American recycled his or her newspaper just one day a week, we would save about 36 million trees a year. You can save a tree for every four feet of paper you recycle. It takes half as much energy to make recycled newspaper as it takes to make fresh newsprint from trees.

Recycle your newspapers. (Check to see if recycling centers want them tied together or in bags.) Anything that comes with the newspaper can also be recycled (except magazines, which must be recycled separately).

Recycle your old notebook paper. It is considered "white paper," and makes better recycled paper. "White paper" is writing paper, notebook paper, white envelopes, typing paper, index cards, computer paper, and white stationary. Cereal boxes, egg cartons, wrapping paper are called "mixed paper." All these things can be recycled. Mixed paper can be made into paperboard, the paper that is used on roofs.

GRAMMAR REVISION

Nouns.

Существительные в английском языке.

Существительными принято называть слова, обозначающие названия предметов, людей, животных, растений, веществ и понятий, например: a book - книга, a woman - женщина, a student - студент, a dog - собака, a flower - цветок, bread - хлеб, snow - снег, problem - проблема, love - любовь. Все существительные делятся на имена собственные (имена людей, клички животных, названия городов, улиц и т.д.), которые всегда пишутся с большой буквы: Tom, London, America, и имена нарицательные, которые подразделяются на исчисляемые и неисчисляемые существительные. К исчисляемым существительным относят названия конкретных предметов и абстрактных понятий, которые поддаются счёту, например: a pen - ручка, a horse - лошадь, a question - вопрос, an effort - усилие. К неисчисляемым существительным относят названия веществ и отвлечённых (абстрактных) понятий, которые счёту не поддаются, например: sand - песок, sugar - сахар, oil - масло, time - время, progress - прогресс.

1. Образование множественного числа имён существительных

Основным способом образования множественного числа имён существительных является прибавление окончания -s

a bag — bags

a cat — cats

a rose — roses

Но надо помнить о том, что если существительное заканчивается на:

-s, -o, -ch, -sh, -ss или -x,

множественное число образуется путем добавления окончания -es.

Example: tomato (помидор) - tomatoes, church (церковь) - churches, bush (куст) - bushes, kiss (поцелуй) - kisses, box (коробка) - boxes.

Только обратите внимание на то, что, если слово иностранного происхождения оканчивается на -o, мы добавляем просто "s":

Example: kilo (килограмм) - kilos, photo (фотография) - photos, piano (рояль) - pianos, soprano (сопрано) - sopranos.

Имена существительные, оканчивающиеся на -у с предшествующей согласной, образуют множественное число путём прибавления окончания -es, причём -у меняется на -i. Например, a dictionary — dictionaries.

Но: a boy — boys, a day — days (перед -у стоит гласная).

Некоторые имена существительные, оканчивающиеся на -f, -fe, образуют множественное число путём изменения -f на -v и прибавлением окончания -es.

a half — halves

a wolf — wolves

a wife — wives

Но: roof — roofs, safe — safes.

Ряд существительных образуют форму множественного числа особым образом.

ед. ч.	мн. ч.
man	men
woman	women
foot	feet
tooth	teeth
goose	geese
mouse	mice
child	children
sheep	sheep
deer	deer
datum	data
ox	oxen

2. Притяжательный падеж существительных в английском языке.

Существительные в английском языке имеют два падежа: общий падеж и родительный или притяжательный падеж. В общем падеже существительные не имеют никаких окончаний и отвечают на вопрос "кто, что"; притяжательный падеж образуется путём прибавления суффикса "-s" к существительным в единственном числе, а также к тем существительным во множественном числе, которые образуют его не по правилам, например: boy's, girl's, men's, children's, и отвечает на вопрос "чей". Апостроф прибавляется к существительным во множественном числе: soldiers', workers'.

This is the boy's book.

These are the boys' books.

Существительные в родительном падеже обычно выступают в качестве определения к другому существительному и выражают принадлежность в широком смысле слова, например: the children's toys - игрушки (чьи?) детей the parents' consent - согласие (чьё?) родителей the girl's story - рассказ (чей?) девочки; или служит описанию предмета, например: sheep's eyes - глаза, как у овцы soldiers' uniform - солдатская форма a mile's distance - расстояние в одну милю. Существительные, обозначающие неодушевлённые предметы, вещества и отвлечённые понятия, как правило, в форме родительного падежа не употребляются, а образуют оборот с предлогом "of":

the windows of the house окна дома
the handle of the door ручка двери.

Упражнение 1. Образуйте форму множественного числа.

Church, sheep, restaurant, country, gentleman, leaf, wolf, man, goose, deer, student, potato, cartoon, dress, child, woman, chicken, ox, weather, library, tree, costume, progress, bone, desert, factory, science, dictionary, hair, suburbs, station, pilot, map, city, dolphin, helicopter, fish, souvenir, lorry, ship, watch, scissors, bank, advice, calendar, information, mouse, ink.

Упражнение 2. Дополните предложения, используя следующие слова (в единственном или множественном числе).

Air, country, day, friend, meat, language, letter, patience, people, photograph, queue, space

1. I have my camera, but I don't take many
2. There are seven in a week.
3. A vegetarian is a person who doesn't eat
4. Outside the cinema there is of people waiting to see the film.
5. I'm not very good at writing
6. Today I go out with some
7. There are very few in the shops today. They are almost empty.
8. I'm going out for a walk. I need some fresh
9. George always wants things quickly. He's got no
10. Do you speak any foreign

11. Jane travels a lot. She has been to many
12. Our flat is very small. We haven't got much

Упражнение 4. Перефразируйте, употребляя притяжательный падеж.

1. the owner/that car _the owner of that car_ 2. the mother/Ann _Ann's mother_ 3. the jacket/that man --- 4. the top/the page --- 5. the daughter/Charles --- 6. the cause/the problem --- 7. the newspaper/yesterday --- 8. the birthday/my father --- 9. the name/this street --- 10. the toys/the children --- 11. the new manager/the company --- 12. the result/the football match --- 13. the garden/our neighbours --- 14. the ground floor/the building --- 15. the children/Don and Mary --- 16. the economic policy/the government --- 17. the husband/Catherine

Упражнение 5. Перепишите предложения начиная с выделенного слова.

1. The meeting tomorrow has been cancelled. - Tomorrow's meeting has been cancelled._
2. The storm last week caused a lot of damage.
3. The only cinema in the town has closed down.
4. Exports from Britain to the United States have fallen recently.
5. Tourism is the main industry in the region.

Pronouns.

Местоимения. Разряды местоимений.

Местоимение – часть речи, которая указывает на лицо, предметы, на их признаки, количество, но не называет их: I я, who кто, which который, this этот, these те, some несколько и другие. Местоимение обычно употребляется в предложении вместо имени существительного или имени прилагательного, иногда – вместо наречия или числительного.

John learns English. He likes it. - Джон учит английский. Он ему нравится.

He is a doctor. Everybody knows him. – Он врач. Каждый знает его.

По своему значению и грамматическим признакам местоимения делятся на следующие разряды:

- личные (I, you, he, she, it, we, you, they);
- притяжательные (my, your, his, her, its, our, your, their; mine, yours, his, hers, its, ours, yours, theirs);
- возвратные (myself, yourself, himself, herself, itself, ourselves, yourselves, themselves);
- указательные (this, these, that, those, such);
- вопросительные (who, what, whose, which);
- неопределенные (some/any, somebody, someone, something, anybody/anyone, anything, one);
- отрицательные (no, none, nobody/no one, nothing, neither);
- обобщающие (all, every, everybody, everything, both, either, other, another, each) и другие.

Характеристики личных, притяжательных, возвратных и указательных местоимений

Личные местоимения в именительном падеже	Личные местоимения в объектном падеже	Притяжательные местоимения	Абсолютная форма притяжательных местоимений	Возвратные местоимения	Указательные Местоимения	
					ед. число	Мн. число
I	me	My	Mine	myself	this-этот	these-эти
you	you	your	Yours	yourself	That-тот	those-те
He	him	His	His	himself		
she	her	Her	Hers	herself		
It	it	Its	Its	itself		
We	us	Our	Ours	ourselves		
you	you	your	Yours	yourselves		
They	them	their	Theirs	themselves		

Местоимения – определители

Much	много - с неисчисляемыми существительными: much time, much money, much water, much snow, much milk, much food.
Many	Много - с исчисляемыми существительными: many books, many students, many houses, many trees, many flowers, many rivers.
Little	мало – с неисчисляемыми существительными: little time, little money, little water, little snow, little milk, little food.
Few	мало – с исчисляемыми существительными: few books, few students, few houses, few trees
A little	немного: I have a little time. Wait a little. There is a little water.
A few	несколько: There are a few chairs in the room. I want to tell you a few words.

Упражнение 1. Используйте местоимения “me”, “you”, “him”, “us”, “her”, “it”, “them”.

1. She gives ... the book and asks to return ... next week.
2. Are you going to invite ... to your party?
3. I don't like the film, I don't want to speak about
4. We'll be very happy if you go on a trip with
5. Don't ask ... this question. I don't know how to answer
6. If she doesn't arrive tomorrow send ... a telegram.
7. I'm sorry to trouble you, but I want ... to do ... a favour.
8. Let's not wait for They are always late.
9. Do you want ... to do it for ... ? I don't mind ...
10. My parents are coming to see ... on Saturday. I like to spend my weekend with ...

Упражнение 2. Используйте личные или притяжательные местоимения в правильной форме.

1. The girls are here, ... came early.
2. When Roger saw Ann ... spoke to ...
3. The boss left an hour ago. I didn't see
4. Sam met Ann at the entrance, ... showed ... the pictures.

5. The Browns moved into a new flat. ... gave ... new address, so I can visit
6. Jane is ... sister, ... is older than ... am.
7. Thank ... for the book ... gave is very interesting.
8. ... like to visit ... friends who live not far from ... house.
9. Bill takes ... guitar lesson on Monday. ... is the only day ... is free after college.
10. I am very happy that ... cat found ... kitten.
11. ... flat is on the third floor, ... windows face the sea.
12. I invite ... to a party. ... hope ... will bring ... husband with

Упражнение 3. Вставьте *much, many, few* или *little*.

1. He isn't very popular. He has few friends.
2. Ann is very busy these days. She has --- free time.
3. Did you take --- photographs when you were on holiday?
4. I'm not very busy today. I haven't got --- to do.
5. The museum was very crowded. There were too --- people.
6. Most of the town is modern. There are --- old buildings.
7. The weather has been very dry recently. We've had --- rain.

