АНГЛИЙСКИЙ ЯЗЫК БАЗОВЫЙ КУРС

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Работа подготовлена на кафедре иностранных языков
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Учебное пособие предназначено для практических занятий по дисциплине «Иностранный язык» студентов технических направлений (специальностей), изучающих английский язык на первом и втором курсах бакалавриата и специалитета. Целью пособия является формирование иноязычной коммуникативной компетенции в общепрофессиональной сфере.

Пособие содержит англоязычные тексты академической и общепрофессиональной тематики, а также разработанный на их основе комплекс заданий, ориентированных на взаимосвязанное формирование умений иноязычного чтения, аудирования, письма и говорения. Пособие также включает дополнительные задания по развитию навыков перевода.

CONTENTS

Unit 1
The System of Higher Education in Russia

Discuss the following questions:

1. What is the purpose of higher education?
2. Why do many people want to get higher education?
3. How many people (in %) have got higher education in Russia?

VOCABULARY

1	under the jurisdiction	под юрисдикцией
2	pursuit of higher education	стремление к высшему образованию
3	establishment	учреждение
4	higher education institution	высшее учебное заведение
5	levels of higher education	уровни высшего образования
6	university	университет
7	academy	академия
8	institute	институт
9	developing	зд. разработка
10	State Educational Standards	Государственные образовательные стандарты
11	advanced	передовой
12	to be capable of	быть в состоянии

READING. TEXT 1.

1. Read the text

Higher Education in Russia

Higher education is under the jurisdiction of the Science and Higher Education of the Russian Federation. State body "Rosobrnadzor" is responsible for the accreditation and licensing of higher education establishments, and for developing and maintaining State Educational Standards.

Russia's higher education system started with the foundation of the universities in Moscow and St. Petersburg in the middle of the 18th century. The system was constructed similar to that of Germany. The pursuit of higher education was and still is considered to be very prestigious.

In the Russian Federation, there are more than 700 state higher educational institutions, which are public, and about 200 non-public (non-State) accredited higher education institutions. Only accredited higher education establishments (universities, academies, and institutes) have the right to use the seal with the national emblem of the Russian Federation and issue state diplomas and degrees ensuring full vocational and academic rights.

As to levels of higher education, basic higher education (4 years) leads to the Bachelor's degree, the first university level degree. There is also a specialist degree (5 years). Postgraduate higher education lasts 3–4 years. After two years, students receive a Master's degree. Then, students can continue to study towards a doctoral degree: the Candidate of Sciences (the first level, equivalent to Ph.D.) and the Doctor of Sciences (the second, highest level, equivalent to Professor).

More than 15 million students including 350,000 foreign students study at Russian State Universities.

Russia has the most educated population in the world. Some 54 percent of 25- to 64-year-old Russians held tertiary degrees as of 2015. Major international experts have noted that Russian educational system is one of the most developed and advanced educational systems in the world. In the context of a changing society, the educational system proved to be capable of adapting to rapid transformations of new realities and to the phase of prolonged evolutionary reformation.

DEVELOPING VOCABULARY

2. The following words in the box are all from the text above. Find them in the text.

ensure	adapting	accredited	non-public	similar

3. For each word, read the sentence it occurs in and answer the questions.

• Is the word positive, negative or neutral?
• Is it a noun, adjective, adverb or verb?
• Can you think of a word with a similar meaning (synonym) and one with an opposite meaning (antonym)?

4. Answer the following questions:

1. What state organ is responsible for the development of higher education in Russia?

2. What are the main types of higher educational institutions in Russia?

3. How many different degrees can be awarded to students of higher educational establishments of the Russian Federation?

4. What are these degrees?

5. How old is the system of Russian tertiary education? How can you prove your point of view?

6. How good is the Russian system of higher education in comparison with the similar systems in other countries? How can you prove it?

7. What are the advantages of the higher education in Russia?

8. What is the period of study in higher educational institutions in Russia?

9. In what case does an institution have a right to award degrees?

10. Why is higher education prestigious?

5. Which sentence below best expresses the essential information in the text?

1. Russia has a multilevel system of education.

2. The system of higher education in Russia is an old and developed one.

3. The main higher educational establishments in Russia are universities, academies and institutes.

6. Read for details. Choose the correct answer:

1. _____ is responsible for the system of higher education in Russia

a) The Ministry of Science and Higher Education   b) The Ministry of Education   c) The Ministry of Higher Education

2. Russian system of higher education is _____ years old.

a) about 370   b) 400   c) about 300

3. In the beginning of the existence of Russian Higher education, it resembled higher education of _____.

a) Germany   b) England   c) the United States

4. Now, the system of higher education in Russia like in many other countries has_____.

 a) two levels   b) several levels c) three levels

5. The classification of Russian higher educational institutions includes_____ universities.

 a) private and public b) old and new c) ancient and redbrick

6. _____ higher educational establishments of Russia can award diplomas with the seal containing the emblem of the Russian Federation.

 a) Only accredited b) All   c) Private and public

7. _____ is the highest one.

 a) Doctor of Science Degree b) Master's Degree c) Bachelor's Degree

8. Foreign students _____ the right to get degrees in the higher educational institutions of the Russian Federation.

 a) do not have b) have   c) are fighting for

9. There are _____ people having higher education in Russia.

 a) many   b) few   c) some

10. Russian system of higher education is _____ with time.

 a) slowly changing b) not changing c) quickly changing

ANALYZE

7. Match the words with their Russian equivalents.

1)	to develop	**a)**	поддерживать
2)	to maintain	**b)**	развивать
3)	to consider	**c)**	считать
4)	to issue	**d)**	вести
5)	to lead	**e)**	выпускать
6)	to include	**f)**	включать
7)	to ensure	**g)**	продлевать
8)	to prove	**h)**	доказывать
9)	to prolong	**i)**	обеспечивать
10)	to study	**j)**	изучать

8. Give the English equivalents.

1) длительные эволюционные изменения;
2) находиться в юрисдикции;
3) считается престижным;
4) иметь право использовать;
5) обеспечивать профессиональные и академические права;
6) стремление к получению высшего образования;
7) лицензирование высших учебных заведений;
8) способная к адаптации.

9. Prove the following statements.

1) The state is responsible for the system of its higher education.
2) First Russian universities appeared in the two biggest cities about 370 years ago.
3) Accreditation is important for Russian higher educational establishments.
4) A student can get for different degrees in Russian higher educational institutions.
5) Specialist program ends with the awarding a Specialist Diploma.
6) Millions of students study in Russia.
7) Half of most grown-up people hold diplomas of higher education in Russia.
8) The system of Higher education in Russia periodically undergoes reforms.

10. Put the words in the correct order.

1. Rosobrnadzor / function / out / the / carries / of / federal / control over / of educational programs / the performance and quality.
2. Bachelor / focus / programs / degree / on / basic / training.
3. Into / are / categorized /the universities / and / flagship / federal / national research / universities.
4. There / than / more / are / 700 / educational / higher / state / institutions.
5. Lasts/ higher / education / postgraduate /3–4/ years.
6. Most / has / the / Russia / educated / world / in / the / population.
7. Education / system / of / higher / Russian / can / fast / to / adapt / economic / and social / changes.

11. Match the words above with their definitions.

1)	accreditation	**a)**	official approval of an organization, worker, or course of study
2)	licensing	**b)**	a large organization such as a bank, hospital, university, or prison
3)	similar	**c)**	getting official permission to do it from a government, business, or other authority
4)	institution	**d)**	the qualification that you get after completing the course
5)	seal	**e)**	higher
6)	degree	**f)**	a special mark that you put on something, for example a document, to show that it is legal or official
7)	receive	**g)**	to get something that someone gives or sends to you
8)	tertiary	**h)**	based on the most recent methods or ideas
9)	advanced	**i)**	alike

12. Match the words from the text with their synonyms

1. The word *higher* in the text is closest to the meaning
   a) tertiary   b) advanced   c) secondary   d) international
2. The word *foundation* in the text is closest to the meaning
   a) basement   b) creation   c) cellar   d) building
3. The word *ensure* in the text is closest to the meaning
   a) give   b) implement   c) allow   d) take
4. The word *receive* in the text is closest to the meaning
   a) award   b) have   c) get   d) take
5. The word *foreign* in the text is closest to the meaning
   a) from   b) native   c) indigenous   d) multicultural
other countries
6. The word *public* in the text is closest to the meaning
   a) social   b) state   c) common   d) national
7. The word *issue* in the text is closest to the meaning
   a) distribute   b) extradite   c) publish   d) produce
8. The word *equivalent* in the text is closest to the meaning
   a) opposite   b) synonymous   c) similar   d) close

13. Find the corresponding prepositions for the following verbs and phrases in the text and write their Russian equivalents.

1) adapt ____ – _____
2) lead ____ – _____
3) start ____ – _____
4) be responsible ____ – _____
5) issue ____ – _____
6) ensure ____ – _____
7) last ____ – _____
8) study ____ – _____
9) be capable ___ – _____

14. Find matching words and phrases:

1	maintaining	**a)**	supporting
2	developing	**b)**	prestigious
3	pursuit	**c)**	improving
4	vocational	**d)**	reforms
5	prestigious	**e)**	trying to achieve something
6	non-public	**f)**	professional
7	transformations	**g)**	private

15. Use the phrases above to fill in the gaps:

1. _____ State Educational Standardsis is the responsibility of Rosobrnadzor.

2. Leading higher education institutions, representatives of the academic community, and employers, whose work is coordinated by the Ministry of Education of the Russian Federation are _____ the State Educational Standards.

3. In _____ of higher education a lot of people make their dreams come true. Diplomas of Specialist, Bachelor's and Master's degrees guarantee graduates full _____ and academic rights.

4. To have higher education is _____ in any country.

5. Besides public educational establishments, there are _____ ones in Russia.

6. _____ of higher education in Russia in the 21st century influence the development of the whole country.

16. Match the opposites.

1)	education	**a)**	illiteracy
2)	developing	**b)**	notorious
3)	start	**c)**	regression
4)	construct	**d)**	private
5)	prestigious	**e)**	advanced

6)	public	**f)**	primary
7)	full	**g)**	partial
8)	basic	**h)**	end
9)	tertiary	**i)**	destroy
10)	include	**j)**	exclude

17. Translate from Russian into English, use the collocations above

1. <u>Образование</u> непросто получить и невозможно отобрать.

2. <u>Разработка</u> образовательных программ и стандартов продолжается безостановочно, следуя за постоянными изменениями в мире.

3. Развитие системы высшего образования в России <u>началось</u> с создания университета в столице страны.

4. Основатели системы высшего образования <u>строили</u> ее похожей на систему Германии.

5. Почему получение высшего образования является <u>престижным</u>?

6. Большинство высших учебных заведений России являются <u>государственными</u>.

7. Дипломы высшего образования обеспечивают <u>полные</u> профессиональные и академические права.

8. Степень бакалавра является базовой для получение более высоких степеней.

9. Более половины взрослого работоспособного населения России являются носителями степеней высшего образования.

10. Общее количество студентов России огромно и включает иностранных студентов.

> **TRANSLATE**

18. Translate from Russian into English:

1. Аккредитация обеспечивает высокое качество высшего образования.

2. Цели и задачи высшего образования меняются по мере развития страны.

3. Российское высшее образование начало свое развитие в середине 18 века.

4. Только аккредитованные высшие учебные заведения могут присуждать дипломы.

5. Основными типами высших учебных заведений в России являются государственные и частные.

6. Они могут быть университетами, академиями или институтами**.**

7. Длительность периода обучения зависит от уровня получаемого образования.

8. В российских университетах обучается много иностранных студентов**.**

19. Translate from English into Russian:

1. Postgraduate higher education lasts 3–4 years and leads to three different degrees depending on the student's ambition.

2. The academic year lasts two semesters.

3. In recent years, the system of higher education of the Russian Federation has been undergoing drastic changes in the framework of the comprehensive transformation of the country as a whole.

4. One of the main changes is introduction of a multi-level higher education system (Bachelor's and Master's Degrees in addition to the traditional Diploma – Specialist Degree).

5. After getting a Master's Degree, students can continue to study towards the doctoral degree.

6. We consider M.V. Lomonosov to be one of the founders of the system of higher education in Russia.

7. Licensing of higher education establishments is another step to provide high quality education.

8. Diplomas of higher education have the seal of the organization with the national emblem on it.

WORD BUILDING

20. Form nouns adding the suffixes *-er, -or* to the given verbs. Translate the nouns and verbs into Russian:

Example: to develop – a developer (*развивать – разработчик*)

1) to start	2) to found
3) to construct	4) to receive
5) to use	6) to lead
7) to adapt	8) to transform
9) to reform	

21. Give the initial words of the following derivatives:

Example: *doctoral – doctor*

1) establishment –	2) education –
3) student –	4) evolutionary –
5) consideration –	6) transformation –
7) introduction –	8) development –
9) continuation –	10) prolongation –

GRAMMAR

DEGREES OF COMPARISON OF ADJECTIVES

22. Read and say:

a) which of the adjectives are monosyllabic, disyllabic, formed from participles, or having three or more syllables

b) which words are in positive, comparative or superlative degree

c) translate them into Russian.

> newer, the highest, the most developed, more responsible, the most educated, rapid, changing, the most advanced, capable, prolonged, prestigious, similar, accredited,
> the most foolish, blacker, the thinnest, more distant, noisier, cheap,
> the ugliest, more formal, funny, more recent, more private

23. Fill in the gaps with the correct degrees of comparison forms of the adjectives in the brackets. What degree of comparison did you use? Translate the sentences from English into Russian.

1. Russian system of higher education is one of _____ (developed) in the world.

2. Master's Degree is _____ (high) than Bachelor's Degree.

3. Ministry of Science and Higher Education of the Russian Federation is _____ (responsible) for the system of higher education in Russia.

4. Changes in higher education are becoming _____ and _____ (rapid).

5. Russian people are some of _____ (educated) people in the world.

6. Rapid transformations of _____ (new) realities require the system of higher education to adapt to them.

7. It is _____ (prestigious) to have higher education in Russia as it gives you many opportunities.

8. Russian system of higher education includes _____ (many) than 700 public educational institutions.

24. Translate from Russian into English using the information about degrees of comparison of adjectives.

1. Российская система высшего образования является одной из передовых в мире.

2. Многие университеты используют новейшее оборудование.

3. Старая советская система высшего образование была изменена к началу 21 века.

4. В контексте все более меняющегося общества система высшего образования адаптируется.

5. Новые поколения выпускников более способны к обучению в течение всей жизни.

6. Никто не может считать себя самым образованным в нашем быстро меняющемся мире.

7. Какой университет самый престижный в России?

8. А вы бы хотели получить более высокую степень?

SIMPLE ACTIVE TENSES

25. Read the following words and say what tense they express. Translate them into Russian.

| is | started | was | have | leads | will get |
| lasts | developed | will prolong | continued | | |

26. Fill in the gaps with the correct forms of the verb in the brackets. What tense did you use? Translate the sentences from English into Russian.

1. It … (take) much time and efforts to develop a good system of higher education.

2. Many students … (continue) their studies in Master of Science programs.

3. Ministry of Science and Higher Education of the Russian Federation … (do) much for the development of the system of higher education in Russia.

4. Reforms … (change) much in the work of higher educational institutions.

5. Universities … (train) students in different specialties.

6. The diploma of higher education … (open) a lot of opportunities.

7. Future economic and political transformations … (influence) the Russian system of higher education.

27. Translate from Russian into English:

1. Российская система высшего образования развилась из двух столичных университетов до множества учебных заведений по всей стране.

2. Международные эксперты высоко оценивают систему российского высшего образования.

3. Половина взрослого населения России имеет высшее образование.

4. Изменения в обществе приведут к изменениям в высшем образовании.

5. Некоторые люди учатся всю жизнь.

6. Почему вы решили поступить в университет?

7. Частные университеты не получают финансовую поддержку от государства.

8. М. В. Ломоносов основал первый в России университет в 1755 году.

LISTENING COMPREHENSION

28. Listen to the text 'Financing higher educational institutions' and answer the questions.

1. What is the main source of financing state educational institutions?
2. What are the additional sources?

29. Fill in the gaps.

The major sources of financing the (1) _____ educational establishments are the federal and local budgets. Non-state educational (2) _____ are permitted to obtain financial support from the federal and local budgets once they have received state (3) _____ State educational establishments also (4) _____ other sources of funding such as:

– the income received for rendering (5) _____ educational services like additional educational (6) _____, special courses, in-depth course study, and so on.;

– (7) _____ charged from pupils, including foreign students;

– income derived from business activities such as the leasing of fixed assets and (8) _____, the selling and buying of goods etc.

Educational institutions are as well financed by their (9) _____.

30. Read the text.

Types of Higher Educational Institutions

In the Russian Federation higher educational institutions are represented by academies, institutes and universities. The universities are categorized into federal, national research, and flagship universities. They are leading higher education institutions in Russia. The aim is to develop best practices and models in the sphere of management, methodology and content of education.

Federal universities train highly-qualified staff in priority areas of research, production and economy in accordance with the long-term plans of social and economic development of educational institutions in the regions and federal districts of the Russian Federation. 10 higher educational institutions were assigned this status.

National research universities have a goal of training highly-qualified staff in priority areas of research and technology. 29 higher educational institutions possess this status.

Since 2015 the Ministry of Education and Science has been implementing the project «Development of the System of Flagship Universities». Flagship universities are universities established in the region on the basis of existing higher education institutions. 33 higher educational institutions were assigned this status. Such a university is oriented at developing the support of the Russian region by providing the regional labor market with highly-qualified staff, solving current problems of regional economy and implementing educational and innovative projects together with the region and its enterprises.

Two higher education institutions – Lomonosov Moscow State University and Saint Petersburg State University – have a special status and the right to award their own diplomas. These higher educational institutions can also develop and approve educational standards of their own at all levels of higher education.

31 Make the glossary to the text

32. Give the English equivalents.

1. классифицировать на _____ ;
2. ведущие учреждения высшего образования _____ ;
3. национальные исследовательские университеты _____ ;

4. обучать высококвалифицированный персонал_____;
5. приоритетные области _____;
6. долгосрочный план _____;
7. опорные университеты _____;
8. региональный рынок труда _____;
9. решение текущих задач _____;
10. выполнение инновационных проектов _____;

33. Answer the following questions.

1. How are universities classified?
2. Why were the new types of universities introduced?
3. What is the difference between the national research and federal universities?
4. What is the aim of flagship universities?
5. Why do some universities have special status?

WRITING

34. Write the summary to the text. Use Appendix 2 to help you.

SPEAKING

35. Retell the text using the glossary.

36. Get prepared with the presentation about higher education system of Russia. Use Appendix 2 to help you.

Unit 2
My University NSTU

Discuss the following questions:

1. What does the abbreviation NSTU stand for?
2. What was the original name of the University?
3. When was the school founded?
4. What levels of academic training does NSTU provide?

VOCABULARY

1	additional training	дополнительное образование
2	approach	подход, метод
3	approximately	приблизительно, почти, около
4	convenient	удобный
5	to develop	развивать, разрабатывать
6	dormitory	студенческое общежитие
7	electrical engineering	электротехника; электротехнический
8	equip	оборудовать, оснастить
9	to establish	учреждать, организовывать, основывать
10	to exceed	превышать, быть больше
11	experience	жизненный опыт, опыт работы
12	facilities	оборудование, аппаратура; удобства
13	faculty member	преподаватель вуза
14	flagship university	опорный университет
15	full-time student	студент-очник
16	to gain	получать
17	graduate (student)	выпускник; студент магистратуры
18	humanities	гуманитарные науки
19	to introduce	представлять, вносить на рассмотрение

20	key feature	ключевая, основная особенность
21	to launch	запускать, начинать
22	postgraduate (student)	студент аспирантуры, аспирант
23	project-based learning	проектное обучение
24	to provide	предоставлять, обеспечивать
25	representative	представитель
26	to restore	восстанавливать
27	school of thought	научная школа
28	to stand for	означать, обозначать
29	undergraduate (student)	студент бакалавриата
30	while	в то время как, пока
31	within walking distance	недалеко, близко, в шаговой доступности

READING. TEXT 1.

1. Read and translate the text.

NSTU NETI: A Flagship University

Novosibirsk State Technical University is one of the largest and leading universities in Siberia. Established in 1950 as Novosibirsk Institute of Electrical Engineering (NETI), it grew from a small institute focused on one industry to one of the largest polytechnic universities in modern Russia. In 1992 NETI gained university status and in 2017 became one of the 22 flagship universities of the Russian Federation. In 2019 NSTU restored its historical name NETI, but the old acronym got a new form and meaning. Now it stands for:

N	**E**	**T**	**I**	**+**
New materials	**Energy & electronics**	**Transport**	**IT**	**+ Business**
				+ Humanities
				+ Space
				+ City

As an academic center, NSTU is famous for its own schools of thought. They deal with fundamental research in such areas as synthesis of automatic control systems, electric power systems control, energy conservation in electrical systems, number theory, computer methods of data analysis, etc.

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NSTU offers about 100 programs of study in such fields as technical, economic and humanities at the Bachelor's, Master's, PhD, and post-doctoral levels. The total number of full-time and part-time students exceeds 13 thousand. Approximately 1500 faculty members from 66 departments work at the University. Nowadays NSTU trains specialists and offers additional training at 16 faculties and institutions.

The key feature of the educational process at NSTU is to teach students in conditions close to practical work. A project-based learning ("learning by doing") approach provides students with an experience that opens doors to high-tech companies while they are still studying. In 2019 the student business incubator "Garage" was opened. Its goal is to help students start up their projects, introduce their ideas and collaborate with experienced coaches to launch their business. "Boiling Point" was also created as a teamwork site to bring together representatives of education, science, business, and government.

NSTU has a long tradition of international cooperation and teaching international students. The first international student entered NETI in 1956. Regular enrollment began in 1978. NSTU has alumni from all the continents – Europe, Asia, Africa, North and South Americas. Today, over 3000 citizens of 40 foreign states are studying here.

NSTU's campus has a developed infrastructure. It includes 8 academic buildings equipped with all necessary facilities and 8 dormitories (or halls of residence) for undergraduate, graduate, postgraduate, and international students – all within walking distance. It also has a science library and publishing house; Cultural Center and clinic; Sports Palace and swimming pool, a ski depot, sanatorium, and two summer camps located on the Ob River and in the Gornyi Altai. Thus, NSTU provides its students with everything for their student lives to be convenient and rich in various events.

DEVELOPING VOCABULARY

2. The words provided in the box are all from the text above. Find them in the text.

alumni	collaborate	still	experienced	various

3. For each word, read the sentence it occurs in and answer the questions.
• Is the word positive, negative or neutral?
• Is it a noun, adjective, adverb or verb?
• Can you think of a word with a similar meaning (synonym) and one with an opposite meaning (antonym)?

4. Answer the following questions.

1. Is NSTU the largest university in the Asian part of Russia?
2. When was this school of higher education founded?
3. What was its original name in both Russian and English?
4. What year did the Institute gain university status in?
5. Why did its original abbreviation receive a new decoding (or expansion)?
6. What levels does NSTU provide academic training at ?
7. What are some benefits of the project-based approach to higher education?
8. How do the NSTU platforms for student collaboration support this principle?
9. How does NSTU benefit from educating international students?
10. What groups of students can get accommodation at NSTU's dormitories?
11. Is the NSTU campus limited to the area of Novosibirsk? Why do you think so?

5. Which sentence below best expresses the essential information of the text?

1. NSTU is the major research and educational center in modern Russia.
2. NSTU is one of the top polytechnic universities in the Russian Federation.
3. NSTU provides great conditions for students' training and living.

ANALYZE

6. Match the words with their Russian equivalents.

1)	campus	**a)**	ведущий
2)	department	**b)**	ориентированный, нацеленный
3)	faculty	**c)**	предлагать
4)	field	**d)**	иностранный, международный
5)	focused	**e)**	профессорско-преподавательский состав
6)	international	**f)**	обучать, готовить
7)	leading	**g)**	территории университета
8)	offer	**h)**	область, направление
9)	train	**i)**	кафедра

7. Give the English equivalents to the expressions bellow.

1. восстановить историческое название
2. известный своими научными школами
3. высокотехнологичные компании
4. граждане иностранных государств
5. один из опорных университетов страны
6. оснащенный всем необходимым
7. получить статус университета
8. преподаватель вуза
9. сотрудничать с опытными наставниками
10. чтобы объединить представителей

8. Match the words below with their definitions.

1)	acronym	**a)**	a doctorate in any discipline except medicine (Doctor of Philosophy)
2)	approximately	**b)**	a person's home; the place where someone lives
3)	establish	**c)**	an abbreviation formed from the initial letters of other words and pronounced as a word
4)	exceed	**d)**	a student who has not yet earned a bachelor's degree
5)	PhD	**e)**	almost, roughly; in a way not completely accurate or exact
6)	residence	**f)**	be greater in number or size
7)	undergraduate	**g)**	set up (an organization, system, etc.) on a permanent basis

9. Match the words from the text with their synonyms.

1. The word *leading* in the text is closest to the meaning of
   a) prestigious   b) well-known   c) major   d) popular

2. The word *restore* in the text is closest to the meaning of
   a) employ   b) reinstate   c) change   d) recall

3. The word *gain* in the text is closest to the meaning of
   a) give   b) award   c) develop   d) obtain

4. The word *feature* in the text is closest to the meaning of
   a) trait   b) quality   c) value   d) thing

5. The word *convenient* in the text is closest to the meaning of
    a) safe   b) easy   c) pleasant   d) comfortable

10. Find the corresponding prepositions for the following verbs in the text and write Russian equivalents.

1. to deal _____   _____
2. to focus _____   _____
3. to grow _____   _____
4. to learn _____   _____
5. to provide ____   _____
6. to stand _____   _____
7. to work _____   _____

11. Match the verbs with their phrases.

1)	discover	**a)**	all creative teams
2)	situated	**b)**	new skills and competencies
3)	have	**c)**	with state-of-the-art facilities
4)	unites	**d)**	their various talents
5)	equipped	**e)**	in a special building
6)	develop	**f)**	significant professional experience

12. Use the verb phrases above to fill in the gaps.

1. NSTU laboratories and classrooms are _____ to support the teaching and learning process.

2. Many of the NSTU faculty _____ and academic qualifications.

3. All this helps students to _____.

4. At NSTU, students have every opportunity to _____, such as singing, acting, playing musical instruments, painting, sewing, and more.

5. The university's Cultural Center is a place that _____.

6. It is _____ and can be named the best student center in Novosibirsk.

TRANSLATE

13. Translate from Russian into English.

1. Новосибирский электротехнический институт был основан в 1950 году.

2. Сначала НЭТИ готовил специалистов для электротехнической промышленности.

3. Институт стал политехническим университетом через сорок лет после его открытия в 1953 году.

4. В 2017 году НГТУ получил статус опорного университета, а через два года добавил к своему названию старый акроним НЭТИ.

5. Что означает аббревиатура IT по-английски и по-русски?

6. Общее число студентов НГТУ, очников и заочников, превышает 13 тысяч.

7. Преподаватели НГТУ работают со студентами, которые обучаются по разным академическим программам на 10 факультетах и в 2 институтах.

8. Метод «проектного обучения» позволяет студентам получить практический опыт работы и открывает двери в высокотехнологичные компании.

9. «Точка кипения» это специализированная площадка для совместной работы студентов с представителями образования, науки, бизнеса и власти.

10. Благодаря современной инфраструктуре кампуса НГТУ студенты имеют все условия для успешной учебы и удобной жизни, богатой различными событиями.

14. Translate from English into Russian.

1. NSTU researchers are leaders in such fields as electrophysics of high voltages, mathematical logic, problems of modern materials science, etc.

2. The direction of scientific research corresponds to the individual areas of specialization at each faculty.

3. The University's scientific publications include "NSTU Bulletin" and "Metal Working and Material Science."

4. NSTU conducts annually a number of international, all-Russian, and regional conferences for students, post-graduate students, and scientists.

5. To promote cooperation in international education, DAAD and Goethe Institute offices, German and French centers, «East-West» Center, and Confucius Institute have been opened at NSTU.

6. Organizing exchange programs for undergraduate and postgraduate students, faculty members and researchers is one of the core activities of the University's International Services.

7. The University has exchange programs with the Republic of Korea and the People's Republic of China.

8. Social and cultural adaptation of international students is an important factor of their academic and personal success.

15. Form adjectives by adding the suffix -al to the nouns below, then translate the word pairs into Russian.

Example: *addition – additional (дополнение – дополнительный)*

1) practice _____   2) education _____
3) technic _____   4) doctor _____
5) nation _____   6) culture _____

16. Form nouns by adding the suffix -ing or -ment to the provided verbs, then translate the word pairs into Russian.

Examples: *to build – building (строить, созидать – здание, строение)*
to equip – equipment (оборудовать – оборудование)

1) to engineer _____   2) to establish _____
3) to develop _____   4) to govern _____
5) to learn _____   6) to mean _____
7) to publish _____   8) to swim _____
9) to train _____   10) to walk _____

17. Give the initial words of the following derivatives. Translate both words and name their parts of speech.

Example: *educational, adj. – education, n (образовательный, прил. – образование, сущ.)*

1. leading _____   2. economic _____
3. historical _____   4. industrial _____
5. federation _____   6. electronics _____
7. business _____   8. humanities _____
9. become _____   10. employee _____
11. institution _____   12. residence _____

CONTINUOUS TENSES (ACTIVE)

18. Read the following sentences, find the predicates and say which of them are in the Continuous and which are in the Simple form. Translate the sentences into Russian.

1. In the year 2020, NSTU celebrated its 70th anniversary.
2. Before becoming a polytechnic university, NETI was training specialists for the electrical engineering sector of the USSR economy.

3. At present, NSTU researchers are conducting their scientific work in the fields of nanotechnology, electric transport, IT, and other promising areas.

4. In 2017, the University's science library moved into a new building equipped with state-of-art facilities.

5. While they are still pursuing their bachelor's degree, NSTU undergraduates have the opportunity to get practical work experience at high-tech companies and research institutes.

6. Currently, the university is developing an interesting international research project in the field of electronics.

7. Last week, the "Boiling Point" site was welcoming new international students who entered NSTU this fall.

8. The engineers will be testing a new aircraft engine during the next month.

9. While the postgraduate students were carrying out their experiment, nobody came into the laboratory.

10. The new solar battery created at NSTU is converting the energy of sun rays directly into electricity much faster than the old one.

11. The apparatus will be working for two more hours until it switches off.

12. We were looking for a simpler method of solution but could not find it.

13. NSTU boasts a beautiful campus with a well-developed and modern infrastructure.

14. The faculty members of our department will discuss the program of the upcoming Translation Day celebration.

15. He didn't attend the class last Friday, as he was participating in a dance competition at the Student Spring festival hosted by NSTU.

19. Read the conversation between an NSTU student and his mother and turn the infinitive form in brackets into the appropriate Continuous or Simple form. Then translate the dialogue.

– Hi mom, it's me. I (***call***) that early as I (***miss***) your call yesterday.

– Hello my dear. (***Be***) everything OK? How you (***do***)?

– Fine. How (***be***) everyone? Dad still (***visit***) at Grandma's? How (***be***) Dasha?

– Dad (***arrive***) tomorrow. Dasha (***be***) fine. She (***do***) well at school, she (***get***) a five for her math test yesterday.

– Great. I (***wish***) our math teacher gave us tests like those Dasha (***do***) at school. It (***be***) much more difficult to study at the university than at school, but it (***be***) more interesting, too. I (***enjoy***) all the classes here, even physical education.

– I (***be***) glad you (***like***) studying at NSTU. How (***be***) your Brazilian roommate?

– Lucas? He (***make***) great progress in learning Russian, so now he (***need***) not my help so often.

– He (***study***) at the Faculty of Aircraft Engineering like you?

– No, he (***be***) at the Faculty of Automation and Computer Engineering… Oh, someone (***knock***) at the door. It must be Lucas, he always (***leave***) his keys behind.

20. Translate the sentences below by using the Continuous tenses in the Active voice where appropriate.

1. Полгода я думал, в какой вуз поступать, и в последний момент выбрал НГТУ.

2. Разве ты не видишь, я пытаюсь закончить задание в срок, до 9 вечера.

3. Почему ты всегда оставляешь важную работу на последний день?

4. Ты вчера на лекции смотрел в свой телефон, когда профессор объяснял это явление.

5. Мне снился чудесный сон, когда вдруг зазвонил будильник.

6. Весной в течение четырех месяцев студенты третьего курса проходят практические занятия в лабораториях института.

7. Извините, я не смогу прийти в 11. Завтра в это время я буду представлять наш групповой проект.

LISTENING COMPREHENSION

21. Listen to the information about NSTU and fill in the blanks in the text with appropriate numbers and phrases.

Novosibirsk State Technical University is located _____ of the River Ob in the largest city _____ of Russia. Until _____ it was known as the Novosibirsk Institute of _____ or NETI. Its history _____ the middle of the _____ century, when NETI was founded _____ the USSR Council of Ministers' Decree of_____. It took it _____ to become one of the major research and educational centers as well as one of the _____ of the country. Nowadays, NSTU provides training to students from different academic programs _____ and 2 institutes (Institute of _____ & Institute of _____). The teaching staff consists of over _____ lecturers working at 66 departments. At present, more than _____ students are receiving

quality education at NSTU. Among them, _____ are citizens of
_____.

22. Rearrange the words to make interrogative sentences.

1. the/ considered/ 1950/ the/ of/ beginning/ is/ why/ NETI/ year?

_____

2. did/ the receive/ NSTU/ name/ when/ NETI?

_____

3. many/ NSTU/ does/ faculties/ how/ have?

_____

4. at/ there/ many/ are/ departments/ NSTU/ how?

_____

5. NSTU/ are/ many/ training/ currently/ how/ at/ receiving/ students?

_____

6. staff/ of how/ teaching/ does/ lecturers/ consist/ many/ the?

_____

23. Write down the answers to the questions from the previous task.

24. Match the beginning and the end of the statements below.

1)	NETI was founded by the government…	a) equals ten
2)	The Institute was renamed NSTU…	b) exceeds 32 hundred
3)	Currently, the number of faculties at NSTU…	c) thirteen thousand
4)	Training is provided by the faculty staff from…	d) in the early 1990s
5)	The number of NSTU students is way over…	e) 15 hundred
6)	The teaching personnel is more than	f) in the mid-1900s
7)	The international students population at NSTU…	g) 66 departments

SUPPLEMENTARY READING

25. Read the text.

NSTU Day & Rebranding

Starting since the early 1990s, NSTU Day has been celebrated annually on May 18th. The tradition dates back to 1993. It was brought to life by the renaming of "Novosibirsk Electro-Technical Institute (NETI)" Novosibirsk

State Technical University in December 1992. In 2020, it was the first time that NSTU Day festivities were held online due to the COVID-19 quarantine. At the university's website, one can find information as to how Alma Mater Day was celebrated at NSTU in the previous years.

On February 28, 2019, the NSTU faculty and students were presented with a new university development concept aimed at strengthening the school's positions on the global market of higher education. The university's new brand name NETI+, logo, and motto were introduced. Today, the expansion of the old acronym NETI is no longer limited to the original phrase. It refers to a broader scope of research and training fields NSTU identifies itself with. Now the name NETI bears a new meaning and stands for Nanotechnologies/New Materials, Energy/Electronics, Transport, and IT/quantum technologies (+ business + humanities + space + design).

The NSTU new logo complements its coat of arms adopted in 1992. It features a square frame of four shades of red and green. The shape refers to both a view of the perimeter of the university's campus from the air and a microcircuit. It resembles a modular grid, where all geometric relationships are clearly aligned. The university's Latin motto *Docendo Discimus* (By teaching, we learn) has been supported with a new one, which reads in Russian as "NSTU: Technologies that work". Its English version is much more concise and goes as "NETI: It works." (1428)

26. Make a text glossary showing the part of speech of the items included.

27. Match the following vocabulary items with their meanings.

1)	annually	a)	a school, college, or university which one has attended or from which one has graduated
2)	date back	b)	to be like or similar to
3)	festivities	c)	to make or become stronger
4)	Alma Mater	d)	an identifying symbol (as for use in advertising)
5)	previous	e)	a space for activity or thought
6)	strengthen	f)	once a year, every year
7)	motto	g)	marked by brevity of expression
8)	scope	h)	to come into being or appear (in a certain time in the past)
9)	logo	i)	a symbolic emblem of a university

10)	coat of arms	g)	a short expression of a guiding principle
11)	resemble	k)	celebration or program of events or entertainment having a specified focus
12)	concise	l)	going before in time or order

28. Decide if the statements below are True (T) or False (F). Confirm your answers with sentences from the text.

1. The first celebration of NSTU Day took place six months after the school got a new status.

2. Starting since 1993, NSTU Day has been celebrated in mid-May every year.

3. The 2019 rebranding of NSTU was caused by its attempts to gain stronger positions at the world market of higher education.

4. The change of image involved redesigning three items: name, coat of arms, and motto.

5. The shape of the red-green logo is a visual metaphor of a microchip.

6. The new motto has dismissed the original Latin one as outdated.

WRITING

29. Write five special questions that reflect the main ideas of the text.

30. Provide subtitles for each paragraph and write the summary to the text. Use Appendix 2 to help you.

SPEAKING

31. Read the text out loud paying attention to pronunciation, stress, and intonation.

33. Translate orally a paragraph assigned by the teacher.

32. Retell the text.

Unit 3
My Faculty

Discuss the following questions:

1. Why have you chosen this faculty?
2. What entrance exams did you take?

VOCABULARY

1	to gain knowledge	приобретать знания
2	software development	разработка программного обеспечения
3	train specialists	обучать специалистов
4	to occupy a separate building	занимать отдельное здание
5	to provide training	проводить обучение
6	to carry out research	проводить исследования
7	to award a degree	присвоить ученую степень
8	major	основной предмет; специализироваться
9	to undertake a postgraduate program	учиться в аспирантуре
10	equipment	оборудование
11	information security	информационная безопасность
12	to be in demand	быть востребованным

READING. TEXT 1.