Упражнение 4. Вставьте *little/a little/few/a few*.

1. We must be quick. We have little time.
2. Listen carefully. I'm going to give you --- advice.
3. Do you mind if I ask you --- questions?
4. This town is not a very interesting place to visit, so --- tourists come here.
5. I don't think Jill would be a good teacher. She's got --- patience.
6. 'Would you like milk in your coffee?' 'Yes, please ---.'
7. This is a very boring place to live. There's --- to do.
8. 'Have you ever been to Paris?' 'Yes, I've been there --- times.'

Упражнение 5. Вставьте *myself/yourself/ourselves* или *me/you/us*.

1. Julia had a great holiday. She enjoyed herself.
2. It's not my fault. You can't blame ---.
3. What I did was very wrong. I'm ashamed of ---.
4. We've got a problem. I hope you can help ---.

5. 'Can I take another biscuit?' 'Of course. Help ---!'
6. Take some money with --- in case you need it.
7. Don't worry about Tom and me. We can look after ---.
8. I gave them a key to our house so that they could let --- in.
9. When they come to visit us, they always bring their dog with ---.

Упражнение 6. Вставьте some или any.

1. We didn't buy any flowers.
2. This evening I'm going out with --- friends of mine.
3. 'Have you seen --- good films recently?' 'No, I haven't been to the cinema for ages.'
4. I didn't have --- money, so I had to borrow ---.
5. Can I have --- milk in my coffee, please?
6. I was too tired to do --- work.
7. You can cash these traveller's cheques at --- bank.
8. Can you give me --- information about places of interest in the town?
9. With the special tourist train ticket, you can travel on --- train you like.
10. If there are --- words you don't understand, use a dictionary.

The Verb "to be"

Глагол "to be"

Значение этого глагола - "быть, находиться". В отличие от других английских глаголов, глагол "to be" спрягается (т.е. изменяется по лицам и числам):

I am	я есть (нахожусь, существую)
He is	он есть (находится, существует)
She is	она есть (находится, существует)
It is	он, она, оно, это (о неодушевленных предметах) есть
We are	мы есть (находимся, существуем)
You are	ты, вы есть (находитесь, существуете)
They are	они есть (находятся, существуют)

I am in the room. Я нахожусь в комнате.

The book is on the table. Книга лежит на столе.

В данных примерах глагол "to be" является полнозначным глаголом. Так же, как и в русском языке, глагол "to be" может быть глаголом-связкой в именном сказуемом (в значении "есть"). В отличие от русского языка, в английском языке глагол-связка никогда не опускается, поскольку английское предложение имеет строго фиксированный порядок слов: подлежащее (subject) + сказуемое (verb) + дополнение (object).

I am a doctor.

Я врач. (Я есть врач.)

The weather is bad.

Погода плохая.

Итак, глагол-связка "to be" в английском предложении никогда не опускается, т.к. он входит в именное сказуемое, и его место после подлежащего. На русский же язык глагол "to be" в данных случаях не переводится. И, конечно же, вы переведете такие предложения, как "Я счастлив", "Книга интересная", "Он наш учитель", употребив глагол "to be" в правильной форме: "I am happy", "The book is interesting", "He is our teacher".

Глагол "to be" не требует вспомогательного глагола для образования вопросительной или отрицательной формы. Чтобы задать вопрос нужно поставить глагол "to be" перед подлежащим: "Am I happy?", "Is the book interesting?", "Is he our teacher?". А для образования отрицательной формы достаточно поставить отрицательную частицу "not" после глагола "to be": "I am not happy", "The book is not interesting", "He is not our teacher". В разговорной речи отрицательная частица "not" часто сливается с глаголом "to be", образуя сокращения: "isn't / aren't"; или глагол "to be" сливается с личным местоимением: "I'm / we're / you're / he's / she's / it's / they're."

В прошедшем времени глагол to be имеет форму was для местоимений I, he, she, it и were для you, we, they.

В будущем времени shall be или will be.

The Verb to have (to have got).

Глагол "to have"

Как самостоятельный глагол to have в настоящем времени (Simple Present) имеет 2 формы: have для всех лиц, кроме 3-го лица единственного числа, и has для 3-го лица единственного числа, в прошедшем времени (Simple Past) - had, в будущем (Simple Future) - shall have, will have.

Значение этого глагола - "иметь, владеть, обладать". Часто в разговорной речи вместо have, has употребляется сочетание have got, has got (краткие формы 've got и 's got) с тем же значением, особенно когда речь идёт о временном владении или только что приобретённом предмете или предметах:

We've got a nice flat.

У нас хорошая квартира.

Have you got any pets?

У вас есть домашние животные?

Yes, a dog and a cat.

Да, собака и кошка.

В вопросительной форме в британском варианте языка глагол have часто стоит перед подлежащим, в американском варианте вопросительная и отрицательная формы всегда образуются с помощью вспомогательного глагола do.

Do you have a car?

Упражнение 1. Используйте глаголы "to be" или "to have" Present, Past, Future Indefinite.

1. You ... welcome. 2. The metro station ... far from house. 3. Mary and Nelly ... friends. 4. She ... out. 5. It ... 5 o'clock now. 6. She ... a nice flat. 7. We ... a little child. She ... four. 8. They ... a big car. 9. How ... you? 10. How many little children they? 11. We ... a small cottage. 12. He ... bad habits. 13. How old ... Mary? 14. What country ... she from? 15. We ... well. 16. She ... at home. 17. He ... no time. 18. How far ... it from here? 19. It ... easy to ask him about it. 20. It ... not good of her to say so. 21. She ... two mistakes in the test. Her mistakes ... bad. 22. They ... glad to see her. 23. It ... a rainy day, ... he an umbrella with him? 24. My parents ... proud of me.

Упражнение 2. Поставьте данные предложения в отрицательную и вопросительную форму. Затем перепишите их в прошедшем и будущем времени.

1. Her name is Lucy. 2. Ted is nine. 3. Her face is round. 4. He is nice. 5. It is a good film. 6. My flat is fine. 7. I am happy. 8. They are clever. 9. Her baby is in bed. 10. She has a white dress. 11. They have a four - year - old son. 12. You have a big car. 13. We have many English books. 14. The house has five floors. 15. He has many uncles and aunts. 16. His cat is black. 17. We are at the university. 18. You are pale. 19. It is a nice day. 20. They are late. 21. She is from Russia. 22. It is time to go to bed. 23. You're a first-year student. 24. It's cold today. 25. We are glad to see them.

Упражнение 3. Составьте предложения из данных групп слов. Поставьте данные предложения в вопросительную и отрицательную формы.

- 1) A computer, machine, is, a very specific, really.
- 2) Can, remember, a computer, information.
- 3) The information, a computer, stores, in, its "memory".
- 4) Problems, solve, the most difficult, the science, computers, of, can.
- 5) Computers, questions, rockets and planes, answer about, bridges and ships.
- 6) Replace, routine tasks, a computer, people, can, in, dull.

Упражнение 4. Переведите на английский язык.

1. Ане восемнадцать лет. Она – студентка. 2. У наших родственников будет новая квартира. 3. У меня нет автомобиля. 4. У моего дяди большая семья. 5. Мамы нет, она на работе. 6. Семь часов. Пора вставать. 7. Холодно. У вас есть камин? 8. Дом моих родителей недалеко от Москвы. 9. По вечерам они всегда бывают дома. 10. Студенты в аудитории, у них сейчас лекция. 11. Эта книга была у нас в библиотеке. 12. Фильм неинтересный. 13. Она говорит, что у нее нет времени. 14. Ты сейчас занята? 15. Сколько вам лет? 16. Интересно, дома ли он сейчас? 17. В это время они обычно обедают. 18. Летом здесь очень жарко, но у нас есть бассейн. 19. Спроси его, почему он сердится. 20. Джон сейчас на Средиземном море. Я полагаю, он там хорошо проводит время.

Adjectives. Degrees of comparison.

Прилагательные. Степени сравнения прилагательных

Прилагательными называют слова, обозначающие свойства или качество предметов, например: large - большой, blue - голубой, simple - простой.

В предложении они обычно выполняют функцию определения к существительному или именной части составного сказуемого, например:

It was early spring.
Была ранняя весна.

The weather is cold.
Погода холодная.

Прилагательные в английском языке не изменяются ни по родам, ни по падежам, ни по числам. Сравните: a long street - длинная улица, a long table - длинный стол, long tables - длинные столы.

Как и в русском языке, в английском языке различают три степени сравнения прилагательных: положительную, сравнительную и превосходную. Положительная указывает на качество предмета и соответствует словарной форме, т.е. прилагательные в положительной степени не имеют никаких окончаний: difficult - трудный, green - зелёный. Часто, когда говорят о равной степени качества разных предметов, употребляют союз "as ... as - такой же... , как" или его отрицательный вариант "not so ... as - не такой ... , как".

The line AB is as long as the line CD.
Линия АВ такая же длинная, как и линия CD.

Если нужно указать, что один предмет обладает более выраженным признаком по сравнению с другим предметом, то употребляют прилагательное в сравнительной степени, которое образуется путём прибавления суффикса "-er" к основе прилагательного, состоящего из одного или двух слогов, например:

short - shorter
короткий - короче

Обратите внимание, что на письме конечный согласный удваивается, чтобы сохранить закрытый слог:

hot - hotter
горячий - горячее

А если основа прилагательного оканчивается на букву "-y" с предшествующим согласным, то при прибавлении суффикса "-er" буква "-y" переходит в "-i":

dry - drier
сухой - более сухой

При сравнении разной степени качества употребляется союз "than" - чем.

The line AB is longer than the line CD.

Линия АВ длиннее, чем линия CD.

Сравнительная степень прилагательных, состоящих из более, чем двух слогов, образуется при помощи слова "more - более":

useful - more useful

полезный - более полезный

The Russian language is more difficult than the English one.

Русский язык сложнее английского.

Превосходная степень указывает на высшую степень качества предмета и образуется при помощи суффикса "-est", от односложных и двусложных прилагательных или слова "most - самый" от некоторых двусложных и более длинных прилагательных. Причём при прибавлении суффикса "-est" сохраняются те же правила, что и для суффикса "-er". Поскольку данный предмет выделяется из всех прочих подобных ему предметов по своему качеству, то перед прилагательными в превосходной степени обычно употребляют определённый артикль "the":

large - the largest

большой - самый большой

hot - the hottest

горячий - самый горячий

dry - the driest

сухой - самый сухой

useful - the most useful

полезный - самый полезный.

It's the most difficult rule of all.

Это самое трудное правило из всех.

В английском языке существует ряд прилагательных, которые образуют степени сравнения не по общим правилам. Некоторые из них приводятся ниже в таблице.

<u>Положительная степень</u>		<u>Сравнительная степень</u>		<u>Превосходная степень</u>
Good	<i>хороший</i>	better	<i>лучше</i>	(the) best <i>самый</i>
bad	<i>плохой, плохо</i>	worse	<i>хуже</i>	<i>лучший</i>
much, many	<i>много</i>	more	<i>больше</i>	(the) worst <i>самый</i>
little	<i>маленький,</i>	less	<i>меньше</i>	<i>плохой</i>
<i>мало</i>		better	<i>лучше</i>	(the) most <i>больше</i>
well	<i>хорошо</i>	farther, further	<i>дальше</i>	<i>всего</i>
far	<i>далеко</i>			(the) least <i>меньше</i>
				<i>всего</i>
				best <i>лучше всего</i>
				farthest, <i>furthest</i>
				<i>дальше всего</i>

Многие наречия (в основном наречия образа действия) имеют степени сравнения: положительную, сравнительную и превосходную, которые образуются также как и степени сравнения прилагательных.

Положительная
степень

Сравнительная
степень

Превосходная степень

1. Односложные наречия и наречия **early**.

fast - быстро

faster - быстрее

(the) fastest - быстрее всего

soon - скоро

sooner - скорее

(the) soonest - скорее всего

early – рано

earlier - раньше

(the) earliest - раньше всего

2. Наречия, образованные от прилагательных при помощи суффикса - **ly**.

clearly – ясно

more clearly - яснее

(the) most clearly - яснее

less clearly - менее ясно

всего

(the) least clearly - наименее
ясно

3. Наречия **well** - хорошо, **badly** - плохо, **much** - много, **little** - мало, **far** - далеко образуют степени сравнения от других корней.

well - хорошо

better - лучше

(the) best - лучше всего

badly - плохо**much** - много**little** - мало**far** – далеко**worse** - хуже**more** - больше**less** - меньше**farther** - дальше**further** - дальше**(the) worst** - хуже всего**(the) most** - больше всего**(the) least** - меньше всего**(the) farthest** - дальше всего**(the) furthest** - дальше всего

Упражнение 1. Дополните предложения, используя сравнительную степень.

1. It's too noisy here. Can we go somewhere _quieter?_
2. This coffee is very weak. I like it a bit ---.
3. The hotel was surprisingly big. I expected it to be ---.
4. The hotel was surprisingly cheap. I expected it to be ---.
5. The weather is too cold in this country. I'd like to live somewhere ---.
6. My job is a bit boring sometimes. I'd like to do something ---.
7. I was surprised how easy it was to use the computer. I thought it would be -
--.
8. Your work isn't very good. I'm sure you can do ---.
9. Don't worry. The situation isn't so bad. It could be ---.
10. I was surprised we got here so quickly. I expected the journey to take ---.
11. You're talking very loudly. Can you speak a bit ---.
12. You hardly ever phone me. Why don't you phone me ---

Упражнение 2. Дополните предложения, используя сравнительную степень данных слов. Где необходимо используйте «than»

big crowded early easily high important interested peaceful reliable
serious simple thin

1. I was feeling tired last night, so I went to bed _earlier than_ usual.
2. I'd like to have a _more reliable_ car. The one I've got keeps breaking
down.
3. Unfortunately her illness was --- we thought at first.
4. You look --- Have you lost weight?
5. I want a --- flat. We don't have enough space here.
6. He doesn't study very hard. He's --- in having a good time.

7. Health and happiness are --- money.
8. The instructions were very complicated. They could have been ---.
9. There were a lot of people on the bus. It was --- usual.
10. I like living in the countryside. It's --- living in a town.

Упражнение 3. Дополните предложения, используя превосходную степень + предлог.

- 1 It's a very nice room. It _is the nicest room in_ the hotel.
2. It's a very cheap restaurant. It's --- the town.
3. It was a very happy day. It was --- my life.
4. She's a very intelligent student. She --- the class.
5. It's a very valuable painting. It --- the gallery.
6. Spring is a very busy time for me. It --- the year.

In the following sentences use one of + a superlative + a preposition.

- 7 It's a very nice room. It _is one of the nicest rooms in_ the hotel.
8. He's a very rich man. He's one --- the world.
9. It's a very old castle. It --- Britain.
10. She's a very good player. She --- the team.

Упражнение 4. Раскройте скобки, употребляя much /a bit и сравнительную степень данных слов. Где необходимо используйте «than»

1. Her illness was _much more serious than_ we thought at first. (much/serious)
2. This bag is too small. I need something ---. (much/big)
3. I'm afraid the problem is --- it seems. (much/complicated)
4. You looked depressed this morning but you look ---now. (a bit/happy)
5. I enjoyed our visit to the museum. It was --- I expected. (far/Interesting)
6. You're driving too fast. Could you drive ---? (a bit/slowly)
7. It's --- to learn a foreign language in the country where it is spoken. (a lot/easy)
8. I thought she was younger than me but in fact she's --- (slightly/old)

Упражнение 5. Переведите предложения.

1. Сегодня гораздо холоднее, чем было вчера.
2. Теперь у меня уходит больше времени на дорогу, чем раньше.
3. Во время спортивного кросса Дейв

пробежал больше, чем остальные участники. 4. В этом году я сдам экзамены успешнее, чем в прошлом. 5. Автобус едет дольше, чем поезд. 6. Наш университет значительно больше вашего. 6. Эта книга гораздо интереснее, чем предыдущая. 7. Путешествовать паромом комфортнее, чем поездом. 8. Эти задания значительно сложнее. 9. Вы себя лучше чувствуете? 10. Этот костюм красивее, но гораздо дороже. 11. Говорят, что английский язык изучать легче, чем остальные. 12. Наша новая квартира просторнее предыдущей.

The Article. Артикль.

Артикль служит определителем имени существительного, он передает значение определенности и неопределенности в существительном и при этом собственного, отдельного вещественного значения не имеет.

Неопределённый артикль a (an – перед словами, начинающимися с гласной) может сочетаться только с существительными в единственном числе. Определённый артикль происходит от числительного **one** и употребляется:

- в значении *один*.

Wait a minute! We walked a mile or two.

- означает *один из многих, какой-то, любой*.

Have you a sister or a brother? A cow gives milk. A ball is round.

- употребляется с существительными, обозначающими время, скорость, вес, расстояние

a minute, a pound, a hundred, a million.

Определённый артикль the происходит от указательного местоимения **that**. Употребляется перед существительными как в единственном, так и во множественном числе.

Определённый артикль употребляется когда:

- из ситуации или контекста ясно, какое именно лицо или предмет имеется в виду.

They went to the station. Close the window and turn on the light.

- после существительного имеется определение, выделяющее лицо или предмет из ряда им подобных.

The book that (which) I gave you yesterday is very interesting.

- перед существительным стоит определение, выраженное: порядковым числительным January is the first month of the year.

прилагательным в превосход. степени This is the biggest building in our town.

словами same, right, very, only и др. Are we on the right road? Do you eat the same food every day?

- существительное обозначает предмет, единственный в своем роде или в определенной ситуации.

The moon moves round the Earth. The sun shines by day in the sky.

- существительное обобщает весь класс подобных лиц (предметов).

The clown first appeared in the English circus.

The horse is a useful domestic animal.

Артикли не употребляются:

- перед неисчисляемыми существительными.

I like milk. The socks are made of thick grey wool.

- перед существительными в значении обращения.

Good morning, sweet child!

- перед названиями времен года.

Summer is my favourite season. When winter comes, the weather gets cold.

- перед названиями приемов пищи.

We have breakfast and supper at home, but we don't have dinner at home.

- перед существительными, обозначающими общественные учреждения.

School, hospital, prison.

Употребление/ неупотребление артикля с именами собственными

Определенный артикль THE

географические названия и части the North Pole, the east, the west и др.
света

названия рек	the Volga, the Thames, the Nile
названия озер (без слова lake)	the Ontario
названия морей и океанов	the Black sea, the Pacific Ocean
названия горных цепей	the Urals, the Alps, the Caucasus
названия пустынь	the Sahara, the Karakum
названия каналов	the Panama Canal, the English Channel
названия некоторых государств и республик (со словами republic,	the USA, the Russian Federation, the United Kingdom

Kingdom, state, federation)

названия большинства газет	the Times, the Washington Post
фамилии, называющие всю семью	the Browns, the Forsytes
названия достопримечательностей	the Kremlin, the Hermitage
<i>Артикли не употребляются</i>	
названия городов и стран	Moscow, New York, London
названия гор	Everest, Kilimanjaro
названия улиц и площадей	Downing Street, Red Square
Имена	Tomas Smith, Ivan Petrov
дни недели, месяцы	Monday, Sunday, February, June
виды спорта, научные области знаний	basketball, hockey; sociology, physics

Упражнение 1. Вставьте артикль, где необходимо.

1. "What do you do?" - "I'm a student. I am ... first- year student". 2. They are ... first- year students. 3. "Is Helen ... student or ... teacher?" - "She is ... student". 4. This ... young man is ... student of ... group 3. 5. This is ... good room. 6. What room is this?" - " This is ... room 25". 7. Is Mary from ... Manchester or from ... Glasgow? 8. ... Thames is ... long river. 9. His ... room is good. 10. Read ... first sentence, please. 11. Are ... Thompsons in ... Middle East now? - Yes, they are. 12. My ... father is ... economist. He is at ... home now. 13. I gave ... magazine to my ... friend. 14. I usually wear ... cap. 15. Give me ... pen. This ... pen is bad. Give me another ... pen. 15. Nick will show ...book to ... teacher.

Упражнение 2. Вставьте артикль, где необходимо.

1. After ... work I usually go home. 2. He often comes to ... work late. 3. I begin my work at ... half past eight. 4. Close ... window, please. It is cold in ... room. 5. She is eating ... apple. 6. He made ... mistake in his dictation. 7. ... lion is ... wild animal. 8. I need ... pencil. Give me ... pencil, please. 9. Yesterday our team won ... match. 10. He is not ... man I am looking for. 11. I don't go to ... school on ... Sunday. 12. Are there any ... flowers in ... vase? 13. She lives on ... fifth floor. 14. This ... young woman is ... engineer. 15. That man has two children. ... first child was born 5 years ago and ... second was born ... last year. 16. Do you like ... city? – It is one of ... most beautiful cities in ... world.