1. Read the text

The Faculty of Automation and Computer Engineering

The Automation and Computer Engineering faculty was set up in 1963. Currently it is one of the best in the country for training specialists for the IT industry. Its students gain knowledge in software development, information security, robotics, biotechnology, automation and others. The faculty

of Automation and Computer Engineering is the largest faculty at the university occupying a separate eight–storied teaching block.

The faculty provides training on the basis of more than 40 educational and research laboratories equipped with computer classes and multimedia classrooms; the faculty's information network is made up of more than 500 computers.

Both Russian and foreign companies such as Eltex, Radio and Microelectronics, Samsung, Huawei, National Instruments, Siemens, D-LINK, Texas Instruments, Analog Devices, etc. house their laboratories and centers here.

The faculty awards Bachelor's, Engineer's and Master's degrees. Graduates may prefer to undertake a Postgraduate program of study leading to a higher degree.

The students of the faculty can major in any of the following areas:
• applied informatics
• information security of automated systems
• technical systems management
• automation and control
• biotechnical and robotics systems
• software engineering
• information systems and technologies
• instrument making
• information measuring technologies
• information security
• informatics and computer engineering

Students are given an opportunity not only to obtain the most up-to-date knowledge in the area chosen, but also to carry out research and participate in engineering developments. The leading areas of scientific research at the faculty are: biotechnical systems and technologies, high-performance computer systems, information and measurement systems, mathematical modeling and automation of processes, methods of designing the processes of functioning of human-machine systems and computer sign language translation systems for the deaf, applied multifunctional statistical analysis of signals and data, development of software for the analysis of dynamic and hybrid systems.

The faculty graduates can work as system programmers, analysts and designers of computer systems, network software developers, web programmers, web designers, database, economic and accounting software developers, artificial intelligence systems developers, multimedia software and computer games developers in training centers and companies. They are in high demand in a variety of areas related to automation and IT.

2. The following words in the box are all from the text above. Find them in the text.

major	knowledge	data	demand	up-to-date	house

3. For each word, read the sentence it occurs in and answer the questions.

• Is the word positive, negative or neutral?

• Is it a noun, adjective, adverb or verb? If it is a noun, is it singular of plural?

• Can you think of a word with a similar meaning (synonym) and one with an opposite meaning (antonym)?

READING COMPREHENSION

4. Answer the following questions

1. Where is the Faculty of Automation and Computer Engineering located?
2. When was the faculty set up?
3. What degrees does the faculty award to their students?
4. What facilities does the faculty provide?
5. What subjects do the students of the faculty major in?
6. What companies does the faculty cooperate with?
7. What are the main areas of scientific research at the faculty?
8. What specialists does the faculty train?

5. Read for details. Choose the correct option stated in the text.

Graduates undertake a postgraduate program:
1. to be entitled to live in a dormitory
2. to get a higher degree
3. to have higher chances to be promoted in the company they work for

ANALYZE

6. Match the names of NSTU faculties with their Russian equivalents:

1)	Radio Engineering and Electronics Faculty	a)	Факультет летательных аппаратов
2)	Power Engineering Faculty	b)	Факультет мехатроники и автоматизации

3)	Aircraft Faculty	c)	Факультет прикладной математики и информатики
4)	Physical Engineering Faculty	d)	Факультет энергетики
5)	Faculty of Humanities	e)	Институт социальных технологий
6)	Electromechanical Faculty	f)	Факультет гуманитарного образования
7)	Mechatronics and Automation Faculty	g)	Факультет автоматики и вычислительной техники
8)	Applied Mathematics and Computer Science Faculty	h)	Механико-технологический факультет
9)	Institute of Social Technology	i)	Факультет радиотехники и электроники
10)	Automation and Computer Engineering Faculty	j)	Физико-технический факультет

7. Give the English equivalents:

1. робототехника _____;
2. автоматизация _____;
3. научно-исследовательская лаборатория _____;
4. выпускник университета _____;
5. технологическая разработка _____;
6. автоматизированные системы управления _____;
7. разработчик ПО для ведения бухгалтерского учета _____;
8. искусственный интеллект _____.

8. Put the words in the correct order:

1. knowledge / Students / areas / related / gain / in / IT
2. 40 / The / computer / with / faculty / has / over / research / equipped / classes / laboratories
3. was / faculty / in / founded / 1963 / The / as early as
4. of / largest / Currently / is / one / the / NSTU / faculties / it
5. in / block. / located / a / It / separate / teaching / is

9. Match the words above with their definitions

1)	to design	b)	a branch of computer science that deals with the design, implementation, and maintenance of complex computer programs
2)	information technology	c)	extending up to the present time; including the latest information

3)	information security	d)	to draw the plans for; to create, fashion, execute, or construct according to plan
4)	database	e)	relating to a subject of academic study chosen as a field of specialization
5)	robotics	f)	the design and implementation of protocols used to guard against unauthorized access to, modification of, or destruction of confidential data, whether in digital or non-digital format
6)	major	g)	a comprehensive collection of related data organized for convenient access, generally in a computer
7)	up-to-date	h)	the use of computer-controlled robots to perform manual tasks, especially on an assembly line
8)	software engineering	b)	the technology involving the development, maintenance, and use of computer systems, software, and networks for the processing and distribution of data

10. Match the words from the text with their synonyms

1. The word *up-to-date* in the text is closest to the meaning
   a) contemporary   b) current   c) cutting edge   d) state-of-the-art

2. The word *equipment* in the text is closest to the meaning
   a) gear   b) hardware   c) machinery   d) apparatus

3. The word *training* in the text is closest to the meaning
   a) practise   b) excercise c) teaching   d) workout

4. The word areas in the text is closest to the meaning
   a) region   b) zone   c) field   d) range

11. Find the corresponding prepositions for the following verbs in the text and write their Russian equivalents:

1. to provide__   2. to lead _____   3. major ____   4. to carry_____

5. to work____   6. to be _____   7. to relate __   8. to participate__
                   demand

12. Translate from Russian into English:

1. Выпускники факультета могут работать системными программистами, аналитиками и проектировщиками компьютерных систем, разработчиками сетевого программного обеспечения, веб-программистами, веб-дизайнерами, разработчиками баз данных, экономического и бухгалтерского программного обеспечения, систем искусственного интеллекта, мультимедийного программного обеспечения и компьютерных игр в учебных центрах и компаниях.

2. Студенты факультета проводят научные исследования и участвуют в технологических разработках.

3. Студенты факультета могут специализироваться в таких областях, как прикладная информатика, информационная безопасность, управление техническими системами, автоматизация и контроль, разработка программного обеспечения.

4. Студенты получают самые современные знания в выбранной области специализации.

5. Выпускники университета пользуются высоким спросом в различных областях, связанных с автоматизацией и информационными технологиями.

6. Выпускники, имеющие степень магистра или диплом инженера, могут поступить в аспирантуру и получить ученую степень кандидата наук.

7. Факультет сотрудничает как с отечественными, так и с иностранными компаниями.

8. Учебные и исследовательские лаборатории оснащены компьютерными классами и мультимедийными аудиториями.

13. Translate from English into Russian:

1. The Faculty has well-equipped workshops and research laboratories specializing in laser, ultrasonic treatment, spark erosion electrochemical machining and computer classes equipped with up-to-date computers having an access to the Internet.

2. Students receive fundamental knowledge in basic subjects and professional training in a wide range of major disciplines.

3. Students undergo industrial training in the leading Novosibirsk companies.

4. A lot of NSTU graduates have been promoted to the position of directors and chief engineers of plants and design institutes.

5. In the early 1950s in Western Siberia there was a pressing need for competent engineers who could solve challenging research and engineering problems.

6. One of the advantages was to provide students with the opportunity to more precisely choose the major he/she wants to explore in depth.

7. During the two years of study students mostly gain basic knowledge necessary for their further professional training and education.

8. In their third and fourth years students acquire professional knowledge and skills in the field chosen.

9. Training in these fields has been provided on the basis of the newest information and facilities of the leading research centers.

10. From the third year of study students are assigned an adviser and do supervised research.

WORD BUILDING

14. Give the initial words of the following derivatives

Example: *Introduction – to introduce*

1. training	2. national	3. following	4. automation
5. related	6. measurement	7. developer	8. applied

15. Form words adding the suffixes -ment, -tion, -ity, -er to the given verbs and translate them.

1. to develop	2. to measure	3. to inform
4. to design	5. to research	6. to secure
7. to automate	8. to apply	9. to manage

GRAMMAR

PERFECT TENSES (ACTIVE)

16. Complete the sentences correctly.

1. This is the first time I (see this film).
2. That's the eighth time you (sing that song) today.
3. This is the only time this week I (feel happy).
4. This is the third serious mistake you (make) in this job.
5. This is the only time I (ever see) her cry.
6. That's the tenth cup of coffee you (drink) since breakfast.

7. It's the first time all the family (be together) since Sue's wed-ding.
8. This is the best meal I (eat) this year.
9. "Excuse me." "That's the first thing you (say) to me today."
10. These are the first clothes I (buy) myself since Christmas.

17. Ask the question about the words given in italics

1. Mrs. Clark and Sarah have been out *shopping*.
2. *They*'ve just returned home.
3. Mrs. Clark has just opened a *letter*.
4. *She* has worked as a private secretary for a musician.
5. The musician has stopped *working*.
6. He has asked *her* to find another job.
7. *The letter* has upset Mrs Clark.
8. Sarah has heard *the bad news*.

18. Translate into English using the Present Perfect.

1. Я уже сдала курсовую работу.
2. Мой брат только что приехал из Пекина.
3. Майкл получил степень бакалавра в этом году.
4. Это первый раз, когда я выступаю с презентацией (make a presen-tation).
5. Это самое интересное задание, что я когда-либо делал.
6. Вы когда-нибудь были в поточной аудитории?
7. Неужели ты сдал все экзамены на отлично?
8. Я не писал конспекты целую вечность.
9. Кейт до сих пор не написала дипломную работу.
10. В последнее время я не ходил на лекции.
11. Я раньше никогда не работала в этой программе.
12. Я дважды в моей жизни участвовал в соревнованиях.
13. Я не видел тебя очень давно. Где ты был все это время?
14. Я знаю профессора с 2000 года.
15. Петр закончил университет в этом году.

19. Put the verbs into the correct tense: Present Perfect, Past Perfect, Future Perfect or Present Simple, Future Simple, Past Simple.

1. Yesterday Nick (to say) that he (to read) much during his summer va-cation.
2. Mike's friends could hardly recognize him as he (to change) greatly after his expedition to the Antarctic.
3. Mike said he (to eat) one ice-cream already by that time.

4. When I (to come) to the station yesterday, I (to learn) that my train already (to leave).

5. You (to go) to the library tomorrow? — No, I already (to be) to the library this week. I (to be) there on Monday. I (to go) to the library on Saturday if I (to finish) the book by that time.

6. You ever (to be) to a research lab?

7. You (to go) for a walk with me? — I (to be) sorry, I can't. I (to do) my homework. I (not yet to write) the English exercise.

8. What you (to do) for today? — I (to be) sorry, I (not to prepare) my home assignment. I (to be) ill yesterday and (not to know) what to do. I (to prepare) my assignment tomorrow.

9. I joined this company in 1995. By 2010 I (to work) here for 15 years and then I'll retire.

10. By the time we get to Birmingham, we (to drive) over two hundred miles

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LISTENING COMPREHENSION

20. Listen to the text 'University Instructions' and choose the correct answer.

1. The speaker works within the Faculty of _____.
   a) Science and Technology
   b) Radio Engineering and Electronics
   c) Power Engineering
   d) Mechatronics and Automation
2. The Faculty consists firstly of _____.
   a) subjects
   b) degrees
   c) divisions
   d) departments.
3. The speaker says students can visit her _____.
   a) every morning
   b) some mornings
   c) mornings only
   d) Friday morning.
4. According to the speaker, a tutorial _____.
   a) is a type of lecture
   b) is less important than a lecture
   c) provides a chance to share views
   d) provides an alternative to groupwork.

5. The speaker's aims are to _____.
   a) introduce students to the university training
   b) introduce students to the members of staff
   c) warn students about the difficulties of studying
   d) guide students round the university.

21. Complete the notes:

The subjects taken in the first semester in this course are calculus, physics, information technology and programming basics, English and _____
Students may have problems with _____ and _____

SUPPLEMENTARY READING.

22. Read the text

At the Forefront of Technologies
that Move the World

The field of Systems Engineering + Design (SE+D) aims to identify, comprehend and enhance the systems that form the foundation of our society. It encompasses a wide range of areas, including civil engineering, transportation and space exploration, recognizing that the challenges facing contemporary society often cannot be solely addressed by a single branch of knowledge. By understanding this concept, one will be able to combine insights from multiple fields to deliver efficient and effective solutions.

Michigan Engineering has proven experience in creating effective online degree programs designed with high-performing professionals in mind.

The curriculum features courses on state-of-the-art engineering competencies such as Design Engineering, Engineering Project Management, Lean and Agile Engineering.

The education earned through an SE+D course of study prepares systems engineers to truly impact the world in which they live. SE+D students enjoy an accelerated learning curve that focuses on an iterative development of models and prototypes to better ensure that project outcomes fit the intended purposes.

Students can benefit from world-class resources and infrastructure like the Center for Entrepreneurship and the Center for Socially Engaged Design. In addition, the University hosts a wide range of research institutes and core facilities from which students can benefit.

The program allows students to customize the degree to their needs and goals, and prepares them for a career in systems engineering. Upon gradua-

tion, students will be ready to take the exam to become an Associate Systems Engineering Professional.

This degree program can enhance careers in areas such as requirements management, systems integration, systems architecture, systems engineering management, technical project management, risk management, and similar specializations. The skills and knowledge obtained can be applied in various industries including aerospace, biomedical, defense, ground transportation, healthcare, infrastructure, software development, and more.

23. Give the English equivalents:

1. достичь карьерного роста
2. гражданское строительство
3. достоверные знания, ценные информационные материалы
4. учебный план
5. воспользоваться ресурсами мирового класса
6. здесь находится широкий спектр научно-исследовательских институтов
7. повлиять на мир
8. самостоятельно выбирать; изготавливать под заказ

24. Answer the following questions

1. What is the main concept of System Engineering +Design?
2. Who is the course for?
3. What are the benefits for the students?
4. What degree will the students get after graduation?
5. What industries can the graduated work in?

WRITING

25. Write the summary to the text. Use Appendix 2 to help you.

SPEAKING

26. Make the glossary to the text. Retell the text using the glossary.

27. Get prepared with the presentation about your faculty.

Unit 4
Higher Education in Great Britain and the USA

Discuss the following questions:

1. What does the abbreviation HE stand for?

2. Are there any differences between British and American higher education systems?

3. Can you compare the Russian higher education system with the foreign one?

VOCABULARY

1	consist of	состоять из
2	identity	индивидуальность
3	campus university	студенческий городок
4	non-campus university	студенческий городок без внутренней инфраструктуры
5	accommodation	проживание
6	lecture theater	лекционный зал
7	department and facility	факультет и учебное помещение
8	examination grade	экзаменационная оценка
9	General Certificate of Secondary Education (GCSE)	общий сертификат среднего образования
10	A-level	программа среднего образования Великобритании, необходимая школьникам, планирующим поступить в Вуз
11	pattern	схема, модель
12	tutor	руководитель группы студентов
13	term	семестр
14	Bachelor of Arts (BA)	бакалавр искусств
15	Bachelor of Science (BS)	бакалавр наук
16	undergraduate courses	курсы бакалавриата

17	enhance	улучшить, повысить
18	Master of Business Administration (MBA)	магистр делового администрирования
19	graduate student	аспирант
20	requirement for admission	требование для поступления
21	Doctor of Philosophy (PhD)	высшая ученая степень
22	clear distinction between	четкое различие между
23	lead to	привести к
24	Scholastic Aptitude Test (SAT)	тест, проверяющий школьные способности
25	freshman	первокурсник
26	sophomore	второкурсник
27	junior	младший
28	senior	старший
29	undergraduate student	студент бакалавриата
30	graduate student	аспирант
31	tuition	обучение
32	Fall and Spring semesters	осенний и весенний семестры
33	grade	оценка
34	grade point average (GPA)	средний балл успеваемости
35	failure	провал, невыполнение

READING. TEXT 1.

1. Read the text

System of Higher Education in Great Britain and the USA

In the United Kingdom the higher education system consists of many academic institutions. Each UK university or college has its own identity and traditions. In a campus university the accommodation, libraries, lecture theaters and seminar rooms are concentrated in one area of the town or city. At a non-campus university, the departments and facilities are spread out across a wider area.

Entry to the institutions of higher education is based on examination grades. For admission to higher education institutions, the General Certificate of Secondary Education (GCSE) and A-level are required.

The general pattern of teaching and learning on full-time courses of higher education is a mixture of lectures, seminars and tutorials, essays,

exercises and tests. A lecture is given to a large group of students on a specific topic of study. Seminars usually consist of a group discussion of ideas and opinions about a particular field of study. Once or twice a term, students meet a tutor alone to discuss their work and progress.

Traditionally, the academic year is divided into three terms: autumn, spring and summer. Each university and department have its own method of assessment. Most universities and colleges still use some form of written examinations. Students have to answer three or four questions in an essay form. Progress is measured through a combination of course work, dissertation and final examinations.

The first-degree titles Bachelor of Arts, Bachelor of Science are called undergraduate courses. Many students wish to enhance their first degree with further study in a particular vocational or professional area.

Many courses are taught at the Master's level, including lectures, seminars, and tutorials. The title of the degree may change depending on the subject being studied, the most common of which are Master of Arts, Master of Science, Master of Business Administration and others. The graduate student is asked to complete a project or carry out research work in order to produce thesis or dissertation.

To study for a Doctoral degree, a Master's degree is a requirement for admission to most universities and colleges. Doctoral degrees are awarded for original research followed by a presentation and defense of a dissertation. A researcher can get Doctor of Philosophy degree in both arts and science subjects for four or more years.

In the US higher education system, there is no clear distinction between the terms "college" and "university". However, a college of higher education leads to a Bachelor's degree. A university is a college, a group of colleges or departments offering courses not only to the Bachelor's degree but also to the Master's and the Doctoral degrees.

Admission to colleges and universities is based on the results of the SAT. This is an exam in school subjects that high school students must pass.

A Bachelor's degree program lasts four years. Students are named from first to fourth years of studying: freshman, sophomore, junior and senior. A student working toward a Bachelor's degree is called an undergraduate student. One working toward a Master's or Doctor of Philosophy degree is called a graduate student.

The American academic year usually is divided into 2 semesters: Fall and Spring. Achievement is measured by grades. Grades are given on

papers and tests during the course of the semester and a final examination at the end of the term. A grade point average (GPA) is determined at the end of a term to show the student's overall achievement. College grades determined by each instructor on the basis of class work and examinations are usually on a four-point scale. The level of achievement is indicated by letters: from "A" to "D", where "F" means failure.

DEVELOPING VOCABULARY

2. The following words in the box are all from the text above. Find them in the text.

grade	academic	meet	usually	lasts

3. For each word, read the sentence it occurs in and answer the questions.

• Is the word positive, negative or neutral?
• Is it a noun, adjective, adverb or verb?
• Can you think of a word with a similar meaning (synonym) and one with an opposite meaning (antonym)?

READING COMPREHENSION

4. Answer the following questions

1. What consists of many academic institutions?
2. Where are the departments and facilities spread out across a wider area?
3. Is entry to the institutions of higher education based on examination grades?
4. How often do students meet a tutor alone to discuss their work and progress?
5. The academic year is divided into three terms, isn't it?
6. How do most universities and colleges use some form of written examinations?
7. Who is asked to carry out research work in order to produce thesis or dissertation?
8. What is measured through a combination of course work, dissertation and final examinations?
9. Does a Bachelor's degree program last four or five years?
10. What is the procedure for evaluating the achievements of a graduate student?

5. Which sentence below best expresses the essential information in the text?

1. In Great Britain the higher education system consists of universities or colleges.

2. There are two different systems of higher education in America and Great Britain.

3. In the system of higher education in America there are differences between colleges and universities.

ANALYZE

6. Match the words and phrases with their Russian equivalents.

1)	examination grades	**a)**	первокурсник
2)	full-time courses	**b)**	достижение
3)	requirement for admission	**c)**	студент бакалавриата
4)	freshman	**d)**	четырехбалльная шкала
5)	sophomore	**e)**	защита диссертации
6)	achievement	**f)**	очные курсы
7)	undergraduate student	**g)**	второкурсник
8)	graduate student	**h)**	аспирант
9)	four-point scale	**i)**	требование для поступления
10)	defense of a thesis	**j)**	экзаменационные оценки

7. Comment on the following proverbs.

1. No man is born wise or learned.
2. If a thing is worth doing at all it is worth doing well.
3. Science is organized knowledge.
4. By doing nothing we learn to do ill.
5. Learning without thought is labor lost, thought without learning is dangerous.

8. Put the words in the correct order.

1. An / have / or / four / students / to / form / in / answer / essay / three / questions.

2. A / to / complete / can / four / take / or / years / more / doctorate.

3. Spring / American / is / 2 / academic / year / the / divided / and / usually / into / Fall / semesters.

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4. PhD / and / subjects / can / arts / people / science / in / take / both / degree.

5. The / "F" / to / level / by / achievement / "A" / of / where / is / from / failure / "D" / letters / means / indicated.

9. Match the words below with their definitions.

1)	Bachelor's degree	**a)**	an advanced college or university degree
2)	Master's degree	**b)**	a teacher at a British college or university who teaches one student or a small group
3)	Doctor of Philosophy degree	**c)**	a teacher of a college or university subject, who usually teaches a limited number of classes
4)	campus	**d)**	a way of discovering by questions or practical activities what someone knows
5)	instructor (AmEng)	**e)**	a first degree at college or university
6)	test	**f)**	the grounds, sometimes including buildings, university, college or school
7)	tutor (BrEng)	**g)**	the highest college or university degree or someone who has this

10. Find the corresponding prepositions for the following verbs in the text and write Russian equivalents.

1. base _____ _____
2. consist _____ _____
3. depend ___ _____
4. divide _____ _____
5. give_____ _____
6. lead _____ _____
7. work _____ _____

TRANSLATE

11. Translate from Russian into English.

1. В университетском кампусе жилые помещения, библиотеки, лекционные залы и помещения для семинаров сосредоточены в одном районе города.

2. Поступление в высшие учебные заведения осуществляется на основе экзаменационных оценок.

3. Семинары обычно состоят из группового обсуждения идей и мнений по конкретной области исследования.

4. Докторские степени присуждаются за оригинальные исследования с последующим представлением и защитой диссертации.

5. В системе высшего образования США нет четкого различия между терминами «колледж» и «университет».

6. Студенты называются с первого по четвертый год обучения: первокурсник, второкурсник, младший и старший.

7. Студент, работающий над получением степени бакалавра, называется студентом бакалавриата.

12. Translate from English into Russian.

1. For admission to higher education institutions, the General Certificate of Secondary Education (GCSE) and A-level are required.

2. A mixture of lectures, seminars and tutorials, essays, exercises and tests are the general pattern of teaching and learning on full-time courses of higher education

3. Students meet a tutor alone to discuss their work and progress once or twice a term.

4. Some forms of written examinations are still used in universities and colleges.

5. A researcher can get Doctor of Philosophy degree in both arts and science subjects for four or more years.

6. Grades are given on papers and tests during the course of the semester and a final examination at the end of the term.

7. Letters from "A" to "D" indicate the level of students' achievements.

WORDBUILDING

*13. Form nouns by adding the suffixes **-er / -or** to the given verbs. Translate the nouns and verbs into Russian.*

Example: to write – writer (писать – писатель)

1. to instruct	5. to present
2. to lead	6. to program
3. to own	7. to research
4. to pass	8. to work

14. Give the initial words of the following derivatives. Translate both words.

Example: accommodation – to accommodate (размещение, жилье – вмещать)

1. academic	8. instructor
2. achievement	9. mixture
3. education	10. presentation
4. examination	11. program
5. requirement	12. researcher
6. traditionally	13. tutorial
7. usually	

GRAMMAR

PASSIVE VOICE

15. Read the following sentences and say which of them are in the Active and which are in the Passive Voice. Translate the sentences into Russian.

1. The main purpose of the academic program at Massachusetts Institute of Technology is to give students a sound command of basic principles.

2. For admission to higher education institutions, the General Certificate of Secondary Education and A-level are required.

3. To study for a Doctoral degree, a Master's degree is a requirement for admission to most universities and colleges.

4. A lecture is given to a large group of students on a specific topic of study.

5. Higher education institutions were run by a Board of regents.

6. These graduate students will be taught by a renowned scientist.

7. My dissertation has been read by the supervisor.

8. I have already defended my dissertation.

9. The rule was explained to the freshmen.

10. The experiment is being carried out in a well-equipped laboratory.

11. Dr. Brown is going to give some advice in our research work.

12. In each college, classes, lectures, practical hours and seminars are held individually.

13. The first two years of a student's studies are generally taken up with prescribed courses in a broad range of subject areas.

14. These scientific problems have been solved by Russian scientists.

15. A group of undergraduates is researching artificial intelligence.

16. The lectures of this famous professor are always listened to with great attention.

16. Read the conversation between a student (Cambridge University) and his friend (Washington University) and turn the infinitive form in brackets into the appropriate passive form.

Victoria: Oh, hi Albert. Long time, no see!

Albert: Hi, Victoria. I was in the neighborhood, so I thought I'd drop by.

Victoria: Come on in. [Thanks.] How have you been? What are your impressions of studying at Cambridge?

Albert: I'm fine. Can you imagine that such ancient universities as Oxford and Cambridge *(found)* in the 12th century?

Victoria: The University of Washington *(establish)* in 1861. Only 3 campuses in Seattle, Bothell and Tacoma *(include)* in the university.

Albert: Cambridge consists of 20 colleges. The system of individual tuition (*organize)* by the colleges. Only full-time tuition *(provide)* in Cambridge.

Victoria: Programs in law, medicine, forest recourses, oceanography and fisheries, library science, aeronautics *(offer)* exclusively by Washington University. It offers full-time courses, distance learning and evening-degree courses.

Albert: You know, each college is large and independent: own faculty, separate building, funding, and individual curricula.

Victoria: This university *(run)* by a President. Now Edmond Meaney *(head)* Washington University.

Albert: Sorry, I have a call. Let's continue later.

17. Translate the sentences below by using the Passive Voice (required Tense is indicated in brackets)

1. Эта статья была написана известным ученым. (Past Simple Passive Voice)

2. Аспиранты приглашены на международную конференцию. (Present Simple Passive Voice)

3. Эти тезисы уже обсуждалась научным сообществом. (Present Perfect Passive Voice)

4. Меня отправили на медицинские курсы в университете Глазго и мне понравилась особая атмосфера для учебы. (Past Simple Passive Voice)

5. Американская модель высшего образования была принята на Филиппинах. (Present Perfect Passive Voice)

6. Британская модель высшего образования была в разной степени скопирована в Канаде, Австралии, Индии, Южной Африке, Новой Зеландии и других бывших британских колониальных территориях в Африке, Юго-Восточной Азии и Тихоокеанском регионе. (Present Perfect Passive Voice)

7. Первые два года обучения посвящены общему образованию. (Present Simple Passive Voice)

8. Оксфордский университет расположен в городе Оксфорд. (Present Simple Passive Voice)

9. В свободное от учебы время студенты приглашаются более чем в 400 кружков по интересам. (Present Simple Passive Voice)

10. Этот вопрос сейчас обсуждается на европейской конференции. (Present Progressive Passive Voice)

LISTENING COMPREHENSION

18. Listen to the text about Oxford University. Fill in the gaps with dates and numbers from the box.

1920s	1096	400	38	4,000	25,000	II

1. Studying at this educational institution is very expensive and amounts to around _____ euros.

2. The history of Oxford University dates back to _____.

3. During the reign of Henry _____ Plantagenet, a large number of English students were expelled from France.

4. The university currently consists of _____ colleges and 6 dormitories.

5. In the _____ women began to enter Oxford.

6. In _____ the university leadership decided that education between boys and girls should be carried out separately.

7. The University of Oxford has more than _____ teachers.

8. Free from studies, students are invited to more than _____ hobby groups.

19. Choose the correct answer.

1. Oxford University is one of _____ oldest universities.

    a. American's   b. Canadian's   c. Britain's

2. The exact date of the founding of Oxford University _____.
  a. has not been deter- b. is unknown   c. is known
mined

3. Oxford University has always carried a _____ connotation.
  a. religious   b. military   c. secular

4. The main condition for _____ students is a good knowledge of English.
  a. foreign   b. local   c. distance learning

5. Annual summer _____ schools are opened to help foreign students.
  a. sports   b. language   c. technical

6. A specific specialist works individually with each student, depending on the chosen _____.
  a. hobby   b. profession   c. specialty

7. The libraries store numerous ancient manuscripts and ancient _____.
  a. buildings   b. skyscrapers   c. pyramids

8. This university has nearly two hundred libraries, museums, and its own _____ house.
  a. copy   b. scanning   c. publishing

9. Oxford University teaches in the following areas: physics, medicine, humanities, environmental _____.
  a. sciences   b. tourism   c. noises

10. More than 100 teachers are _____ of the British Academy.
  a. students   b. members   c. doctors

SUPPLEMENTARY READING

20. Read the text

Massachusetts Institute of Technology

Massachusetts Institute of Technology (MIT) is an independent university located in Boston area. It was founded in 1861 by William Barton Rogers, a distinguished natural scientist, who believed professional competence to be best fostered by the combining of teaching, research, and the application of knowledge to real-world problems. MIT held its first classes in 1865

after having delayed opening because of the Civil War. There were approximately 15 students enrolled at that time.

Today MIT has about 9,700 students. The total teaching staff numbers more than 1,800 including several thousand research staff. The institute is broadly organized into five academic Schools: Architecture and Planning, Engineering, Humanities and Social Science, Management and Science and a large number of interdisciplinary programs, laboratories and centers. A unique feature of MIT is that undergraduates join with graduate students, faculty, and staff to work on research projects throughout the institute.

Most academic activities take place in a group of interconnected buildings designed to permit easy communication among the Schools and their 22 departments. Across the street from this set of buildings there are athletic fields, the student center, and many of the dormitories.

The main purpose of the academic program at MIT is to give students a sound command of basic principles, the habit of continued learning and the confidence that comes from a thorough and systematic approach to learning. This results in continued professional and personal growth especially in today's rapidly changing world.

The two essential parts of all MIT educational programs are teaching and research. Both of these activities carried on together have greater potential than either performed alone. They provide experience in theory and experiment for both students and teaching staff. Each student pursues a degree in one of the departments. Undergraduate courses at MIT lead to the degree of Bachelor of Science (S.B.). The academic programs require four years of full-time study for the Bachelor of Science. Degrees are awarded on the basis of satisfactory completion of general institute and departmental requirements in each program.

21. Make the glossary to the text. Retell the text using the glossary.

22. Choose the term to the following definition.

1. A place where people study for an undergraduate (= first) or postgraduate (= higher level) degree.
   a. Establishment   b. University   c. Private school

2. An expert who studies or works in one of the sciences.
   a. Student   b. Head of education   c. Scientist
                             department

3. An amount or level of something.
   a. Degree   b. Reward   c. Fee

4. The people who teach in a college or university, or in a department of a college or university.
   a. Primary school teacher   b. Coach   c. Faculty (AmEng)

5. A student who is studying for a degree that is higher than the one received after four years of study at a college or university.
   a. Graduate student   b. Student   c. School graduate

6. The state of knowing about or being familiar with something.
   a. Degree   b. Skill   c. Knowledge

7. A test done in order to learn something or to discover if something works or is true.
   a. Test   b. Experiment   c. Study

8. A large building at a college or university where students live.
   a. Dormitory   b. Apartment   c. Department (AmEng)

9. A formal statement of ideas that are suggested to explain a fact or event, or how something works.
   a. Practice   b. Theory   c. Research work

10. An official rule about something that it is necessary to have or to do.
    a. Need   b. Curriculum   c. Requirement

23. Put the words in the correct order.

1. At / were / time / 15 / there / approximately / that / enrolled / students
2. Students / today / 9,700 / has / about / MIT
3. 1,800 / more / the / several / total / staff / staff / numbers / than / teaching / research / including / thousand
4. Are / MIT / teaching / and / the / essential / of / two / research / all / programs / parts / educational
5. Each / departments / in / a / student / of / one / pursues / the / degree
6. S.B. / to / undergraduate / the / at / courses / of / MIT / degree /lead
7. The / require / four / Science / the / full-time / of / years / Bachelor / for / academic / of / study / programs

WRITING

24. Write five special questions that reflect the main ideas of the text.

25. Write the summary to the text. Use Appendix 2 to help you.

SPEAKING

26. Retell the text.

27. Make up the dialogue comparing the system of higher education in Russia and Europe or America.

28.Get prepared with the presentation about any foreign University. Use Appendix 2 to help you.

Unit 5
Ecological Issues and The Ways of Their Solution

Discuss the following questions with your groupmate and share your ideas with other students:

1. What kind of ecological problems are the most harmful in modern cities?

2. What can people do to solve these ecological issues in mega cities?

VOCABULARY

1	ample	изобильный
2	consumption	потребление
3	crucial	решающий
4	environment	окружающая среда
5	expand	расширять
6	encroach on	вторгаться в
7	grey water	сточные воды
8	issue	проблема
9	impact	влияние
10	incorporate	включать
11	involvement	вовлеченность
12	mitigate	смягчать
13	pace	темп
14	recycling	переработка отходов
15	resident	житель
16	sustainable	устойчивый
17	waste	расточительство

1. Read the text

The Ecology of Mega Cities: A Vital Concern

Mega cities are growing at a fast pace, and with their growth come various economic, social, and environmental problems. To address these issues, it is essential that we adopt sustainable practices in these cities.

One of the biggest challenges facing mega cities is balancing economic growth with environmental protection. This can be a difficult task, as cities that grow in size often lead to more pollution, waste, and destruction of natural habitats. To overcome this challenge, cities must prioritize reducing the emission of harmful gases, conserve water, and ensure ample green spaces.

Another challenge is managing the impact of cities on the environment. As cities expand, they encroach on natural areas, causing loss of flora and fauna and harm to the environment. To mitigate this impact, cities should protect and restore natural areas inside and outside the city. This could involve creating pathways for animals to move around, preserving critical wet areas, and utilizing land sustainably.

Efficient use of resources is also vital for sustainability in mega cities. There are significant problems with energy consumption, water usage, and waste in these cities. To address these issues, cities can utilize resources more efficiently, such as by recycling and composting, conserving water through rainwater collection and greywater systems, and promoting the use of public transportation.

The design of cities can also influence their sustainability. A compact design with mixed uses in a single area could reduce the need for transportation, conserve energy, and make land use more sustainable. Additionally, incorporating green spaces such as parks and gardens can provide habitat for wildlife, clean the air, and provide recreational areas for people.

Finally, citizens involvement is necessary to make mega cities more sustainable. It is crucial to educate and involve the public in environmental initiatives, such as recycling programs and conservation efforts. By working together, mega cities can become more sustainable, improving the quality of life for residents and protecting the planet for future generations.

DEVELOPING VOCABULARY

2. The following words in the box are all from the text above. Find them in the text. For each word, read the sentence it occurs in and answer the questions.

sustainable	issue	expand	impact	encroach	crucial	resident

3. For each word, find the sentence it occurs in the text and answer the questions.

a) Is the word positive, negative or neutral?

b) Is it a noun, adjective, adverb or verb?

c) Can you think of a word with a similar meaning (synonym) and one with an opposite meaning (antonym)?

READING COMPREHENSION

4. Answer the following questions

1. What kind of problems come in connection with a fast growth of mega cities?

2. What is one of the biggest challenges facing mega cities?

3. How is it possible to overcome this challenge?

4. In what way can people mitigate the harmful impact to the natural environment?

5. Why is it vital to provide an efficient use of resources in mega cities?

6. What can city residents do to address these issues?

7. How can design of cities influence their sustainability?

8. In what way can citizens be involved to make mega cities more sustainable?

5. Which sentence below best expresses the essential information in the text?

1. Efficient use of resources is vital for sustainability in mega cities.

2. With the growth of mega cities come various economic, social, and environmental problems.

3. By working together, mega cities can become more sustainable, improving the quality of life for residents.

ANALYZE

5. Match the words with their Russian equivalents:

1)	ample	**a)**	смягчать
2)	encroach	**b)**	включать
3)	consumption	**c)**	темп
4)	incorporate	**d)**	изобильный

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5)	mitigate	**e)**	вторгаться
6)	involvement	**f)**	устойчивый
7)	pace	**g)**	вовлеченность
8)	sustainable	**h)**	потребление

6. Give the English equivalents:

1. в быстром темпе;
2. принимать практики устойчивого развития;
3. сбалансированный экономический рост;
4. разрушение естественной среды обитания;
5. смягчать негативное влияние;
6. сохранять важнейшие зоны орошения;
7. использовать ресурсы более эффективно;
8. включать пространства озеленения;
9. обеспечивать зоны отдыха для людей;
10. вовлекать граждан в поддержку экологических инициатив.