Упражнение 3. Вставьте артикль, где необходимо.

1. ... London is ... capital of ... Great Britain, ... full name of which is ... United Kingdom of ... Great Britain and ... Northern Ireland.
2. ... Volga is fabulous river. It is one of ... most beautiful ... rivers in ... Russia.
3. They used to spend their summer holidays on ... Black Sea coast in ... Crimea.
4. Many European adventurers crossed ... Atlantic Ocean in ... search of ... riches on ... American continent prior to ... Columbus.
5. ... Gorki Street was renamed into ... Tverskaya Street.
6. ... Red Square and ... Kremlin are ... heart of ... capital.
7. ... St. Petersburg was founded on ... banks of ... Neva by Peter ... Great.
8. ... Johnsons are our next-door neighbors.
9. ... Canada is situated in ... northern part of ... North America.
10. We left for ... East on ... following morning.
11. They passed many coal mines on ... way.
12. He arrived in ... New York on ... very rainy day.
13. She spent several hours at ... Bronx Zoo on ... Monday.
14. They took ... wonderful boat ride around ... Manhattan on ... last day of their visit.

Упражнение 4. Вставьте артикль, где необходимо.

1. I don't usually like staying at ... hotels, but last summer we spent a few days at ... very nice hotel by ... sea.
2. ... tennis is my favourite sport. I play once or twice ... week if I can, but I'm not ... very good player.
3. I won't be home for ... dinner this evening. I'm meeting some friends after ... work and we're going to ... cinema.
4. ... unemployment is very high at the moment and it's very difficult for ... people to find ... work.
5. There was ... accident as I was going ... home last night. Two people were taken to ... hospital. I think ... most accidents are caused by ... people driving too fast.
6. Carol is ... economist. She used to work in ... investment department of ... Lloyds Bank. Now she works for ... American bank in ... United States.
7. A: What's ... name of ... hotel where you're staying?
B: ... Imperial. It's in ... Queen Street in ... city centre. It's near ... station.

8. I have two brothers. ... older one is training to be ... pilot with ... British Airways. ... younger one is still at ... school. When he leaves ... school, he hopes to go to ... university to study ... law.

The Verb

Глагол

Глагол – часть речи, которая обозначает действие или состояние лица или предмета. Глагол в английском языке обладает гораздо более сложной, чем в русском, системой видовременных форм. Эта система охватывает личные формы (**Finite Forms**) и неличные формы (**Non-finite Forms**).

Личные формы глагола выражают следующие категории: лицо, число, время, вид, залог, наклонение. Личная форма, как и в русском языке, в предложении всегда употребляется в функции сказуемого.

We live in Russia. - Мы живём в России.

They write letters every day. – Они пишут письма каждый день.

Do you hear what he is saying? – Вы слышите, что он говорит?

Основные глагольные формы.

I	II	III	IV
Инфинитив	Прошедшее неопределённое время	причастие II	причастие I
Infinitive to write to develop	Past Indefinite wrote developed	Participle II written developed	Participle I (-ing форма) writing developing

Инфинитив представляет собой неличную форму глагола, которая только называет действие. Он не имеет ни лица, ни числа и соответствует неопределённой форме глагола в русском языке. В словаре глагол даётся обычно в форме инфинитива. Формальным признаком инфинитива является частица **to**.

По способу образования II и III формы все глаголы английского языка делятся на правильные (стандартные) и неправильные (нестандартные).

I	II	III	IV
to ask	ask<u>ed</u>	ask<u>ed</u>	asking
to write	wrote	written	writing

Времена английского глагола. Действительный залог.

<i>Употребление</i>		Образование
Indefinite показывает действие как факт (обычное, повторяемое)	Present Past Future	глагол в личной форме
Continuous показывает действие как процесс	Present Past Future	to be + ing
Perfect показывает действие, законченное до определённого момента в настоящем, прошедшем и будущем	Present Past Future	to have + причастие II
Perfect Continuous показывает действие, начатое некоторое время назад и все ещё продолжающееся или только что закончившееся	Present Past Future	to have been + ing

The Present Indefinite (Simple) Tense (настоящее неопределенное время) обозначает постоянное, повторяющееся, обычное действие, какой-либо факт или общеизвестную истину. *We live in St. Petersburg. The Earth rotates round its axis. I leave home at 8 every day.*

Present Indefinite по форме совпадает с инфинитивом глагола (без частицы **to**) во всех лицах, кроме 3-го лица ед. ч., принимающего окончание –s (**-es**).

Утвердительная форма	Отрицательная форма	Вопросительная форма
I play	I do not play	Do I play ?

He	plays	he		
She		she	does not	play
It		it		
We	play	we		
You		you	do not	play
They		they		
				Does he (she, it) play ?
				Do we (you, they) play ?

do not = don't; does not = doesn't

Present Indefinite часто употребляется с наречиями, выражающими частотность: *always* всегда, *often* часто, *seldom* редко, *sometimes* иногда, *never* никогда, *hardly ever* почти никогда, *nearly always* почти всегда, *usually* обычно, *generally* как правило, *every day* каждый день (*week, month, year* - неделю, месяц, год).

Упражнение 1. Поставьте данные предложения в отрицательную и вопросительную форму.

A. Model: I like bananas. - I do not like bananas. Do you like bananas?

1. I write letters regularly. I ... not ... letters regularly. ... you ... letters regularly? 2. I drive a car. I ... not ... a car. ... you ... a car? 3. You sing well. You ... not ... well. ... you ... well? 4. They live in London. They ... not ... in London. ... they ... in London?

B. Model: He likes coffee. - he does not like coffee. Does he like coffee?

1. She watches TV every day. She ... not ... TV every day. ... she ... TV every day? 2. He often gives her flowers. He ... not ... her flowers. ... he often ... her flowers? 3. She helps her mother about the house. She ... not ... about the house. ... she ... her mother about the house? 4. He likes classical music. He ... not ... classical music. ... he ... classical music?

Упражнение 2. Раскройте скобки, употребляя глаголы в Present Indefinite. Поставьте данные предложения в отрицательную и вопросительную форму.

1. Her brothers always (to tell) the truth, she sometimes (to lie). 2. They (to laugh) a lot, she (to cry) a lot. 3. We (to eat) much, she (to eat) little. 4. I (to like) meat, she (to like) fish. 5. We (to go) to the disco three time a week, he never (to go) there. 6. They (to ask) questions, my little sister (to ask) many questions too. 7. My brother and I always (to help) our mother with the housework, but our sister never (to help) her. 8. I always (to give) her good advice, she (to follow) it. 9. You (to like) ballet, she (to like) opera. 10. My friends often (to visit) me, my girlfriend never (to visit) me. 11. We always (to get) up early, she always (to get) up late. 12. We (to be) from Moscow, she (to be) from Canada. 13. They (to make) friends easily, she hardly (to make) friends. 14. They (to look) very happy, she (to look) unhappy. 15. My friends (to go) to the Crimea every summer, she (to go) to the Caucasus every summer. 16. We (to drive) slowly, he (to drive) fast. 17. They (to speak) Spanish and Italian, she (to speak) English.

Упражнение 3. Дополните предложения, используя следующие глаголы.

believe, eat, flow, grow, make, rise, tell, translate, speak, drink, cause, live

1. Ann German very well. 2. Rice in Britain. 3. I never coffee. 4. The sun in the east. 5. Bees honey. 6. Vegetarians meat. 7. An atheist in God. 8. Bad driving many accidents. 9. An interpreter from one language into another. 10. My parents in a very small flat. 11. A liar is someone who the truth. 12. The River Amazon into the Atlantic Ocean.

Past Indefinite (Simple)

Прошедшее неопределенное время

The Past Indefinite (Simple) Tense (прошедшее неопределенное время) обозначает действие, совершившееся или совершавшееся в прошлом, не связанное с настоящим; описывает ряд последовательных действий в прошлом, описывает обычные, повторяющиеся действия в прошлом.

Форма Past Indefinite правильных глаголов образуется путем прибавления к основе инфинитива окончания –ed. Форме Past Indefinite неправильных глаголов соответствует II форма глагола в соответствующих глагольных рядах, приводимых в специальных таблицах (см. таблицы неправильных глаголов).

We went to the cinema yesterday. He arrived in London last year.

Утвердительная форма		Отрицательная форма		Вопросительная форма	
I He, she, we, you, they	worked (wrote)	I did not	work (write)	Did I	work (write) ?

did not = didn't

Past Indefinite употребляется с наречиями ago тому назад, (month ago месяц тому назад, three days ago три дня тому назад), long ago давно, the other day на днях (в прошлом), yesterday вчера, the day before yesterday позавчера, last прошлый (last week на прошлой неделе, last month в прошлом месяце, last year в прошлом году); с указанием даты или периода времени в прошлом (in July в июле, in 1990 в 1990 году и т.д.).

Упражнение 1. Раскройте скобки, употребляя глаголы в Past Indefinite. Поставьте данные предложения в вопросительную и отрицательную форму.

1. He (to lose) his balance and (to fall). 2. Ann's grandfather (to found) his firm in 1901. 3. Queen Elizabeth II (to be) born in 1926. She (to become) Queen of England in 1952. 4. We (to meet) last summer. 5. Yesterday she (to find) the key in its usual place. 6. Sunday (to pass) peacefully. 7. Who (to ring) you up an hour ago? 8. It (to take) you long to find his house yesterday? 9. One of her brothers (to make) a tour of Europe last summer. 10. We (not to rest) last week. 11. Last night we (to go) to a football match. 12. Paul and I (to play) tennis yesterday.

Упражнение 2. Перепишите текст в прошедшем времени.

He gets up at seven o'clock. He washes his face, cleans his teeth and combs. He goes to the kitchen and has his breakfast. For breakfast he has a cup of coffee and cheese. When the breakfast is over, he goes to the office. He takes a bus to get to his work. At the office he works till two o'clock. At two o'clock he has dinner. He finishes his work at seven o'clock in the evening. He decides to walk a little after his working day. He returns home at nine. He doesn't want to have supper, he only drinks tea. Suddenly he remembers that he has to phone to his friend. He dials the number but nobody answers. His friend is not at home. He goes to his room and decides to watch TV. When the TV programme is over, he sleeps.

Упражнение 3. Раскройте скобки, употребляя глаголы в Past Indefinite (утвердительной или отрицательной форме).