7. Prove the following statements:

1. As cities expand, the encroach of natural areas, causing loss of flora and fauna and harm the environment.
2. Efficient use of resources is vital for sustainability in mega cities.
3. A compact design with mixed uses in a single area could reduce the need for transportation.
4. Citizen involvement is necessary to make mega cities more sustainable.

8. Put the words in the correct order:

1. gases/ cities/ emission/ harmful/ the/ of/ prioritize/ reducing/ must
2. pace/ mega/ growing/ fast/ cities/ at/ are/ a
3. consumption/ there/ problems/ with/ are/ significant/ energy
4. wildlife/ incorporating/ as/ can/ habitat/ such/ green/ parks/ spaces/ gardens/ and/ provide/ for

9. Match the words above with their definitions

1)	consumption	**a)**	state of being included in an activity
2)	environment	**b)**	using a special industrial process so that materials or products can be used again
3)	expand	**c)**	person who lives or has their home in a place
4)	issue	**d)**	able to continue over a period of time

5)	impact	**e)**	use too much of something or use something badly
6)	involvement	**f)**	increase something in size, number or importance
7)	recycling	**g)**	the act of using, eating, or drinking something
8)	resident	**h)**	powerful effect that something, especially something new, has on a situation or person
9)	sustainable	**i)**	subject or problem that people are thinking and talking about
10)	waste	**j)**	the conditions that you work or live in

10. Match the words from the text with their synonyms

1. The word *encroach* in the text is closest to the meaning
   a) enter   b) intrude   c) enroll   d) introduce

2. The word *incorporate* in the text is closest to the meaning
   a) impose   b) invade   c) integrate   d) involve

3. The word *mitigate* in the text is closest to the meaning
   a) diminish   b) soften   c) decrease   d) mirror

4. The word *recycle* in the text is closest to the meaning
   a) refine   b) rebuild   c) remind   d) reuse

11. Find in the text the corresponding nouns with the suffix **-tion** for the following verbs and give their Russian equivalents:

1. protect _____
2. pollute _____
3. destruct _____
4. emit _____
5. consume _____
6. transport _____
7. reduce _____

12. Find matching phrases

1)	growing	**a)**	this challenge
2)	adopt	**b)**	on natural areas
3)	overcome	**c)**	this impact

4)	encroach	**d)**	recreational areas
5)	mitigate	**e)**	at fast pace
6)	provide	**f)**	sustainable practices

13. Use the phrases above to fill in the gaps

1. Mega cities are growing _____.
2. It is essential that we _____ in these cities.
3. To _____, cities must prioritize reducing the emission of harmful gases.
4. As cities expand, they _____, causing loss of flora and fauna.
5. To _____, cities should protect and restore natural areas.
6. Incorporating green spaces can _____ for people.

14. Match the collocations:

1)	grow	**a)**	on the environment
2)	adopt	**b)**	these issues
3)	overcome	**c)**	this impact
4)	impact	**d)**	recreational areas
5)	vital	**e)**	this challenge
6)	address	**f)**	the need
7)	mitigate	**g)**	involvement
8)	reduce	**h)**	at a fast pace
9)	provide	**i)**	the public
10)	citizen	**j)**	for sustainability
11)	involve	**k)**	sustainable practices

15. Translate from Russian into English, use the collocations above:

1. Большие города растут в быстром темпе, и их рост приводит к различным экономическим, социальным и экологическим проблемам.

2. Чтобы решить эти проблемы, важно, чтобы мы взяли на вооружение практики устойчивого развития.

3. Чтобы преодолеть эти проблемы, города должны сделать приоритетным уменьшение выделения в атмосферу вредных газов.

4. Другой проблемой является управление влиянием городов на окружающую среду.

5. Чтобы смягчить это влияние, городам следует защищать и восстанавливать природные участки внутри городской территории и за её пределами.

6. Эффективное использование ресурсов также является жизненно важным для устойчивого развития больших городов.

7. Чтобы справиться с этими проблемами, города могут использовать ресурсы более эффективно.

8. Компактное проектирование в сочетании со смешанным использованием на одной территории могло бы сократить потребность в транспортировке.

9. Включение зелёных территорий, таких как парки и сады, может обеспечить зоны отдыха для людей.

10. Наконец, вовлечение жителей крупных городов в решение экологических проблем необходимо для обеспечения стабильного развития мега городов.

11. Очень важно образовывать и вовлекать общество в инициативы, связанные с защитой окружающей среды.

TRANSLATE

16. Translate from Russian into English:

1. Одна из самых больших проблем, с которой сталкиваются большие города, заключается в обретении баланса между экономическим ростом и защитой окружающей среды.

2. В связи с ростом городов, происходит их вторжение в природные территории, что вызывает уничтожение флоры и фауны.

3. Чтобы смягчить это вредное влияние, жители городов должны защищать и восстанавливать природные территории.

4. Это может включать в себя создание тропинок для животных, чтобы они могли обходить наиболее густонаселённые места, а также необходимо сохранять участки с повышенной влажностью почвы, чтобы их использование было стабильным.

5. Эффективное использование ресурсов является жизненно важным для устойчивого развития мега городов.

6. Чтобы справиться с этими проблемами, жители должны перерабатывать отходы, экономно использовать воду, пользоваться общественным транспортом.

7. Существуют значительные проблемы с потреблением энергии, воды и утилизацией отходов в крупных городах.

8. Работая вместе, можно обеспечить устойчивое развитие мега городов, улучшить качество жизни их жителей, сохранить планету для будущих поколений.

17. Translate from English into Russian:

1. Mega cities are growing at a fast pace, and with their growth comes various economic, social, and environmental problems.

2. One of the biggest challenges facing mega cities is balancing economic growth with environmental protection.

3. To overcome this challenge, cities must prioritize reducing the emission of harmful gases, conserve water, and ensure ample green spaces.

4. There are significant problems with energy consumption, water usage, and waste in these cities.

5. Cities can utilize resources more efficiently, such as by recycling and composting, conserving water through rainwater collection and greywater systems.

6. The design of cities can also influence their sustainability.

7. Incorporating green spaces such as parks and gardens can provide habitat for wildlife, clean the air, and provide recreational areas for people.

8. Citizen involvement is necessary to make mega cities more sustainable.

WORD BUILDING

18. Form nouns adding the suffixes -er, -or, **-tion, -th** to the given verbs. Translate the nouns and verbs into Russian

Example:

to design – a designer (конструировать – конструктор)
to educate – an educator (преподавать – преподаватель)

1. to grow _____
2. to adopt _____
3. to protect _____
4. to pollute _____
5. to consume _____
6. to utilize _____
7. to promote _____
8. to create _____

19. Give the initial words of the following derivatives

Example:

growth – to grow

1. adoption _____
2. protection _____
3. pollution _____
4. destruction _____
5. reduction _____
6. emission _____
7. conservation _____
8. management _____
9. consumption _____
10. usage _____

GRAMMAR

MODAL VERBS

20. Match the modal verbs with their definitions:

Modals	Definitions
1) must	a) to be suggested to
2) have to	b) to have the ability to
3) may	c) to be possible
4) might	d) to be recommended to
5) can	e) to be required to
6) could	f) to have the ability to
7) to be able to	g) to be permitted to
8) ought to	h) to be obliged to
9) should	i) to be probable

21. Complete the following sentences with modal verbs:

can, should, must, ought to

1. Cities _____ prioritize reducing harmful emissions.
2. Cities _____ protect and restore natural areas.
3. Cities _____ utilize resources more efficiently.
4. The design of cities _____ play a key role in their environmental sustainability.
5. Citizens _____ be involved in environmental initiatives.

22. Change the modal verb in each sentence to another modal verb (have to, should, could, might, might):

1. Cities must make reducing harmful emissions a priority.
2. Cities should protect and restore natural areas.
3. Cities ought to use resources more efficiently.
4. The design of cities can reduce the need for transportation.
5. Citizens must be involved in environmental initiatives.

LISTENING COMPREHENSION

23. Listen to the talk from the podcast "What Makes Us Human?" about ecological issues of large cities, then answer the given questions.

1. Why did reformers from the late 19th century begin addressing industrialization?

2. In what way are our today environmental problems more diffuse and multifaceted?

3. What problem do the local governments tend to be more focused on?

4. Why do cities tend to highlight and even exacerbate inequalities?

5. How can the built or physical environment shape our behavior and decision making?

6. Why bigger cities are more efficient?

7. What type of household emits less carbon dioxide: urban or rural? Why?

8. Why do denser cities have lower transportation energy costs?

9. What other benefits do higher residential and employment densities have?

10. Why are the ways we design and build our cities more important now than ever?

SUPPLEMENTARY READING

24. Read the script of the text from 23 and check your answers to the questions above:

Cities Matter

This is an episode from the "What Makes Us Human?" podcast's second season, "Where Is the Human in Climate Change?" from Cornell University's College of Arts & Sciences, showcasing the newest thinking from across the disciplines about the relationship between humans and the envi-

ronment. Featuring audio essays written and recorded by Cornell faculty, the series releases a new episode each Tuesday through the spring.

People have long considered cities a major source of environmental problems. Reformers from the late 19th century onward began addressing industrialization, overcrowding, and public health as specifically urban issues, and they turned to government regulation to intervene in the built environment to ensure the health, safety and wellbeing of city residents.

Today our environmental problems are more diffuse and multi-faceted in nature. Pollution, wealth inequality, and greenhouse gas emissions often can't be traced back to specific cities. Moreover, it's often unclear what effect individual cities can have on complex issues like climate change.

So, we need to ask whether cities are still the appropriate scale at which to address our common problems. Can changing or re-designing our cities have an impact on global environmental problems? Are the issues we face *really* urban problems, or do cities simply cluster resource use and problems in ways that are especially visible?

Cities certainly face challenges when it comes to addressing global environmental problems. Local governments tend to be more focused on job creation and economic growth than climate change, and most environmental issues cross borders: local waste often gets exported elsewhere, and commuters who leave the city increase its energy footprint.

Cities also tend to highlight and even exacerbate inequalities. In wealthy countries cities may be cleaner, but they consume more resources per capita than cities in poorer regions: If smog levels are falling but greenhouse gas production is rising, is that city really becoming more sustainable?

However, there is evidence that the built or physical environment can shape our behavior and decision making. Choices that have environmental impacts, such as where and how we live or how we get around, may be less a function of *who* we are than *where* we are. That is, place urgently matters. And cities are especially well equipped to influence individual behavior and promote good environmental choices.

Most importantly, cities concentrate people, infrastructure and resources in a way that makes efficient use of them. For example, if a city doubles in size, the number of gas stations or amount of electricity it requires does not double. In short, bigger cities are more efficient. By concentrating population and more efficiently using land, cities also decrease human encroachment on natural habitats, farmland, and wild areas.

The higher population density of cities also produces additional benefits. Denser settlement patterns yield energy savings; for example, apartment

buildings are more efficient to heat and cool than detached suburban houses. It turns out that urban households emit less carbon dioxide than their suburban and rural counterparts. And although larger cities do produce more emissions, as their population and economy grow, the rate of growth of their emissions actually declines.

In one well-known study, researchers found a correlation between population density and average transportation energy costs. Denser cities tend to have lower transportation energy costs because higher density means reduced travel distances and greater access to travel destinations. There's evidence that smart planning can encourage better decision making in terms of environmental impacts. Higher residential and employment densities, and mixed land uses can reduce car use in favor of public transport. Better designed public spaces and pedestrian oriented streets can encourage walking and cycling.

Cities also matter because they are sites of political will. We have seen frustrating inaction at the national and international levels, leading many cities to "act locally." When President Trump recently pulled out of the Paris agreement, it was city mayors around the nation who redoubled their commitments to reducing greenhouse gas emissions.

We are used to associating the environment with wilderness and untouched nature. We think of climate change through the lens of international agreements and arctic warming. However, it's often more mundane decisions about where we live and work and how we choose to get around that have the most significant individual impact on global environmental problems. And that means that the ways we design and build our cities are more important now than ever.

25. Make the glossary to the text. Retell the text using the glossary.

WRITING

26. Write the summary to the script of the text. Use Appendix 2 to help you.

SPEAKING

27. Make up the dialogue about ecological issues of mega cities.

28. Get prepared with the presentation "Cities Matter", highlight the crucial ecological problems and the ways of their possible solution. Use Appendix 2 to help you.

Unit 6
Ecological Protection and Restoration Methods

BEFORE YOU READ

Discuss the following questions:

1. Why do you think ecological restoration is important?
2. What methods of ecological restoration do you know

VOCABULARY

1	encompass	включать в себя
2	reforestation	восстановление лесного покрова
3	secondary succession	вторичная сукцессия
4	translocation	перенос
5	deforestation	обезлесение
6	introductions	заселение (видов)
7	reintroductions	повторное заселение (видов)
8	soil depth	мощность почвы
9	carbon sink	поглотитель углекислого газа
10	tree or shrub cover	древесный или кустарниковый покров
11	community	сообщество (растений)
12	colonize	заселять/высаживать

READING. TEXT 1.

1. Read the text

Ecological Restoration Methods

The **ecological restoration** is the recovery of the structure and function of a degraded ecosystem, returning to a previous condition known or estimated. The **ecological restoration** encompasses a set of procedures and techniques that depends on both the type of ecosystem and the degree of degradation it presents. Among the methods used in ecological restoration are reforestation, secondary succession, biological corridors, translocations,

introductions and reintroductions. Ecological restoration is important to remediate ecosystem degradation, recover endangered species, and ensure ecosystem services. Among these services are water sources, energy, oxygen, carbon sinks, recreation and tourism.

The first step of any ecological restoration project is to stop or control the action of those degrading factors of the ecosystem. These can be, among others, periodic fires, pollution or human productive activities.

Deforested or burned areas

Reforestation is an alternative in areas that have lost their tree or shrub cover due to deforestation or fires. In terms of ecological recovery, reforestation must be carried out with native species of the ecosystem to be recovered. On the other hand, for it to be successful, it must be taken into account that the soil and humidity conditions are adequate. In a deforested or burned zone, the abiotic conditions of the area change, the soil erodes more rapidly and its depth decreases. Similarly, the temperature increases, there is more solar radiation and less humidity. These new conditions must be taken into account to guarantee the survival of the individuals planted.

Secondary succession

In conditions of high degradation of an ecosystem, covering large areas, reforestation is not enough for ecological restoration. In these cases, secondary succession may be more successful, although it is a slower and more laborious process. Ecological succession is a natural process that consists of the progressive replacement of some communities by others until an optimal condition. In this process, they first colonize fast-growing pioneer plants that create conditions for other more demanding species.

Biological corridors

One form of degradation is the fragmentation of habitats, that is, a large ecosystem is divided into patches without connections to each other. This alters the functions of the ecosystem as a whole and for some species it can pose a great risk of extinction. To correct fragmentation, an ecological restoration strategy is the establishment of ecological corridors. These are restored areas that connect one fragment to another, allowing the movement of species along them.

DEVELOPING VOCABULARY

2. The following words in the box are all from the text above. Find them in the text.

encompass	procedure	technique	endangered	fragmentation

3. For each word, read the sentence it occurs in and answer the questions.

a) Is the word positive, negative or neutral?
b) Is it a noun, adjective, adverb or verb?
c) Can you think of a word with a similar meaning (synonym) and one with an opposite meaning (antonym)?

READING COMPREHENSION

4. Answer the following questions

1. What is ecological restoration?
2. What is the first step of any ecological restoration project?
3. What are the ways to restore deforested or burned areas?
4. What is reforestation?
5. What should be taken into account while doing reforestation?
6. When does secondary succession occur?
7. What is the purpose of secondary succession?
8. What is the importance of biological corridors?

5. Read for details. Choose the correct option.

The first step of any ecological restoration project is:
a) to correct fragmentation;
b) to stop or control the action of degrading factors of the ecosystem such as periodic fires, pollution or human productive activities;
c) to remediate ecosystem degradation, recover endangered species, and ensure ecosystem services.

ANALYZE

5. Match the words with their Russian equivalents:

1)	encompass	**a)**	фрагментация среды обитания
2)	reforestation	**b)**	вторичная сукцессия
3)	secondary succession	**c)**	повторное заселение (видов)
4)	fragmentation of habitat	**d)**	включать в себя
5)	remediate	**e)**	обезлесение
6)	humidity conditions	**f)**	древесный или кустарниковый покров
7)	reintroductions	**g)**	восстановление лесного покрова

8)	deforestation	**h)**	сообщество (растений)
9)	tree or shrub cover	**i)**	влажность
10)	community	**j)**	восстанавливать

6. Give the English equivalents:

1. совокупность процедур и методов;
2. устранить последствия экологического кризиса;
3. восстановить исчезающие виды;
4. обеспечить экосистемные услуги;
5. проект восстановления экологии;
6. производительная деятельность человека;
7. представлять большой риск
8. трудоемкий процесс

7. Put the words in the correct order:

1. are / one / areas / another / to / that / restored / these / fragment / connect
2. restoration / degradation / ecosystem / important / to / ecological / remediate / is
3. laborious /may be / a slower /secondary succession / successful / it / and / more / process / more / although / is
4. new / taken / conditions / planted / individuals / must be / into account / the / to guarantee / of the survival / these
5. first / is / to stop / or / of those / factors / of the step / ecosystem / the / ecological / degrading / of any restoration / control / project / the / action

8. Match the words above with their definitions

1)	reforestation	**a)**	a natural process that consists of the progressive replacement of some communities by others until an optimal condition
2)	secondary succession	**b)**	restored areas that connect one fragment to another, allowing the movement of species along them
3)	biological corridors	**c)**	transferring animal species from one population to another
4)	translocations	**d)**	recovery of the structure and function of a degraded ecosystem, returning to a previous condition known or estimated
5)	ecosystem	**e)**	a large ecosystem is divided into patches without connections to each other

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6)	fragmentation of habitats	**f)**	a way of doing an activity that needs skill
7)	ecological restoration	**g)**	the act of planting trees on an area of land that has become empty or spoiled
8)	technique	**h)**	all the living things in an area and the way they affect each other and the environment

9. Match the words from the text with their synonyms

5. The word *encompass* in the text is closest to the meaning
 a) surround   b) include   c) embrace   d) affect

6. The word *reestablish* in the text is closest to the meaning
 a) recover   b) reinstall   c) rebuild   d) restore

7. The word *extinction* in the text is closest to the meaning
 a) destruction   b) disappearance   c) termination   d) extermination

8. The word *laborious* in the text is closest to the meaning
 a) hardworking   b) tedious   c) intensive   d) industrious

10. Find the corresponding prepositions for the following verbs in the text and write Russian equivalents:

1. return _____
2. depend_____
3. consist _____
4. carry _____
5. taken _____ account _____
6. include _____
7. divide _____
8. connect _____

TRANSLATE

11. Translate from Russian into English:

1. Экологическое восстановление важно для устранения последствий деградации экосистем, восстановления исчезающих видов и обеспечения экосистемных услуг.

2. Первым шагом любого проекта по восстановлению окружающей среды является прекращение или контроль действия разрушающих экосистему факторов.

3. Среди этих факторов периодические пожары, загрязнение окружающей среды или производственная деятельность человека.

4. Восстановление лесного покрова является альтернативой в районах, которые потеряли свой древесный или кустарниковый покров из-за обезлесения или пожаров.

5. В выгоревшей местности изменяются абиотические условия, быстрее происходит эрозия почвы и уменьшается ее мощность.

6. Сначала высаживают быстрорастущие растения-первопроходцы, которые создают условия для других, более требовательных видов.

7. Разрушение среды обитания изменяет функции экосистемы в целом, а для некоторых видов может представлять большой риск.

8. Биологические коридоры – это восстановленные участки, позволяющие особям перемещаться по ним.

12. Translate from English into Russian:

1. Translocation is applied to animal species and consists of transferring individuals from one population to another.

2. This method is especially useful in conditions of habitat fragmentation, where some populations remain isolated and have greatly diminished.

3. It is also used to protect endangered species, moving them to an area with better conditions.

4. Sometimes degradation affects populations of specific species to a greater extent, which can drastically decrease or disappear.

5. In these cases, introductions in order to reinforce affected populations and reintroductions when species have disappeared from an area are very effective.

6. The term reforestation is used in a broad sense to refer to the replacement of the vegetation removed from a given area.

7. Ecosystems are subject to a permanent process of degradation due to human pressure.

8. There are various methods to carry out ecological restoration, which in turn have variants depending on the ecosystem to be restored.

WORD BUILDING AND VOCABULARY DEVELOPMENT

13. Give the initial words of the following derivatives:

Example: *Introduction – to introduce*

1. restoration	_____	5. endangered	_____
2. degradation	_____	6. productive	_____
3. ecological	_____	7. replacement	_____
4. reforestation	_____	8. demanding	_____

14. Form nouns adding the suffixes –ment, -tion, -al to the given verbs and translate them.

1. to move	_____	6. to survive	_____
2. to replace	_____	7. to pollute	_____
3. to connect	_____	8. to act	_____
4. to extinct	_____	8. to introduce	_____
5. to degrade	_____	10. to apply	_____

GRAMMAR

SEQUENCE OF TENSES

15. Open the brackets and choose the correct form of the verb. Mind Sequence of Tenses.

1. The secretary realized that nobody (will come/would come) to the meeting.

2. Mr. Smith, the general director of our company says he (has not seen/had not seen) his friend from LG Corporation for ages.

3. I wanted to know who (is working/was working) at ecological restoration project.

4. All administrative staff of our company supposes the negotiations on reforestation (will start/would start) in some hours.

5. I supposed that my assistant (has finished/had finished) the annual report on ecosystem services in time.

6. The director thought we (are looking / were looking) through restoration of deforested areas.

7. Our teacher says we (will be writing/would be writing) the test on 'Ecology Restoration Methods' at two p.m.

8. The chief engineer told they (are discussing/ were discussing) a set of procedures and techniques to restore ecosystem.

16. Change the following commands from direct into indirect speech

1. 'Go home', the teacher said to us.
2. 'Buy some good dictionary in the bookshop', our lecturer asked us.
3. Lecturer: 'Sit down at the table and do your project'.
4. 'Don't forget to clean after yourself', he said to Helen.
5. 'Don't sit up late', said the doctor to Mary.
6. The doctor said to Pete: 'Don't go for a walk today'.
7. 'Explain to me how to solve this problem', my friend said to me.

17. Change the following questions from direct into indirect speech

1. I said to Boris: 'Does your friend live in London?'
2. I said to the colleague: 'Do you know anything about reforestation in this area?'
3. Nick said to his friend: 'Will you stay at the conference?'
4. He said to me: 'Do you often participate in eco projects?'
5. He said to me 'Will you see your groupmates before you leave St. Petersburg?'
6. They said to him: 'What time does the lecture start?'
7. Ann said to Mike: 'When did you leave the class?'
8. She said to Boris: 'When will you be back home?'
9. Boris said to them: 'How can I get to the University building?'
10. Mary asked Tom: 'What time will you come here tomorrow?'

18. Change the following sentences from direct into indirect speech. Mind the Sequence of Tenses

11. Laura asked me, 'Where did you buy this reference book?'
12. Mr. Nyman asked his colleague, 'How much do you spend on your English language courses each month?'
13. He asked me, 'When will your working day start?'
14. The journalist asked, 'When are you going to start working at ecological restoration project?'.
15. The students asked the ecologist, 'Could you tell us about endangered species?'.
16. The delegation asked, 'How do you ensure ecosystem services?'.
17. The reporter said, 'The reason of habitat degradation is human productive activities'.

LISTENING COMPREHENSION

19. Listen to the text 'Ecology and Environmental Protection' and choose the correct answer

1. The word *ecology* come from….

a) Greek	b) Latin	c) Italian

2. One of the climatic effects of air pollution is….

a) acid rain	b) polluted water	c) deforestation

3. Burning of wastes leads to….

a) pollution of soil	b) disappearance of fish	c) contamination of air

4. Birds and fish die because of…
   a) noise   b) polluted water   c) greenhouse effect

5. Water shortage results from ….
   a) abuse of ara-   b) overgrazing   c) acid rains
ble lands

6. A nuclear plant in Pennsylvania suffered a severe accident …
   a) in 1986   b) in 1978   c) in 1961

7. The media has begun to complain against ….
   a) oil wastes   b) tin cans and   c) air pollution
                       trash

8. To protect nature people should….
   a) eliminate   b) reduce using   c) change their attitude
rubbish   engines

SUPPLEMENTARY READING

20. Read the text

Transport Ecology

The Earth is suffering from many ecological problems. One of them is air pollution. Urban air pollution continues to expand as a result of the increased number of motor vehicles. Exhaust fumes from the engines of automobiles contain a number of polluting substances. Tokyo has such a serious air-pollution problem that oxygen is supplied to policemen who direct traffic at busy interchanges. Milan, Ankara; Mexico City, and Buenos Aires face similar problems. Air pollution destroys the ozone layer which protects the Earth from the dangerous light of the Sun.

Nowadays efforts are being made to reduce pollution from automobile engines by developing pollution-free engines which may eventually eliminate more serious air pollution problems.

Railway transport industry negatively impacts on the nature by building railroads and industrial enterprises. Operation of railways and rolling stock lead to great fuel and energy consumption and exhaust fumes from diesel locomotives contain a lot of harmful substances.

Construction and functioning of railways is connected with pollution of natural complexes by emissions, drains, waste which may break balance in ecological systems. In comparison with different means of transport railways are environmentally friendly. Electric trains cause no pollution at all,

while diesel-powered trains generate fifteen times less harmful substances than automobiles for the same traffic.

Land occupation is much less for rail transport than for other transport modes and specifically three times less than for road transport. For the purposes of comparison with airplanes, it is important to mention that the high-speed Paris-Lyons line (a distance of 427 km), occupies as much space as the Paris airport at Roissy. Different methods based on new technologies can help people use railway transport in the most efficient way.

21. Give the English equivalents:

1. выхлопные газы
2. загрязняющие вещества
3. рельсовые транспортные средства
4. транспортная развязка
5. устранить проблему загрязнения
6. большое потребление топлива и энергии
7. экологически безвредный
8. дизельный поезд

22. Answer the following questions

6. How do people pollute land, water and air?
7. Why does urban air pollution continue to expand?
8. What is being made to reduce pollution from automobile engines?
9. What should people do to protect nature?
10. How does railway transport influence the environment?

WRITING

23. Write the summary to the text. Use Appendix 2 to help you.

SPEAKING

24. Make the glossary to the text. Retell the text using the glossary.

25. Get prepared with the presentation about methods of ecology protection. Use Appendix 2 to help you.

Unit 7
Science and Outstanding Scientists

BEFORE YOU READ

Discuss the following questions:

1. Who is a scientist?
2. Do you know any outstanding scientists of the world? Tell about their great discoveries.

VOCABULARY

1	to be inclined to do smth	быть склонным делать что-либо
2	celestial bodies	небесные тела
3	breakthrough	прорыв
4	valuable	ценный
5	contemporary	современник
6	who is commonly regarded	которого считают
7	enduring legacy	долговечное наследие
8	the oath	клятва
9	to attract	притягивать
10	groundbreaking	выдающийся
11	pendulum clock	часы с маятником
12	accurate	точный
13	to isolate	выделять
14	hydrogen	водород
15	density	плотность
16	nitrogen	азот
17	organic compound	органическое соединение
18	urea	мочевина
19	inorganic chemicals	неорганические химикаты
20	atomic nucleus	атомное ядро
21	abide by	соблюдать

1. Read the text

The history of science

Ancient Greek science

From the very first moment people appeared on the planet, they have attempted to understand and explain the world they live in. The most curious of them have become scientists. Some of these individuals were inclined to study the human body, while others were intrigued by celestial bodies.

Astronomy

During the era of Ancient Greece, astronomy, physics, and philosophy were discussed together, mathematics and geometry were used to explain the movements of celestial bodies. Aristotle, one of the most important philosophers of ancient Greece, developed a universe model that centered Earth in everything – so called geocentric model of the universe.

Medicine

But early humans weren't only interested in astronomy. They also tried to understand how the human body works. Breakthroughs in the sphere of medicine have been numerous and valuable. Study in this discipline begins with a contemporary of Aristotle's named Hippocrates, who is commonly regarded as the "father of medicine." Perhaps Hippocrates' most enduring legacy to the field is the Hippocratic Oath, the ethical code that doctors still abide by today.

The Middle Ages

During the medieval period, any knowledge that was gathered by observation and logical thinking all fell within the term science. People were curious enough about why the sun, stars, and the moon exist or developing the teachings of logic and mathematics.

Science in the 17th century

The 17th century brought to light the scientific genius of the British physicist Isaac Newton. Newton realized that there is a universal force (gravity) that attracts all objects in the universe to each other. His theory of gravity explained the movements of the planets.

Many other groundbreaking scientists worked in the late 17th century. Christiaan Huygens (1629–1695) discovered Titan, the moon of Saturn. In 1656 he made the first pendulum clock, which made accurate measurement of time possible. A man named Antonie van Leeuwenhoek (1632–1723) made his own microscopes and through them, he made many observations.

Science in the 18th century

During the 18th century, chemistry made great advances. In 1751 a man named Axel Cronstedt discovered Nickel. In 1766 Henry Cavendish (1731–1810) isolated hydrogen and studied its properties. (He also calculated the density of the Earth). In 1772 Daniel Rutherford (1749–1819) discovered Nitrogen.

Science in the 19th century

The 19th century saw some of the great names of science: people like the chemist Friedrich Wohler, who produced urea, an organic compound from inorganic chemicals, Dmitry Mendeleyev (1834–1907), who formulated the Periodic Table, which arranged all the known elements according to their atomic weight, and Charles Darwin, who proposed the controversial theory of evolution. Each of these developments forced scientists radically to reexamine their views of the way in which the world worked.

Science in the 20th century

During the 20th century, science continued to go forward at fantastic speed. Scientists came to understand the atom. In 1910 Ernest Rutherford (1871–1937) discovered the atomic nucleus. He realized that almost all the mass of an atom is in the nucleus with electrons orbiting it. In 1932 James Chadwick (1891–1974) discovered the neutron.

DEVELOPING VOCABULARY

2. The following words in the box are all from the text above. Find them in the text.

groundbreaking	abide	compound	reexamine	radically

3. For each word, find the sentence it occurs in the text and answer the questions.

• Is the word positive, negative or neutral?
• Is it a noun, adjective, adverb or verb?
• Can you think of a word with a similar meaning (synonym) and one with an opposite meaning (antonym)?

READING COMPREHENSION

4. Answer the following questions

1. What was Aristotle's contribution to science?
2. Who is known as the "father of medicine"?

3. Why is the Hippocratic Oath the most enduring legacy in the medicine field?

4. What were people curious about during the medieval period?

5. Who realized that a universal force (gravity) attracts all objects in the universe to each other?

6. What did Christiaan Huygens discover in 1656?

7. What did Henry Cavendish (1731-1810) isolate in 1766?

8. What were great advances in the 18th century?

9. What did a scientist named Axel Cronstedt discover in 1751?

10. What great names of science did the 19th century see?

11. What did scientist focus their attention on in the 20th century?

5. *Which sentence below best expresses the main idea in the text?*

1. People have always attempted to understand and explain the world they live in.

2. At different stages of the development of science, scientists have shaped humankind's knowledge and laid the foundation for different disciplines, from astronomy to medicine.

3. Some scientists were inclined to study the human body, while others were intrigued by celestial bodies.

ANALYZE

6. *Match the words with their Russian equivalents:*

1)	nucleus	**a)**	водород
2)	hydrogen	**b)**	ценный
3)	isolate	**c)**	маятниковые часы
4)	valuable	**d)**	соединение
5)	pendulum clock	**e)**	противоречивый
6)	properties	**f)**	выделять
7)	controversial	**g)**	свойства
8)	compound	**h)**	ядро

7. *Give the English equivalents:*

1. небесные тела

2. быть склонным к чему-либо

3. долговечное наследие

4. расположить элементы

5. пересматривать свои взгляды

6. проводить наблюдения

7. прорывы в данной области

8. притягивать объекты

8. Prove the following statements:

1. Ancient people were interested not only in astronomy, but also in medicine.

2. Isaac Newton came up with the law of gravity.

3. Axel Cronstedt and Daniel Rutherford made breakthroughs in the field of chemistry.

4. Rutherford proposed a model of an atom in the center of which there is a nucleus containing most of the mass of the atom.

9. Put the words in the correct order:

1. was / Axel Cronstedt / and / who / chemist / a Swedish / discovered / mineralogist / the / nickel / element / who.

2. developed / periodic / the / of / the / Dmitry Mendeleyev / classification / elements.

3. Henry Cavendish /was / showed / water / that / a / composed / oxygen / of / and / hydrogen / compound.

4. helped / the / Isaac Newton / of /modern /including / laws / of / develop / principles physics /the / motion.

5. Nuclear / is / the / father / Ernest Rutherford / physics / nuclear /of / chemistry / and.

10. Match the words above with their definitions

1)	celestial	**a)**	a chemical that combines two or more elements
2)	breakthrough	**b)**	a chemical element that is a gas with no color or taste, forms most of the earth's atmosphere, and is a part of all living things
3)	compound	**c)**	a serious promise that you will tell the truth or that you will do what you have said
4)	nucleus	**d)**	a part of an atom that has no electrical charge
5)	neutron	**e)**	a chemical element that is the lightest gas, has no color, taste, or smell, and combines with oxygen to form water
6)	oath	**f)**	something that is a part of your history or that remains from an earlier time
7)	hydrogen	**g)**	the central part of an atom, usually made up of protons and neutrons

| **8)** legacy | **h)** of or from the sky or outside this world |
| **9)** nitrogen | **i)** an important discovery or event that helps to improve a situation or provide an answer to a problem |

11. Match the words from the text with their synonyms

1. The word *groundbreaking* in the text is closest to the meaning
   a) outstanding
   b) innovative
   c) extra
   d) initial

2. The word *realize* in the text is closest to the meaning
   a) implement
   b) think
   c) understand
   d) achieve

3. The word *accurate* in the text is closest to the meaning
   a) proper
   b) precise
   c) wrong
   d) unreal

4. The word *controversial* in the text is closest to the meaning
   a) disputable
   b) certain
   c) wrong
   d) definite

12. Find the corresponding prepositions for the following verbs in the text and write Russian equivalents:

• To be intrigued _____
• To be interested _____
• To be gathered _____
• To be regarded _____
• To be inclined _____

13. Find matching phrases

| 1) to be intrigued | a) in studying properties of chemical substances |
| 2) to be interested | b) to study compounds |

3) to be gathered	c) as a closed system
4) to be inclined	d) by different scientists
5) to be regarded	e) by geometry

14. Use the phrases above to fill in the gaps

1. Some scientists were _____ and chemical elements.
2. He _____ and mathematics and gave up his free time to study.
3. The scientist _____ and this was the first break-through in our understanding of chemistry.
4. He _____ the outstanding representative of the late 19th-century Russian realist school.
5. The evidence for them has been _____ of many disciplines.

15. Match the collocations

1)	celestial	**a)**	compound
2)	enduring	**b)**	force
3)	groundbreaking	**c)**	advances
4)	pendulum	**d)**	legacy
5)	accurate	**e)**	Table
6)	make	**f)**	weight
7)	Periodic	**g)**	theory
8)	controversial	**h)**	measurement
9)	atomic	**i)**	clock
10)	universal	**j)**	scientists
11)	organic	**k)**	bodies

16. Translate from Russian into English, use the collocations above

1. К небесным телам можно отнести кометы, планеты, метеориты, астероиды, звёзды и прочее.
2. Это событие оставит будущим поколениям долговечное наследие.
3. Когда речь заходит о выдающихся российских ученых, многие вспоминают героев прошлых лет – Менделеева, Павлова или Ландау, забывая, что и среди наших современников есть множество незауряд-ных исследователей.
4. Создание маятниковых часов состояло в соединении маятника с устройством для поддержания его колебаний и их отсчета.

5. В 1994 году были произведены более точные измерения космических расстояний.

6. В 19 веке такая наука, как физика добилась больших успехов, однако еще был ряд нерешенных вопросов.

7. Периодическая таблица Менделеева Д.И. является основой обучения химии.

8. Ученые, так или иначе, имеют дело с противоречивыми теориями, которые объясняют ряд экспериментов.

9. Исходя из атомного веса различных элементов, можно составить периодическую таблицу.

10. Ученые-физики всегда считали, что все силы, действующие в природе, должны сводиться к единой универсальной силе и ее следует найти.

11. Число известных органических соединений значительно превышает число соединений всех остальных элементов периодической системы Менделеева.

TRANSLATE

17. Translate from Russian into English:

1. Среди сложных веществ можно выделить неорганические и органические вещества.

2. Год спустя Владимир Демихов совершил прорыв – провел первую в мире пересадку лёгкого собаке.

3. Все последующие дни Эддингтон провел над фотографиями, пытаясь провести точные измерения с помощью сложного устройства под названием микрометр.

4. Генри Кавендишем еще в 1772 году был осуществлен интересный эксперимент, позволивший выделить новое простое вещество – азот.

5. В 1828 году Фридрих Вёлер синтезировал из обычных «лабораторных» химикатов мочевину – органическое вещество, которое содержится в почках и моче животных.

6. Электроны вращаются вокруг ядра на большом расстоянии, создавая значительное пустое пространство в атоме.

18. Translate from English into Russian:

1. While gravity's effects can clearly be seen on the scale of things like planets, stars and galaxies, the force of gravity between everyday objects is extremely difficult to measure.