1. It was warm, so I (to take) of my coat. 2. The film wasn't very good. I (to enjoy) it very much. 3. I knew Sarah was very busy, so I (to disturb) her. 4. I was very tired, so I (to go) to bed early. 5. The bed was very uncomfortable. So I (to sleep) very well. 6. Sue wasn't hungry, so she (to eat) anything. 7. We went to Kate's house but she (to be) at home. 8. It was a funny situation but nobody (to laugh). 9. The window was open and a bird (to fly) into the room. 10. The hotel wasn't very expensive. It (to cost) very much. 11. I was in a hurry, so I (to have) time to phone you. 12. It was hard work carrying the bags. They (to be) very heavy.

Упражнение 4. Раскройте скобки, употребляя глаголы в форме Present Indefinite или Past Indefinite.

1. They (to be) in London last month.
2. Who of your friend (to speak) English?
3. How many lessons you (to have) every day?
4. I (not to be) at home yesterday, I (to go) for a walk.
5. He usually (to sleep) well. But last night he (to sleep) bad.
6. Your sister (to be) a doctor? – Yes, she (to become) a doctor two years ago.
7. He (not to shave) today because he (not to have) time.
8. You (to get) up early on Sunday? – Yes. But last Sunday I (to sleep) till ten.
9. When you (to leave) the meeting yesterday?
10. She (to enjoy) the film, which we (to see) last week?

The Future Indefinite (Simple)

Будущее неопределенное время

The Future Indefinite (Simple) Tense (будущее неопределенное время) употребляется для выражения однократного или повторяющегося обычного действия или ряда последовательных действий в будущем.

I will go to the theatre with you. In winter Nick will walk in the country every Sunday.

Future Indefinite образуется при помощи вспомогательного глагола shall для 1-го лица единственного и множественного числа и will для всех остальных лиц и инфинитива без частицы to знаменательного глагола (shall/will + ask).

Утвердительная форма		Отрицательная форма		Вопросительная форма
I, we He, she, it, you, they	shall will go	I, we He, she, it, you, they	shall will not go	Shall (will) I (we) go? Will he (she, it, you, they) go?

shall not = shan't; will not = won't

Примечание. В современном английском языке существует устойчивая тенденция употреблять will для всех лиц, а в разговорной речи употребляется, как правило, только сокращённая форма вспомогательного глагола с личным местоимением.

I will come (I'll come) to see you tomorrow. - Я навещу вас завтра.

На будущее время в предложении могут указывать обстоятельства времени: tomorrow завтра, next week на следующей неделе, next year в будущем году, in a week через неделю, in a few days через несколько дней, one of these days на днях.

В придаточных предложениях условия и времени вместо будущего времени употребляется настоящее. Придаточные предложения условия и времени вводятся союзами:

If - если	after - после
When - когда	till (untill) - до сих пор
Before - до, перед	as soon as - как только

Упражнение 1. Раскройте скобки, употребляя глаголы в форме Future Indefinite.

1. I (to see) them next Saturday. 2. They (to be) here tomorrow. 3. We (to have) the test in a week. 4. She (to spend) holidays in the country. 5. The journey (to take) three hours. 6. I (to open) the door for you. 7. I (to go) to school tomorrow? 8. They (to come) back next week? 9. We (to leave) Moscow this evening? 10. You (to wait) for me? 11. Nick (to finish) the University next year? 12. She (to agree) with you? 13.

I (not to swim) tomorrow. 14. He (not to play) in the garden. 15. The weather (not to be) fine on Saturday. 16. We (not to be) busy in the evening. 17. Sheila (not to get) passport next year. 18. Why your father (to help) you? 19. How many people (to arrive) today? 20. When you (to go) to the cinema?

Упражнение 2. Раскройте скобки, употребляя глаголы в форме Present Indefinite или Future Indefinite (Все действия совершаются в будущем времени).

1. If the weather (to be fine), the plane (to leave) in time.
2. They (to visit) their parents next month if they (to get) letter from them.
3. Jack (to miss) the train if he (not to hurry).
4. When he (to feel) better, he (to invite) us.
5. She (to finish) her work when she (to be) at the office.
6. What she (to do) when she (to return) home?
7. I (to take) my child to the ZOO if I (to have) time.
8. They (not to swim) if the water (to be) cold.
9. Dan (to send) us a postcard when he (to get) to St. Petersburg.
10. I (not to go) for a walk before my parents (to come) home.

Упражнение 3. Раскройте скобки, употребляя глаголы в форме Present Indefinite или Future Indefinite.

1. If you (to take) a taxi, you (to be) there in time.
2. He says that he (to stay) at home, until I (to ring) him up.
3. I (to give) you my answer when I (to be) sure of my feelings.
4. I (to be) very thankful if you (to help) me.
5. I (not to give) you my opinion before I (to study) the matter thoroughly.
6. They say that they (not to go) skiing if the weather (to be) nasty.
7. When you (to learn) all the truth you (not to like) him any more.
8. If he (not to like) your plan, he (to refuse) to take part in the work.
9. He says that as soon as the film (to be) on, we (to see) it together.
10. If you (to follow) my advice, everything (to be) all right.
11. You (to understand) me when you (to know) my life story.
12. He says that he (to wait) till I (to finish) my work.
13. If I (to have) an opportunity, I (to talk) to her about you.
14. I (to begin) the work as soon as I (to find) all necessary books.
15. He says that he (to help) me if I (to ask) him for his help.

Упражнение 4. Переведите на английский язык следующие предложения.

1. Если ты приедешь в наш город, ты остановишься у нас. 2. Когда он осознает свои ошибки, он извинится перед родителями. 3. Я обещаю, что как только вернусь домой, позвоню тебе. 4. Я обязательно сообщу тебе, как только узнаю что-нибудь новое. 5. Он говорит, что купит эту книгу, когда у него будут деньги. 6. Друзья спрашивают нас о том, где мы остановимся, когда приедем на побережье. 7. Он говорит, что никогда не простит меня, если узнает, что я говорю неправду. 8. Когда мы закончим работу, обязательно отдохнем.

The Present Continuous (Progressive) Tense
Настоящее продолженное время

The Present Continuous Tense (настоящее продолженное время) обозначает действие, происходящее в момент речи или в настоящий период времени; выражает будущее действие, когда налицо намерение совершить действие или уверенность в его совершении.

He is watching TV now. They are leaving Moscow next week. They are going to the south.

Сочетание Present Continuous глагола to go с инфинитивом часто употребляется для выражения намерения совершить действие.

They are going to spend next winter in Spain. He is going to take part in the competition.

Некоторые глаголы не употребляются в Present Continuous. Это глаголы, обозначающие чувственное восприятие (to see, to hear), умственную деятельность (to know, to believe, to remember, to understand, to forget); желания, чувства (to want, to wish, to like, to love, to dislike, to hate), принадлежности (to belong, to possess).

Present Continuous образуется при помощи Present Indefinite вспомогательного глагола to be и Participle I знаменательного глагола (окончание –ing) (am/is/are + sitting).

Утвердительная форма	Отрицательная форма	Вопросительная форма
I am working	I am not working	Am I working ?
He, she, it is working	He, she, it is not working	Is he (she, it) working?

We, you, they are work- ing	We, you, they are not work- ing	Are we (you, they) working ?
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I am = I'm; He is = He's; We are = We're; is not = isn't; are not = aren't

На длительный характер действия в Present Continuous могут указывать обстоятельства времени: now сейчас, right now прямо сейчас, at this moment сейчас, в данный момент, today сегодня, this week (month, year) на этой неделе (в этом месяце, году).

Упражнение 1. Образуйте отрицательную и вопросительную форму предложений.

1. She is watching television at the moment. 2. They are playing football together now. 3. My sister is writing a letter. 4. They are talking to my friend. 5. Mary is sleeping. 6. You are listening to the radio. 7. He is at home now. He is having breakfast at the moment. 8. They are working now. 9. We are drinking a coffee right now. 10. Michael is holding a book in his hand. 11. His friend is playing volley-ball. 12. I am planting trees now.

Упражнение 2. Раскройте скобки, используя Present Indefinite или Present Continuous.

1. They (to go) out of town at weekends. 2. We (to leave) for York tomorrow morning. 3. He usually (to drive) to his office. 4. They (to change) guard every day at 11.00. 5. Sometimes he (to walk) to his work instead of driving. 6. They (to stay) with us at that moment. 7. She never (to stay) out late. 8. They often (to go) to the sea in summer. 9. She (to write) now about her visit to London. 10. He (to study) French this year at college. 11. Our mother (to cook) lunch now. 12. I'm tired. I (to go) to bed now. 13. Ann (to speak) German very well. 14. The swimming pool (to open) at 9 o'clock and (to close) at 18.30 every day. 15. Listen to those people. What language they (to speak)? 16. Bad driving (to cause) many accidents. 17. My friends (to live) in a very small flat. 18. The Olympic Games (to take place) every four years. 19. Let's go out. It (not to rain) now.

Упражнение 3. Переведите на английский язык, употребляя глаголы в Present Indefinite или в Present Continuous.

1. Что ты делаешь? – Я готовлю доклад. 2. Ты мне веришь? – Да, я тебе верю. 3. Он знает, что ты ошибаешься. 4. Я ненавижу холодную погоду. 5. Как вы себя чувствуете? – Неплохо. 6. Сейчас она мне нравится. 7. Мой муж сейчас в саду, он сажает деревья. 8. Что ты хочешь? – Я хочу пить. 9. Извините, но я с вами не согласен. 10. Она сейчас ищет одежду. 11. Он никогда не соглашается с тем, что я говорю. 12. Вы меня понимаете? – Нет, я вас не понимаю. 13. Она наблюдает сейчас за нами. 14. Ты меня ищешь? – Нет, я ищу свою сестру. 15. Я часто работаю ночью, поэтому у меня сегодня выходной. 16. Чему вы отдаете предпочтение: прогулкам или поездкам? 17. Сейчас ребенок рисует в соседней комнате. 18. Что вы думаете о спорте? 19. Чем они занимаются? – Они обсуждают мою новую книгу.

Упражнение 4. Раскройте скобки, употребляя глаголы в Present Indefinite или Present Continuous.

1. Let's go out. It (not/to rain) now.
2. Julia is very good at languages. She (to speak) four languages very well.
3. Hurry up! Everybody (to wait) for you.
4. “ (you/ to listen) to the radio?”- “No, you can turn it off.”
5. “ (you/ to listen) to the radio every day?”- “No, just occasionally.”
6. The River Nile (to flow) into the Mediterranean.
7. Look at the river. It (to flow) very fast today – much faster than usual.
8. We usually (to grow) vegetables in our garden but this year we (not/ to grow) any.
9. “How is your English?” – “Not bad. It (to improve) slowly.
10. Ron is in London at the moment. He (to stay) at the Park Hotel. He always (to stay) there when he's in London.