2. Nickel is a metallic element with a silvery-white, shiny appearance.

3. The atomic mass is the mass of a single atom, when the atom is at rest at its lowest energy level.

4. Before its isolation, scientists predicted the existence of rhenium and some of its properties.

5. A microscope is an instrument for viewing objects that are too small to be seen by the naked eye.

6. Nitrogen is the chief constituent of the Earth's atmosphere and a vital element in all known forms of life.

WORD BUILDING

19. Form nouns adding the suffixes -er, -or to the given verbs. Translate the nouns and verbs into Russian

Example: *to design – a designer (конструировать – конструктор)*

1. to discover   2. to produce   3. to isolate
4. to develop   5. to invent   6. to orbit

20. Give the initial words of the following derivatives

Example: *agreement – to agree*

1. appearance   2.discussion   3. observation
4. measurement   5. radically   6. controversial
7. logical   8. movements   9. valuable
10. evolution

21. Form nouns adding the suffixes a)-tion, b)-ment to the given verbs and adjectives and translate them.

Example: a) connect – соединять; connection – соединение
b) develop – развивать; development – развитие

1. to invent, to innovate, to expand, to attract, to reflect, to ignite, to consider, to educate, to express.

2. to move, to measure, to accomplish, to equip, to improve, to require, to treat, to state.

GRAMMAR

MODAL VERBS

22. Read the following sentences and name the modal verb and the type of Infinitive that is used with it in each sentence. Translate all sentences into Russian.

1. Scientists can detect the immense gravity and radiation around black holes.

2. The scientist under discussion must have made a great contribution to science.

3. Black holes can have various sizes; some may be even as small as an atom.

4. This outstanding scientist ought to have headed our conference.

5. Can malaria affect more people than ever before?

6. He must have been working on his invention for a year.

7. You shouldn't have conducted your experiment alone.

8. He must be working on creating a new vaccine; I saw him entering the laboratory.

9. Could he have used new methods in his research?

10. You are not allowed to experiment with organic compounds without your professor.

11. You may use this tool to measure a temperature of a heated object.

12. She might be reading about the atomic nucleus at the moment.

13. The scientist under discussion should have isolated hydrogen.

23. *Make up sentences with the following modal verbs* **should, ought to, might / may, could / can, have to, must.** *Write them down.*

Example: *You ought to have called him.*

24. *Translate the following sentences from Russian into English*

1. Возможно, его доклад станет одним из самых лучших работ.

2. Ты мог бы использовать новые методы изучения химического строения органических веществ.

3. Он не должен был делиться результатами нашего опыта с кем-либо.

4. Я думаю, вам следует проверить строение клетки под микроскопом.

5. Вам не разрешается оглашать результаты эксперимента, если они не прошли проверку.

6. Должно быть, он сейчас в лаборатории. Я видел, как он туда заходил.

7. Я вынужден был следовать инструкции по работе с инструментами.

25. Translate the following sentences from English into Russian.

1. You shouldn't have any difficulty in conducting the experiment.
2. Could he have invented the apparatus under discussion?
3. His theory must have won him the Nobel Prize.
4. Penicillin might have come into use during World War II.
5. Ought I to tell you the truth?
6. Bohr's first contribution to the emerging new idea of quantum physics must have been made in 1912.
7. To complement the experimental tool that X-ray analysis provided for exploring molecular structure, Pauling had to turn to quantum mechanics as a theoretical tool.

LISTENING COMPREHENSION

26. Listen to the information about Joseph Priestley. What is the main idea of the audio?

27. Listen to the audio again and complete the gaps.

1. Joseph Priestley was an English scientist, philosopher, theologian and _____ who authored more than 150 publications.
2. He is noted for his _____ to experimental chemistry, electricity and _____, as well as his extraordinary work regarding liberal political and religious thought.
3. Born at Birstall Fieldhead, England, on 13 March in _____, Joseph Priestley proved to be a very intelligent child from an early age.
4. Priestley also learnt more than six different languages including Latin, _____.
5. As a friend of Benjamin Franklin, Priestley contacted him regarding his _____.
6. Before him, scientists thought that the air on Earth consisted of carbon _____.
7. Priestley brought 10 more gases to this list, such as _____, hydrogen chloride, _____, nitrous oxide and oxygen. He also invented soda water.
8. He also invented _____.
9. Priestley, along with his family, narrowly escaped hundreds of _____ who attacked their home in 1791.
10. Joseph Priestley died in Northumberland, Pennsylvania on Feb 6, 1804, _____.

28. Read the text.

Outstanding Scientists

Over the centuries, there have been countless scientists and intellectuals whose efforts have kept the wheels of progress turning.

All the technologies that make our lives easier, all the medicines and medical equipment that save us, and indeed all of our understanding of the world itself are the result of the tireless efforts of all those scientists who spent thousands of hours inventing and discovering different things. Presented below, is a list of some of the world's greatest and most famous scientists, along with brief descriptions of the things they invented or discovered.

Dmitry Ivanovich Mendeleyev (1834–1907)

Russian *chemist* Dmitry Ivanovich Mendeleyev developed the periodic classification of the elements. Mendeleyev found that, when all the known chemical elements were arranged in order of increasing atomic weight, the resulting table displayed a recurring pattern, or periodicity, of properties within groups of elements. He even predicted the likely properties of three of the potential elements.

Mendeleyev published a textbook on organic chemistry in 1861. He then set out to write "The Principles of Chemistry". When Mendeleyev began to compose the chapter of the book on the halogen elements, he compared the properties of this group of elements to those of the group of alkali metals such as sodium. Within these two groups of dissimilar elements, he discovered similarities in the progression of atomic weights, and he wondered if other groups of elements exhibited similar properties.

Mendeleyev established that the order of atomic weights could be used not only to arrange the elements within each group but also to arrange the groups themselves. Thus, Mendeleyev discovered the periodic law.

Edwin Powell Hubble (1889–1953)

American *astronomer* Edwin Powell Hubble is considered the founder of extragalactic astronomy. He provided the first evidence of the universe expansion.

After discovering the existence of external galaxies, Hubble undertook the task of classifying them according to their shapes and exploring their stellar contents and brightness patterns. In studying the galaxies, Hubble made his second remarkable discovery – namely, that these galaxies are ap-

parently receding from the Milky Way and that the further away they are, the faster they are receding. The universe, long considered static, was expanding; and, even more remarkably, as Hubble discovered in 1929, the universe was expanding in such a way that the ratio of the speed of the galaxies to their distance is a constant now called Hubble's constant.

Ernest Rutherford (1871–1937)

New Zealand-born British *physicist* Ernest Rutherford was considered the greatest experimentalist since Michael Faraday (1791–1867). Rutherford was the central figure in the study of radioactivity, and with his concept of the nuclear atom he led the exploration of nuclear physics. Rutherford conceived in 1911 that the atom could not be a uniform solid but rather consisted mostly of empty space, with its mass concentrated in a tiny nucleus. Radioactivity, he explained, lies in the nucleus, while chemical properties are due to orbital electrons.

John Lister

British *surgeon* and *medical scientist* Joseph Lister was the founder of antiseptic medicine and a pioneer in preventive medicine. He adopted the only feasible method of surgically clean treatment, which consists in creating an antiseptic barrier between the wound and the air. He began using carbolic acid as an effective antiseptic to protect the operation site from infection.

29. Make the glossary to the text. Retell the text using the glossary.

30. Match the collocations.

1)	alkali	**a)**	astronomy
2)	extragalactic	**b)**	medicine
3)	stellar	**c)**	physics
4)	chemical	**d)**	acid
5)	preventive	**e)**	electrons
6)	orbital	**f)**	barrier
7)	Hubble's	**g)**	properties
8)	antiseptic	**h)**	expansion
9)	nuclear	**i)**	constant
10)	carbolic	**j)**	contents
11)	universe	**k)**	metals

31. Fill in the gaps.

1. D.I. Mendeleyev published a textbook on _____ in 1861.

2. When Mendeleyev began to compose the chapter of the book on the halogen elements, he compared the properties of this group of elements to those of the group of _____ such as sodium.

3. Mendeleyev established that the order of _____ could be used not only to arrange the elements within each group but also to arrange the groups themselves.

4. American astronomer Edwin Powell Hubble is considered the founder of _____.

5. Edwin Powell Hubble provided the first evidence of _____.

6. Rutherford was the central figure in the study of _____.

7. Rutherford conceived in 1911 that the atom could not be a _____ but rather consisted mostly of empty space, with its mass concentrated in a tiny nucleus.

8. British _____ and _____ was the founder of antiseptic medicine and a pioneer in preventive medicine.

9. Joseph Lister created an _____ between the wound and the air.

10. Joseph Lister began using _____ as an effective antiseptic to protect the operation site from infection.

WRITING

32. Write the summary to the text "Outstanding scientists". Write the summary to the text. Use Appendix 2 to help you.

SPEAKING

33. Retell the text "Outstanding scientists".

34. Make up the dialogue on the theme "The most important scientific discoveries of ancient time".

35. Get prepared with the presentation about a famous scientist. Use Appendix 2 to help you.

Unit 8
Great Inventions and Their Role
in the Development of Technology

BEFORE YOU READ

Discuss the following questions:

1. What do you know about the greatest inventions of the world?
2. Can you describe the invention you consider to be the most important one?

VOCABULARY

1	advance	двигать вперёд
2	BC (before Christ)	до н. э. (до нашей эры)
3	composite	составной
4	contribute	способствовать
5	discover	обнаруживать
6	discovery	открытие
7	endeavour	устремление, предприятие
8	ensure	гарантировать
9	ensuring	обеспечение
10	improve	улучшать
11	improvement	улучшение
12	invent v.	изобретать
13	invention	изобретение
14	solve	решать
15	solution	решение
16	remark	отмечать

1. Read the text

Great Inventions and Science

Science is the greatest collective endeavor. It contributes to ensuring a longer and healthier life. Science generates solutions for everyday life and helps us to answer the great mysteries of the universe. In other words, science is one of the most important channels of knowledge. The great philosopher, Francis Bacon, had argued, 'Knowledge is power. The real test of knowledge is not whether it is true but whether it empowers us.'

Technology affects almost every aspect of our life, from transport efficiency and safety to access to food and healthcare, socialization and productivity.

In our current times, it may seem as if we are constantly bombarded with exciting new innovations and discoveries. However, many of the new ideas and technologies that are shaping our modern world often can be traced back centuries in their origins.

There are many inventions throughout history that may have contributed more than others to advance civilization and technological development.

1. The Wheel (3500 BC)
2. The Compass (200 BC)
3. Waterwheel (300–100 BC)
4. Calendar
5. Ancient Concrete
6. Clock (725 AD)
7. The Printing Press (100 AD in China; 1436 by Johannes Gutenberg)
8. The Steam Engine (1606 by Jerónimo de Ayanz)
9. Vaccines (1700 AD in China; 1798 by Edward Jenner)
10. The Steam-Powered Train (1804 by Richard Trevithick)
11. Electric Battery (BC, in the Parthian empire; 1799 by Alessandro Volta)
12. Computer (1834 by Charles Babbage)

Looking back at these ground-breaking inventions, one thing is clear – our desire to improve and innovate. We see a society that invented the wheel to tread ground quickly, who mastered the skies and waves. It is truly remarkable and something that we will continue to do for ages to come! What major inventions will be created in the future?

DEVELOPING VOCABULARY

2. The following words in the box are all from the text above. Find them in the text.

collective	contribute	empower	productivity	origin

3. For each word, find the sentence it occurs in the text and answer the questions.

a) Is the word positive, negative or neutral?
b) Is it a noun, adjective, adverb or verb?
c) Can you think of a word with a similar meaning (synonym) and one with an opposite meaning (antonym)?

READING COMPREHENSION

4. Answer the following questions

1. Is science an individualistic or collective business?
2. Can science and technology contribute to a better life? In what way?
3. Could philosophy be connected with science? In what way?
4. Have you heard about philosophers, speculating upon the role of science for our life?
5. What spheres of our life are mostly affected by technology?
6. Are we totally dependent on science in our everyday life?
7. Do you feel the difference between the words 'innovation' and 'discovery'?
8. What are the greatest human inventions?
9. What other inventions can you think of?

5. Read detailed information about the greatest inventions and answer the following questions.

1. The Wheel (3500 BC) – Let's get things rolling

Evidence suggests that the first freely-spinning device to use the wheel and axle combination was developed in Mesopotamia (modern-day Iraq, Kuwait, Turkey, and Syria).

What mechanism is the basis for the wheel? (Device; axle; development)

2. The Concrete – Why not eternalize it

Concrete is a composite material made from a mixture of broken stone or gravel, sand, Portland cement, and water.

What kind of material is concrete? (Composite; natural; synthetic)

3. The Steam Engine – The Invention that started the Industrial Revolution

Jerónimo de Ayanz patented a device that used steam power to propel water from mines.

What invention is considered to have started the Industrial Revolution? (Steam engine; steam power; mine)

ANALYZE

6. Match the words with their Russian equivalents.

1)	science	**a)**	эффективность
2)	empower	**b)**	доступ
3)	universe	**c)**	Вселенная
4)	efficiency	**d)**	здравоохранение
5)	exciting	**e)**	начинание
6)	access	**f)**	естественные науки
7)	endeavor	**g)**	наделять властью
8)	healthcare	**h)**	волнующий
9)	advanced	**i)**	передовой

7. Give the English equivalents.

1. общее дело;	5. инновации, не оставляющие равнодушным;
2. источник знаний;	6. доступность здравоохранения;
3. на протяжении истории;	7. формировать наше представление о мире;
4. настоящее время;	8. развивать цивилизацию.

8. Put the words in the correct order.

1. everyday / life / solutions / for / Science / generates.
2. innovations / There / new / discoveries / exciting / and / are / many.
3. a / material / is / composite / Concrete.
4. started / Revolution / Steam / Industrial / Engine / The / the.
5. obvious / innovate / improve / Our / and / is / desire / to.

9. Match the words above with their definitions.

1)	Compass	**a)**	a system, which set the length of the months and the year
2)	Water-wheel	**b)**	a method in medicine helping immunity

3)	Calendar	**c)**	a machine making books and newspapers accessible to many
4)	Mechanical Clock	**d)**	a device to measure time
5)	Printing Press	**e)**	a device to navigate around the world
6)	Vaccines	**f)**	a device to carry a constant supply of power
7)	Electric Battery	**g)**	a machine that converts the energy of flowing or falling water into useful forms of power

10. Match the words from the text with their synonyms.

1. The word *affect* in the text is closest to the meaning
   a) influence
   b) impact
   c) force
2. The word *efficiency* in the text is closest to the meaning
   a) performance
   b) productivity
   c) effectiveness
3. The word *contribute* in the text is closest to the meaning
   a) bring
   b) introduce
   c) implement
   d) represent, present
   e) cooperate

TRANSLATE

11. Translate from Russian into English.

1. Ежегодно в последнюю субботу июня в России отмечается День изобретателя и рационализатора.

2. Увлечение Бориса Якоби физикой вылилось в создание первого в мире электродвигателя.

3. 12 февраля 1914 года в Риге на полигоне Русско-Балтийского завода в воздух поднялся четырехмоторный «Илья Муромец».

4. Прокудин-Горский организовал ряд экспедиций по территории Российской империи, снимая известных персон (например, Льва Толстого).

5. Владимир Кузьмич Зворыкин разработал прибор ночного видения, электронный микроскоп и много других интересных вещей.

6. Александр Николаевич Лодыгин, будучи членом Русского технического общества, в 1870 году предложил применять в лампах нити накаливания из вольфрама.

7. Только благодаря двум русским инженерам-физикам – Н. Г. Басову и А. М. Прохорову, которые разработали квантовый генератор, лазер начал свою историю на практике. В 1964 году Басов и Прохоров получили Нобелевскую премию по физике.

8. Имя Владимира Петровича Демихова связано не с одной операцией, которая совершалась впервые.

9. Николай Иванович Пирогов – великий русский хирург, которому мир обязан многими важнейшими открытиями, внес огромный вклад в анестезиологию.

12. Translate from English into Russian.

1. The list of Leonardo da Vinci's contributions to the world of engineering is virtually endless.

2. Thomas Edison is credited with thousands of inventions, including the phonograph, the electric light bulb, the telephone, the movie camera, the microphone and others.

3. Frenchman Louis Pasteur was the first microbiologist. He invented the principles of vaccination and pasteurization, which turned out to be hugely important for human health.

4. We thank Nikola Tesla for alternating current, the modern electric motor, remote controlled boats and radar technology, wireless communications. He didn't get credit for much of it in his lifetime and died alone in poverty.

5. Johannes Gutenberg was a German goldsmith and inventor best known for the Gutenberg press.

6. James Naismith was a Canadian physical education instructor who invented basketball in 1891.

7. Hedy Lamarr is often recognized as a Hollywood actress. As an inventor, Lamarr made significant contributions to radio and technology systems. During World War II, she invented a radio-guidance system for torpedoes.

13. Give the initial words of the following derivatives.

Example: *agreement – to agree*

1. accessible	2. contribution	3. invention
4. technological	5. vaccination	6. generation
7. effectiveness	8. production	9. industrial
10. historic	11. logical	12. implementation
13. dependent	14. remarkable	15. productivity

GRAMMAR

THE DIRECT AND INDIRECT SPEECH

14. Read the following sentences, point out Direct and Indirect Speech. Translate the sentences into Russian. Why is the citation used?

1. "Doubt is the father of invention." – Galileo Galilei.
2. "Name the greatest of all inventors. Accident." – Mark Twain.
3. Thomas Alva Edison claimed that he had never invented anything by accident, and that all his inventions had come by work.
4. "I invent nothing, I rediscover." – Auguste Rodin.
5. Joshua Reynolds said that the invention is little more than a new combination of those images which had been gathered before in the memory.
6. Many great inventors advise us not to fear mistakes.
7. Santiago Ramón y Cajal, the Spanish neuroscientist, pathologist, and artist, believed that the brain is built of discrete cells, the "butterflies of the soul," as he put it, that hold our memories, thoughts and emotions.

15. Paraphrase the following sentences with the Direct Speech into those with Indirect Speech.

1. "The spinning wheel is a symbol of nonviolence for me." – Mahatma Gandhi.
2. "The printing press is either the greatest blessing or the greatest curse of modern times, sometimes one forgets which it is." – E. F. Schumacher.
3. "The switch from "steam engines" to "heat engines" signals the transition from engineering practice to theoretical science." – Hans Christian von Baeyer.

4. "If God had a refrigerator, your picture would be on it." – Max Lucado.

5. "The press, the machine, the railway, the telegraph are premises whose thousand-year conclusion no one has yet dared to draw." – Friedrich Nietzsche.

6. "Technology gives us the facilities that lessen the barriers of time and distance – the telegraph and cable, the telephone, radio, and the rest." – Emily Greene Balch.

7. "The real danger is not that computers will begin to think like men, but that men will begin to think like computers." – Sydney J Harris.

8. "A computer will do what you tell it to do, but that may be much different from what you had in mind." – Joseph Weizenbaum.

9. "Computers are useless. They can only give you answers." – Pablo Picasso.

10. "The human spirit must prevail over technology." – Albert Einstein.

LISTENING COMPREHENSION

16. Listen to the text and fill in the gaps with proper adjectives.

Darwin and new Era

One of Darwin's most quoted statements is: "It is not the (1) _____ of the species that survives, nor the most (2) _____ that survives. It is the one that is the most (3) _____ to change." According to his (4) _____ selection theory, individuals less suited to the environment are less likely to survive whereas individuals more suited to the environment are more likely to survive.

To survive the Fourth (5) _____ Revolution we need to adapt to (6) _____ situation. In this context some are speaking of (7) _____ Darwinism. It is the one that is most (8) _____ to change", refers to the need for businesses and people to adapt to (9) _____ situations arising due to digitalization. And our survival is still at stake because those who fail to adapt get left behind.

adaptable (2)	industrial	strongest	intelligent
natural		digital	new (2)

99

17. Read the text

Artificial Intelligence

Artificial Intelligence (AI), the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience. Since the development of the digital computer in the 1940s, it has been demonstrated that computers can be programmed to carry out very complex tasks – as, for example, discovering proofs for mathematical theorems or playing chess – with great proficiency.

Still, despite continuing advances in computer processing speed and memory capacity, there are as yet no programs that can match human flexibility over wider domains or in tasks requiring much everyday knowledge. On the other hand, some programs have attained the performance levels of human experts and professionals in performing certain specific tasks, so that artificial intelligence in this limited sense is found in applications as diverse as medical diagnosis, computer search engines, and voice or handwriting recognition.

What is intelligence? All but the simplest human behavior is ascribed to intelligence, while even the most complicated insect behavior is never taken as an indication of intelligence. What is the difference? Consider the behavior of the digger wasp, Sphex ichneumoneus. When the female wasp returns to her burrow with food, she first deposits it on the threshold, checks for intruders inside her burrow, and only then, if the coast is clear, carries her food inside. The real nature of the wasp's instinctual behavior is revealed if the food is moved a few inches away from the entrance to her burrow while she is inside: on emerging, she will repeat the whole procedure as often as the food is displaced. Intelligence – conspicuously absent in the case of Sphex – must include the ability to adapt to new circumstances.

18. Make the glossary to the text. Retell the text using the glossary.

19. Write the summary to the text "Artificial Intelligence". Use Appendix 2 to help you.

SPEAKING

20. Get prepared with the presentation about Artificial Intelligence. Use Appendix 2 to help you.

Unit 9
Information Technology

BEFORE YOU READ

Discuss the following questions:

1. What is information technology?
2. Where can you study information technology?
3. Which job can you choose if you're interested in information technology?

VOCABULARY

1	digital	цифровой
2	software	программное обеспечение
3	assemble	собирать, составлять
4	enable	давать возможность
5	application	приложение, применение
6	hardware	аппаратное обеспечение
7	database	база данных
8	essential	необходимый
9	convenience	удобство
10	CRM (customer relationship management)	система управления взаимоотношениями с клиентами
11	IT governance	управление IT
12	network maintenance	обслуживание сети
13	device management	управление устройством
14	efficiency	эффективность

READING. TEXT 1.

Read the text

What Is Information Technology?

Nowadays, IT (Information Technology) has become synonymous with everything related to digital communication and technology. From checking

email to running software on our laptops, a zoom call with colleagues at work or live streaming on social media, analyzing consumer data from a marketing campaign to even booking online vaccination appointments on a healthcare website, IT is everywhere. Let's take a closer look at the meaning and place of the IT sector in the modern world.

The term IT (Information Technology) in its simplest form covers every task that computers are used for. While there is overlap between the terms "*IT*" and "*computer science*", the two have different meanings. Computer science focuses on the logic and design of the components that IT experts use to assemble business systems. Much of the work in computer science involves developing the algorithms and logic and writing the low-level code that enables computer systems to address business problems.

IT, on the other hand, is generally associated with the application of technology to deal with business issues. As such, the IT workforce is oriented toward developed technologies such as hardware systems, OSes and application software. Thus, future IT specialists study business analysis, project management, database design, etc.

Global connectivity and operations are solely dependent on IT systems. IT services are essential to keep systems running, networks connected and data secure. Some of the most common fields of IT application are: building communication networks within the organization, security of data and vital information, creation and management of databases, CRMs and other tools that help employees overcome operational challenges, boost efficiency, and improve speed, accuracy and convenience of processes.

An IT department consists of three main sectors of responsibility:

IT governance. This refers to the combination of policies and processes that ensure IT systems are effectively run and in alignment with the organization's needs;

IT operations. This is a catchall category for the daily work of an IT department. This includes providing tech support, network maintenance, security testing and device management duties;

Hardware and infrastructure. This focus area refers to all the physical components of IT infrastructure. This pillar of IT includes the setup and maintenance of equipment like routers, servers, phone systems and individual devices like laptops.

Data processing plays a significant role in these core business practices, among others, including: product development and design, marketing and market research, sales and invoicing, customer development and retention, accounting and taxes, human resources and payroll, regulatory compliance.

Today few businesses – large or small – can remain competitive without the ability to collect data and turn it into useful information. IT provides the means to develop, process, analyze, exchange, store and secure information.

DEVELOPING VOCABULARY

The following words in the box are all from the text above. Find them in the text.

enable	*common*	*issue*	*secure*	*solely*

2. For each word, find the sentence it occurs in the text and answer the questions.

a) Is the word positive, negative or neutral?
b) Is it a noun, adjective, adverb or verb?
c) Can you think of a word with a similar meaning (synonym) and one with an opposite meaning (antonym)?

READING COMPREHENSION

3. Answer the following questions

1. What can be related to digital communication and technology?
2. What is the difference between the terms IT and computer science?
3. Which disciplines do future IT specialists study?
4. What does the sector of IT governance include?
5. What does the sector of IT operations include?
6. What does the sector of hardware and infrastructure include?
7. What are the most common fields of IT application?
8. What does the phrase "catchall category" mean?
9. Why is data processing important for modern business?

4. Which sentence below best expresses the essential information in the text?

A. Information technology is synonymous to digital communication and securing systems.

B. Information technology is essential in global connectivity and in dealing business issues, as it provides the means to develop, process, analyze, exchange, store and secure information.

C. An IT department consists of IT governance, IT operations and hardware infrastructure.

5. Match the words with their Russian equivalents:

1)	related	**a)**	термин
2)	term	**b)**	включать
3)	to involve	**c)**	проблема
4)	issue	**d)**	развивать
5)	to develop	**e)**	полезный
6)	to refer	**f)**	устройство
7)	useful	**g)**	относиться
8)	device	**h)**	связанный

6. Give the English equivalents:

1. предоставлять средства для развития _____
2. взглянуть поближе _____
3. позволить решать задачи _____
4. быть ориентированным на _____
5. зависеть от IT систем _____
6. общие области применения технологий _____
7. играть значительную роль _____
8. обслуживание сети _____

7. Prove the following statements:

1. IT plays significant role in modern day world.
2. IT and computer science are not the same things.
3. IT has many fields of application.
4. IT is essential to nowadays business.

8. Put the words in the correct order:

1. has / IT / of / many / application / of / fields.
2. IT / specialists / to / have / management / study / project / future.
3. difference / science / computer / between / is / what / the / IT / and / ?
4. essential / processing / is / data / today's / in / business
5. provides / means / the / IT / store / information / to / secure

9. Match the words above with their definitions

1)	maintenance	**a)**	suited to personal comfort or to easy performance.
2)	convenient	**b)**	the tools, machines, or other things needed for a particular job or activity.

3)	equipment	**c)**	an organized collection of structured information, typically stored electronically in a computer system.
4)	hardware	**d)**	a device that connects two or more packet-switched networks or subnetwork.
5)	software	**e)**	an act of giving one thing and receiving another.
6)	dependent	**f)**	determined or conditioned by another.
7)	exchange	**g)**	a set of instructions, data or programs used to operate computers and execute specific tasks.
8)	database	**h)**	the machines, wiring, and other physical components of a computer or other electronic system.
9)	router	**i)**	the work of keeping something in proper condition; to care.

10. Match the words from the text with their synonyms.

1. The word *overlap* in the text is closest to the meaning
   a) intersect   b) unite   c) join   d) combine

2. The word enable in the text is closest to the meaning
   a) prohibit   b) allow   c) give   d) send

3. The word secure in the text is closest to the meaning
   a) united   b) safe   c) alone   d) lost

4. The word development in the text is closest to the meaning
   a) decrease   b) dynamics   c) graphics   d) progress

11. Find the corresponding prepositions for the following verbs in the text and write Russian equivalents:

to depend _____   to focus _____   to consist _____

to be oriented _____   to be associated _____   to turn _____

to deal _____

12. Find the matching phrases.

1) to remain	a) a closer look
2) to take	b) overcome potential challenges
3) to help	c) the means to secure

4) to address	d) data secure
5) to keep	e) business problems
6) to provide	f) competitive

13. Use the phrases above to fill in the gaps:

1. This company took a number of steps to _____ in the market.
2. This time we will _____ at this phenomenon.
3. The new courses may help employees to _____.
4. It is essential _____, otherwise it is an easy target for hackers.
5. Much of the work involves developing the algorithms that enable computer systems _____.
6. New technologies in this field can _____ and organize a lot of important information.

14. Match the opposites.

1)	enable	**a)**	worthless
2)	develop	**b)**	analog
3)	useful	**c)**	compound
4)	digital	**d)**	insignificant
5)	assemble	**e)**	solution
6)	issue	**f)**	unreliability
7)	convenient	**g)**	unlimited
8)	responsibility	**h)**	incomfortable
9)	essential	**i)**	demount
10)	hardware	**j)**	regress
11)	dependent	**k)**	software

TRANSLATE

15. Translate from Russian into English, use the collocations from Text 1.

1. Современные компьютеры позволяют оптимизировать, например, такие конструкции, как проект целого самолёта.

2. Вы будете развивать свою способность применять принципы IT менеджмента и развивать приверженность качественной практике.

3. Ближайший маршрутизатор отправляет пакет другому маршрутизатору, который находится ближе к компьютеру-получателю.

4. То, что у нас до сих пор не хватает специалистов по кибербезопасности, это другой вопрос.

5. Все программное обеспечение можно разделить на три категории: системное программное обеспечение; прикладное программное обеспечение; инструментальное программное обеспечение.

6. Все происходит в режиме онлайн и это действительно очень удобно.

7. В настоящее время мы занимаемся усовершенствованием технологий, лежащих в основе планирования переписи, обработки данных и контроля качества процессов.

8. В этом плане под эффективностью рынка понимается, в первую очередь, его информационная эффективность.

16. Translate from Russian into English, using your active vocabulary.

1. Современные методы получения и накопления знаний базируются на теории искусственного интеллекта, методах информационного моделирования, когнитивной компьютерной график.

2. ИТ позволяют активизировать и эффективно использовать информационные ресурсы общества, которые сегодня являются наиболее важным стратегическим фактором его развития.

3. Использование обучающих информационных технологий оказалось весьма эффективным методом для систем самообразования.

4. В 2022 году ИИ стал намного ближе к потребителям. Технологии многому научились и способны еще больше облегчить нашу жизнь.

5. Почему термины "информационные технологии" и "информатика" обычно пересекаются?

6. Сегодня специалистам крайне важно постоянно поддерживать свой профессионализм новыми знаниями, и стараться преуспевать не только в одном профиле.

7. Сегодня все настолько привыкли ежедневно использовать мобильные устройства, компьютеры и интернет, что не представляют своей жизни без них.

8. Чтобы разработать сайт или приложение, требуется много ресурсов в виде денег, времени и знаний кодирования.

9. Мы предлагаем вам рассмотреть несколько полезных сервисов и программ для начинающих программистов.

10. Язык программирования Python действительно универсален. Он применим во многих сферах информационных технологий, разработки и программирования.

17. Translate from English into Russian.

1. A lot of computer scientists are working now on Artificial Intelligence. This is software which makes computers think more like humans.

2. By 1984 the Internet began to develop into the form we know it today.

3. The tech industry started the year with a wave of job cuts, around 50,000 in January alone.

4. The most influential computer scientists include Alan Turing, the World War II code breaker commonly regarded as the "father of modern computing".

5. Many universities across the world offer degrees that teach students the basics of computer science theory and the applications of computer programming.

6. Nations with advanced IT-industries have realized that developing competence in information technologies including new media is essential, expensive, and difficult.

7. One particularly important aspect is that software engineering builds on computer science and mathematics.

8. Cyber security is a hot topic in Information Technology because it is evolving due to new worldwide cyber threats.

WORD BUILDING

18. Form nouns, verbs and adjectives for each group of words (where it is possible). Translate the words into Russian.

Noun	Verb	Adjective
application	apply	applicable
	to depend	
development		
		convenient
	secure	
		useful
difference		
		related
	maintain	
management		

19. Add the suffixes a)-tion-, b)-ance-/-ence- to form nouns. Translate the words to Russian.

Example: *satisfy – satisfaction*

1) inform	4) differ	7) comply	10) compete
2) communicate	5) connect	8) govern	11) satisfy
3) depend	6) associate	9) orient	12) create

20. Form nouns adding the suffixes a)-age, b)-ment to the given verbs and adjectives and translate them.

Example: a) to leak – течь; leakage – утечка
b) to equip – оборудовать; equipment – оборудование

a) to use, to cover, to store, to break, to pass, to carry, to link, to stop, to assemble, to short(en);

b) to develop, to arrange, to achieve, to move, to measure, to improve, to manage, to establish, to excite, to require.

GRAMMAR

ENGLISH PARTICIPLE

21. Read the following sentences. Underline the participles and say which ones are in the Active and which are in the Passive Voice. Translate the sentences into Russian.

1. Being developed by the best specialists, the new device was promising.
2. Having finished his speech, the CEO was asked some questions.
3. Buying new equipment, we realized we didn't have enough money.
4. IT has a lot of fields, including cyber security, database design, big data operations and many more.
5. The task cannot be performed by a common computer.
6. We can see modern technologies developing every year.
7. Employees overcoming operational challenges become more efficient.
8. The system that is being tested at the moment is very promising.
9. Having checked the software updates, we figured out how to boost this device.
10. Today a lot of young people interested in computer science decide to continue their studying as future IT specialists.

11. Our company could potentially solve this issue enabling lower-cost connectivity and faster deployment.

12. The guests satisfied with the presentation agreed on signing the contract.

13. Having been reassured, we decided to try this approach.

14. IT governance, being one of the three main sectors of an IT department, refers to the combination of policies and processes that ensure IT systems are effectively run.

15. Have you ever seen a good IT specialist working for this company?

22. Translate the following word groups. State the tense and the forms of the participles.

1. принятые меры
2. защищенная система
3. проверенный метод
4. получающий знания специалист
5. использованный метод
6. обновлённое программное обеспечение

7. пересекающиеся термины
8. устаревшее оборудование
9. повышенная эффективность
10. развивающаяся отрасль
11. развитая модель
12. соединённые устройства

23. Translate to Russian, mind the Nominative Absolute Participal Construction.

1. The documents being signed, the two companies united.
2. The meeting being over, we assembled in the dining room.
3. The measures being taken, we expected the best of this approach.
4. All the preparations having been done; the CEO told us to finally have a rest.
5. Our research resulting in nothing, we returned to the office.
6. The system being secured, our job here was done.
7. She left alone, her hands carrying heavy bags.
8. I stood on the stage, my knees trembling and my hands sweating.
9. It being very early, I didn't expect to meet anyone here.
10. The work finished, I went to bed and slept until the next morning.

LISTENING COMPREHENSION

24. Listen to the audio. Fill in the gaps.

We live in the era of high technologies, and we use _____ in our everyday life because they have brought us much comfort. New technologies have spread on every field over the past 15 years. Moreover,

they are rapidly changing. For example, video-recorders, DVD-players or compact disks have already become _____ and have been replaced by more _____. Today we can hardly imagine our life without such modern mobile devices as _____ or _____. Our offices are fully equipped with computers, printers, scanners, air-conditioners, _____ and wi-fi modems. Household appliances (vacuum-cleaners, coffee-machines, dish-washers, food processors and others) help us to save our time and energy.

New technologies or gadgets are making things faster, easier, more comfortable and interesting.

For instance, if you install a GPS (Global Positioning System) in your car you'll never _____. And could we imagine just _____ all the things we can do on the wireless Internet nowadays: connecting with friends from all over the world, online shopping and banking, distance _____, finding virtual relationships and even working from home? Isn't that awesome? Our parents used to go to post-offices to send letters or pay bills, they went to libraries to find a good book and they used telephone-booths for phone-calls.

Today we can only imagine how the new technologies will be developing in the future.

SUPPLEMENTARY READING

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25. Read the text

Stereotypes of IT professions

Many people have outdated opinions about IT workers. If you're someone who works in the tech industry, you might find that your friends and family don't understand what it is you do. Historical inequalities in the technology sector and media portrayals of tech professionals has led to several IT stereotypes. So, what are these stereotypes exactly?

1. Only men work in IT. A common misconception is that only men go into IT careers. While there's certainly a disparity between sexes, since 1970, the percentage of women workers in STEM fields has grown from 8 % to 27 %. Representation matters and steady growth is an important step toward greater equality.

2. IT is only for young people. People may associate tech professionals with young college graduates working at startups, but many people who work in tech are older. According to latest reports, 54 % of information technology professionals are 40 years old or older. "It's not unusual for people to come to IT as a second or third career.

3. IT is all about fixing computers. Actually, a wide range of careers fall under information technology, and many people have the opportunity to make lasting contributions to their field.

4. IT doesn't require social skills. Because IT is rooted in math and science, people may assume that IT professionals do not need to have strong communication skills. However, IT professionals frequently collaborate with their teammates. They also have to interpret complex information to those who don't possess technical knowledge. The U.S. Bureau of Labor Statistics lists communication as a top skill for computer systems analysts.

If you're new to the tech industry, you may feel as though these stereotypes weigh you down and prevent you from reaching your full potential. Nevertheless, following your passions, learning from your mistakes and ignoring excessive criticism from colleagues or customers may help in becoming a successful specialist in the field.

26. Make the glossary to the text. and use it to retell the text.

27. Discuss the following questions with your partner:

• what did you know about stereotypes of IT professions before the text?
• which information was new to you?
• can you agree with some stereotypes mentioned? Do you know people who can agree with some of them?

28. Provide your own ideas on how to fight the stereotypes of IT professions. Share your ideas with your group.

WRITING

29. Write the summary to the text "Stereotypes of IT Professions". Use Appendix 2 to help you.

SPEAKING

30. Make up a dialogue.

Act out an interview an employer of an IT company and a promising employee. Discuss the following issues:
• Why do you need the job?
• What is the most important for you as for potential employee?
• What advantages/disadvantages of your character can you name?).