The Past Continuous (Progressive) Tense

Прошедшее продолженное время

The Past Continuous Tense (прошедшее продолженное время) обозначает действие, происходившее в определённый момент в прошлом, который обозначен либо обстоятельством времени, либо другим действием в прошлом. При этом ни начало, ни конец длительного действия неизвестны. Подчёркивается сам процесс действия, его продолжительность.

I was writing a letter to my friend at 5 o'clock yesterday.

I was writing a letter to my friend from 5 to 6 on Sunday.
 I was writing a letter to my friend when my brother came.
 I was writing a letter while my mother was cooking dinner.

Кроме того, Past Continuous может употребляться для выражения одновременных действий, протекавших в прошлом в один и тот же момент.

The children were playing while their mother was watching them. –

Дети играли, в то время как их мать наблюдала за ними.

As I was taking a shower, mother was cooking breakfast. –

В то время, когда я принимала душ, мама готовила завтрак.

Past Continuous образуется из сочетания вспомогательного глагола to be в Past Indefinite и Participle I знаменательного глагола (was/were + working).

Утвердительная форма	Отрицательная форма	Вопросительная форма
I, he, she, it was writing	I, he, she, it was not writing	Was I (he, she, it) writing?
We, you, they were writing	We, you, they were not Writing	Were we (you, they) writing ?

was not = wasn't; were not = weren't

На длительный характер действия в Past Continuous могут указывать обстоятельства времени from six to seven с шести до семи, all day long last Saturday весь день в прошлую субботу, the whole day yesterday весь вчерашний день и т.д.

Упражнение 1. Раскройте скобки, употребляя глаголы в форме Past Continuous. Поставьте данные предложения в вопросительную и отрицательную форму.

1. I (to read) a book at two o'clock yesterday. 2. They (to write) the test at this time yesterday. 3. He (to work) in the garden from two till five o'clock. 4. We (to watch) television the whole evening. 5. You (to play) football at six o'clock. 6. You (to drink) coffee at seven o'clock. 7. He (to draw) all day long last Saturday. 8. It (to rain) the whole day yesterday. 9. They (to skate) at three o'clock. 10. You (not to sleep) at nine o'clock last night. 11. I (not to write) a letter to my granny at eight o'clock. 12. She (not to help) mother about the house from two till six. 13. George (to

do) his lessons the whole evening. 14. This time last year I (to live) in my native town.

Упражнение 2. Раскройте скобки, употребляя глаголы в форме Present Continuous или в Past Continuous.

1. What you (to do) from seven till nine yesterday?
2. What she (to drink) now? – She (to drink) juice.
3. Nick (to draw) a picture when I saw him.
4. Who (to stand) near the door now?
5. When I looked through the window, the sun (to shine) but the wind (to blow).
6. What they (to discuss) at the moment?
7. It (to snow) when I left my house yesterday.
8. Robert (to have) dinner now? – No, he (to read) a book.
9. Our children (to make) noise the whole evening yesterday.
10. What they (to speak) about when I (to enter) the room?
11. He (to look) for his keys at the moment.
12. Look! Somebody (to swim) across the river.
13. He (to go) to the office when I met him in the street.
14. She (to read) a book while I was watching television.
15. My friend (to wait) for a bus when I saw him at the bus stop.

Упражнение 3. Раскройте скобки, употребляя глаголы в форме Past Indefinite или Past Continuous.

1. Jane (to wait) for me when I (to arrive). 2. “What you (to do) this time yesterday?” “I was asleep.” 3. “You (to go) last night?” “No, I was too tired.” 4. “Was Carol at the party last night?” “Yes, she (to wear) a really nice dress.” 5. How fast you (to drive) when the accident (to happen)? 6. John (to take) a photograph of me while I (not to look). 7. We were in a very difficult position. We (not to know) what to do. 8. I haven’t seen Alan for ages. When I last (to see) him, he (to try) to find a job in London. 9. I (to walk) along the street when suddenly I (to hear) footsteps behind me. Somebody (to follow) me. I was frightened and I (to start) to run. 10. When I was young, I (to want) to be a bus driver.

Упражнение 4. Раскройте скобки, употребляя глаголы в форме Past Indefinite или Past Continuous.

1. When the taxi (to arrive) I still (to pack) my things. 2. What you (to do) in the evening yesterday? – I (to watch) TV and my wife (to wash up). 3. I (to do) all the exercises while you (to smoke). 4. Mr. Brown, where you (to be) when they (to drive) your car at midnight? 5. When the clock (to strike) nine she (to run) up the stairs to her office because the lift (not to work). 6. He (to stand) and (to watch) while the boys (to fight). 7. She (to wear) marvelous new dress at the party and (to look) fantastic! 8. He (to wait) for her for an hour but she never (to come). 9. When the telephone (to ring) I (to bake) a cake and (to ask) Mary who (to do) nothing at the moment to answer the call. 10. Why you (not to attend) the lecture on Saturday? Professor B (to speak) about UFO and other mysterious objects.

The Future Continuous (Progressive) Tense **Будущее продолженное время**

The Future Continuous Tense (будущее продолженное время) обозначает будущее действие в процессе его совершения, т.е. незаконченное длительное действие. Future Continuous употребляется также для выражения намерения совершить действие в будущем или уверенности в его совершении.

He will be writing a letter to his friend ... at 5 o'clock tomorrow.
... from 5 to 6 on Sunday.
... when I come.

Он будет писать письмо другу ... завтра в 5 часов,
... с 5 до 6 в воскресенье, ... когда я приду.

I will (shall) be visiting him tomorrow. Завтра я собираюсь навестить его.

Future Continuous образуется при помощи Future Indefinite вспомогательного глагола to be и Participle I знаменательного глагола (shall/will be + working).

Утвердительная форма	Отрицательная форма	Вопросительная форма
I (we) He, she, it, will be writing We, you, they	I (we) He, she, it, will not be we, you, they writing	Shall (will) I (we) be writing ? Will he (she, it, we, you, they) be writing ?

Упражнение 1. Раскройте скобки, употребляя глаголы в форме *Future Continuous*. Поставьте каждое предложение в вопросительную и отрицательную форму.

1. I (to read) newspapers all evening tomorrow. 2. She (to work) at home the whole morning tomorrow. 3. They (to stay) at a new hotel at 6 o'clock tomorrow. 4. He (to live) in Kazan for the next few weeks. 5. Beth (to write) a letter at that time next week. 6. You (to do) your home task all these days. 7. Dan (to enjoy) the sunshine on the beach at that time next summer. 8. Peter (to read) the whole night. 9. We (to have) coffee from five to six. 10. At this time tomorrow I (to take) my exam. 11. I (not to work) at the library from 3 till 4 o'clock tomorrow. 12. The conference (not to take place) from 2 till 6 o'clock on Monday. 13. He (not to wait) for us at 6 o'clock tomorrow. 14. She (to type) letters at 5 o'clock tomorrow.

Упражнение 2. Раскройте скобки, употребляя глаголы в форме *Future Indefinite* или *Future Continuous*.

1. You (to work) all tomorrow morning?
 2. He (to see) them tomorrow. He (to tell) them what you said.
 3. I (to visit) her office next day. I (to ask) her then.
 4. My son (to stay) with my parents for the holidays.
 5. You (to stay) here all weekend?
 6. Don't disturb him at that moment tomorrow, he (to have) breakfast.
 7. I (to see) manager at the meeting next week. And he (to give) me all the information he knows.
 8. Next year he (to come) to Paris.
 9. You (to come) to our party? – No, I (to work) on my report.
 10. She (to give) me this book? – No, she (to be) busy at that time.

Упражнение 3. Переведите на английский язык, употребляя глаголы в форме *Present Indefinite*, *Present Continuous*, *Future Indefinite* или *Future Continuous*.

1. Он сейчас работает над докладом, но через час он сможет поговорить с вами.
 2. Когда они возвратятся домой, бабушка будет накрывать на стол.
 3. Ежегодно мы проводим отпуск в деревне, но в следующем году мы поедем за границу.

4. Когда ты пригласишь их на вечеринку? – Я сделаю это, как только увижу их.
5. Я думаю, что он не остановится в отеле, когда приедет в ваш город.
6. Когда он будет просматривать газеты, он найдет статью, которую ищет.
7. Следующим летом я поеду на море. Я буду лежать на солнце весь день.
8. Где твой брат? – Он работает в библиотеке. Он будет работать там еще три дня.
9. Вы останетесь на обед? – Нет. К сожалению, мы очень заняты.
10. Не уходите, пока он не вернется. – Хорошо. Мы подождем его еще полчаса.
11. Ты пойдешь с нами в кино? – Нет, не пойду. Я буду готовиться к экзаменам весь вечер.
12. Она будет участвовать в концерте? – Да, она будет завтра петь.
13. Завтра мы встречаемся с ней в офисе. Я передам ей вашу записку.
14. Что делает твоя сестра? Помогает маме? – Нет, обычно она помогает маме ежедневно, но сейчас она ушла за покупками.
15. Он будет ждать меня на станции, когда я приду?

The Present Perfect Tense

Настоящее совершенное время

The Present Perfect Tense (настоящее совершенное (перфектное) время) употребляется:

1. Для выражения действия, завершившегося к моменту речи. Время действия не указывается, важен сам факт совершения действия к настоящему моменту или его результат.

She has read this book. Она прочитала эту книгу. (Действие завершено к моменту речи).

В этом значении Present Perfect часто употребляется с наречиями *just* – только что, *already* уже, *yet* ещё, *lately* недавно, *of late* в последнее время, *recently* недавно.

The mail has just come. Почта только что пришла.

He has seen many films lately. В последнее время он посмотрел много фильмов.

2. Для выражения действия, которое завершилось, но тот период, в котором оно происходило, ещё продолжается и может быть обозначен

обстоятельствами времени today сегодня, this week на этой неделе, this month в этом месяце, this century в нашем веке и др.

I have written a letter this morning. Я написал письмо сегодня утром.

3. Для выражения действия, которое началось в прошлом и продолжается до настоящего времени.

I have known him all my life. Я знаю его всю жизнь.

I have known him for 2 years. Я знаю его 2 года.

He has not seen his parents since January. Он не видел своих родителей с января.

Present Perfect может употребляться с наречиями always всегда, often часто, seldom редко, ever когда-нибудь, never никогда.

She has never been to London. Она никогда не была в Лондоне.

Have you ever been to Moscow? Вы когда-нибудь были в Москве?

Present Perfect образуется при помощи вспомогательного глагола to have в Present Indefinite и Participle II (Причастия II) смыслового глагола.

Утвердительная форма	Отрицательная форма	Вопросительная форма
I, we, have seen you, they	I, we, have not seen you, they	Have I (we, you, they) seen ?
He, she, it has seen	He, she, it has not seen	Has he (she, it) seen ?

I have = I've; He has = He's; I have not = I haven't; He has not = He hasn't

Упражнение 1. Измените время глаголов на форму Present Perfect. Поставьте полученные предложения в вопросительную и отрицательную форму. Переведите предложения на русский язык.

1. She is watering the flowers. 2. He is taking his examination. 3. Beth is opening the window. 4. I am dusting the furniture. 5. John is washing his car. 6. The teacher is explaining the rule. 7. Mary is reading the letter. 8. We are having dinner. 9. I am cleaning my teeth. 10. Jane is translating the article. 11. Little Frank is breaking his toys. 12. He is having breakfast. 13. Nick is drawing a picture. 14. My daughter is having lunch. 15. He is putting on his coat.

Упражнение 2. Раскройте скобки, употребляя глаголы в форме Present Perfect. Обратите внимание на употребление предлогов for и since.

1. I (to live) here (for/since) 1999. 2. He (to work) there (for/since) May. 3. They (to be) friends (for/since) they started college. 4. We (to know) him (for/since) three years. 5. They (to live) in our house (for/since) two years. 6. She (to be ill) (for/since) Friday. 7. I (not to be) in London (for/since) I (to be) a child. 8. I (to leave) Paris last year and I (not to see) my best friend (for/since). 9. He (to study) French (for/since) ten years. 10. My mother (to work) in the factory (for/since) some years. 11. They (to live) in Brasil (for/since) 1960. 12. I (not to see) him (for/since) this Tuesday. 13. He (to be) in prison (for/since) five years. 14. She (not to hear) about them (for/since) almost a year. 15. I (to know) nothing about him (for/since) several month.

Упражнение 3. Раскройте скобки, употребляя глаголы в Present Perfect или в Past Simple.

1. She (to visit) all capital cities of Europe this year. 2. John (to travel) around Europe last year. 3. You ever (to live) in a foreign country? 4. My friend knows a lot because he (to read) a lot. 5. She (to go) home two days ago. 6. She is free now. She (to pass) her final exam. 7. David (to start) school in 1990. 8. Look! Somebody (to break) my window. 9. I (to leave) home early last night. 10. Is he still watching this programme? – No, he just (to watch) it. 11. We (not to see) them last week. 12. His family (to build) a new house this year. 13. It (to stop) snowing an hour ago. 14. I (not to decide) where to go tonight. 15. I (to learn) all the new words. Now I can translate this text. 16. When you (to arrive) to Paris? 17. We (not to know) about the disco last night. 18. You (to read) this book before? 19. He (to work) here two month ago? 20. Tom (to be) to London before?

Упражнение 4. Переведите на английский язык. Обратите внимание на употребление Present Perfect.

1. Мы не видели ее с того времени, как она вышла из офиса. 2. Я живу в этом доме около семи лет, но я хочу переехать. 3. Она знает эту семью пять лет. Они познакомились в Лондоне восемь лет назад. 4. Он учил немецкий язык на протяжении двух лет, но потом решил бросить учебу. 5. Я работаю на этом заводе с сентября. 6. Наш ребенок болел почти две недели. 7. Я могу поговорить с директором? – Извините, он вышел несколько минут назад. 8. Моя подруга звонила мне сегодня? – Нет, она еще не звонила. 9. Этот ученик не знает ответа, потому что он не выучил урок. 10. Почему ты еще не сделал уроки?

Past Perfect Tense

Прошедшее совершенное время

The Past Perfect Tense (прошедшее совершенное (перфектное) время) выражает прошедшее действие, предшествовавшее какому-то определенному моменту в прошлом или завершившееся до другого действия в прошлом, иначе говоря, предпрошедшее.

Past Perfect употребляется:

1. Для выражения прошедшего действия, которое уже совершилось до определенного момента в прошлом. Этот момент может быть указан обстоятельством времени: by 5 o'clock к пяти часам, by Saturday к субботе, by that time к тому времени, by the end of the year к концу года.

She had left by the 1st of June. – Она уехала (еще) до первого июня.

I had cleaned the apartment by 5 o'clock. – К пяти часам я убрала квартиру.

2. Для выражения прошедшего действия, которое уже завершилось до другого, более позднего прошедшего действия, выраженного глаголом в Past Indefinite. В таких случаях Past Perfect употребляется главным образом в сложноподчиненных предложениях.

They had already gone when I arrived. – Они уже ушли, когда я появился.

Past Perfect часто употребляется в придаточных предложениях с союзами after после того как, before прежде чем, до того как.

Past Perfect образуется путем сочетания вспомогательного глагола to have в Past Indefinite и Participle II (Причастие II) знаменательного глагола.

Утвердительная форма		Отрицательная форма		Вопросительная форма
I, we		I		Had I worked (done) ?
You	had done	You	had not worked	Had you worked (done)?
He, she, it	had worked	He, she	had not done	Had he (she, it) worked?
They		It, they		Had they worked (done)?

I had = I'd; I had not = I hadn't

Упражнение 1. Раскройте скобки, употребляя глаголы в Past Perfect. Поставьте каждое предложение в вопросительную и отрицательную форму.

1. My father (to visit) London before, and so the city was not new to him. 2. When we came the plane (to take off). 3. I went to sleep as soon as the show (to finish). 4. When they came home mother (to do) everything about the house. 5. I went to see the

sights after I (to buy) a map of Moscow. 6. Karen didn't want to come to the cinema with us because she already (to see) this film. 7. We knew our itinerary only after the leader of the group (to tell) us. 8. After I (to spend) all the money I turned to my father. 9. She understood the letter after she (to read) it a second time. 10. We (to keep) waiting until we lost patience.

Упражнение 2. Раскройте скобки, употребляя глаголы в форме Past Indefinite или в Past Perfect.

1. When the police (to arrive), the car (to go). 2. When she (to get) to the shop, it (to close). 3. The train (to leave) when he (to come) to the station. 4. We (to eat) everything by the time he (to arrive) at the party. 5. I (to know) that he (not to learn) the poem. 6. He (to take) the decision before I (to come). 7. Nick (to return) from office by seven o'clock. 8. I (to think) that my parents already (to return). 9. It (to be) the second time she (to make) that mistake. 10. He (to be sure) that we (not to recognize) him. 11. The car (to go) when I (to look) into the street. 12. You (to find) your key which you (to lose) before? 13. Meg (to say) that she (to be) in this city. 14. The doctor (to arrive) when we already (to help) him. 15. He (to study) guitar for two years when he (to be) a teenager.

The Future Perfect Tense

Будущее перфектное время

The Future Perfect Tense (будущее перфектное время) употребляется для выражения будущего действия, которое закончится до определенного момента в будущем. Момент в будущем, до которого закончится действие, может быть выражен:

1) обстоятельством времени с предлогом by (by five o'clock к пяти часам, by the end of the year к концу года)

By the end of the week we'll have finished this work. – К концу недели мы закончим эту работу.

2) другим будущим действием, выраженным Present Indefinite в придаточном предложении времени и условия с такими союзами, как before до того как, when когда.

When we meet next time, I'll have read this book. – Когда мы встретимся в следующий раз, я уже прочитаю эту книгу.

Future Perfect образуется при помощи вспомогательного глагола to have в Future Indefinite и Participle II (Причастие II) знаменательного глагола (shall/will have + worked).

Утвердительная форма		Отрицательная форма		Вопросительная форма
I, we He, she, it you, they	will have worked	I, we He, she, it, you, they	will not have worked	Shall (will) I (we) have worked ? Will he (she, it, you, they) have worked ?

Упражнение 1. Раскройте скобки, употребляя глаголы в форме Future Perfect. Поставьте предложения в вопросительную и отрицательную форму.

1. I (to do) it by that time. 2. He (to write) a letter by the time she comes. 3. We (to build) a new house by the end of the year. 4. Mother (to cook) dinner when we come home. 5. You (to do) your homework by seven o'clock. 6. They (to arrive) by the evening. 7. She (to come) by five o'clock. 8. I (to look) by this time through all magazines.

Упражнение 2. Раскройте скобки, употребляя глаголы в форме Future Simple, Future Continuous, Future Perfect.

1. He (to write) a letter at seven o'clock tomorrow. 2. Where she (to go) to buy a new dress? 3. What country he (to visit) by the next year? 4. Our family (to have) dinner at half past four. 5. What time he (to come) this evening? – He (to come) by seven o'clock. 6. I (to meet) you at the station at nine o'clock tomorrow. – My train already (to arrive) by that time. 7. What you (to buy) him for his birthday? 8. When you (to finish) the University? 9. My sister and I (to do) washing-up by the time mother comes. 10. I (to go) to the cinema with you tomorrow.

Упражнение 3. Переведите предложения, употребляя глаголы в форме Future Perfect.

1. Они не переведут эту статью до трех часов. 2. Она сделает эту работу до конца месяца. 3. Почему твой друг не напишет статью до вечера? 4. Ты закончишь читать эту книгу до завтра? 5. Сбудется ли мое желание до Нового года? 6. Они уже уйдут к тому времени. 7. Почему она не начнет работать до

девяти утра? 8. Эта телепередача закончится к четырем часам? 9. Учитель проверит все тексты до завтра. 10. К этому времени дети уже уберут в комнате? 11. Все туристы соберутся у отеля к шести часам? 12. Никто не придет сюда до конца дня. 13. Телеграмма придет, когда вы не будете ждать ее. 14. Мои родители придут домой к семи часам вечера. Я сделаю уроки к этому времени. 15. Он обещал написать доклад до десяти вечера.

Active and Passive Voices.

Действительный и страдательный залоги в английском языке.

Залог - это форма глагола, которая показывает, является ли подлежащее предложения производителем или объектом действия, выраженного сказуемым. В английском языке имеется два залога: the Active Voice (действительный залог) и the Passive Voice (страдательный залог).

Страдательный залог употребляется, когда исполнитель действия очевиден или несуществен, или когда действие или его результат более интересны, чем исполнитель. Страдательный залог образуется с помощью глагола to be в соответствующем времени и III формы глагола (причастие II).