31. Make a presentation "IT in my country". Highlight the issues that you find the most interesting. Get prepared with the presentation (7–8 slides) Use Appendix 2 to help you.

Unit 10
Engineering

1. Discuss the following questions:

1. What can you say about engineers and their job?
2. Why is engineering critical to our life?

VOCABULARY

1	engineering	инженерное дело, техника
2	device	устройство
3	involve	вовлекать, включать
4	set up	устанавливать
5	create	создавать
6	initial technologies	первичные технологии
7	integral part	неотъемлемая часть
8	genius	гений
9	visionary	провидец
10	discovery	открытие
11	invention	изобретение
12	mature	созреть
13	expand	расширять
14	cutting edge	передовой
15	design	разрабатывать, конструировать
16	maintain complex devices	обслуживать сложные устройства
17	operate	управлять, эксплуатировать,

2. Read the text

Engineering

Engineering is all around us, from the device you are reading this on to the buildings we live in, cars we drive and more. From bridges to computers and medical devices to railways – engineers have been involved at some step of the way. Although they are not required in every business, they will still have been involved in setting up or creating initial technologies. Engineering is all around us and is an integral part of our everyday lives. It is something that many people take for granted, but it is engineering that allows you to make a coffee in the morning, heats or cools your home, allows you to travel, communicate on your mobile device, and so much more besides. As real-world problem solvers, engineers continue to be important across all parts of society.

Indeed, we owe pretty much all of our infrastructures to the work of engineers throughout the centuries. From the ancient Greek mathematical genius Archimedes, to artists-engineers like Leonardo da Vinci and visionary Nikola Tesla (including Elon Musk), engineers help shape the world as we know it in a variety of ways. Engineering is the application of science and maths to solve problems. While scientists and inventors come up with innovations, it is engineers who apply these discoveries to the real world. The word 'engine' itself comes from the Latin word 'ingenium' (c. 1250), which means 'innate quality, especially mental power, hence a clever invention.'

Engineering is critical to industrial innovation, combining scientific and mathematical principles with practical knowhow to deliver products, services and processes. Engineers keep pushing humankind forward, developing new innovations, protecting lives, preventing diseases and helping to keep the planet itself safe and clean. Engineering has matured and expanded over the centuries along with our knowledge and understanding of science, mathematics and the laws of physics and their applications. Today, engineers apply both well-established scientific principles and cutting-edge innovations in order to design, build, improve, operate and maintain complex devices, structures, systems and processes.

DEVELOPING VOCABULARY

3. The following words in the box are all from the text above. Find them in the text:

application	discovery	inventor	practical	improve

4. For each word, read the sentence it occurs in and answer the questions:

• Is the word positive, negative or neutral?
• Is it a noun, adjective, adverb or verb?
• Can you think of a word with a similar meaning (synonym) and one with an opposite meaning (antonym)?

READING COMPREHENSION

5. Answer the following questions:

1. Why is engineering an integral part of our everyday lives?
2. Do engineers continue to be important across all parts of society as real problem-solvers?
3. Who were the first engineers in the ancient times?
4. What does the word "engine" mean?
5. Why is engineering so critical?
6. Engineers stagnate the humankind back, destroying planet with their innovations, polluting the environment, don't they?
7. Has engineering matured and expanded over the centuries along with our knowledge and understanding of science, mathematics and the laws of physics and their applications?
8. What principles do the engineers apply in order to design, build, improve and operate complex devices, etc.?

6. Which sentence below best expresses the essential information in the text?

1. Engineering is all around us and is an integral part of our everyday lives.
2. Engineering is the application of science and maths to solve problems.
3. Engineering is critical to industrial innovation, combining scientific and mathematical principles with practical knowhow to deliver products, services and processes.

ANALYZE

7. Match the words and expressions with their Russian equivalents:

1)	device	**a)**	люди, решающие проблемы
2)	to involve	**b)**	защищать
3)	to take for granted	**c)**	воспринимать как должное

4)	problem solvers	**d)**	толкать
5)	to push	**e)**	разнообразие
6)	humankind	**f)**	человечество
7)	to protect	**g)**	прибор, устройство
8)	variety	**h)**	вовлекать

8. Give the English equivalents:

1. создавать начальные технологии;
2. не требуются в бизнесе;
3. быть обязанным инженерам;
4. инженерное дело имеет решающее значение;
5. инженеры продолжают вести человечество вперёд;
6. предотвращая болезни;
7. инженеры применяют уже устоявшиеся научные принципы и передовые технологии;
8. управлять и обслуживать сложные устройства.

9. Prove the following statements:

1. As real-world problem solvers, engineers continue to be important across all parts of society.

2. From the ancient Greek mathematical genius Archimedes, to artists-engineers like Leonardo da Vinci and visionary Nikola Tesla (including Elon Musk), engineers help shape the world as we know it in a variety of ways.

3. Engineering is the application of science and maths to solve problems.

4. Today, engineers apply both well-established scientific principles and cutting-edge innovations in order to design, build, improve, operate and maintain complex devices, structures, systems and processes.

10. Put the words in the correct order:

1. Pretty/ much/throughout/ indeed/the/to/ the/ centuries / owe / our infrastructures / all /of / our / of / engineers / work.

2. To / solve / of / maths / science / problem s/ application / the / engineering.

3. Keep / humankind / developing / forward / new / lives / protecting / diseases / preventing / innovations / helping / the / itself / clean / safe / and / planet / forward / to / keep / pushing / engineers.

11. Match the words below with their definitions:

1)	discovery	**a)**	to have need of, depend on, want
2)	require	**b)**	something new that didn't exist before
3)	business	**c)**	to grow or gradually change into larger, stronger or more advanced state
4)	develop	**d)**	1) a new idea, method, or device; 2) making changes in something established, especially by introducing new methods, ideas, or products (such as goods and services)
5)	infrastructure	**e)**	the practice of making one's living or making money by producing or buying and selling products
6)	genius	**f)**	exciting, very modern and with all the newest features
7)	cutting-edge	**g)**	the basic systems and services such as transport and power supplies that a country or organization uses in order to work effectively
8)	innovation	**h)**	something that existed but was not known before
9)	invention	**i)**	develop and reach maturity, undergo maturation
10)	mature	**j)**	someone possessing extraordinary intelligence or skill; especially somebody who has demonstrated this by a creative or original work in science, music, art etc.

12. Match the words from the text with their synonyms.

1. The word *communicate* in the text is closest to the meaning of
   a) transmit   b) transform   c) associate   d) contact

2. The word *device* in the text is closest to the meaning of
   a) apparatus   b) tool   c) instrument   d) gadget

3. The word *critical* in the text is closest to the meaning of
   a) serious   b) essential   c) risky   d) burning

4. The word *problem* in the text is closest to the meaning of
   a) issue   b) dilemma   c) challenge   d) headache

5. The word *push* in the text is closest to the meaning of
   a) press   b) drive   c) pleasant   d) insist

*13. **Find the corresponding prepositions for the following verbs in the text and write Russian equivalents:***

to apply _____   to involve _____   to push _____
to expand _____   to owe _____   to use _____
to help _____

*14. **Find matching phrases:***

1) involved	**a)** to the real world
2) apply	**b)** behind the scenes
3) owe	**c)** to keep the planet
4) working	**d)** in setting up
5) helping	**e)** humankind forward
6) pushing	**f)** over the centuries
7) expanded	**g)** to the work of engineers

*15. **Use the phrases above to fill in the gaps:***

1. They will still _____ or creating initial technologies.
2. It is engineers who _____ discoveries.
3. We _____throughout the centuries.
4. Engineers keep _____, developing new innovations, protecting lives, preventing diseases and _____ itself safe and clean.
5. Most people picture brainy individuals _____the scenes on planes and trains.
6. Engineering_____ along with our knowledge.

*16. **Match the collocations:***

1)	integral	**a)**	these discoveries
2)	take	**b)**	keep pushing
3)	world	**c)**	principles
4)	come from	**d)**	industrial innovation
5)	critical to	**e)**	genius Archimedes
6)	scientific and mathematical	**f)**	for granted
7)	mathematical	**g)**	part
8)	apply	**h)**	the Latin word 'ingenium'
9)	engineers	**i)**	problem solvers

17. Translate from Russian into English, use the collocations above:

1. Инженерия окружает нас и является неотъемлемой частью нашей повседневной жизни.

2. Люди воспринимают это (инженерию) как должное.

3. В качестве реальных специалистов по решению глобальных (мировых) проблем, инженеры продолжают играть важную роль во всех слоях общества.

4. Само слово «двигатель» происходит от латинского слова 'ingenium' (двигатель).

5. От древнегреческого гения математики Архимеда до художников-инженеров, таких как Леонардо да Винчи, и провидца Николы Тесла (включая Илона Маска), инженеры придают форму (формируют) мир различными способами, как мы его представляем.

6. Инженерия имеет решающее значение в области разработки новых промышленных технологий, сочетая научные и математические принципы с практическим «ноу-хау» для доставки продуктов, предоставления услуг и запуска процессов.

7. Пока ученые придумывают инновации, именно инженеры применяют эти открытия в реальном мире.

8. Инженеры продолжают вести человечество вперёд.

18. Translate from English into Russian:

1. From bridges to computers and medical devices to railways – engineers have been involved at some step of the way.

2. Although they are not required in every business, they will still have been involved in setting up or creating initial technologies.

3. As real-world problem solvers, engineers continue to be important across all parts of society.

4. Indeed, we owe pretty much all of our infrastructures to the work of engineers throughout the centuries

5. From the ancient Greek mathematical genius Archimedes, to artists-engineers like Leonardo Da Vinci and visionary Nikola Tesla (including Elon Musk), engineers help shape the world as we know it in a variety of ways.

6. Today, engineers apply both well-established scientific principles and cutting-edge innovations in order to design, build, improve, operate and maintain complex devices, structures, systems and processes.

19. Form adjectives by adding the suffix -al to the nouns below, then translate the word pairs into Russian.

Example: medicine – medical (медицина – медицинский)

1. practice	3. initiation	5. reality
2. integration	4. mathematics	6. industry

20. Form nouns by adding the suffix -ing or -ment to the provided verbs, then translate the word pairs into Russian.

Examples: to build – building (строить, созидать – здание, строение)
to equip – equiptment (оборудовать – оборудование)

1. to involve	3. to travel	5. to understand
2. to develop	4. to push	6.

21. Give the initial words of the following derivatives. Translate both the words.

Example: industrial – industry (промышленный – промышленность)

1. business	4. invention	7. scientific	10. delivery
2. critical	5. discovery	8. expansion	11. development
3. apply	6. combination	9. improvement	

THE GERUND AND GERUNDIAL CONSTRUCTIONS

22. Read the following sentences, find the Gerund and say which of them have the Indefinite Gerund or the Perfect Gerund. Translate the sentences into Russian.

1. Although they are not required in every business, they will still have been involved in setting up or creating initial technologies.

2. Engineering is critical to industrial innovation, combining scientific and mathematical principles with practical knowhow to deliver products, services and processes.

3. Engineers keep pushing humankind forward, developing new innovations, protecting lives, preventing diseases and helping to keep the planet itself safe and clean.

4. He did not remember having been in that room.

5. This habit of discussing other people's affairs may damage reputations and ruin friendships.

6. I don't approve of your having signed the document.

7. If you walk into the road without looking you risk being knocked down by a car.

8. She denies having spoken with him.

9. He did not remember having been at that conference.

10. The equipment needs upgrading.

23. Read the conversation between two people and turn the verb in brackets into the appropriate Gerund form. Then perform the dialogue with a groupmate.

Pierre (Office Manager): Hey, Larry. Good morning. Did you hear about the problem with the company software today?

Larry (Sales Manager): Morning, Pierre. Yeah, I already miss *(work)* on my project. I needed to advance.

P: What happened? Engineers didn't avoid (*get*) virus when they installed programs?

L: No worries, Pierre. Software engineers told that a hacker attempted to steal online information from or system.

P: Oh, I see. Then what are we supposed to do today? What are my duties?

L: I am not sure. Would you mind *(wait)* for the boss call, please. He will tell us what to do.

P: Of course. I will be in the other office waiting for the boss. I postponed *(call)* an important client today. That's not good.

L: I feel like (go) home now, but we need to wait for the boss, right?

P: No, you can't go home. We don't know when they can fix the problem exactly, so….

L: Yeah, I know. I just can't stop *(think)* about my clients, too. We need to sell, right?

P: You are right. As soon as the software engineers will fix the problem, we'll continue *(work)* on our projects, Larry.

L: Ok, Pierre. Have a nice day!!!

P: Thanks, have a nice day, too!!!

24. Translate the following sentences into Russian paying attention to the Gerundial Construction. Underline the Gerundial Construction.

1. I've heard of their experiment being successfully completed in the nearest future. 2. Mr. Smirnov's taking part in the design of the new data processing system was of great help to us.

2. We were told about their having studied a number of problems connected with the development of computing machinery.

3. Mankind is interested in atomic energy being used only for peaceful purposes.

4. Benjamin Franklin's having invented the first lightning conductor is a well- established fact.

5. We all know of their designing a new type of computer.

6. He mentioned his having shown these slides at the conference.

7. Your having worked at the plant helped you to master technical subjects.

8. Kurchatov's having devoted all his life to nuclear physics is known to everybody. 10. I know of their being shown the new device.

9. We remembered having mentioned the works of this scientist.

10. We know of the Curies' having discovered some new radioactive elements.

11. We know of Rutherford's having investigated the nature of alpha-particles.

12. We insisted on the experiment being repeated.

13. There was no hope of their solving this complex engineering problem so soon.

LISTENING COMPREHENSION

25. Listen to the information about different branches of engineering. Match the beginning and end of the statements.

1. However, since the human race has been swiftly advancing with regards to technology	a) designing and optimizing moving mechanical systems such as engines
2. Mechanical Engineering is	b) including these six major branches
3. Chemical Engineering is	c) optimizing complex systems and organizations
4. Industrial Engineering is	d) developing and optimizing computer hardware systems
5. Computer Engineering is	e) developing methods to manufacture chemicals and other products that require chemical processes
6. There are many different branches of engineering	f) new branches of engineering are being developed

26. Read the text

Pre-History of Engineering

Engineering has been used to solve people's problems from the very moment the primitive men lifted a stone and began to sharpen it to make an ax in the Paleolithic era 70000 years ago. As for tools, first there were the hand axes of stone and then the stone knives. At Neolithic, stone sickles were invented and people wore obsidian because they could be much sharper than a flint. For agriculture, the most important invention is agriculture itself, but later the plow was introduced. Later animals were introduced that helped in this work. The oxen were important for transport along with the idea of the wheel and axles.

Mythology highlights the flying machines of Daedalus and Icarus and the first robot, Talos, built of bronze and whose function was to protect Europe from invaders. In excavations have been found ships with aerodynamic structures built in 3000 BC. The Romans were known for their impressive technological advances such as roads, bridges, tunnels or aqueducts. Its constructions, many of them still standing, are a testimony of the abilities achieved by this society. The first aqueduct built in Rome was the Aqua Appia in 312 BC.

However, many important concepts and techniques were developed during this time and that formed the basis for a rapid technological advance during the industrial revolution. Engineers developed techniques for building impressive buildings including cathedrals and castles. The industrial revolution was a time of great changes during the eighteenth and nineteenth centuries. It succeeded in taking production out of inefficient processes where products were made in people's homes into the modern era. The revolution paved the way for the efficiency and volume of the production lines with which we have today.

27. Make the text glossary showing the part of speech of the items included.

28. Answer the following questions.

1. Since when has engineering been used to solve people's problems?
2. What were the first tools? What were they made from?
3. What period of time were stone sickles invented?
4. Why did people wear obsidian?

5. What was the most important invention for agriculture?

6. Were the animals introduced to help in the agriculture work? What were the most important animals to be used for transport?

7. What does the mythology highlight?

8. What impressive technological advances were Romans known for?

9. When was the first aqueduct built?

10. What did engineers develop for building impressive buildings?

11. Why was the industrial revolution a time of great changes during the $19^{th} - 20^{th}$ centuries?

12. Did the revolution pave the way for the efficiency and volume of the production lines which we have today?

29. Give the English equivalents of the following words and word combinations:

1. решать проблемы людей
2. первобытные люди
3. точить топор
4. эпоха Палеолита (Палеолит)
5. носить обсидиан (обсидиан – чёрный непрозрачный камень)
6. летающие машины Дедала и Икара
7. защитить Европу от захватчиков
8. в раскопках были найдены корабли с аэродинамическими устройствами
9. Римляне были известны своими впечатляющими техническими достижениями
10. много важных концепций и способов было разработано
11. основа для быстрого технологического процесса
12. промышленная революция способствовала эффективности и объёму производства

WRITING

30. Provide subtitles for each paragraph and write the summary of the text. Use Appendix 2 to help you.

31. Write down three statements that reflect the main ideas of the text.

SPEAKING

32. Retell the text "Pre-History of Engineering" using your glossary.

33. Work in teams or groups of 4–5 students and make up a mini – presentation of each paragraph.

34. Read and give your comments on the quote.

"*Normal people believe that if it ain't broke, don't fix it. Engineers believe that if it ain't broke, it doesn't have enough features yet*".
Scott Adams, Creator of Dilbert

• *Do you agree with S. Adam's quotation? Why? Why not? Give your reasons.*

• *What can you say about the author of the quote?*

Unit 11
Engineering Materials

Discuss the following questions:

1. What engineering materials do you know?
2. Where do we see engineering materials in everyday life?
3. In what fields are engineering materials important?

VOCABULARY

1	properties	свойства
2	ductility	пластичность
3	brittleness	хрупкость, ломкость
4	compressive	сжимающий, компрессионный
5	tensile	растяжимый
6	ferrous metals	чёрные металлы
7	alloy	сплав
8	conducting	проводящий
9	moisture	влага
10	conductivity	проводимость
11	fiber	волокно, фибра
12	resin	смола

READING. TEXT 1.

1. Read the text:

Engineering Materials

Engineering materials are the materials used for the application in engineering works. Based on the mechanical, physical, chemical and manufacturing properties materials are selected according to the application.

Mechanical properties of materials are strength (compressive or tensile), toughness, stiffness, elasticity, plasticity, ductility, brittleness and hardness.

Depending upon the nature of the substance engineering materials are classified as metals and alloys, ferrous metals, non-ferrous metals, non-metals, ceramics, polymers, composites, semiconductors and biomaterials.

The primary content of **ferrous metals** is iron and carbon. Ferrous metals are magnetic and vulnerable to rust when exposed to moisture. Wrought iron won't rust due to purity, and stainless steel due to presence of chromium. The basic properties of ferrous metals are durability, good tensile strength, good electrical conductivity, low corrosion resistance, silvery color, recyclability.

Non-ferrous metals. Iron is not primary content. Due to the non-presence of iron these metals have high resistance to rust and corrosion and they are non-magnetic. Non-ferrous metals include aluminum, copper, lead, nickel, tin, titanium and zinc, as well as copper alloys like brass and bronze. The difference between ferrous and non-ferrous metals is that ferrous metals contain iron. Ferrous metals, such as cast irons or carbon steel, have a high carbon content, which generally makes them vulnerable to rust when exposed to moisture.

Alloy is a combination of two or more metals. It is named based on metallic bonding character. There are two types: ferrous metal alloys and non-ferrous metal alloys. Cast iron is an alloy made from iron, carbon and silicon. Brass is an alloy of copper and zinc.

Ceramics have regular atomic structure and crystal structure. They are non-conducting materials and due to this insulating property, they are used as insulators. They are very hard and brittle in nature.

Polymers are one of the major types of engineering materials. They are low density materials and they are also flexible. In some cases, polymers are not flexible. Polymers are not only used as structural materials – they can be used as fibers and resins in the matrix of composite materials. Wool, cotton and silk are natural polymer-based materials that have been used since ancient times. Cellulose, the main component of wood and paper, is also a natural polymer.

Composite materials are a composition of two or more constituent materials with different physical and chemical properties produced in order to obtain a material with new characteristics.

Semiconductors are intermediate conducting materials. Their conductivity is not as high as that of metals and not as low as that of insulating ceramic materials. In these materials resistance decreases as their temperature increases.

Biomaterials are non-viable materials that are used in medical devices to interact with biological systems with no side effects. E. g.: alumina, zirconia, titanium, tantalum, niobium, carbon, etc.

DEVELOPING VOCABULARY

2. The following words in the box are all from the text above. Find them in the text.

iron	rust	application	mechanical	constituent

3. For each word, read the sentence it occurs in and answer the questions.

- Is the word positive, negative or neutral?
- Is it a noun, adjective, adverb or verb?
- Can you think of a word with a similar meaning (synonym) and one with an opposite meaning (antonym)?

READING COMPREHENSION

4. Answer the following questions.

1. What are mechanical properties of materials?
2. What are classifications of metals?
3. What is the primary content of ferrous metals?
4. What are the examples of non-ferrous metals?
5. What is the primary difference between ferrous and non-ferrous metals?
6. What are the properties of ferrous metals?
7. What are natural polymer-based materials?
8. What polymer is the main component of wood and paper?

ANALYZE

5. Match the English words with their Russian equivalents.

1	aluminum	**a**	свинец
2	brass	**b**	олово
3	copper	**c**	титан
4	nickel	**d**	латунь
5	lead	**e**	цинк
6	tin	**f**	медь
7	titanium	**g**	никель

8	zinc	h	алюминий
9	toughness	i	эластичность
10	stiffness	j	сплав
11	elasticity	k	перерабатываемый
12	plasticity	l	ковкость
13	ductility	m	жесткость
14	brittleness	n	цветные металлы
15	hardness	o	чёрные металлы
16	alloy	p	пластичность
17	recyclable	q	сопротивление
18	non-ferrous metals	r	прочность
19	ferrous metals	s	твердость
20	resistance	t	хрупкость

6. Give English equivalents:

1. на основании механических, технических и химических свойств;
2. в зависимости от природы вещества;
3. основным содержанием чёрных металлов является;
4. высокая устойчивость к ржавчине;
5. высокое содержание углерода;
6. чёрные металлы содержат железо;
7. природный полимер;
8. сопротивление снижается по мере повышения температуры.

7. Match the words with their definitions.

1)	rust	a)	a result or product of combining;
2)	nonferrous metals	b)	of or relating to the manufacture of any product (such as earthenware, porcelain, or brick) made essentially from a nonmetallic mineral (such as clay) by firing at a high temperature;
3)	biomaterial	c)	a chemical compound or mixture of compounds formed by polymerization and consisting essentially of repeating structural units;
4)	semiconductor	d)	any metal that contains iron;
5)	ceramics	e)	don't contain iron;
6)	polymer	f)	a metal that is made by mixing two or more metals, or a metal and another substance;
7)	ferrous metal	g)	crystal material whose ability to conduct electricity rises as its temperature goes up;

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8)	combination	**h)**	to become reddish brown;
9)	alloy	**i)**	a natural or synthetic material (such as a metal or polymer) that is suitable for introduction into living tissue especially as part of a medical device (such as an artificial joint)

8. Complete each sentence with a word from the list below.

last	*durability*	*ferrous metals*	*blended*
sturdy	*skyscraper*	*cars*	*strength* *steel*

Ferrous Metals Promise Durability

1. Iron and many types of _____ are all common examples of ferrous metals.

2. These ferrous metals are well-known and popular because of how long they _____.

3. As you can imagine, thanks to the _____ of these composites, ferrous metals are often used in construction, pipelines, and even the creation of tools.

4. Cast iron skillets are a great example of the durability of _____.

5. When you look at the uses of ferrous metals, you'll recognize many products that are associated with _____.

6. Products such as railroad tracks and _____ rely on this strength to do their jobs over many years.

7. Just because they're _____ doesn't mean ferrous metals aren't also extremely malleable, which means the metal can be shaped without cracking or breaking.

8. Steel, for example, is just _____ iron and carbon.

9. However, by changing the amount of either ingredient or adding in a few other materials, steel can be transformed to become anything from the thick steel beams used in _____ to shiny stainless steel.

9. Fill in the gaps with appropriate verbs from the box:

encompass	is	explains	contain	causes
	include (x2)	gives	means	motivated

Difference between Ferrous Metals and Non-ferrous Metals

1. The main difference between ferrous and non-ferrous metals _____ the presence of iron (Ferrum).

2. Ferrous metals _____ iron while the non-ferrous metals don't contain iron.

3. The presence of Ferrum in the metal _____ physical, chemical and structural differences between them.

4. This _____ that they also differ in terms of their properties.

5. The key distinctions between these two classes of metals are what might have _____ you to choose one type of metal over the other.

6. Ferrous metals _____ a wide range of alloying elements.

7. These elements _____ nickel, chromium, manganese, vanadium, and molybdenum.

8. The presence of these elements _____ ferrous metals desirable material properties.

9. Some of the most notable properties of ferrous metals _____ strength and durability.

10. This _____ why they are used for heavy-duty engineering applications.

10. Match the words from the text with their synonyms.

1. The word *application* in the text is closest to the meaning
   a) coating   b) use   c) request   d) device

2. The word *property* in the text is closest to the meaning
   a) establishment   b) possessions   c) characteristic   d) value

3. The word *resistance* in the text is closest to the meaning
   a) stability   b) counteraction   c) protest   d) barrier

4. The word *flexible* in the text is closest to the meaning
   a) adaptable   b) loose   c) versatile   d) elastic

11. Find the corresponding prepositions for the following verbs in the text and write their Russian equivalents:

a) use _____
b) apply _____
c) depend _____
d) expose _____
e) base _____
f) make _____

12. Find matching phrases.

1)	ferrous metals	**a)**	insulating property
2)	wrought iron	**b)**	include aluminum
3)	non-ferrous metals	**c)**	an alloy of copper and zinc
4)	brass is	**d)**	the main component of wood and paper
5)	due to their	**e)**	are magnetic
6)	cellulose is	**f)**	won't rust

13. Use the phrases above to fill in the gaps.

1. Ferrous metals _____ and are vulnerable to rust when exposed to moisture.

2. Wrought iron _____ due to purity and stainless steel due to presence of chromium.

3. Brass is an _____.

4. They are non-conducting materials, due to their _____ they are used as insulators.

5. Cellulose, _____, also is a natural polymer.

6. Non-ferrous metals _____, copper, lead, nickel, tin, titanium and zinc, as well as copper alloys like brass and bronze.

TRANSLATE

14. Translate from Russian into English.

Композиты

1. Композиты представляют собой комбинацию из двух (или большего числа) отдельных материалов, относящихся к различным классам веществ, т. е. металлов, керамики и полимеров.

2. Целью создания композитов было стремление достичь такого сочетания свойств различных материалов, которые не могут быть получены для индивидуальных компонентов, а также обеспечить оптимальное сочетание их характеристик.

3. Известно большое количество различных композитов, которые получены при совмещении металлов, керамики и полимеров.

4. Более того, некоторые природные материалы также представляют собой композиты, например, это дерево и кость.

5. Однако большинство композитов – это материалы, полученные из синтетических материалов.

6. Одним из наиболее популярных и знакомых всем композиционных материалов является стеклопластик.

7. Этот материал представляет собой короткие стеклянные волокна, помещенные в полимерную матрицу, обычно в эпоксидную или полиэфирную смолу.

8. Стеклянные волокна обладают высокой прочностью и жесткостью, но они хрупкие.

9. Комбинирование указанных веществ приводит к получению относительно жесткого и высокопрочного материала, который, тем не менее, обладает достаточной пластичностью и гибкостью.

10. Другим примером технологически важного композита являются углепластики – полимеры, армированные углеродными волокнами.

WORD BUILDING

15. Form nouns adding the suffixes -er, -or to the given verbs. Translate the verbs and nouns into Russian.

Example:

• *to design – a designer (конструировать – конструктор)*
• *to detect – a detector (определять – детектор)*

1. to build	4. to receive	7. to transmit
2. to operate	5. to read	8. to invent
3. to contain	6. to produce	9. to discover

16. Give the initial words of the following derivatives.

Example: agreement – to agree

1. application	4. resistance	7. composition
2. classification	5. combination	8. production
3. exposure	6. regulation	9. insulation

GRAMMAR

The Infinitive

17. Read the sentence, find the infinitive and translate.

1. The primary function of an engineering material is to withstand applied loading without breaking and without exhibiting excessive deflection.

2. The goal of alloying is to improve the properties of the base material in some desirable way.

3. Some strengthening can be achieved through cold working, but it does not respond well to heat treatment.

4. It can be heat treated to increase strength, especially with the higher carbon contents.

5. What sets HSLA steels apart from other low-alloy steels is that they are designed to achieve specific mechanical properties rather than to meet a specific chemical composition.

6. It can only be strengthened through cold work.

7. It can have up to twice the strength of austenitic stainless steel.

8. Alloying the aluminum tends to reduce its corrosion resistance.

9. Bronzes may also contain aluminum, nickel, zinc, silicon, and other elements.

10. This process causes cross-links to form between the polymer chains.

18. Translate from Russian into English.

1. Для того чтобы понять, что такое инженерные материалы, необходимо иметь техническую подготовку и знания.

2. Конструкции из пластмасс начали применять лишь несколько десятилетий тому назад в связи с развитием химической промышленности.

3. Целесообразность их применения обусловливается их небольшой массой и значительной химической стойкостью.

4. В продажу вводятся высококачественные и легко поддающиеся обработке термопластичные материалы: инженерные (конструкционные) полимеры.

5. Механическая обработка является лучшим способом изготовления небольшого количества пластиковых деталей или деталей с конфигурациями, которые не могут быть получены путем литьевого формования.

6. Инженеры должны знать лучшие и самые экономичные материалы для использования.

7. Инженеры также должны понимать свойства этих материалов и как они работают.

8. Мы можем разделить металлы на чёрные и цветные.

9. Для начала необходимо условиться, что под композитными материалами мы понимаем, в первую очередь, филаменты повышенной прочности и износостойкости.

10. Не трудно догадаться, что более жесткими являются полукристаллические материалы, а более эластичными – аморфные.

19. Use the appropriate form of the infinitive (Active or Passive).

1. She only pretends _____. She isn't easy _____. (frighten, frighten)
2. He is sorry ____ way to panic then. (give)
3. I am glad _____ to you at the party yesterday. (introduce)
4. I didn't expect ___ this question. (ask)
5. Don't talk too much if you want ___. (listen to)
6. Unpleasant things shouldn't _____. (put off)
7. He is happy ____ through with this task. (be)
8. It's bad of you ____ so much attention to trifling matters. You should be more serious. (pay)
9. Dan is happy ___ first prize for this picture. (award)
10. He is sorry ___ your advice then. (not follow)
11. There are a hundred things ___. (do)
12. According to the schedule the plane was _____ long ago. (land)
13. It's sensible of John _____ Kate this advice. I hope she'll follow it. (give)
14. He is sorry ____ you in your work. (disturb)
15. It's thoughtful of you ____ the flowers. She was pleased. (bring)
16. He claims ____ Elvis Priestly. Who'll believe him? (meet)
17. I am sorry _____ you but I didn't mean anything of the kind. (disappoint)
18. It was considerate of my son __ of me when I was ill. (take care)
19. The woman pretended ___ and not ____ the bell. (read, hear)
20. Ann would love ___ on the beach now instead of typing letters. (lie)

20. Make up sentences according to the example:

Example: Following him is hard. – It's hard to follow him.
It's a relief that I see you safe and sound. – It's a relief to see you safe and sound.

1. Banning smoking in public places is very important.
2. Learning English is necessary.
3. Killing people is unforgivable.
4. Riding a bicycle is dangerous.
5. Interrupting people is impolite.
6. Dressing a wound is very painful.
7. Attending your classes is your duty.
8. It's a pleasure that I can see you again.
9. Watching a comedy is very amusing.
10. Rushing through a book is useless.

21. Translate into English.

1. Она набрала слишком большой вес, чтобы сбросить его за такой короткий срок.

2. Джон был слишком озабочен своим состоянием, чтобы обратить внимание на сестру.

3. Недостаток жизненного опыта у Гарри был достаточно очевиден, чтобы предлагать ему эту работу.

4. Я была слишком возбужденной, чтобы позвонить им и поблагодарить.

5. Дом казался брошенным и достаточно старым, чтобы продать его за такую цену.

6. Новая работа оказалась слишком трудной, чтобы он мог справиться с ней.

7. Он слишком горд, чтобы занимать у вас деньги.

8. Она слишком молода, чтобы воспитывать детей самой.

9. Расходы на проживание в городе слишком велики, чтобы молодая семья могла прожить, не занимая денег.

10. Все было сделано достаточно быстро, чтобы спасти его.

LISTENING COMPREHENSION

22. Listen to the text about metal alloys and mark the following statements True (T) or False (F).

1. The properties of a metal can be improved by alloying.

2. The engineering properties of an alloy are similar to those of its constituent elements.

3. Brass has a low coefficient of friction.

4. Bronze is composed of two metals: copper and tin.

5. Steel is used exclusively in engineering products.

6. Beryllium copper has a wide range of applications: from computer components to musical instruments.

7. Copper alloys are corrosion-resistant.

8. Metal alloys are expensive as their production involves many operations.

23. Listen again and fill in the gaps with the correct words from the text.

1. Pure metals are rarely used in manufacturing as they are too _____, or _____.

2. The physical properties of an alloy — such as _____, _____, and _____ — may not differ significantly from its constituent elements.

3. Metal alloys are in high demand in a variety of _____ and _____ such as manufacturing, electronics, domestic goods, architecture, plumbing, and the automotive and aerospace industries.

4. Brass is an alloy of two metals: _____ and _____.

5. Brass is extremely _____ and _____.

6. Steel is an alloy of _____ and _____.

7. Also known as _____ or _____, beryllium copper is a copper alloy with 0.5 – 3 % beryllium.

8. Beryllium copper has excellent _____ and _____ capabilities.

SUPPLEMENTARY READING

24. Read the text

What Are the Uses of Polymers?

Polymers function.

With the countless technological advances, the polymeric industry has become increasingly important in maintaining the contemporary lifestyle. No wonder, it is very common for the uses of polymers to be part of the plastic, civil and textile industry, besides many others.

This happens for the reason that these materials enable the development of products with innovative chemical characteristics, such as polyvinyl acetate (PVA), used in coatings. It can also contribute positively in the production of nylon, being an example of polymers in clothing and fibers, and polyvinyl chloride (PVC), used in the pipes.

These polymers used in everyday life only have these functions on account of polymerization, a process in which the smaller molecules (monomers) come together to form long molecules. Furthermore, they can be formed by chain reaction or through chemical reactions, such as polyaddition or polycondensation.

In a simplified way, the former is a polymerization responsible for obtaining large polymers by means of double bond monomers. The latter is a process used in non-vinyl monomers, that is, when the molecule is formed through the condensation between the same or different materials.

Polymers applications.

Having understood the uses of polymers, the next step is to know what options are available on the market and the applications of each one. With that in mind, we have some examples of polymers in everyday life, such as civil construction, automotive sector, communications, among other fields.

Polycarbonate (PC).

Polycarbonate is a long-chain compound, formed by functional groups linked to carbonate groups. It is considered thermoplastic, since it can be molded when heated. The main applications of this compound are in CDs, filter containers, bottles, showcases, partitions, etc.

Polyurethane (PU).

This polymer is composed of a chain of organic units connected by urethane links. It is widely used in metal sheets, car upholstery, thermal insulation in waterproof clothing, casing, coatings, films, belts and frames.

Polystyrene (PS).

Polystyrene is a homopolymer formed by the polymerization of the styrene monomer. It is also part of the thermoplastic polymers group, which gives it greater flexibility. It can be used in the manufacture of thermal insulation, air-conditioner fan cover, and toys, as well as machine and automobile parts.

Polyvinyl chloride (PVC).

Polyvinyl chloride is one of the most produced synthetic polymers in the world. It can be characterized as rigid or flexible. Its main applications are in partitions, translucent roof tiles, pipes and connections for water, window blinds, sewers and ventilation.

Polypropylene (PP).

Belonging to the group of polyolefins, polypropylene, also called polypropene, is a thermoplastic compound produced by polymerization by adding the propylene monomer. It can be applied in containers for food, chemicals, fibers, oriented films, hospital materials, among others.

Polyethylene terephthalate (PET).

Finally, polyethylene terephthalate is a thermoplastic obtained by means of the reaction between ethylene glycol and terephthalic acid. In general, this polymer is applied in the manufacture of wires, fabrics, beverage packaging, cleaning products, brooms, food, soft drinks, and others.

VOCABULARY

contemporary lifestyle – современный образ жизни
technological advances – технологические достижения

civil and textile industry – строительство и текстильная промышленность
mold – форма
thermal insulation – теплоизоляция
polymerization – полимеризация
translucent roof tiles – полупрозрачная черепица
soft drinks – безалкогольные напитки
long-chain compound – соединение с длинной цепью
civil construction – строительство гражданских объектов

WRITING

25. Write the summary to the text. Use Appendix 2 to help you.

SPEAKING

26. Make the glossary to the text. Retell the text using the glossary.

27. Prepare a presentation. Use Appendix 2 to help you.

You have bought a piece of land. Now you want to build a house. Prepare a presentation of the project of your house describing the materials you will need and giving the reasons why you have chosen a particular material.

Unit 12
Nanotechnology

Discuss the following questions:

1. What is nanotechnology?
2. What does nanotechnology deal with?

VOCABULARY

1	dimension	измерение, величина, объем
2	diverse	иной, отличный, разнообразный, разный
3	extension	распространение, предоставление
4	conventional	обусловленный, стандартный, условный
5	to approach	приближаться, подходить
6	assembly	сбор
7	assume	присваивать
8	to assemble	подбирать, собирать, монтировать
9	entities	сущность
10	to evolve	развивать, раскрывать

READING. TEXT 1.