Passive voice			
	Indefinite	Continuous	Perfect
Present	am is + V3 are	am is + being + V3 are	have (has) + been + V3
Past	was + V3 were	was + being + V3 were	had + been + V3
Future	shall + be +		shall + have + been +

	V3 will		V3 will
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Сравним действительный залог со страдательным залогом:

Active Voice

Tom delivers the mail. Том доставляет почту.

Passive Voice

The mail is delivered by Tom. Почта доставляется Томом.

Как и в русском языке, существительное, играющее роль дополнения в предложении действительного залога, в предложении страдательного залога становится обычно подлежащим. Если в оборотах со страдательным залогом указан производитель действия, то в русском языке он обозначается творительным падежом, а в английском ему предшествует предлог *by*. Употребление времени в английском страдательном залогом принципиально не отличается от его употребления в действительном залогом.

Следует обратить особое внимание на перевод глаголов с предлогом в страдательном залогом. Наиболее распространённые из этих глаголов:

hear of - слышать о

laugh at - смеяться над

look after - присматривать за (кем-либо)

look at - смотреть на

rely on - полагаться на

send for - посылать за

speak of (about) - говорить о

pay attention to - обращать внимание на

take care of - заботиться о

The book is much spoken about. Об этой книге много говорят.

He can't be relied on. На него нельзя положиться.

В русском переводе не все глаголы сохраняют предлог:

to listen to - слушать что-либо, кого-либо

to look for - искать что-либо

to provide for - обеспечить кого-либо, чем-либо

to explain to - объяснять кому-либо

He was listened to with great attention. Его слушали с большим вниманием.

Упражнение 1. Дополните предложения, используя следующие глаголы.

cause damage hold include invite make overtake show translate write

1. Many accidents _are caused_ by dangerous driving.
2. Cheese --- from milk.
3. The roof of the building --- in a storm a few days ago.
4. There's no need to leave a tip. Service --- in the bill.
5. You --- to the wedding. Why didn't you go?
6. A cinema is a place where films ---
7. In the United States, elections for President --- every four years.
8. Originally the book --- in Spanish and a few years ago it
9. We were driving along quite fast but we --- by lots of other cars.

Упражнение 2. Раскройте скобки, употребляя глаголы в Present Simple or Past Simple, Active or Passive.

1. It's a big factory. Five hundred people _are employed_ (employ) there.
2. Water --- (cover) most of the Earth's surface.
3. Most of the Earth's surface --- (cover) by water.
4. The park gates --- (lock) at 6.30 p.m. every evening.
5. The letter --- (post) a week ago and it --- (arrive) yesterday.
6. The boat --- (sink) quickly but fortunately everybody --- (rescue).
7. Ron's parents --- (die) when he was very young. He and his sister --- (bring) up by their grandparents.
8. I was born in London but I --- (grow) up in the north of England.
9. While I was on holiday, my camera --- (steal) from my hotel room.
10. While I was on holiday, my camera --- (disappear) from my hotel room.
11. Why --- (Sue/resign) from her job? Didn't she enjoy it?
12. Why --- (Bill/sack) from his job? What did he do wrong?
13. The company is not independent. It --- (own) by a much larger company.

14. I saw an accident last night. Somebody --- (call) an ambulance but nobody --- (injure) so the ambulance --- (not/need).

15. Where --- (these photographs/take)? In London? --- (you/take) them?

Упражнение 3. Дополните предложения, используя следующие глаголы.

carry cause do make repair send spend wake up

1. The situation is serious. Something must be done before it's too late.
2. I haven't received the letter. It might have been sent to the wrong address.
3. A decision will not --- until the next meeting.
4. I told the hotel receptionist that I wanted to --- at 6.30 the next morning.
5. Do you think that less money should --- on armaments?
6. This road is in very bad condition. It should --- a long time ago.
7. The injured man couldn't walk and had to ---
8. It's not certain how the fire started but it might --- by an electrical fault.

Упражнение 4. Перепишите предложения в пассивном залоге.

1. Somebody has cleaned the room. _The room has been cleaned._
2. They have postponed the concert. The ---
3. Somebody is using the computer at the moment. The computer ---
4. I didn't realise that somebody was recording our conversation. I didn't realise that ---
5. When we got to the stadium we found that they had cancelled the game. When we got to the stadium, we found that ---
6. They are building a new ring road round the city. ---
7. They have built a new hospital near the airport. ---

Упражнение 5. Перепишите предложения по образцу.

1. They didn't give me the money. I _wasn't given the money._
2. They asked me some difficult questions at the interview. I ---
3. Janet's colleagues gave her a present when she retired. Janet ---
4. Nobody told me that George was ill. I wasn't ---
5. How much will they pay you? How much will you ---
6. I think they should have offered Tom the job. I think Tom ---
7. Has anybody shown you what to do? Have you ---

Modal verbs Модальные глаголы

В отличие от других глаголов, модальные глаголы не обозначают действия или состояния, а лишь передают отношение говорящего к действию, выраженному инфинитивом. Модальные глаголы могут показывать, что говорящий рассматривает действие как возможное, желательное, необходимое, сомнительное, допустимое, требуемое и т.д.

I can't go with you. – Я не могу идти с вами.

We must go now. – Теперь нам надо идти.

Модальные глаголы отличаются от других глаголов рядом особенностей:

1. они не изменяются по лицам и не имеют окончания –s в 3-м лице единственного числа.
2. у них нет неличных форм – инфинитива, причастия и герундия, а следовательно, нет и аналитических видовременных форм.
3. за исключением глаголов *can (could)* и *may (might)* имеют только одну форму.
4. инфинитив смыслового глагола, следующий за модальными за исключением глагола *ought*, употребляется без частицы *to*.
5. в вопросительном и отрицательном предложениях они употребляются без вспомогательного глагола. В вопросительном предложении перед подлежащим ставится сам модальный глагол, в отрицательном отрицание *not* присоединяется к модальному глаголу.

Наиболее употребительны следующие модальные глаголы:

Can (could) выражает:

- умение, физическую и умственную возможность, способность (*Can you skate?*);
- возможность выполнения действий при соответствующих обстоятельствах (*You can see the forest through the other window.*);
- разрешение или просьбу (*Can you use your car? You can use my car.*);
- сомнение и неуверенность (*Can it be true?*);
- невероятность (*It can't be true.*)

May (might) выражает:

- разрешение (*May I borrow your pen?*);

- предположение с оттенком неуверенности (He may be ill);
- неодобрение или упрек (You might have helped me);

Must выражает:

- обязательность совершения действия (You must talk to your son about his future);
- запрещение (He must not leave his room for a while);
- предположение, граничащее с уверенностью (Your father must be eighty now.)

to have to выражает:

- обязанность (He had to do it.);
- отсутствие необходимости (You don't have to go there)

to be to выражает:

- долженствование, необходимость как результат договоренности (We are to discuss it next time)

Should и ought to выражают:

- моральное обязательство (You should (ought to) be always polite.);
- порицание прошлого действия (You should (ought to) have helped me.);
- совет (You should (ought to) see a doctor.);
- предположение (He should (ought to) be at home.)

Exercises:

Упражнение 1. Вставьте модальные глаголы may (might) или can (could).

1. ... you help me? 2. I ... not imagine her speaking in public: I knew that she was so shy. 3. Something was wrong with the car: he ... not start it. 4. A fool ... ask more questions than a wise man ... answer. 5. She asked me if she ... use my telephone. 6. ... I use your pen? 7. ... find a pen on that table. 8. The school was silent: nothing ... be heard in the long dark corridors. 9. You ... take this book: I don't need it. 10. You ... read this book: you know the language well enough.

Упражнение 2. Дополните предложения, используя should или ought to.

1. You ... follow instructions before taking medicines. 2. It's very late. Children ... be in bed. 3. You ... not smoke here. 4. It's his anniversary next week. Maybe we ... to sent him a telegram. 5. Her room is dirty. She ... clean it. 6. This hotel is very expensive. You ... not stay here. 7. She drives very fast. She ... drive carefully. 8. They ... not let the children see such films. 9. They invite us to have

barbecue. ... we take something to eat? 10. You ... not read in the car. You may feel sick. 11. He ... book the tickets in advance. 12. She ... leave valuable in the car. Someone broke in and stole them.

Упражнение 3. Дополните предложения, используя must, have to, ought to, should.

1. If you want to be fit, you ... not eat cake, but you certainly... walk a lot. 2. I'm late. I ... hurry. 3. We ... wait an hour for them. 4. ... you get up very early on Saturday or Sunday? 5. There is light in the house, somebody ... be in. 6. We ... reach the station in half an hour. 7. His English ... be giving him a lot of trouble. 8. The bus we took didn't go up the hill and we ... walk. 9. The doctor says I ... stay in bed for a week. 10 Every child ... know traffic rules. 11. My parents are going out to a party tomorrow and I ... stay with my younger brother. 12. It's dark outside, it ... be about 7 now. 13. You ... not eat so many sweets because they contain a lot of calories. 14. When he was at the university he ... work to pay his own tuition (плата за обучение). 15. You ... not speak to your mother like this. 16. ... I offer her my help? 17. They got married at last. They ... be very happy. 18. She ... know the truth, you ... tell her. 19. Why ... I do somebody else's work? 20. Mother leaves early on Mondays and he ... make his breakfast himself. 21. It's 2 o'clock, you ... be hungry. 22. I think you ... give up smoking. 23. Why ... they worry if they're paid so well?

Упражнение 4. Переведите предложения, используя модальные глаголы can, could, may, might.

1. У детей богатое воображение, они могут легко придумывать различные истории. 2. Ты можешь взять словарь, он мне больше не нужен. 3. Неужели это правда, что она вышла замуж за Джона? 4. Не может быть, чтобы вы этому действительно верили. 5. Я могла бы вам это сразу сказать, но мне не хотелось вас расстраивать. 6. Можете зайти к нам после семи, если хотите. 7. Возможно, меня летом не будет в городе. 8. Не возвращайте эту книгу в библиотеку, она может вам понадобиться. 9. Ты могла бы посоветоваться с сестрой. 10. Вы могли бы быть повежливее с ним! Ведь он старше вас. 11. Неужели ребенок все еще спит? 12. Неужели они опоздали на поезд? 13. Оливер спросил, можно ли ему получить еще тарелку каши? 14. Я могла бы вас встретить, но не получила вашего письма. 15. Можно мне занять это место? 16. Больному стало лучше. Вы можете навестить его завтра.

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