1. Read the text

Nanotechnology

Nanoscience is the study of phenomena and manipulation of materials at atomic, molecular and macromolecular scales, where properties differ significantly from those at a larger scale.

Nanoscience is not just the science of the small, but the science in which materials with small dimension show new physical phenomena, collectively called quantum effects, which are size-dependent and dramatically different from the properties of macroscale materials.

Bulk materials (the 'big' pieces of materials) possess continuous (macroscopic) physical properties. The same applies to micron-sized materials (e.g., a grain of sand). But when particles assume nanoscale dimensions, the principles of classic physics are no longer capable of describing their behavior (movement, energy, etc.): at these dimensions, the principles of quantum mechanics principles. Nanotechnology is defined thus:

'Nanotechnology is the design, characterization, production and application of structures, devices and systems by controlling shape and size at the nanometer scale.'

The nanometer scale is conventionally defined as 1 to 100 nm. One nanometer is one billionth of a meter (10–9 m). Nanoscience and nanotechnology deal with clusters of atoms of 1 nm in at least one dimension.

For scale comparisons, the average human hair is about 80,000 nanometers wide, and a single virus particle is about 100 nanometers in width. The prefix nano-comes from the Greek word *nenos*, meaning "dwarf." Scientists originally used the prefix just to indicate "very small," as in "nanoplankton," but it now means one-billionth, just as milli- means one-thousandth, and micro- means one-millionth.

The story of nanotechnology begins in the 1950s and 1960s, when most engineers were thinking big, not small. This was the era of big cars, big atomic bombs, big jets, and big plans for sending people into outer space. Other researchers, however, focused on making things small. The invention of the transistor in 1947 and the first integrated circuit (IC) in 1959 launched an era of electronics miniaturization.

As electronics engineers focused on making things smaller, engineers and scientists from other fields also turned their focus to small things - atoms and molecules. Usually, the credit for inspiring nanotechnology goes to a lecture by Richard Phillips Feynman, a brilliant physicist. Feynman himself didn't use the word "nanotechnology"; in fact, only in the 1980s did this new field of study get a name -Nanotechnology. This new name was popularized by physicist K. Eric Drexler.

Two main approaches are used in nanotechnology. In the "bottom-up" approach, materials and devices are built from molecular components which assemble themselves chemically by principles of molecular recognition. In the "top-down" approach, nano-objects are constructed from larger entities without atomic-level control.

Areas of physics such as nanoelectronics, nanomechanics and nanophotonics have evolved during the last few decades to provide a basic scientific foundation of nanotechnology.

2. The following words in the box are all from the text above. Find them in the text.

nanoscale	define	dimension	miniaturization
	nanophotonics	average	

3. For each word, read the sentence it occurs in and answer the questions.

• Is the word positive, negative or neutral?
• Is it a noun, adjective, adverb or verb?
• Can you think of a word with a similar meaning (synonym) and one with an opposite meaning (antonym)?

READING COMPREHENSION

4. Answer the following questions

1. What is nanotechnology?
2. What does nanotechnology deal with?
3. Is a nanometer one-billionth of a matter?
4. How many approaches are used in nanotechnology? What are they?
5. What do prefixes "milli" and "micro" mean?
6. What areas of physics have evolved during the last few decades?
7. Which properties do materials hundreds of nanometers in size exhibit?
8. What are the applications of nanotechnology?

ANALYZE

5. Give the English equivalents.

1. иметь отношение;
2. материал;
3. подход;
4. эволюционировать;
5. интегральная схема;
6. большой объем;
7. традиционно;
8. разнообразный;
9. величина;
10. открывать/запускать;
11. сущность;
12. собираться;
13. пучок;
14. обратить внимание

6. Match the words and phrases with their English equivalents

| **1** | как результат химического и физического взаимодействия | **a** | to deal with structures of the size 100 nanometers |
| **2** | превращать пластичные материалы в твердые | **b** | to improve efficiencies of catalysts |

3	улучшать эффективность катализаторов	**c**	to characterize and predict properties of nanostructures
4	вырабатывать свет	**d**	effects of nanomaterials on global economics
5	характеризовать и предсказывать свойства наноструктур	**e**	a vast range of applications of nanomaterials
6	на атомном и молекулярном уровне	**f**	on an atomic and molecular scale
7	действие наноматериалов на глобальную экономику	**g**	to explore the full potential of nanotechnology
8	иметь дело со структурами размером в 100 миллимикронов	**h**	to turn ductile materials into solids
9	беспокойства по поводу токсичности наноматериалов	**i**	to generate light
10	широкий спектр применения наноматериалов	**j**	concerns about the toxicity of nanomaterials
11	исследовать весь потенциал нанотехнологии	**k**	to alter physical and chemical properties of materials
12	изменять химические и физические свойства материалов	**l**	as the result of physical and chemical interaction

7. A lot of words are used to describe nanotechnology. Choose four from the list below that you think best describe nanotechnology.

Study, engineering, system, nanoscale, molecule, dimension, components, atomic and molecular scale, investigate, implications, nanoobjects, nanophotonics, entities, impact of nanomaterials, toxicity

8. Find the corresponding prepositions for the following verbs in the text and write Russian equivalents.

1. the study _____ some phenomena
2. _____ atomic scale
3. to deal _____ clusters of atoms
4. to be popularized _____ scientists
5. to send people _____ outer space
6. to be focused _____ making things smaller
7. the credit _____ inspiring nanotechnology
8. to differ significantly _____ something

9. Put the words in the correct order.

1. Two/are/ in/ main / used/ approaches/ nanotechnology.
2. Bulk/ physical/ materials / continuous / possess/ properties.
3. Is / nanotechnology/and/ at/ the/ design/ shape/ systems/ scale/ characterization/ the/ and/ production/ of/ application/ by/ controlling/ structures/ devices/ size/ nanometer.
4. Electronics/ on/ focused /smaller/ engineers/ making/ things.
5. Used/small/ prefix/ scientists/to/ very/originally/ the / nano/ indicate.
6. The/ hair/ is/wide/ average/ human/ about/ 80,000/ nanometers.

10. Complete the sentences.

1. Nanoscience is the study of …
2. Bulk materials possess...
3. In the "bottom-up" approach, materials and devices are built from ...
4. In the "top-down" approach, nanoobjects are constructed from …
5. Nanoelectronics, nanomechanics and nanophotonics provide …

11. Say whether the following statements are true, false or not mentioned.

1. Nanotechnology is creating an entirely new class of materials and devices with unique and potentially very useful properties.
2. The physical dimensions of nanotechnology are small, spanning from just a few to tens of nanometers.
3. Nanotechnology is very diverse, ranging from extensions of conventional device physics to completely new approaches based upon molecular self-assembly.
4. Nowadays current interest in nanotechnology is not high.
5. The field of nanotechnology is developing slowly as are its practical application.
6. Unique nanoscale properties are already being used to increase energy efficiency and improve healthcare.

SPEAKING

12. Do a survey.

Work in pairs. Ask the students of your group their opinions on the question: Do nanoscience and nanotechnology do more good than harm, more harm than good, or about equal? What are their reasons? Discuss the results with your partner. Give reasons for your opinion.

opinion	more good than harm	more harm than good	about equal	total
Yes				
No				

10. Brainstorm for the words or phrases you associate with nano-technology. Speak about nanotechnology using your notes.
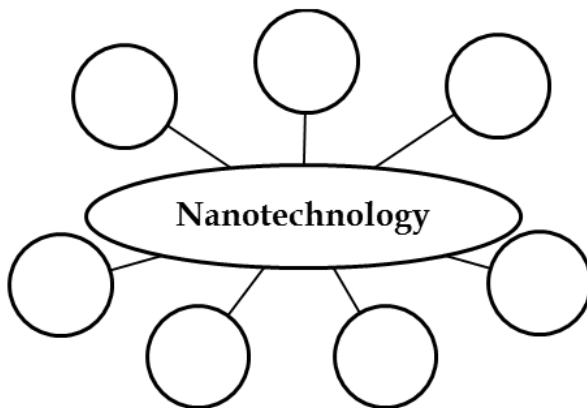
13. Make up a presentation on: "Nanotechnology and its potential in the future". Consult Appendix 2 to help you.

TRANSLATE

14. Translate from Russian into English.

Очиститель воздуха для подводных лодок

Вряд ли кто-то задумывался о том, каким воздухом приходится дышать экипажам подводных лодок, кроме самих членов экипажа. А между тем очистка воздуха от двуокиси углерода должна производиться немедленно, так как за одно плаванье через легкие команды подлодки одному и тому же воздуху приходится проходить сотни раз. Для очистки воздуха от углекислого газа используют амины, обладающие весьма неприятным запахом.

Для решения этого вопроса была создана технология очистки, получившая название *SAMMS* (аббревиатура от Self-Assembled Monolayers on Mesoporous Supports). Она предлагает использование специальных наночастиц, помещенных внутрь керамических гранул. Вещество обладает пористой структурой, благодаря которой оно поглощает избыток углекислого газа. Различные типы очистки SAMMS взаимодействуют с различными молекулами в воздухе, воде и земле, однако все из этих вариантов очисток невероятно эффективны. Всего одной столовой ложки таких пористых керамических гранул хватит для очистки площади, равной одному футбольному полю.

15. Translate from English into Russian.

Nanoengineering

Nanoengineering is one field of nanotechnology. Nanotechnology is an umbrella term that encompasses all fields of science that operate on the *nanoscale.* A nanometer is one billionth of a meter, or three to five atoms in width. It would take approximately 40,000 nanometers lined up in a row to equal the width of a human hair. Nanoengineering concerns itself with manipulating processes that occur on the scale of 1–100 nanometers.

The general term, nanotechnology, is sometimes used to refer to *common products* that have improved properties due to being fortified with nanoscale materials. One example is nano-improved tooth-colored enamel, as used by dentists for fillings The general use of the term "nanotechnology" then differs from the more specific sciences that fall under its heading.

Nanoengineering is an *interdisciplinary science* that builds biochemical structures smaller than bacterium, which function like microscopic factories. This is possible by utilizing basic *biochemical processes* at the atomic or molecular level. In simple terms, *molecules* interact through natural processes, and nanoengineering takes advantage of those processes by direct manipulation.

Nanoengineering, in its infancy, has seen some early successes with using DNA as a catalyst to self-assemble simple structures. In 2006 a Brown University research team was able to grow zinc oxide *nanowires* of approximately 100–200 nm in length by fusing snippets of synthetic DNA to carbon nanotubes. DNA, nature's manual for creating matter from the bottom up, is of *particular interest* in the field of nanoengineering. By assembling specific DNA code a *nanoengineer* can set up the conditions for the genetic code to perform tasks that result in the biochemical *assembly* of nanomaterials.

16. Give derivatives from the following words and translate them.

Example: to define – definition – definable – definability – definite – definitely

1. to develop _____;
2. to vary _____;
3. to manufacture _____;
4. to improve _____;
5. to compose _____;
6. to equip _____;
7. to manipulate _____;
8. to produce _____;
9. to achieve _____.

GRAMMAR

COMPLEX OBJECT

17. Find Complex Object Infinitive in the following sentences and translate them.

1. Scientists know this superlattice to possess very interesting electrical properties.

2. David Tomanek, a professor of physics at Michigan State University, considers each of the nanotube forms to find applications for which they are best suited.

3. Since their discovery in 1991, researchers believed carbon nanotubes to be the most important candidates to dominate the 21st century revolution.

4. They assumed the extraordinary magnetoresistance (EMR) effect to work by changing the paths of electrons travelling through the device.

5. Manufacturers of optoelectronics device expected scientists to obtain considerably greater magnetoresistance (MR) from a nonmagnetic metal such as gold.

6. We supposed them to be studying the properties of microelectronic structure called a semiconductor superlattice.

7. The researchers believed magnetoresistance to be the phenomenon in which the electrical resistance of a metal or a semiconductor increases or decreases in response to magnetic field.

8. The design of the nanobattery enables it to lie inactive for at least 15 years, but then it is capable of waking up and immediately providing a burst of high energy.

9. Not only does nanotechnology enable structures to be made much smaller. It also enables effects that are not visible on larger structures to be utilized. Researchers found the material to exhibit different electromagnetic or optical properties on these scales as a result of atomic sizes involved. This opens tremendous opportunities to be exploited in many different ways.

LISTENING COMPREHENSION

18. Listen to the text and fill in the missing information.

Semiconductor Nanomaterials

Semiconductors are crystalline or amorphous (1) _____ with distinct electrical characteristics, but (2) _____ semiconductors are also known. A large number of elements and (3) _____ have semiconducting (4) _____, including certain (5) _____ elements (e.g., silicon and germanium), (6) _____ compounds (e.g., silicon carbide), certain ternary compounds, oxides, alloys and (7) _____ semiconductors made of organic compounds.

When the (8) _____ of semiconductor materials is reduced to (9) _____, their physical and chemical properties (10) _____ drastically, resulting in unique properties due to their large surface (11) _____ or quantum size effect.

Recently there has been substantial interest in the (12) _____, characterization and application of semiconductor (13) _____ that play a major role in several new technologies. The (14) _____ of the semiconductor and its optical properties (absorption coefficient and refractive index) can be (15) _____. Semiconductor nanomaterials and (16) _____ are still in the research stage, but they are (17) _____ for applications in many fields, such as solar cells, nanoscale electronic devices, light-emitting diodes, (18) _____ technology, waveguide, chemical and biosensors, packaging films, superabsorbents, components of armor, parts of automobiles, and (19) _____.

19. Read the text. Discuss what the main idea of the text is.

Applications and Benefits of Nanoengineering

The socio-economic benefit of nanoengineering will be ubiquitous and lead to improved safety, security, and standard of living throughout the world. Future materials and structures will have vastly improved properties and durability. Smart machines will control their own performance, preserve their integrity, and partially self-repair when damaged, and when they are worn out or obsolete, they will be programmed to demanufacture and be recycled into new machines.

Building without machining may be another outgrowth of nanoengineering. Nanoengineering will produce new launch vehicles, lightweight agile aircraft, and may allow the human exploration of space. Major areas of impact include future space missions that will use hybrid nanocomposites to provide a wholesale reduction in weight in space vehicle systems through material substitution, redesign, and integration; autonomous reconfigurable structures will increase speeds, reduce fuel consumption, reduce pollution, reduce noise, and provide lasting performance for aircraft; intelligent materials will provide structural health and performance monitoring to prevent degradation and failure of structures in all types of critical applications; nanocoatings, fillers, sprays, and films will provide protection from abrasion, EMI, heat, and provide artificial skins for materials.

Commercial applications of nanocomposite materials potentially include all composite material products, brake disks, turbine engine shrouds, composite bushings, brake parts, metallic composites, smart materials, biosensing, and power harvesting. New applications will emerge as our knowledge increases.

Nanoengineering is also important in fuel cells where functionalized nanotubes may store hydrogen safely for use in automobiles. Electronics, medicine, and computing are other areas where nanotechnology promises advances. Indeed, our vision of nanoengineering is to obtain nanoscale control over the synthesis of matter to build designer materials that can be used to solve the most difficult scientific and medical problems that face humanity

20. Look through the text and find the sentences that refer to potential applications of nanoengineering and their advances.

21. Mark each statement as T (True), F (False) or N (Not Mentioned).

1. Nanoengineering will improve standard of living throughout the world.

2. Smart machines will be able to be recycled into new machines.

3. The materials used to build cars will be able to resist scratches, dents, and rust.

4. One of the goals of Nanoengineering is to allow human beings to explore space.

5. Humanity has to solve problems of safe use of nanotubes in medicine.

22. Divide the text into logical parts and entitle them.

23. Guess the meaning of the following international words and phrases:

Electronics, humanity, standard of living, material, structure, property, performance, integrity, outgrowth, consumption, critical applications, artificial skin, nanocomposite material, safety, security

24. Discuss these questions in pairs or small groups.

1. What are the applications of Nanoengineering?
2. What are the advantages of Nanoengineering?
3. Are there any disadvantages of Nanoengineering? What are they?

25. Choose the word similar in meaning.

1. *obsolete:* a) last b) modern c) outdated d) deep
2. *ubiquitous:* a) intelligent b) reliable c) capable d) widespread
3. *artificial*: a) natural b) unnatural c) exact d) reliable
4. *launch*: a) start b) defuse c) perform d) count
5. *consumption*: a) accumulation b) spending c) commonness d) manipulation
6. *substitution:* a) creature b) performance c) replacement d) collection
7. *recycle*: a) require b) reuse c) reshape d) remind
8. *preserve*: a) retain b) miss c) move d) obtain
9. *durability*: a) height b) length c) strength d) arbitrary
10 *integrity*: a) utility b) consistency c) growth d) longevity

26. Complete the sentences.

1. The socio-economic benefit of nanoengineering will lead to … .
2. Smart machines will control … .
3. Building without machining may … .
4. Major areas of impact include … .
5. Commercial applications of nanocomposite materials potentially include … .

6. New applications will emerge … .
7. Electronics, medicine, and computing are other areas where … .
8. Our vision of nanoengineering is to … .

27. Translate into English.

1. Наноинженерия – инженерная деятельность человека, связанная с наноразмерными объектами и с объектами, характеризующимися размерными рядами в десятки или единицы нанометров, создающимися методами нанотехнологий.

2. «Наноматериал» – материал, содержащий структурные элементы, геометрические размеры которых, хотя бы в одном измерении, не превышают 100 нм.

3. Интерес к наноструктурам – сверхрешеткам, квантовым ямам, нитям и точкам существенно вырос в последнее десятилетие.

4. Среди наноматериалов особое место занимают образцы, содержащие наноразмерные частицы металла и полупроводников.

5. Инженер-нанотехнолог – очень молодая профессия, которая зародилась лишь во второй половине прошлого века. Сейчас она лишь набирает свою популярность.

6. Профессионал работает с материалами на молекулярном и атомном уровне.

WRITING

28. Write the summary to the text. Use Appendix 2 to help you.

SPEAKING

29. Make the glossary to the text. Retell the text using the glossary.

30. Get prepared with the presentation about applications and benefits of nanoengineering. Use Appendix 2 to help you.

Unit 13
Robotics and Automation

Discuss the following questions:

1. What is a robot in one sentence?
2. In your opinion, what are three things that describe a robot?
3. Which of your daily jobs would you like to do with a robot?
4. Which jobs would you never delegate to a robot?
5. How do robots change humanity?

VOCABULARY

1	to design	проектировать, разрабатывать, создавать
2	to assemble	собирать
3	assembly line	конвейер, сборочная линия
4	to maintain	поддерживать, сохранять, обслуживать
5	to perform	выполнять, осуществлять, работать
6	manufacturing	производственный
7	to malfunction	выходить из строя
8	to fix	чинить
9	stakeholders	заинтересованные стороны
10	to determine	определять, обусловливать
11	prototype	опытный образец, прототип
12	project scope	объем работ и содержание проекта
13	feedback	обратная связь
14	improvement	улучшение
15	industry standards	отраслевые стандарты
16	to provide	предоставить, оказать, обеспечить

17	technical support	техническая поддержка
18	workstation	(автоматизированное) рабочее место, рабочая станция
19	computer software	программное обеспечение
20	cost estimates	смета расходов
21	soft skills	«мягкие» навыки
22	decision-making	принятие решений
23	to evaluate	оценивать
24	cutting-edge	передовой, новейший
25	debug	отлаживать

READING. TEXT 1.

1. Read the text and put the titles (A – C) in the correct gap.

A. What do robotics engineers do?
B. What skills are required for robotics engineers?
C. What is a Robotics Engineer?

Career Exploration Journey: Robotics Engineering

A. _____

A robotics engineer is a designer responsible for designing, assembling, testing, and maintaining robots and robotic systems that are able to perform tasks that humans are either unable, or prefer not to complete. They create robots for various purposes, from exploring other planets to working in factories. Through their creations, robotics engineers help to make jobs safer, easier, and more efficient particularly in the manufacturing industry. As a robotics engineer, you can make a significant difference in the world.

B. _____

Robotics engineers work on a variety of tasks that span the life cycle of a robotics project. They are not just building the hardware of a robot; they are teaching that robot to act, think, and solve problems. When the robot malfunctions or requires new functionality, they are often on the line to fix it. Robotics engineers spend the majority of their time designing the plans and processes needed to not only build robots, but to have them work effectively.

At the beginning of a project, they may work with stakeholders such as clients, project managers, and other engineers to determine the project scope, and then draft potential designs for the robot in question. Prior to a robot being constructed, engineers determine exactly what the robot will be used for. What exact issue is the robot solving? Is it a repetitive task? What might restrict the robot from functioning properly? These and many other questions need to be answered before moving on to any design stage.

Robotics engineers may spend much time working at a computer designing new products. Then they may move to a workstation to assemble prototypes, test them and adapt to any bugs that appear. They collect feedback from the client to make any necessary improvements, and perform tests to ensure the robots function correctly and meet industry standards before people use them.

Once the engineer's team has built these robots or robotics systems, they are responsible for providing technical support and troubleshooting any problems that may arise once the robot begins its job. Some robotics engineers work on-site at manufacturing plants overseeing robots as they operate on assembly lines.

C. _____

Unlike other types of engineering, robotics engineering requires the ability to be proficient in a variety of technical areas — robotics engineers are the bridge between mechanics, electronics, computer science, and even cognitive psychology. Their role-specific knowledge and skills include:

Math skills: As a robotics engineer, you'll use advanced math on a daily basis as you design and analyze the performance of robots. Algebra, geometry, measurement, and statistics are commonly used, as well as calculus or trigonometry.

Computer skills: Robotics engineers use computer software to create detailed designs of robots and robotic systems before they're built. They also use specialized software programs to test how robots perform in different environments.

Some engineers may also be in charge of documenting the development process or performing project management-related tasks like developing cost estimates and project calculations.

You'll also need domain-specific skills. For example, if you're working on designing robotic brain interfaces, you may need knowledge in flexible conducting metals used as neural probes. If you're working on autonomous robots, you'll need to understand programming languages and artificial intelligence. You can often learn domain-specific technical skills on the job.

Those who usually stand out as high performers need some additional qualities which are commonly known as soft skills.

Creativity: You must be able to visualize how a robot will move and interact with its environment.

Decision-making skills: Many problems don't have clear solutions. In these situations, it's up to you to evaluate different options to ascertain the best path forward and make the best decision.

Communication skills: The ability to clearly communicate your designs to other professionals is essential. You need well-developed skills to work successfully in groups, receive and process feedback, and work well with all relevant stakeholders.

As robotics engineering is a cutting-edge, multidisciplinary field, you may need to be curious and committed to continuous learning. You also need a distinct practical focus since you need to use practical and logical thinking to debug machines and get them working properly.

DEVELOPING VOCABULARY

2. The following words are all from the text but the letters in the words are jumbled. Find them in the text and unscramble. In each word, the first letter is Uppercase.

1. l e f t n e c r a
2. P m e a e c f o n r r
3. u o s o t u A o n m
4. u s a z e V l i i
5. r a e n c I t t
6. e n o i b r h t g s l o o T u
7. m u n a t o C c e m i
8. u b e g D
9. s F o c u
10. i O t n o p
11. u v a l a E t e
12. e r o s c s P

3. For each word, find the sentence it occurs in the text and answer the questions.

• Is the word positive, negative or neutral?
• Is it a noun, adjective, adverb or verb?
• Can you think of a word with a similar meaning (synonym) and one with an opposite meaning (antonym)?

READING COMPREHENSION

4. <u>According to the text</u>, are these statements TRUE or FALSE? Correct the false ones.

1. Robots are used in manufacturing only.

2. Humans still have to do the jobs that robotic systems are unable to perform.

3. Robotics engineers' concern is to make robots' jobs safer and easier.

4. Robotics engineers are able to contribute to the improvement of this world.

5. Throughout their entire career, robotics engineers maintain robots.

6. Stakeholders ask a lot of questions to the designers in order to better understand the scope of the project.

7. Some robots are as small as bugs.

8. Soft skills are all about computer software.

9. As a robotics engineer, you need a strong practical focus rather than deep technical knowledge.

10. Robotic engineering is an innovative cross-disciplinary area.

5. *Answer the following questions:*

1. What are the major tasks of a robotics engineer?

2. What is the social significance of robotics engineering?

3. What is the sequence of robotics engineering tasks throughout the life cycle of a robotics project?

4. Why are robotics engineers supposed to be proficient in a variety of technical areas?

5. How can knowledge of cognitive psychology be useful to them?

6. How do people in this profession use soft skills?

ANALYZE

6. Word collocations. Match the adjectives on the left with the nouns on the right.

1)	artificial	**a)**	purposes
2)	various	**b)**	difference
3)	repetitive	**c)**	software
4)	manufacturing	**d)**	managers
5)	computer	**e)**	industry \ plant
6)	significant	**f)**	languages
7)	programming	**g)**	intelligence
8)	project	**h)**	interfaces
9)	cost	**i)**	estimates
10)	brain	**j)**	task

7. Word collocations 2. Match the verbs on the left with the nouns on the right.

1)	solve	**a)**	data
2)	assemble	**b)**	problems
3)	collect	**c)**	improvements
4)	make	**d)**	designs
5)	troubleshoot	**e)**	feedback
6)	to perform	**f)**	standards
7)	draft	**g)**	problems
8)	process	**h)**	tasks
9)	meet	**i)**	options
10)	evaluate	**j)**	prototypes

8. Look at the words in the box. Try and answer the following questions:

> debug   fix   mend   repair   restore   reinvent
> maintain   troubleshoot

• What do they all have in common?
• Which are limited to putting things back to the way they were?
• Which imply modifications or improvements?
• Which are interchangeable? Suggest examples.
• Which are used in relation to specific objects?
• Which are colloquial?

9. Match the words in 3 and their definitions. Then work through the questions again. Any corrections?

1 _____ to put something that is damaged, broken, or not working correctly, back into good condition or make it work again;

2. _____ to fasten something in a position so that it cannot move; to make simplistic or temporary modifications to restore smth.

3. _____ to do routine activities in order to prevent damage, slow down deterioration and prolong the life of appliances, fixtures, and the property itself

4 _____ analyze and solve serious problems for a company or other organization; trace and correct faults in a mechanical or electronic system

5. _____	change (something) so much that it appears to be entirely new
6 _____	to return something or someone to an earlier condition, or to bring something back into existence
7. _____	to remove problems (usually) from software
8. _____	to put smth. back into good condition (mostly about clothes OR relationship)

10. Use the words to feel out the gaps. Change the forms where necessary.

1. She meets daily with various stakeholders to _____ any issues or potential problems.

2. The roads in the town have been very poorly _____.

3. Our free download will enable you to _____ all http communications between the web browser on the client side and the and web server on the other side.

4. They couldn't _____ my old computer, so I bought a new one.

5. It is going to cost $5,000 to _____ the damage caused by the storm.

6. They _____ a historical building to its original look.

7. Cinemas were shut down, music gigs went online, and culture spaces had to _____ how they would engage their audiences from a distance.

8. –What do you do here? –I _____ stuff.

9. They would live together, she would cook his meals, _____ his clothes, look after him, have his babies, be a good wife to him.

10. The two countries are set to _____ their relationship after half a century of hostilities.

11. Do you know the difference between these two words?

effective vs. efficient

• *Read the quotation and example below. Do they make sense for you?*
”Effectiveness is doing the right things, while efficiency is doing things right“.
Peter Drucker

Walking may be an ***effective*** way to get to the office, but driving is more ***efficient***. Both methods will get you there, but driving takes less time and energy.

• *Now complete the sentences to explain the difference:*

The words *effective* and *efficient* both mean "capable of producing a re-sult," but there is an important difference.

If someone or something is *effective*, they _____ even if it takes _____ .

If someone or something is *efficient*, they _____, without _____, using as _____ as possible.

12. Chose effective *or* efficient *to complete the sentences.*

1. We need _____ street lighting.
2. Simple antibiotics are _____ against this virus.
3. She was very _____ in getting people to communicate.
4. You need a highly _____ production manager if you want to re-duce costs.
5. Engines and cars can be made more _____.

13. Find Russian equivalents to the words:

− Effectiveness – _____
− Effective – _____
− Efficiency – _____
− Efficient – _____

14. What are the responsibilities of a robotics engineer? Fill out the gaps with the words from the box.

Analyze	Design	Modify
Apply	Draft	Perform
Assist	Evaluate	Provide
Conduct	Maintain	Troubleshoot

1. _____ and develop robotic systems
2. _____ technical procedures and schematics
3. _____ blueprints and sketches to demonstrate their ideas
4. _____ blueprints and sketches based on feedback received
5. _____ necessary research to determine the parameters of a robotic application
6. _____ with cost estimates
7. _____ integration tests and quality control
8. _____ technical support when necessary
9. _____ robotic systems and applications

10. _____ and calibrate systems for maximum efficiency
11. _____ machine learning techniques
12. _____ accurate documentation and records

15. Which of these jobs do you like the most? What appeals to you about this role?

16. Bilateral translation. Go back to the text 'Career Exploration Journey: Robotics Engineering', **Page 153–155.**

Work in closed pairs: **Student A** and **Student B.**

Student A. *Keep the book open. Read the text silently and translate it into Russian sentence by sentence. Voice your translation to your partner.*

Student B. *Keep the book closed. Listen to your partner and translate his speech back into English sentence by sentence.*

Student A. *Compare your partner's version with the original text in your book. Help and make corrections if necessary.*

Switch roles and carry on.

After you finish, discuss as a group:

• Which language areas were the greatest problem: vocabulary, prepositions, articles, sentence structures, other?

17. Translate the text:

Excerpt A.

1. Мы уверенно входим в новую эру автоматизации.

2. Робототехника стала одним из самых передовых направлений, на которые ученые и инженеры делают особенный упор.

3. Поэтому в наши дни специалисты этого профиля чрезвычайно ценятся на рынке труда.

Excerpt B.

4. There are over 270 robotics companies operating in 23 industries in Russia.

5. According to the National Robotics Market Association, the staff of robotics companies is growing by 20 % per year, and by 2030 about 500,000 engineers will be needed in the country.

Excerpt C.

6. Специалист этого профиля занимается разработкой и обслуживанием роботов и автоматизированных технических систем.

7. Он отвечает за разработку механики будущего помощника человека, его электронной части и программирование действий.

8. Таким образом, робототехника находится где-то между механикой, электроникой и программированием. Именно поэтому будущему специалисту необходимо разбираться и в одном, и в другом, и в третьем.

Excerpt D.

9. Robotics engineers work in automakers, aviation and space industry enterprises, engineering companies and startups that specialize in creating robots.

10. Teaching also provides great opportunities for a robotics engineer: a new subject is already included in school curricula, and robotics clubs proliferate in every town.

WORD BUILDING AND VOCABULARY DEVELOPMENT

18. Can you explain the difference in the meanings of the following words?

design   develop   discover   innovate   invent

19. Match the words from Ex.1 with their definitions:

1. _____ – to create something that has never been made before;

2. _____ – to make or draw plans for something (often suggests that the project only exists on paper or on the computer);

3. _____ – to elaborate or expand in detail, to bring to a more advanced or effective state;

4. _____ – to gain sight or knowledge of something previously unseen or unknown;

5. _____ – to introduce something new; make changes in anything established.

20. Complete the table with the noun and adjective forms of the verbs above:

verb	noun (result)	noun (actor)	adjective (quality)
design			–
develop			
discover			–
innovate			
invent			

21. Fill out the gaps to complete the sentences with the words from Ex. 3. Some words are not involved; some words are used more than once. You may have to change the form of the verb or make the nouns plural.

1. A robust adaptive control algorithm is _____ to compensate for disturbance; then trajectory tracking has been achieved.

2. We have to _____ a new policy / strategy to deal with the problem.

3. Various ecological issues have come to the fore since the _____ of the hole in the ozone layer.

4. The missing wallet was _____ under the chair.

5. There are numerous examples of treatments that were widely used yet it was later _____ that they were either ineffective or dangerous.

6. More autonomous agencies can _____ and shape policy direction on their own while less autonomous agencies are more dependent on their political superiors.

7. She has won a reputation as a leading _____ in the industry. He wasn't afraid to try something new.

8. It is essentially human to be at once an inheritor, part of a culture, and an _____, creatively striving within or against tradition.

9. Big companies are always looking for _____ products that can't be easily copied.

10. _____ covered under the patent law have to meet the criteria of novelty and industrial applicability.

11. But each of us, in conversation, must be _____: must respond to the not entirely expected.

12. Web _____ usually refers to the user experience aspects of website development rather than software development. It is related to website usability and visual aesthetics.

13. Global deflation is squeezing profits and extinguishing jobs in the _____ world.

14. In other words, it is unlikely that these individuals _____ such similar stories at different times and in different places.

15. All our profits are re-invested in research and _____.

16. The company is spending $ 650 million on _____ new technology.

17. They are working to _____ the next generation of underwater vehicles.

THE COMPLEX SUBJECT

22. Practice. Read this collection of facts about robotics. Paraphrase the passages using The Complex Subject where possible.

Example:

• The term 'robot' comes from the Czech word 'robota', that means 'hard work' or 'forced labor'.

• The term 'robot' is known to come from the Czech word 'robota', that means 'hard work' or 'forced labor'.

Ten interesting facts about robotics

1. The three laws of robotics are a set of rules by Isaac Asimov.

Isaac Asimov, a science fiction writer, presented the three laws of robotics that governed the behavior of robots in the year 1942. The laws stipulated that robots must not hurt human beings. In contrast, they must obey human beings and must preserve their own life unless they violate the first or second law.

2. Most computerized robot voices tend to be female.

Technically, robots are genderless, but the voices given to the computerized robots tend to be female. One of the reasons is that females traditionally are lovely and caretaking.

3. Sophia is the first robot to get citizenship.

Sophia is a social humanoid robot. Most noteworthy, Sophia is the first robot to get citizenship from Saudi Arabia on October 25, 2017. This robot uses visual data processing, facial recognition and also imitates human gestures and facial expressions.

4. A Nano-robot is a microscopic robot that is 50–100 nm wide.

A Nano-robot is a microscopic robot that is 50–100 nm wide. They can be used efficiently for drug delivery in the human bloodstream along with delicate surgical procedures that can support standard surgery.

5. The Japanese government is spending one-third of its budget on the growth of Care-Robots to help the elderly.

Currently, 25 % of Japan's population is over 65 years of age, and by the year 2065, it is going to rise to 40 %. As a result, the nursing-care robot market has rapidly increased. Thus, the government is spending one-third of its budget on the growth of care-robots to help the Japanese elderly.

6. The SIAR Project is a sewage inspection robot.

The SIAR is a sewage inspection robot. It is a prototype autonomous ground robot that navigates and inspect sewage systems. Inspecting sewers can be a dangerous job, or sewers are awkward places to work for humans, the SIAR project is a perfect substitute.

7. The self-driving mining robots are creating a huge impact on the mining industry.

Due to the dangerous jobs of underground mining, robot mining became popular. The robots can locate rare minerals underground. The self-driving mining robots are creating a huge impact on the mining industry in terms of cost and safety.

8. A robot can't replace a medical surgeon, yet.

One of the questions after the diagnostics is, can a robot replace a doctor? Probably not in the near future because it lacks surgery skills, and without the help of a human, it can't complete its tasks. However, there is a robot-assisted surgery that has been criticized as expensive and unproven.

9. Robotic prosthesis work like a real human body part.

For those people who have lost their hands, arms or legs in an accident may opt for robotic prosthesis. Robotic prosthesis can read brain signals and can turn this prosthesis into action like a real body part of a human.

10. Robophobia is an anxiety disorder in which a person has an irrational fear of robots.

In contrast to their professions, tech moguls like Elon Musk and Bill Gates have a disorder called Robophobia. This disorder may be common for most people who find it bizarre when a robot is socializing with humans.

LISTENING COMPREHENSION

Starting a career in the field of robotics engineering

23. These are some FAQ about the career. Try and answer them in pairs; then discuss your ideas as a group.

A. Is it Hard to Become a Robotics Engineer?
B. Is it worth choosing a career in robotics now?
C. Can you become a robotics engineer without a degree?
D. How long does it take to become a robotics engineer?
E. What are the main steps to start a career in robotics?

23. You are going to listen to an expert answering the questions (A–D). The questions are in jumbled order. Listen and write them in the order they follow.

Question 1: _____

Question 2: _____

Question 3: _____

Question 4: _____

Question 5: _____

24. Listen again and write down short answers. (Yes/No for closed question and key words for open questions)

25. Match the words to make collocations. For some verbs, more than one collocation is possible. Listen again and check your answers.

1) follow	a) credibility
2) gain (2)	b) a college degree
3) advance	c) the ladder
4) search	d) experience
5) improve	e) your skills
6) move up	f) to the field
7) to exercise	g) a typical career path
8) to pursue	h) their way up
9) work	i) your creative side
10) to be dedicated	j) for a job
11) provide	k) your chances
	l) a career

26. Complete the sentences by memory. Listen and check.

1. To become a _____ robotics engineer, it might take up to ten years. This is a _____ job that needs _____ robotics skills.

2. Most engineers begin as _____ employees and work their way up through the ranks. Robotics, on the other hand, is always evolving as the _____ industry continues to change.

3. The very nature of robotics necessitates a great deal of _____ knowledge.

4. In most cases, new graduates begin their careers in an entry-level role, which provides _____ experience in both the workplace and the business world.

5. Engineers may operate in any field provided they have the _____ certifications.

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6. Because artificial intelligence is rapidly becoming _____ across all sectors of the economy, there is an _____ need for robotics engineers.

7. Becoming a robotics engineer is, indeed, a _____ and _____ endeavor.

27. Now give detailed answers to the questions.

SUPPLEMENTARY READING

28. Read the text below. While reading, <u>underline</u> and mark most important lines in the text. You will use your marks as an aid to future review.

29. Use the marked fragments to create a scheme of the text.

30. Can you add examples on your own to illustrate the ideas presented in your scheme?

Robotics Vs. Artificial Intelligence: What is the difference?

Robotics and artificial intelligence serve very different purposes. However, people often get them mixed up. A lot of people wonder if robotics is a subset of artificial intelligence or if they are the same thing.

Are Robotics and Artificial Intelligence the Same Thing?
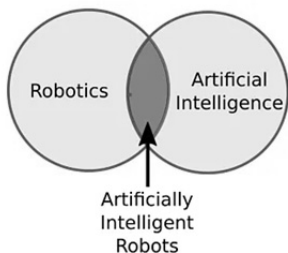
The first thing to clarify is that robotics and artificial intelligence are not the same thing at all. In fact, the two fields are almost entirely separate. People tend to confuse the two because of the overlap between them: Artificially Intelligent Robots. To understand how these three terms relate to each other, let us look at each of them individually.

What Is Robotics?

Robotics is a branch of technology which deals with robots. It is surprisingly difficult to get experts to agree exactly what constitutes a "robot". In fact, there are three important factors:
• Robots interact with the physical world via sensors and actuators.
• Robots are programmable.
• Robots are usually autonomous or semi-autonomous.

However, some robots are not autonomous. Telerobots, for example, is entirely controlled by a human operator but telerobotics is still classed as a branch of robotics. This is one example where the definition of robotics is not very clear.

Whatever definition you choose, robotics involves designing, building and programming physical robots. Only a small part of it involves artificial intelligence.

What Is Artificial Intelligence?

Artificial intelligence (AI) is a branch of computer science. It involves developing computer programs to complete tasks which would otherwise require human intelligence. AI algorithms can tackle learning, perception, problem-solving, language-understanding and/or logical reasoning. Most AI programs are not used to control robots.

Even when AI is used to control robots, the AI algorithms are only part of the larger robotic system, which also includes sensors, actuators and non-AI programming.

Often – but not always – AI involves some level of machine learning, where an algorithm is "trained" to respond to a particular input in a certain way by using known inputs and outputs.

The key aspect that differentiates AI from more conventional programming is the word "intelligence." Non-AI programs simply carry out a defined sequence of instructions. AI programs mimic some level of human intelligence.

What Are Artificially Intelligent Robots?

Artificially intelligent robots are the bridge between robotics and AI. These are robots which are controlled by AI programs.

Many robots are not artificially intelligent. Until quite recently, all industrial robots could only be programmed to carry out a repetitive series of movements, which do not require artificial intelligence. Non-intelligent robots are quite limited in their functionality. AI algorithms are often necessary to allow the robot to perform more complex tasks.

Let us look at some examples.

Example: Non-Artificially Intelligent Cobot. A simple collaborative robot (cobot) is a perfect example of a non-intelligent robot. For example, you can easily program a cobot to pick up an object and place it elsewhere. The cobot will then continue to pick and place objects in exactly the same way until you turn it off. This is an autonomous function because the robot does not require any human input after it has been programmed. However, the task does not require any intelligence.

Example: Artificially Intelligent Cobot. You could extend the capabilities of the cobot by using AI. Imagine you wanted to add a camera to your cobot. Robot vision comes under the category of "perception" and usually requires AI algorithms. For example, say you wanted the cobot to detect the object it was picking up and place it in a different location depending on the type of object. This would involve training a specialized vision program to recognize the different types of objects.

Conclusion and a Confusion: Software Robots

As you can see, robotics and artificial intelligence are really two separate things. Robotics involves building robots whereas AI involves programming intelligence.

However, we leave you with one slight confusion: software robots.

"Software robot" is the term given to a type of computer program which autonomously operates to complete a virtual task. They are not physical robots, as they only exist within a computer. The classic example is a search engine web crawlers which roams the internet, scanning websites and categorizing them for search. Some advanced software robots may even include AI algorithms. However, software robots are not part of robotics.

31. What is the takeaway message from the text? Formulate in one or two sentences:

_____

_____

32. Use the Venn diagram on page 174 to explain the relationship between Robotics and Artificial Intelligence.

33. Prepare a presentation (3–5 minutes). Use Appendix 2 to help you.

Grammar Reference

1. DEGREES OF COMPARISON OF ADJECTIVES

Most descriptive adjectives can show degree of quality or quantity by forming two degrees of comparison: **the comparative degree and the superlative degree**. These degrees are formed from **the positive degree**, which is the usual form of adjectives. The comparative and superlative forms can be simple (**higher, highest**) or compound (**more responsible, most responsible**). The comparative degree indicates one of two objects, while the superlative degree singles out one of three or more objects.

The comparative degree and the superlative degree are formed by adding the suffixes ER and EST to the positive form of the adjective or by using MORE and MOST before the positive form of the adjective. The choice of ER, EST or MORE, MOST depends mostly on the number of syllables in the adjective.

An adjective in the comparative or superlative form can stand **before the noun that it modifies** or **after the verb 'be' in the predicative**. For example, Students can continue to study towards the Doctor of Sciences Degree, which is the second and highest **level**. "Rosobrnadzor" **is responsible** for the accreditation.

As a rule, the definite article is required before the superlative form of the adjective: **the most developed**.

Monosyllabic adjectives

One-syllable adjectives form the comparative and superlative degrees by adding the suffixes ER, EST: **high – higher – the highest. Bachelor of Science is a high degree. Master of Science is a higher degree. Doctor of Science is the highest degree.**

Disyllabic adjectives

Most adjectives having two-syllables and ending in the suffixes "al, ant, ent, ish, ive, ic, ous, ful, less", form the comparative and superlative degrees with the help of t6he words MORE, MOST: **active – more active – most active; careless – more careless – most careless.**

Two-syllable adjectives ending in "y, er, ow" usually form the comparative and superlative degrees by adding ER, EST: **angry, angrier, angriest; busy, busier, busiest.** They often have variants with MORE, MOST: **lazy,**

lazier / more lazy, laziest / most lazy; fancy, fancier / more fancy, fanciest / most fancy. The choice of ER, EST or MORE, MOST in the case of disyllabic adjectives ending in "y, er, ow" depends to some extent on preferences in usage, on what sounds better or more natural to an English speaker in the given sentence. In general, simple forms formed with the help of ER, EST are more traditional and more widely used than those with MORE, MOST.

There are some other disyllabic adjectives, which have variant forms with ER, EST, or MORE, MOST, for example, **rapid, quiet, simple, stable, noble, gentle, common, polite, pleasant, and handsome.** Though both variants are considered correct, the following comparative and superlative forms seem to be more frequently used for these adjectives at present: **more rapid, most rapid; quieter, quietest; simpler, simplest; gentler / more gentle, gentlest / most gentle; more stable, most stable; more noble, most noble; more common, most common; more polite, most polite; more pleasant, most pleasant; more handsome, most handsome.**

Spelling

If an adjective ends in a single consonant preceded by a single vowel, the consonant is doubled before adding ER, EST: **big, bigger, biggest.**

If an adjective ends in mute E, the letter E is dropped before adding ER, EST: blue, bluer, bluest. If an adjective ends in Y preceded by a consonant, Y is changed to I before adding ER, EST: **busy, busier, busiest.**

If final Y is preceded by a vowel, Y doesn't change before adding ER, EST: **gray, grayer, grayest.**

Adjectives of three or more syllables

Adjectives consisting of three or more syllables form the comparative and superlative degrees by using MORE, MOST before the adjective: **prestigious, more prestigious, most prestigious.**

Adjectives formed from participles

Adjectives formed from participles form the comparative and superlative forms with the help of MORE, MOST irrespective of the number of the syllables: changing, more changing, most changing; advanced, more advanced, most advanced.

Notes

1. MOST + adjective is not always the superlative degree. MOST may have the meaning "very, extremely, highly". In such cases, a singular noun is used with the indefinite article, and a plural noun is used without an arti-

cle. In this meaning of MOST, monosyllabic and disyllabic adjectives are used with MOST.

She is a most beautiful woman.

In most of such cases, the meaning will be clearer if you use "very" instead of "most": a very beautiful woman; very interesting people; a very strange dream; very pleased.

2. The definite article before the superlative form may be omitted in some cases, for example, in those cases where the adjective is used in the predicative after the verb BE (or other linking verbs), and there is no noun or defining phrase after the adjective. Compare these examples:

She felt like the happiest girl in the whole wide world. She is happiest when she is alone with her books.

Incomparable adjectives

Some adjectives should not be used in either the comparative or the superlative degree because, logically, their meaning does not admit of comparison. Such adjectives are sometimes called absolute adjectives.

Examples of incomparable adjectives: **absent, absolute, chief, complete, contemporary, daily, dead, essential, eternal, excellent, empty, full, entire, fatal, final, honest, impossible, infinite, inevitable, ideal, junior, meaningless, perfect, main, major, minor, round, sufficient, supreme, senior, square, unique, universal, utmost, vital, weekly, whole, wooden, worthless, wrong.**

If it is necessary for you to make some kind of comparison of such adjectives, use "almost, nearly, quite" with them, for example, "almost perfect; almost empty; nearly full; quite sufficient". You can also use the constructions "as...as" or "not as...as" described at the end of this article. In everyday speech, phrases like "emptier than; more complete than; more correct than; more honest than; more perfect", etc., are sometimes used. Examples: He looks more dead than alive. Karl is more honest than Bart. Now you are more wrong than ever.

Predicative adjectives

Some adjectives, such as "afraid, alike, alive, alone, ashamed, asleep, awake, aware", are used only predicatively after linking verbs (i.e., they are not used in the position before a noun). Predicative adjectives can form the comparative degree with the help of MORE, but are hardly ever used in the superlative degree.

As time passed, he became more and more ashamed of himself.
She is more afraid of him than of his father.

Irregular adjectives

Several adjectives have irregular forms of the comparative and superlative degrees: **good, better, best; bad, worse, worst; many/much, more, most; little, less (lesser), least; far, farther, farthest; far, further, furthest.** "Less" can be an adjective or an adverb; "lesser" is only an adjective; "farther, farthest" refer to distance; "further, furthest" refer to distance or addition.

The adjective "less" is used with uncountable nouns; the adjective "fewer" is used with plural countable nouns.

He has less time than she does. She has fewer books than he does.

The adjectives "ill" and "well" (referring to health) have the same comparative and superlative forms as the adjectives "bad" and "good": ill, worse, worst; well, better, best.

Is he well? Is he ill? He is worse yesterday. He is better today.

Set expressions

There are quite a few set expressions containing the comparative or superlative forms of irregular adjectives, for example**, a change for the better; a change for the worse; at best / at the best; at most / at the most; at worst / at the worst; get the worst of it; go from bad to worse; if worst comes to worst / if the worst comes to the worst; last but not least; more or less; none the less; not in the least; prepare for the worst; so much the better; so much the worse.**

If he leaves, so much the better.

If he doesn't want to obey the rules, so much the worse for him.

Many companies sustained losses during that period, but small companies got the worst of it.

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2. SIMPLE ACTIVE TENSES

The group if Simple Active Tenses includes three tenses - Present Simple Active Tense, Past Simple Active Tense and Future Simple Active Tense. The word 'Simple' in the name of this group is synonymous to the word 'Indefinite'. The name 'Simple' does not mean that the rules of usage and forms are in fact simple, so the term 'Indefinite' is more accurate. However, we will continue to use the more popular term 'Simple'. In each of the three tenses of the group, we will define the meaning and the forms in statements, questions and negative sentences.

Present Simple Active

• Meaning of Present Simple Active

Present Simple Active Tense is used to express repeated or regular actions in the present (Students take exams during sessions), facts (Sessions start in June and February), general truth (higher education is an important step in the development of a person), likes and dislikes (Many foreigners prefer to study in Russia), interests and hobbies (Besides studying, students have many interests and hobbies), goals and ambitions (Some graduates apply for Master of Science program).

Present Simple Active is often used with adverbs and adverbial phrases that indicate the time of the action and help to choose the right tense – Present Simple Active. They are the following: usually; regularly; every day; every week; every year; often; frequently; sometimes; occasionally; seldom; rarely; never (i. e., zero regularity); always (i. e., regularly, usually); on Fridays; on weekends.

• Verb forms of Present Simple Active

To make a statement in Present Simple Active we should use the form similar to the infinitive, if the subject of the sentence is or may be replaces by the pronouns 'I', 'you', 'we', 'they'. If the subject of the sentence is or can be replaced by the pronouns 'he', 'she' and 'it', we should use the verb form with the ending –s or –es.

In questions in Present Simple Active we should use the auxiliary verb 'do' before the subject, if the subject is or may be replaced by the pronouns 'I', 'you', 'we', 'they'. If the subject of the sentence is or can be replaced by the pronouns 'he', 'she' and 'it', we should use the auxiliary 'does' before the subject. After the subject we use the main verb. In questions the form of the verb is similar to the infinitive form.

In negations in Present Simple Active we should use the auxiliary verb 'do' and a negative particle 'not' after the subject, if the subject is or may be replaced by the pronouns 'I', 'you', 'we', 'they'. If the subject of the sentence is or can be replaced by the pronouns 'he', 'she' and 'it', we should use the auxiliary 'does' after the subject. The form of the main verb follows the particle 'not'. In negations, like in questions, the form of the verb is similar to the infinitive form.

The verb forms of the present Simple Active are given in the Table below:

	Statement	Question	Negation
I, you, we, they	I study hard. You study hard. We study hard. They study hard.	Do I study hard? Do you study hard? Do we study hard? Do they study hard?	I do not study hard. You do not study hard. We do not study hard. They do not study hard.
He, she, it	He studies hard. She studies hard. AI studies hard.	Does he study hard? Does she study hard? Does AI study hard?	He does not study hard. She does not study hard. AI does not study hard.

For the verb 'be' the forms in a statement are 'am' for the subject that is expressed or may be replaced by 'I', 'is' for the subjects that are expressed or may be replaced by 'he', 'she', 'it', and 'are' for the subjects that are expressed or may be replaced by 'you', 'we', 'they'. In questions we put the forms of the verb 'be' before the subject. In negations we use the particle 'not' after the forms of the verb 'be'.

	Statement	Question	Negation
I,	I am a student.	Am I a student?	I am not a student.
you, we, they	You are a student. We are students. They are students.	Are you a student? Are we students? Are they students?	You are not a student. We are not students. They are not students.
He, she, it	He is a student. She is a student. AI is a student.	Is he a student? Is she a student? Is AI a student?	He is not a student. She is not a student. AI is not a student.

Past Simple Active

• Meaning of Past Simple Active

The action happened, started and ended, in the past (Russia's higher education system started with the foundation of the universities in Moscow and St. Petersburg in the middle of the 18th century).

Past Simple Active is often used with adverbs and adverbial phrases that indicate the time of the action and help to choose the right tense – Past Simple Active. They are the following: yesterday; last week; last year; in 1984; in 2007; an hour ago; a year ago; a long time ago.

• Verb forms of Past Simple Active

In statements in Past Simple Active the main verb has the form of the infinitive with the ending –ed (Past Simple form), if the main verb is a regular one. If it is irregular, then the second, Past Simple form is used.

In question in Past Simple Active we use the auxiliary 'did' before the subject and the infinitive form of the main verb after the subject.

In negations in Past Simple Active we use the auxiliary 'did' after the subject, then we use the particle 'not' and after that the infinitive form of the main verb.

Statement	Question	Negation
I studied hard.	Did I study hard?	I did not study hard.
You got a 'five'.	Did you get a 'five'?	You did not get a 'five'.
We studied hard.	Did we study hard?	We did not study hard.
They studied hard.	Did they study hard?	They did not study hard.
He studied hard.	Did he study hard?	He did not study hard.
She studied hard.	Did she study hard?	She did not study hard.
AI studied hard	Did AI study hard?	AI did not study hard.

For the verb 'be' the forms in a statement in Past Simple Active are 'were' for the subjects that are expressed or may be replaced by the pronouns 'you', 'we', 'they', and 'was' for the subjects that are expressed or may be replaced by the pronouns 'I', 'he', 'she', 'it'. In questions we put the forms of the verb 'be' before the subject. In negations we use the particle 'not' after the forms of the verb 'be'.

	Statement	Question	Negation
you, we, they	You were a student. We were students. They were students.	Were you a student? Were we students? Were they students?	You were not a student. We were not students. They were not students.
I, He, she, it	I was a student. He was a student. She was a student. AI was a student.	Was I a student? Was he a student? Was she a student? Was AI a student?	I was not a student. He was not a student. She was not a student. AI was not a student.

Future Simple Active

• Meaning of Future Simple Active

The action will happen in the future, but it is not a preplanned or scheduled action. (After four years of study, students will get Bachelor's Degreee.).

Future Simple Active is often used with adverbs and adverbial phrases that indicate the time of the action and help to choose the right tense – Future Simple Active. They are the following: tomorrow; next week; soon; in a few days; in a year; in 2050.

• Verb forms of Future Simple Active

In statements in Future Simple Active the main verb has the form of the infinitive and before it we should use the auxiliary 'will'. The old form of the auxiliary for the subjects expressed by 'I' or 'we' was 'shall'. It is rarely used nowadays.

In question in Future Simple Active we use the auxiliary 'will' before the subject and the infinitive form of the main verb after the subject.

In negations in Future Simple Active we use the auxiliary 'will' after the subject, then we use the particle 'not' and after that the infinitive form of the main verb.

Statement	Question	Negation
I will study hard.	Will I study hard?	I will not study hard.
You will study hard.	Will you study hard?	You will not study hard.
We will study hard.	Will we study hard?	We will not study hard.
They will study hard.	Will they study hard?	They will not study hard.
He will study hard.	Will he study hard?	He will not study hard.
She will study hard.	Will she study hard?	She will not study hard.
AI will study hard	Will AI study hard?	AI will not study hard.

For the verb 'be' the forms in a statement in Future Simple Active are 'will be'. In questions we put the auxiliary 'will' before the subject and the word 'be' after the subject. In negations we use the particle 'not' after the auxiliary verb 'will' and the word 'be' after the particle 'not'.

Statement	Question	Negation
I will be a student.	Will I be a student?	I will not be a student.
You will be a student.	Will you be a student?	You will not be a student.
He will be a student.	Will he be a student?	He will not be a student.
She will be a student.	Will she be a student?	She will not be a student.
AI will be a student.	Will AI be a student?	AI will not be a student. We
We will be students.	Will we be students?	will not be students.
They will be students.	Will they be students?	They will not be students.

CONTINUOUS TENSES (ACTIVE)

• The general meaning of the Continuous tenses

The main purpose of the tenses known as Continuous, or Progressive (*продолженные, или длительные*) is to express lasting actions that took

place, are taking place or are being prepared at a certain point in time. Additional characteristics of such actions are their incompleteness, dynamism and visibility.

• How to make the Continuous tenses

The Continuous verbs have three tenses: Present, Past, and Future. In the Active voice, their forms consist of the appropriate tense form of the auxiliary verb "to be" and Participle I, or Present Participle of the main verb. Participle I is formed by adding the *-ing* ending to the first form of the verb. This can result in the following changes in spelling (orthography).

1. If the verb ends on -e, the last letter is dropped: ***make*** – ***making*** (делать)

2. If the verb ends on -i.e., the last two letters become **-y**: **lie** – **lying** (лежать)

3. If the verb ends on a stressed vowel and consonant, the consonant is doubled: ***get*** – ***getting*** (получать; становиться), ***begin*** – ***beginning*** (начинать).

As the three tables below show, the tense forms differ in Affirmative, Negative, and Interrogative sentences (*утвердительных, отрицательных и вопросительных предложениях*).

• Present Continuous Tense / Настоящее длительное время

Affirmative		
I	**am**	**working**
He / She / It	**is**	**working**
We / You / They	**are**	**working**
Negative		
I	**am not**	**working**
He / She / It	**is not** (isn't)	**working**
We / You / They	**are not** (aren't)	**working**
Interrogative		
Am	I	**working?**
Is	he / she / it	**working?**
Are	we / you / they	**working?**

• Past Continuous Tense / Прошедшее длительное время

Affirmative		
I / He / She / It	**was**	**working**
We / You / They	**were**	**working**
Negative		
I / He / She / It	**was not** (wasn't)	**working**
We / You / They	**were not** (weren't)	**working**
Interrogative		
Was	I / he / she / it	**working?**
Were	we / you / they	**working?**

• Future Continuous Tense / Будущее длительное время

Affirmativ*e*		
I / We	**will & shall**	**be working**
You / He / She / It / They	**will**	**be working**
Negative		
I / We	**will not** (won't) & **shall not** (shan't)	**be working**
You / He / She / It / They	**will**	**be working**
Interrogative		
Will & Shall	I / we /	**be working?**
Will	you / he / she / it / they	**be working?**

The negative form puts the particle *not* after the first (auxiliary) verb and is often contracted in informal use, like in *He isn't doing well in math*. In questions, the first (auxiliary) verb – positive or negative – takes place before the subject group, like in **Won't** <u>the Chinese delegation</u> **be attending** *the conference for another two days? – Разве китайская делегация не будет присутствовать на конференции ещё два дня?*

• When to use the Continuous tenses

A. Present Continuous in use
The Present Continuous is used as often as Present Simple. The two tenses often share the same time expressions, such as *now*, *today*, *at the moment*, *this week*, etc. However, these words might be absent in the Con-

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tinuous sentences as the verb form itself emphasizes the duration of the action in the present. Here are some situations when the Present Continuous is required.

1. The action is happening right now, or several actions are occurring simultaneously at the moment of speaking. The marker words are ***at the moment*** (в данный момент), ***right now*** (прямо сейчас).

Sorry, I can't join you tonight, Ann is finishing her project and I am helping her.

2. The action is not limited to the moment of speaking. It started some time ago and will continue for some time. The marker words are ***now***, ***currently*** (теперь, в настоящее время), ***these days*** (в эти дни, на днях), etc.

I am taking a French course this semester.

The university library is moving into a new building.

3. The state is developing or constantly changing. The predicate contains a process verb, such as ***get*** (становиться), ***become*** (становиться), ***begin*** (начинать,-ся), ***start*** (начинать,-ся), ***change*** (менять,-ся), ***rise*** (подниматься), ***fall*** (падать), ***grow*** (расти), ***improve*** (улучшать,-ся), etc.

Your English is getting better. – *Твой английский становится лучше.*

4. The situation is temporary. The marker words include ***until*** (пока не), ***for*** (в течение), ***during*** (в течение).

He is staying in Rome until May only. – *Он пробудет в Риме только до мая.*

5. The action is planned and will be done in the near future, with a date, place, or other detail mentioned. The marker words include ***this/next week*** (на этой/следующей неделе), ***tonight*** (сегодня вечером), ***today*** (сегодня), ***tomorrow*** (завтра), ***this/next year*** (в этом/следующем году), ***this/next weekend*** (в эти/следующие выходные), etc.

Next semester we are offering a new course on translation problems. – *В следующем семестре мы предлагаем новый курс по проблемам перевода.*

6. The action effects the nearest future. It is expressed with verbs of motion, such as ***go*** (идти), ***move*** (двигаться), ***leave*** (уходить), ***come*** (приходить), ***return*** (возвращаться), ***approach*** (приближаться, наступать), etc.

I'm coming in five minutes. Are you ready? – *Я приду через 5 минут. Ты готов?* **7. The speaker is dissatisfied or annoyed** by something that happens regularly. The marker words include ***all the time*** (все время), ***constantly*** (постоянно), ***always*** (всегда) and are used after the auxiliary verb 'to be.'

You are always interrupting me! – *Ты постоянно меня перебиваешь!*

• Verbs avoiding the Present Continuous

Most verbs that denote a state are not used in the Present Continuous. The static verbs include, but are not limited to the following verbs.

• *Verbs of sense perception*: see, recognize, hear, smell, appear, taste, seem, sound

• *Verbs of desire and preference*: want, wish, hope, like, forgive, prefer, hate, love

• *Verbs of mental activity*: think, know, mean, understand, remember, guess, agree, believe

• *Verbs of relation, possession, and belonging*: have, own, belong to, be, matter, concern, depend (on), consist (of), contain, cost.

However, some static verbs can become action verbs signifying a physical or mental activity that has a beginning and an end, for example, *see* (встречаться, видеться), *think* (размышлять), or the verb *have* in some set expressions like *have* breakfast (завтракать), *have* a good time (хорошо проводить время), etc. When denoting an action, such verbs can have Continues tenses:

Sorry, I am having a dinner now. Can I call you back? – Извините, я сейчас ужинаю. Могу я позвонить вам позже?

B. Past Continuous in use

The Past Continuous denotes an action that took place at a certain moment in the past. It emphasizes the process and duration of the action and can be signaled by time expressions (*at that moment*, *at ... o'clock, yesterday*) or by another verb denoting a short, one-time action. There are three main cases when the Past Continuous is used.

1. A lasting action took place at a certain moment in the past.
They were presenting their project exactly at this time a week ago.

2. Two actions were taking place simultaneously, at the same time.
My friends were reading for a quiz on IT while I was memorizing a text in English.

3. The sentence describes an action, during which another action occurred (expressed in the Past Simple).
I was cleaning the room when my roommate came. He was having a bath when suddenly the light went out.

C. Future Continuous in use

Verbs in the Future Continuous tense denote an action that will take place at a certain point in time in the future. In this case, certain time

expressions are often used, e.g., ***tomorrow at five o'clock***, ***at this time next week***, ***the whole morning tomorrow***, and the like. There are several cases when the Future Continuous is used.

1. A lasting action is projected into the Future as real or desirable.

Just think! This weekend I will be skiing in the Gornyi Altai. – Поду-мать только!

В эти выходные я буду кататься на лыжах в Горном Алтае!

2. A continuous event is expected to happen.

When he arrives, he will be staying with friends. – Когда он приедет, он будет жить у друзей.

3. An upcoming action is predicted or guesses are made about it.

He'll be coming to the meeting, I expect. – Я полагаю, он придет на встречу.

4. An event is already happening now and might continue into the future.

The marking word is the adverb *still*.

Sea levels will still be rising in 20 years. – Уровень моря будет повышаться и через 20 лет.

5. In interrogative sentences, the form can be used to ask politely for information about the future.

Will you be bringing your friend to the exhibition tonight? – Вы приве-дете вашего друга на выставку сегодня вечером?

PERFECT TENSES (ACTIVE)

HAVE + V3

Present Perfect Tense

I've been to London. She hasn't phoned her friend. Have you seen Rachel?

There are three basic uses of the ***Present Perfect Tense***.

• **To talk about an action at an indefinite point in the past**. The time when the action happened is not important.

I've read "War and Peace". (At some time in my life – it's not important when.) *Ever* is common in questions: *Have you ever been to London?*

Never can be used to form the negative: *I've never been to New York.*

• **To talk about something started in the past and continuing up to the present**. It is unfinished.

She's worked here for three years. (She still works here now.)

• **To talk about an action recently finished in the past.**

Just is frequently added to emphasise this.

I've just done the washing up. (The action is finished, but it finished a short time ago.)

Tense indicators:

just	up till now	today
already	before (now)	this morning
yet	never	it's the first time
recently	so far	often
lately	since	(not) ever
for ages	at last	in the last few days

Future Perfect Tense

I'll have finished my homework by 6.00. She won't have caught the train yet.

Will you have typed that letter by 7.00?

There are three basic uses of the *Future Perfect Tense*.

• **To say how long something will have been in progress by a certain time in the future.**

By next month I'll have lived in the same house for ten years.

• **To say that something will have finished by a certain time in the future**. We do not know when exactly it will finish - only that it will finish before the given time.

I'll have finished this report by 9.00. (At some time before 9.00.)

• **The future perfect is common with the expression by now to make predictions**. It means 'by this time' - the time that we are speaking.

Belinda has an exam today.

I know. I think she'll have finished by now. She may be at home.

Past Perfect Tense

She had left before I arrived. I hadn't met her before.
Had you known each other long before you got married?

The Past Perfect Tense is formed with had and the past participle of a verb.

• The Past Perfect is used to say that one thing happened in the past before another thing happened, also in the past.

She had left when I arrived.

• The Past Perfect Tense is not used on its own. The Past Perfect Tense always relates to another verb in the past (either simple or continuous), although this verb may not be in the same sentence.

• The Past Perfect Tense is often used with when and after. Time words like these can give the same information as the Past Perfect Tense – tell you which action happened first. Therefore, you can sometimes use either the Past Simple or the Past Perfect with no change in meaning.

Present Perfect	Future Perfect	Past Perfect
I *have* already *written* the letter	I *will have written* the letter by Monday	After I *had written* the letter, I put it on the table

PASSIVE VOICE

• What is the passive voice?

The passive voice in English grammar allows us to make the recipient of the action the focus of the sentence. The person or thing performing the action is unknown, unimportant or obvious.

• The passive is formed as follows: (form of) to be + past participle.

Example:

English proverbs are studied. – Английские пословицы изучаются.

Scientific article is being written by me. – Научная статья пишется мной.

• When to use the passive in English grammar?

Active sentences usually follow the subject-verb-object word order and focus on the person or thing performing the action.

Example:

I studied English proverbs. – Я изучала английские пословицы.

In contrast, the passive voice focuses on the action itself. Passive sentences tell us what happens to the recipient of the action.

Example:

English proverbs have been studied. – Английские пословицы изучены.

We use the passive when the person or thing performing the action (known as the agent) is unknown, unimportant or obvious.

Example:

English proverbs have been studied. → unknown agent;

Scientific article is being written by me. → *obvious agent (I);*

A mistake has been made. → *avoids naming the agent;*

If we want to include the agent of a passive sentence, we use the preposition by;

English proverbs have been studied by me. – Английские пословицы изучены мной.

• How to form the passive?

Passive sentences are formed as follows: **form of be + past participle of the main verb.**

Only the form of the verb be changes depending on the tense that we are using; the past participle remains the same in every tense.

Tense	Example
Present Simple	Thesis is studied
Present Progressive	Thesis is being studied.
Present Perfect	Thesis has been studied.
Simple Past	Thesis was studied.
Past Progressive	Thesis was being studied.
Past Perfect	Thesis had been studied.
Will Future	Thesis will be studied
Future with going to	Thesis is going to be studied.
Future Perfect	Thesis will have been studied.
Infinitive	Thesis should be studied.Thesis would be studied.
Perfect Infinitive	Thesis should have been studied.Thesis would have been studied.

The present perfect progressive and the past perfect progressive do not exist in the passive. Instead, we use the simple forms (present perfect simple and past perfect simple).

• How to change a sentence from active to passive?

When transforming a sentence from active to passive, we can take a step-by-step approach.

Step 1: identify the object of the sentence and bring it to the front
active: *I studied English proverbs*   **passive:** *English proverbs ...*
Step 2: identify the tense and conjugate the verb **be** accordingly
active: *I studied English proverbs*
I studied English proverbs = simple past
passive: *English proverbs were ...*

Step 3: find the past participle of the main verb

active: *I studied English proverbs. → study – studied – studied*

passive: *English proverbs were studied.*

Step 4: decide if you need to include the agent

active: *Someone studied English proverbs. → Who studied English proverbs? We don't know.*

The agent is unknown and therefore unnecessary in this case.

Step 5: if the agent is important, we introduce it using the preposition by.

active: *I studied English proverbs.*

passive: *English proverbs were studied by me.*

This sentence does not make sense without the agent.

Note. Because the direct object of the active sentence becomes the subject of the passive sentence, we can only use transitive verbs in the passive voice (e.g., *steal a car, write a book, make a mistake…*). Intransitive verbs do not take a direct object (e.g., *arrive, die, go…*) so cannot be used in the passive.

Table of English Tenses in Active and Passive

Check out the table below to learn how to change active sentences into the passive voice in every tense.

Tense	Active	Passive
Simple Present	I write an article.	An article is written.
Present Progressive	I am wringing an article.	An article is being written.
Present Perfect	I have written an article.	An article has been written .
Simple Past	I wrote an article.	An article was written.
Past Progressive	I was writing an article.	An article was being written.
Past Perfect	I had written an article.	An article had been written.
Will Future	I will write an article.	An article will be written.
Future be going to do smith	I am going to write an article.	An article is going to be written.
Future Perfect	I will have written an article.	An article will have been written.

Tense	Active	Passive
Infinitive	I <u>would write</u> an article. I <u>can write</u> an article.	An article would <u>be written</u>. An article can <u>be written</u>.
Perfect infinitive	I <u>would have written</u> an article. I <u>might have written</u> an article.	An article <u>would have been written.</u> An article <u>might have been written.</u>

MODAL VERBS

Modals: ***can, could, shall, should, will, would, may, might, must*** are used to show the speaker's attitude towards the action. We use them with other verbs. We don't use the "to" – infinitives after modals. There is no – (e)s in the 3rd person singular.

Example: He **can** solve difficult tasks.
She **must** educate students on the environmental issues.
Modals form questions and negatives without use of other auxiliary verbs.

Example: **Can** you plant flowers and take care of them?
Why **must** people be involved in environmental initiatives?
People **shouldn't** use natural resources in a wasteful way.
Cities **mustn't** encroach on natural areas.)

Overview of Modals and Related Expressions

Examples	Explanations
She **should** leave. (advice) She **must** leave. (necessity) She **might** leave. (possibility)	Modals add meaning to the verbs that follow them.
You **should** not leave now. He **cannot** speak English.	To form the negative, put ***not*** after the modal. ***Cannot*** is written in one word.
A pen **should be used** for the test. The movie **can be seen** next week.	A modal can be used in the passive voice: **modal + be + past participle**
He **must** go to the court. = He **has to** go to court. He **can** speak English well. = He **is able** to speak English well.	The following expressions are like modals in meaning: ***have to, have got to, be able to, be supposed to, be allowed to, had better***

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Can

• Forms

Modal verbs / equivalents	Present	Past	Future
can to be able to	can am / is / are able to	could was / were able to	– will be able to

NOTES:

− *To be able to* can be used in any tense. *Can* is used only in the present and in the past.

− The expression *to be able to* means the possibility of performing specific actions in a particular situation. The verb *can* means general ability.

− I can play basketball, but I'm not able to play today, I have hurt my arm. – Я умею играть в баскетбол, но я не могу играть сегодня, потому что я повредил руку (particular situation).

• Functions

1. Mental, physical, circumstantial ability	Can you lift the box? – Ты можешь поднять эту коробку? He can't solve this problem. – Он не может решить эту проблему. She can get home by bus. – Она может добраться домой на автобусе.
2. Permission	They can leave now. – Теперь они могут уходить.
3. Request	Can I borrow your book, please? – Можно я возьму вашу книгу, пожалуйста?
4. Prohibition	You can't tell me what to do. I'm a grown independent person! – Ты не можешь указывать мне. Я взрослый и независимый человек!
5. Strong doubt or astonishment	Can he know it? Неужели он это знает?

Can / could may be followed by the Simple, Continuous, Perfect or Perfect Continuous infinitive.

She **can't / couldn't** be still waiting – Не может быть, чтобы она вас все еще ждала. (The Continuous infinitive)

Can / could they have spent all the money? – Неужели они потратили все деньги? (The Perfect infinitive)

Can / could he have been waiting for us all this time? – Неужели он ждал нас все это время? (The Perfect Continuous infinitive)

Could implies more uncertainty than *can*.

May

• Forms:

Modal verbs / equivalents	Present	Past	Future
may / to be allowed to	may am / is / are allowed to	might was / were allowed to	– will be allowed to

NOTES:

− *To be allowed to* is used when we want to emphasize that permission or prohibition comes from someone else:

− You are not allowed to enter here. – Вам не разрешается входить сюда.

• Forms:

1.To ask for permission	May / might I borrow your pen? –Могу я одолжить вашу ручку?
2.To give permission	You may / might shut the window if you become cold. – Вы можете закрыть окно, если вам станет холодно.
3.To express possibility	Take your coat, it might get colder outside – Возьми пальто, на улице может похолодать.
4.To express uncertainty, supposition implying strong doubt	I can't find my keys anywhere. – You may / might have left it somewhere. - Я нигде не могу найти свои ключи. – Возможно, вы оставили их где-то.
Reproach	You might have told me the truth – Ты мог рассказать мне правду.

NOTES:

In the meaning of supposition implying uncertainty and expressing possibility, the form *might* can also be used. While we use *may* in the sentences which are somewhat possible, *might* is found in the situation which is hypothetical, and the chances of possibility are quite less.

May / might / may be followed by the Simple, Continuous, Perfect infinitive, Perfect Continuous infinitive.

She **may / might** be hungry – Возможно, она голодная. (The Simple infinitive)

He **may / might** be reading a book at the moment – На данный момент она, возможно, читает книгу. (The Continuous infinitive)

You **may / might have told** me the truth – Ты мог рассказать мне правду. (The Perfect infinitive)

He **may have been talking** to his daughter for an hour – Возможно, он уже час разговаривает со совей дочерью. (The Perfect Continuous infinitive)

Might implies more uncertainty than *may*.

In the meaning of asking or giving permission, the form *might* is used when we wish to express a more polite request.

Must

• Forms:

Modal verbs / equivalents	Present	Past	Future
must have to	must have to has to	– had to	– will have to

NOTES:

To have to expresses obligation or necessity arising out of circumstances (приходится, вынужден). – I have to get up at 5 every day. – Я вынужден вставать в 5 утра каждый день.

• Functions

1.Obligation, necessity	You must talk to your daughter about her future. – Вы должны поговорить с вашей дочерью о ее будущем.
2.Prohibition	People mustn't smoke in the building. – Людям запрещается курить здесь.
3. Supposition implying strong probability	He must be at home. I saw him entering the house. – Он, должно быть, дома. Я видел, как он заходил в дом.

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NOTES:

Both *may* and *must* serve to express supposition but their use is not parallel. *May* denotes supposition implying uncertainty, whereas the supposition expressed by *must* implies strong probability.

The form *must* may be followed by the Simple, Continuous, Perfect infinitive, Perfect Continuous infinitive.

It is ten o'clock. She **must have done** her homework. – Сейчас десять часов. Должно быть, она сделала свою домашнюю работу. (The Perfect infinitive)

The car keys are not on the shelf. She **must be driving** her car. – На полке нет ключей от машины, она, должно быть, едет на машине. (The Continuous infinitive)

She **must have been crying** all the night. Her eyes are red. – Должно быть, она плакала всю ночь. У нее глаза красные. (The Perfect Continuous infinitive)

Should

• Functions

1.Moral obligation, advisability and desirability	You should spend more time with your daughter. – Вам нужно проводить больше времени с вашей дочерью.
2.Disapproval	You should have helped your parents. – Вы должны были помочь родителям.
3.Supposition implying strong probability	She should be at work. – Она должна быть на работе.

NOTES:

– In the meaning of moral obligation, *should* can be used with the Perfect infinitive (should + have + past participle). This structure is used to talk about past events which did not happen. – You **should have told** me the truth. – Вам следовало бы мне сказать правду.

– If reference is made to the present, the Continuous infinitive is used. – We **shouldn't be telling** you all this. – Мы не должны вам все это рассказывать.

Ought to

The modal verb *ought to* has only one form which is used with reference to the present or future.

• Functions

1.Obligation	He oughtn't to send it to anybody. – Он не должен был посылать это кому бы то ни было.
2.Supposition implying strong probability	The new hospital ought to be very comfortable. – Новая больница должна быть более удобной.

NOTES:

− *Ought to* can be used with the Perfect infinitive.

− You **ought to have chosen** a more suitable time to tell me this news. – Тебе следовало бы выбрать более подходящее время для того, чтобы сообщить эту новость.

− In the meaning of supposition, the use of *ought to* in this case is not very common as this meaning is normally rendered by *must*.

− *Should* and *ought to* are very much alike in meaning and are often interchangeable. In using *ought to*, however, we lay more stress on the meaning of moral obligation, whereas *should* is common in instructions and corrections.

− You **ought to help** your grandparents. – Вы должны помогать своим бабушке и дедушке.

− You **should** correct this sentence. – Вам следует исправить это предложение.

SEQUENCE OF TENSES

He says…	He said…
1. …that he **works** hard 2. …that he **worked** hard 3. …that he **will work** hard	1. …that he **worked** hard 2. …that he **had worked** hard 3. …that he **would work** hard

If the verb in the principal clause is in the past tense (usually, in the Simple Past), a past tense (or future -in- the past) must be used in the subordinate clause. The action expressed in the subordinate clause can be simultaneous with the action expressed in the principal clause, prior or poster to that of the principal clause.

General rule is: we move the reported clause '**one tense back**', *Present* becomes *Past, the Past Simple* becomes *the Past Perfect*, *will* becomes *would*.

When reporting something which was said in another place or a long time ago, other parts of the sentence may have to be changed.

• *here – there*

- *this – that*
- *these – those*
- *now – then / at that moment / right away*
- *today – that day*
- *yesterday – the day before / the previous day*
- *tomorrow – the next / following day*
- *a year ago – a year before*
- *last night – the previous day*
- *tonight – last night*

NB! Adverb changes depend on the context. It is not always necessary to make these changes, especially in spoken Indirect Speech.

*'I'll see you **tonight**', he said. – He said he **would see** me **tonight**.*

Notes:

1. The Past Simple can stay the same if we use Past Simple indicators such as:

*in 1971 – He **said** that he **was** born in 1977.*

*5 years ago – Laura **said** that she **visited** Novosibirsk 2 years ago.*

*yesterday – She **knew** that I **was** at home yesterday.*

*last week – They **thought** that I **was** in China last week.*

*when he came – He **said** he **was** working when I rang him up.*

2. If a general truth is expressed in the object subordinate clause, the present tense is usually used in the subordinate clause despite the fact that the past tense is used in the main clause.

*Newton **discovered** that the force of gravity **pulls** all bodies to the Earth.*

*Galileo **proved** that the Earth **revolves** around the Sun.*

Indirect Statements

Indirect Speech is formed according to the rule of the Sequence of Tenses. The verbs mostly commonly used to introduce reported speech are: *to tell, to say, to add, to notice, to remark, to explain, to inform, to remind, to mention* etc.

Direct Speech	Indirect Speech
*Nick explained 'I **know** the man'.*	*Nick explained that he **knew** the man.*
*The teacher told John 'You **didn't wright** exercise two'.*	*The teacher told John that he **hadn't written** exercise two.*
*'I **will be absent** tomorrow,' John remarked.*	*John remarked that he **would be absent** the next day.*

If the reporting verb is in the present, the tenses that follow are usually the same as used in the original statement.

*'I've eaten' – He says he **has eaten**.*
*'I **enjoyed** it' - He says he **enjoyed** it.*

Indirect Command and Request

We report the imperative with a suitable *verb + to Infinitive*

Direct Speech	Indirect Speech
The mother said to her lazy boy '**Wake up**!'	The mother *told* her lazy boy **to wake** up.
Father said to me '**Remember to post** these letters'.	Father *reminded* me **to post** those letters.
Mother said to the children '**Don't enter** this room'.	Mother *warned* the children **not to enter** that room'.

Indirect General Questions

To report a question, we should:

1. change the word order: the inversion in the direct question changes to statement word order.

2. If necessary, change the tense according to the Rule of the Sequence of Tenses.

3. Use if / weather (ли) after the verbs *ask, inquire, want to know, wonder etc.*

Direct Speech	Indirect Speech
Ann's mother: '**Are** you **tired**?'	Ann's mother *asked* her **if** she **was tired.**
She: '**Do** you **have** any plans for the weekend?'	She *asked* **if** I **had** any plans for the weekend.
Laura: '**Did** you **buy** a new car?'	Laura *wondered* if I **had bought** a new car.
The policeman: '**Have** you **seen** the sign?'	The policeman *wanted to know* whether I **had seen** the sign.
She asked: '**Can** you give them a call?'	She *asked* **if** I **could** give them a call.

Indirect Special Questions

An indirect special question is introduced by the same adverb or pronoun that introduces the direct question (word order and tense changes remain the same as in the Indirect General Questions).

Direct Speech	Indirect Speech
The teacher: 'Why **haven't** you **done** your home assignment?'	The teacher *inquired* why the students **hadn't** done their home assignment.
Laura: 'Where **do** your parents **live**?'	Laura *wondered* where my parents **lived**.
The grandmother: 'Why **is** the child **crying**?'	The grandmother *asked* why the child **was crying.**
My friend: 'Who **did** you **meet** at the theater?'	My friend *wanted to know* who I **had met** at the theater.

THE DIRECT AND INDIRECT SPEECH

Direct Speech, also known as quoted speech, consists of words or phrases that are taken directly from the source. These words are quoted or written exactly as the words were originally spoken.

With regard to direct speech, there is no interpretation or annotation; the words are taken directly from one source and repeated to another. In other words, we take the words directly from the speaker and repeat them exactly as they were originally stated.

Here are some examples of direct speech:

1) *Jonah said, "I don't like your hat."*

2) *Jonah said, "Please take off that Yankees hat."*

In these examples, the direct speech is shown in quotations, which signifies that the speech is taken directly from the source with no alterations.

Indirect Speech, also known as reported speech, is when words or phrases are reported in our own words. The original words are modified and/or interpreted as opposed to being quoted.

When talking about indirect speech, we use words that refer to something that has already happened. To do so, we are speaking in the past tense and are summarizing, modifying, or synthesizing what has already been said.

Here are some examples of indirect speech:

1) *Amy said it was cold.*

2) *She said she had been teaching college classes for two years.*

Converting Direct to Indirect Speech

When we use direct speech, we are repeating what was said. So, we use the rule Sequence of Tenses (if only this is not an exception when speaking about natural laws, permanent characteristics, etc.). When converting speech

from direct to indirect, you must change the present tense verbs to the past tense and remove any quotation marks or commas.

1. Changing from Present Tense to Past Tense. When converting speech from direct to indirect, you must change the present tense verbs to the past tense and remove any quotation marks or commas.

Direct Speech (Present Tense) ⇨	Indirect Speech (Past Tense)
Jenn says, "I love watching TV." ⇨	Jenn said she loved watching TV.

2. Changing from Simple Past Tense to Past Perfect Tense. What if the direct speech is already written in the past tense? If the sentence is written in simple past tense, you just remove the punctuation and change the verb to past perfect to make it indirect speech.

Direct Speech (Simple Past Tense) ⇨	Indirect Speech (Past Perfect Tense)
Lana said, "I saw him at the mall." ⇨	Lana said she had seen him at the mall.

ENGLISH PARTICIPLE

Participle is a type of word derived from a verb that is used for a variety of purposes, such as an adjective or to construct verb tenses.

Example: We can solve the issue *using* this approach.

Have you read the letter *written* by out teacher?

Participles have a number of **functions**, such as:

Function	Example
1. Attribute (определение)	The trees growing in our garden are beautiful. Деревья, растущие в нашем саду, красивы. The method used in this research was effective. Метод, использованный в этом исследовании, был очень эффективен.
2. Circumstance (обстоятельство)	Travelling a lot, she learned a lot of languages. Часто путешествуя, она выучила множество языков. He walked at the park singing his favorite song. Он гулял в парке, напевая свою любимую песенку. Having lost the keys, we couldn't enter the room. Потеряв ключи, мы не могли попасть в комнату.

Function	Example
3. Part of the predicate (часть сказуемого)	They are running together in the park. Они бегают в парке вместе. They will be studying tomorrow. Завтра они будут учиться вместе.
4. After the verbs of perception (глаголы восприятия): hear, look, smell, see, find, notice, feel, watch.	I watched him crying and sobbing. Я смотрела, как он плачет и всхлипывает. She noticed us being lazy and careless. Она заметила нас, ленящихся и беззаботных.
5. Complex object (сложное дополнение)	He heard his name mentioned. Он услышал, как упомянули его имя (услышал своё имя упомянутым). I'll have the work done by the next week. Работа будет закончена к следующей неделе (Я закончу работу к следующей неделе).

• Present Participle/Participle I (причастие настоящего времени)

The Present Participle in English is used to denote an action that occurs simultaneously with the action expressed by the predicate. The present participle is formed by adding "ing" to the base form of the verb:

Active voice:

I saw her *laughing*. Я увидел, как она смеялась (Я увидел её, смеющуюся).

We talked a lot *drinking* tea and *playing* table games. Мы много болтали, *попивая* чай и *играя* в настольные игры.

Passive voice:

Being built many years ago, the house looked very old. *Будучи построенным* много лет назад, дом выглядел старым.

The test *being written* at the moment is very important. Тест, который в данный момент пишут (будучи проходимым), очень важен.

• Past Participle/Participle II (причастие прошедшего времени)

The Past Participle in English is used only in the passive voice, and in the past tense. It denotes actions that were already done or actions that had occurred before the main action was performed.

This girl is *loved* and *admired* by everybody. Эту девушку любят и восхваляют все (Она любима и обожаема всеми).

The book *written* by our teacher was interesting. Книга, написанная нашим учителем, была интересной.

Painted by a young artist, the picture looked unusual. Нарисованная молодым художником, картина выглядела необычно.

• Perfect Participle/Participle III (перфектное причастие)

The Perfect Participle shows that the action being expressed happened before the main action in the sentence. The structure of Perfect Participle is: **having + Verb-ed/V3.**

Active voice:

Having finished his task, he went out for a walk. Закончив задание, он вышел прогуляться.

Having bought some vegetables, she drove home. Купив овощей, она поехала домой.

Passive voice:

Having been told about this place, she decided not to go there. Узнав об этом месте (когда ей рассказали об этом месте), она решила не ходить туда.

Having been cooked, the cake looked delicious. Будучи приготовленным (когда его приготовили), торт выглядел вкусно.

• Nominative Absolute Participle Construction

Nominative Absolute Participal Construction is a combination of a common noun or a nominative pronoun and a participle (where the noun or pronoun is not the subject of the sentence). Both participle I and participle II can be used in the construction:

The door of the room being open, *we came in.* – *Так как дверь комнаты была открыта, мы вошли.*

The weather being rainy, *we decided to delay our trip.* – *Поскольку погода была дождливой, мы решили отложить поездку.*

It is used **only** in the functions of **an attribute** and **an adverbial modifier**. It can be:

a) a complex attribute, e.g.: They passed old villages, *some of them deserted and forlorn,* and saw an ancient abandoned castle high on a hill.

b) a complex adverbial modifier of time, e.g.: *The question being settled,* we went home.

THE GERUND AND GERUNDIAL CONSTRUCTIONS

General review:

The verb has finite and non-finite forms. The latter being also called the Verbals. The Verbals do not express person, number or mood, that is why they cannot be used as the predicate of a sentence.

There are three verbals in English: The Gerund, the Infinitive and the Participle.

Gerunds are formed from verbs by adding ING: *be – being; go – going; play – playing*; write – writing. Gerunds can be formed from most verbs (except modal verbs).

Example: *His hobby is collecting coins.*

Forms/ use of the Gerund

FORMS	**Active**	**Passive**
Simple (Indefinite)	writing	being written
Perfect	having written	having been written

The Tense Distinctions of the Gerund are relative:

The Indefinite Gerund	**The Perfect Gerund**
• denotes an action simultaneous with that of the predicate. *I was tired of reading and dead sleepy.*	• denotes an action prior to that of the predicate. *He didn't remember ever **having seen** her in black.*

1. Prior action is not always expressed by a Perfect Gerund. In some cases we find an Indefinite Gerund.

After the verbs: *remember, excuse, forgive, thank.*

After the prepositions: *on (upon), after, without.*

• I don't remember **hearing** the legend before.

• You must excuse my **not answering** you before.

The Gerund has special forms for the Active and Passive Voice.

• He liked neither **reading** nor **being read to**.

2. After the verbs: *want, need, deserve,* require, be worth, the Gerund is used in the active form though it is <u>passive in meaning</u>.

• The room *needs* **painting.**

• The film is *worth* **seeing.**

• The child *deserves* **praising.**

The functions of the Gerund

The main functions of the Gerund are: **the Subject, the Object and the Predicative**.

1. The Subject

<u>Gambling</u> *is a very dangerous occupation. – Азартные игры – это очень опасное занятие.*

2. The Object

He was accused of <u>having stolen</u> this necklace. – *Его обвиняли в том, что он украл это ожерелье.*

3. The Predicative

The main occupations of the Slavonic tribes <u>were hunting, fishing, bee-keeping and herding</u>. – *Основными занятиями славянских племен были охота, рыбалка, пчеловодство и скотоводство.*

4. The Gerund can be part of the Compound Verbal Aspect Predicate.

When I came in, they stopped <u>talking</u>. – *Когда я вошел, они перестали говорить.*

5. The Gerund can be used as an attribute, always with the preposition *of*.

I don't approve of the idea <u>of his being sent </u>there. – *Я не одобряю идею, отправить его туда.*

6. The Gerund can be used as an adverbial modifier; in this function it is always preceded by a preposition.

a. An adverbial modifier of time with the prepositions *before*, *in* (the actions are simultaneous), *at*, *on* (*upon*), *after* (the action is prior).

<u>At</u> looking at her watch she saw that it was late to go to the lecture. – *Посмотрев на часы она поняла, что было уже поздно идти на лекцию.*

<u>On</u> going into the street, he saw that the rain had stopped. – *Выйдя на улицу он увидел, что дождь уже кончился.*

<u>After</u> analyzing these data, we changed our opinion. – *После анализа этих данных мы изменили свое мнение.*

b. **An adverbial modifier of manner with the prepositions *by* or *in*.**

He spent the day in packing. – *Он провел день упаковывая вещи.*

c. **An adverbial modifier of attendant circumstances with the preposition *without*.**

He went out without saying a single word. – *Он вышел не проронив ни слова.*

d. **An adverbial modifier of cause with the prepositions *due to*, *owing to*, *because of*, *for fear of*, *for* (in the meaning of *благодаря*).**

He feels much better for having spent summer in the country. – *Он чувствовал себя на много лучше благодаря тому, что провел лето загородом.*

e. **An adverbial modifier of concession with the preposition *in spite of*.**

He always finds time to play with his son in spite of being busy. – *Он всегда находит время для того, чтобы поиграть со своим сыном, несмотря на занятость.*

f. **An adverbial modifier of condition with the preposition *without*.**

I will not be able to do it without being helped. – Я не смогу сделать это, если мне не помогут.

The Gerundial Construction

Like any construction the Gerundial construction consists of two elements – the nominal and the verbal one expressed by the Gerund; the nominal element can be expressed in three ways:

1. By a possessive pronoun.

It resulted in his being arrested. – Это закончилось тем, что его арестовали.

2. By a noun in the Possessive case.

I insist on our customer's being invited to this discussion. – Я настаиваю на том, чтобы нашего клиента пригласили на обсуждение.

3. By a noun in the Common case.

Einstein being rewarded the Nobel price soon became widely known. – Вскоре стало широко известно, что Эйнштейн награжден Нобелевской премией.

I hate animals being treated cruelly. – Я ненавижу, когда с животными жестоко обращаются.

There are cases where the nominal element must be expressed by a noun in the common case:

a. When the nominal element is expressed by two or more nouns.

I insist on Ivanov and Smirnov joining our group. – Я настаиваю на том, чтобы Иванов и Смирнов присоединились к нашей группе.

b. When the nominal element has an attribute in postposition:

He insisted on all Russian prisoners of war being returned to their motherland. – Он настоял на том, чтобы все русские пленные были возвращены на родину.

c. When the nominal element is expressed by a noun denoting a lifeless thing:

The captain insisted on the boat being unloaded at once. – Капитан настаивал на том, чтобы корабль немедленно разгрузили.

d. When the nominal element is expressed by a pronoun that is not possessive.

I hope I can reply on everything being done in a proper way. – Я надеюсь, что могу положиться на то, что всё сделано правильно.

Verbs followed by Gerunds

1. The Gerund is used after the following verbs and word expressions:

to mind doing	*Do you mind opening the door?*
to keep doing	*She kept laughing*
to avoid doing	*Avoid walking alone in the dark.*
to deny doing	*He denies robbing the bank.*
to imagine doing	*Just imagine spending a holiday there*
need doing	*The floor needs washing.*
can't help doing	*I couldn't help laughing.*
to be worth doing	*The exhibition is worth visiting.*
to feel/not feel like doing	*I don't feel like talking.*
it's no use doing	*It was no use speaking with him*
What's the use of?	*What's the use of arguing?*
to be used to doing	*He is used to getting up late.*
to be fond of	*I'm fond of swimming.*
to be tired of	*I'm tired of waiting*
to be (in) capable of	*He is capable of doing the work.*
to be interested in	*He is interested in talking to you*
There are a lot of ways of doing	*There are a lot of ways of doing it*
his manner (way, habit) of doing	*I hate his manner of speaking*

2. The Gerund is used after the following prepositions:

before	Please phone me *before* coming.
after	*After* talking to him let me know.
on	*On* arriving in the city, he went to the hotel.
without	He sat down *without* saying anything.

3. The Gerund is used after the following verbs with prepositions:

to go on	He went on speaking.
to dream of	I'm dreaming of spending a week at the sea.
to look forward to	I'm looking forward to seeing them.
to give up	She gave up smoking.
to object to	I object to your coming late.
to insist on	He insists on leaving

THE INFINITIVE

Infinitives are a special form of verbs that can be used as a noun, adjective, or adverb. They are usually made by adding the word *to* before the base verb, and they can be useful when discussing actions without actually doing the action, such as "I want to go home."

Usually, infinitives are formed by adding the word *to* before the base form of the verb, as in *to be*, but sometimes the base form of the verb is used alone.

The purpose of infinitives is to discuss an action in general instead of a specific instance of the action being done. For example, take a look at these two sentences:

• *I need **to win**.*
• *Today, we win.*

The first sentence uses the infinitive form of the verb *win* as a noun; the main verb of the sentence is actually "need." The second sentence uses the standard form of *win* as an actionable verb. In the first sentence with the infinitive, the action of "winning" is not actually done; the sentence simply discusses the idea of winning. The second sentence, however, describes the action of winning.

There are two main types of infinitives: **full infinitives** and **bare infinitives**. Below, we explain when and how to use each.

FULL INFINITIVES

Full infinitives, also known as to-infinitives, are the most common infinitives in writing. You can create a full infinitive by taking the base form of a verb and adding *to* in front of it. For example, the verb *be* – which is often conjugated to *is*, *are, was, were,* etc. – becomes the full infinitive *to be*, as in Shakespeare's famous infinitive example from *Hamlet*:

• *To be or not to be...*

Full infinitives are used in the following situations:

1) To show purpose or intention. Infinitives are used to explain why someone is doing something, often replacing the phrase "in order to." In this case, they act as adverbs to describe the main verb.

• *Mom left **to buy** milk.*
• *I'm writing this email **to tell** you something important.*
• *Did you come to college **to study** or **to party**?*

Unlike an adverbial clause, an infinitive phrase used as an adverb does **not** need an active verb.

2) To modify nouns. Just like how full infinitives can add extra information about verbs, they can also modify the meanings of nouns. In this case, they act as adjectives and adjective phrases.

• *We need a hero **to save** us.*
• *Would you like something **to drink**?*
• *It was a dumb thing **to say**, and I regret it.*

3) As the subject of a sentence. If you want to talk about an action in general as the subject of the sentence, use the full infinitive form.

• ***To love** someone requires patience and understanding.*
• ***To go** this late seems pointless.*
• ***To unlearn** is the highest form of learning.*

4) After adjectives. Full infinitives can add context or extra description when used after adjectives.

• *I'm happy **to be** here.*
• *Isn't it nice **to leave** the city?*
• *Computers are easy **to use** with practice.*

5) With the words *too* or *enough*. When using the adverbs *too* and *enough*, we use the full infinitive to explain why. In these cases, the infinitive is often unnecessary, but it's nonetheless a helpful addition if the sentence is vague.

• *I have too many books **to fit** in my backpack.*
• *We collected enough firewood **to last** the winter.*
• *They were old enough **to vote** but not **to drink**.*

6) Phrases with most relative pronouns. Use the full infinitive in phrases that start with one of the relative pronouns *who, whom, what, where, when,* and *how* – but **not** *why*.

• *I don't understand how **to beat** the Level 5 boss.*
• *Playing cards is about knowing when **to hold** them and when **to fold** them.*
• *Here's a list of whom **to call** in an emergency.*

Keep in mind that you only use full infinitives when relative pronouns are used as phrases, but not typically when used for questions:

• *I don't know what **to do**.*
• *What to do?*

7) With certain verbs. Certain verbs always use the full infinitive if they're followed by a verb form. These words can still be used without an infinitive at all – but if they use an infinitive, it should be the full infinitive.

1. afford	11. condescend	21. guarantee	31. offer	41. swear
2. agree	12. consent	22. happen*	32. plan	42. tend
3. aim	13. decide	23. have **	33. prepare	43. threaten
4. appear	14. demand	24. hesitate	34. pretend	44. trouble
5. arrange	15. deserve	25. hope	35. proceed	45. undertake
6. attempt	16. determine	26. learn	36. promise	46. used***
7. beg	17. endeavor	27. manage	37. refuse	47. volunteer
8. care	18. expect	28. mean	38. resolve	48. vow
9. choose	19. fail	29. need	39. seem	49. want
10. claim	20. forget	30. neglect	40. stop	50. wish

as an impersonal verb
** *as a main verb, not as an auxiliary verb*
*** *as "used to . . ." for past habitual actions*

• BARE INFINITIVES

Bare infinitives, also known as zero infinitives, are formed without *to* – you simply use the base form of a verb within a sentence. As you can imagine, this gets confusing, but thankfully bare infinitives are less common than full infinitives.

Bare infinitives are used in the following situations:

When using an infinitive after modal verbs, you don't need to include *to*. Common modal verbs include *can*, *may, might, could, should, would, will,* and *must.*

• *Iggy can **do** this all day.*
• *We might **be** late tonight.*
• *You must not **mention** politics when talking to my father.*

After perception verbs:

Perception verbs (*see, hear, taste, feel,* etc.) use bare infinitives when their object takes an action. In this case, the order is **main verb → object → bare infinitive**.

• *I heard the car **arrive** before I saw it.*
• *They felt the ants **crawl** on their arm.*
• *She watched the woman in the red dress **walk** across the dance floor.*

These constructions are related to infinitive phrases, which we explain in detail later.

With the verbs *let*, *make*, and *do*:

Just like certain verbs always use the full infinitive, a few verbs always use the bare infinitive. These include the common verbs *let*, *make*, and *do*.

Keep in mind the verbs *let* and *make* often use a direct object, which comes between them and the bare infinitive.

• *Let me **work** in peace!*
• *He made him **promise** to behave.*
• *I don't **drink** coffee in the evening.*

With the relative pronoun *why*:

While the other relative pronouns use the full infinitive form, the word *why* uses the bare infinitive, especially when used to make suggestions in the form of a question.

• *Why **wear** a raincoat when it's sunny outside?*
• *Why not **ask** for directions?*
• *Why **bother**?*
• FORMS OF THE INFINITIVE

As the infinitive has no tense, it does not in itself indicate the time of the action that it refers to. However, it can have aspect, which shows the temporal relationship between the action expressed by the infinitive and the time of the preceding verb. There are four types of infinitives, two of which have an active and passive form:

	Active	Passive
Simple infinitive	*(to) write*	*(to) be written*
Continuous infinitive	*(to) be writing*	
Perfect infinitive	*(to) have written*	*(to) have been written*
Perfect continuous infinitive	*(to) have been writing*	

Simple infinitive refers to the same time as that of the <u>preceding verb</u>:
• *I <u>was</u> glad **to see** her.*
• *He <u>must</u> **be** very happy.*
• *I'<u>ll</u> **arrange** a meeting with the manager.*
• *My son's football coach <u>is said</u> **to be** very strict.*

Continuous infinitive refers to the same time as that of the <u>preceding verb</u> and expresses an action in progress or happening over a period of time:
• *I'<u>m</u> glad **to be sitting** here.*
• *You <u>must</u> **be joking**.*
• *This time next week, I'<u>ll</u> **be lying** on the beach in Croatia.*
• *Vincent <u>was reported</u> **to be staying** in Paris at that time.*

Perfect infinitive refers to a time before that of the <u>preceding verb</u>:

• *I'm glad **to have studied** at that school.*
• *They <u>must</u> **have forgotten** about the deadline.*
• *By next week, they'll **have finished** painting the rooms.*
• *Lucy <u>was assumed</u> **to have left** the day before.*

Perfect continuous infinitive refers to a time before that of the <u>preceding verb</u> and expresses an action in progress or happening over a period of time:
• *I'm glad **to have been living** in Barcelona for the last ten years.*
• *He <u>must</u> **have been waiting** for ages.*
• *Soon, he'll **have been running** for four hours.*
• *The organizers <u>were thought</u> **to have been preparing** for days.*

Passive infinitives are also possible:
• *Your composition <u>has</u> **to be typed**.* (Passive simple infinitive)
• *This sonnet <u>must</u> **have been written** by Shakespeare.* (Passive perfect infinitive)

COMPLEX OBJECT

Subject + Predicate + Complex Object
(Noun/Pronoun + Infinitive)

The combination of a noun in the common case or a pronoun in the objective case and an infinitive used after the predicate forms a **complex object**. The relation between the noun (pronoun) and the infinitive is that of subject and predicate.

Key examples:
• I saw **my colleague raise** his hand.
• I heard **him quote** this scientist.
• I want **you to know** the answer.

We use Complex Object after the following words:

Verb	Complex Object
mental activity: *to know, to think, to consider, to find, to expect, to suppose*	1. We *know* engineers **to use** **to be using** **to have used** nanocrystals in order to make the engine parts more durable. 2. We *know* **nanocrystals** **to be used** **to have been used** in order to make the engine parts more durable.

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wish, likes and dis-likes: *to want, to like, to hate*	1. The developers of the engine *would like* **the engineers to use** nanocrystals in order to make the engine parts more durable. 2. The developers of the engine *would like* **nanocrystals to be used** in order to make the engine parts more durable.
order and permis-sion: *to order, to ask (for), to offer, to tell, to allow, to enable, to encourage, to forbid*	1. The developers of the engine *asked* **the engineers to use** nanocrystals in order to make the engine parts more durable. 2. The developers of the engine *asked for* **nanocrystals to be used** in order to make the engine parts more durable.
NB: *to let, to make*	The researchers *made* **the metal particles form** into nano-crystals.
sense perception: *to see, to hear, to watch, to observe*	1. The researchers *saw* **the metal particles form** into nano-crystals. **forming** into nanocrystals. 2. The researchers *saw* **the nanocrystals formed**.

The interesting form of Complex Object is construction "to have some-thing done". It **means that somebody else and not the person himself performs the action, which is expressed by the verb + Past Participle, in correlation to the request or order of acting person**.

E.g., We have had our laboratory equipment repaired today. (Actually, the workmen have done it).

THE COMPLEX SUBJECT

(The Nominative-with-the-infinitive)

Examine the sentence:

Someone is supposed to meet me at the bus station.

• Which word is the actor in this sentence?
• Underline all the verbs in the sentence and identify their forms.
• Which word is logically connected with the subject and tells what (is expected) to happen to the subject or what state it is in?
• Who is the subject for the verb 'suppose'? Who performs this action or is in the state?

Translate the sentence into Russian and examine the difference in Russian and English sentence structures.

> **The Complex Subject** consists of **a noun/pronoun** (in the nominative case) and **the infinitive.** It is considered to be the subject of the sentence; its Russian equivalent is in most cases a subordinate clause.

Consider one more example:
Laser *is known* to be used in medicine.
***Известно, что* лазер используется в медицине**
Translate the sentence. How does your translation differ from the model above?

Robots operated by artificial intelligence are known as artificially intelligent robots.

The Complex Subject is used with the <u>following groups of verbs in the Passive</u>:

• Verbs of sense perception: *to see,* to *hear, to notice, etc.*

The car was seen **to disappear** in the distance	**Видели, что** машина скрылась вдали.

• Verbs of mental activity: *to think, to consider, to believe, to expect, to suppose, to know*, etc.

A robot is supposed **to do tasks** without the help of a person.	**Предполагается**, что робот выполняет задачи без помощи человека.

• Speech verbs: *to say, to report, to order, to ask, to allow, to state, to announce*.

The delegation is reported **to have arrived.**	**Сообщается,** что делегация уже прибыла.

The Complex Subject with Passive verbs is more characteristic of a literary than a colloquial style, except with the verbs *to suppose, to expect, to make*.

The Complex Subject is used with some<u> verbs in the Active voice</u>: *seem, prove, appear, happen, turn out*.

He **doesn't seem to know** this subject.	Он, кажется**,** не знает этого предмета.
He **proved to be** a very experienced specialist.	Он **оказался** очень опытным специалистом.
He **didn't happen** to be there at that time.	**Случилось так,** что его не было там в это время.
The forecast **turned out** to be quite wrong.	Прогноз **оказался** совершенно неверным. (**Оказалось**, что…)

Note 1: If the verbs *to prove, to seem/to appear* (выглядеть, произво-
дить впечатление) are followed by adjectives or nouns, the verb *to be* after
them can be omitted.

She proved (~~to be~~) very smart.	Она казалась очень умной.
He appears (~~to be~~) an experi-enced analyst.	Он производит впечатление опытного аналитика

The Complex Subject is used with some <u>verbal phrases, such as:</u>
• to be likely (вероятно), to be unlikely (маловероятно, вряд ли),
• to be certain /to be sure (несомненно, обязательно, бесспорно,
непременно).

The company **is likely to in-vest in R&D.**	Вероятно, компания **будет** ин-вестировать в исследования и раз-работки.
The company **is not likely to invest in R&D**	Вероятно, компания **не будет** инвестировать в исследования и разработки.
The company **is not unlikely to invest in R&D**	**Вполне** возможно, что компа-ния **будет** инвестировать…

Note 2: The Infinitive in the Complex Subject is used in all its forms
and expresses:
• a <u>simultaneous</u> action: He is said **to live** in London.
• an action <u>in progress</u>: The water seems **to be boiling**.
• an action <u>prior</u> to the action expressed by the finite verb: They are re-ported **to have finished** the construction.

These verbs refer the infinitive to the future: *to expect, to be
sure/certain, to be likely*.

We **are sure** to come to the heart of the matter	Мы обязательно **доберемся** до сути дела.
He **is expected** to give us an answer tomorrow.	Ожидают, что он **даст** нам ответ завтра.

Speaking & Writing

HOW TO WRITE A SUMMARY

A summary is a brief statement or account of the main points of a piece of writing. A summary is not a rewrite of the original text and does not have to be long. Your purpose in writing the summary is to give the basic ideas of the original reading. What was it about and what did the author want to communicate?

1. Identify the type of work (text, article), title, author, and main point.

In the text (article) "…" the author presents (shows, describes ...) his opinion on the hot topic of living in a technological society.

The text "…" deals with the problem of ... (discusses some problems relating to ..., provides information on ...).

2. Write in the present tense.

At the beginning of the text / article the author characterizes... (comments on ..., explains ..., analyses ...).

Attention is drawn to the fact that ... . It should be noted that ... .

3. Don't forget to include linking words so your reader can easily follow your thoughts.

Next / Further / Then it is reported / shown that ....

4. Don't copy the article. Instead, paraphrase.

Besides the author explains that ..., gives a detailed analysis of ... (the description of ...). Finally the author comes to the conclusion that ... .

In conclusion ... . At the end of the text / article the author describes ..., emphasizes that ..., points out that …, summarizes that ... .

5. Don't put your own opinions, ideas, or interpretations into the summary.

Your summary should have between 100 and 120 words

A Presentation Outline

Your presentation should have the following structure:

1. AN INTRODUCTION

This is the most important part of your presentation because the audience will make judgements about you. They will decide in the first few minutes what you are like. They will also decide whether you deserve their

attention. Therefore, it is very important that you plan carefully what you want to say in the introduction.

• *TRY TO DO THESE THINGS IN YOUR INTRODUCTION:*

Get the audience's attention.

Introduce yourself.

Explain why you are there.

Explain what you hope to achieve.

Build a good relationship with the audience.

• *USEFUL LANGUAGE*

Introduction and welcome

Good morning, ladies and gentleman. My name's John Jones. I'm head of sales at Acme Services.

I would like to thank you for inviting me here today to talk about...

I would like to thank you all for attending this presentation. I plan to be brief.

I will only take about fifteen minutes of your time. If you have any questions, I'd be very happy to answer them at the end.

Feel free to interrupt me if you have any questions during my presentation. (Not recommended unless your English level is good.)

Explaining the purpose of your presentation.

I'd like to give you a brief presentation about...

The subject of my talk is...

I'm going to talk about...

My topic today is...

My talk is concerned with...

The purpose of my talk is to...

Giving an overview of the presentation.

I'm going to divide this talk into four parts.

There are a number of points I'd like to make.

Basically, I have three things to say.

This talk is designed to be a springboard for discussion on the topic of...

I'd like to begin by...

Let's begin by...

First of all, I'll discuss...

and then I'll go on to talk about

Then... / Next,... Secondly,... / Thirdly,... Finally,... / Lastly,...

2. THE MAIN BODY

You should use this part of the presentation to explain key information. Explain your points clearly one at a time so your audience can follow what you are saying. Remember to keep your points simple and short. Try not to give too much information, otherwise the audience will not remember your message.

• *USEFUL LANGUAGE*
Starting a new section.
Moving on now to
Turning now to...
Let's turn now to
So that brings me now to the topic of...
The next area I'd like to focus on next is
Now, we'll move on to...
I'd now like to discuss...
Let's now look at...

Finishing a section.
That's all I have to say about...
So, in this section, we've looked at...
Well, I think I've said enough about.

Analyzing a point in your presentation.
Where does that lead us?
Let's consider this in more detail...
I'd like to elaborate on what I said earlier about
What does this mean for...?
Translated into real terms, this means that...
Why is this important?
The significance of this is...
On the one hand,...
...on the other hand,...

Giving examples.
For example,...
A good example of this is...
As an illustration, I'd like to mention...
To give you an example,...
To illustrate this point,...

Paraphrasing and clarifying.
Simply put,...
In other words,...
So what I'm saying is..
To put it more simply...
To put it another way,...

3. THE CONCLUSION

It is important to create a lasting impression in your conclusion. Use the last couple of minutes to repeat important points and key information. Leave some time for discussion, questions and answers at the end of the presentation. Don't forget to thank your audience for attending and listening.

• U*SEFUL* L*ANGUAGE*
Summarising the content of your presentation.
To sum up,...
To summarise,...
In short,...
Right then, let's sum up, shall we?
Let's summarise briefly what we've looked at...
If I can just sum up the main points,...
Finally, let me remind you of some of the issues we've covered.
So, to remind you of what I've covered in this talk,...
Unfortunately, I seem to have run out of time, so I'll conclude very briefly by saying that...
I'd now like to recap on the points I've mentioned.

Closing the presentation.
To conclude...
In conclusion,...
Well, that covers all I wanted to say today.
Before I finish let me say just one last thing.
That brings me to the end of my presentation.It just remains for me to say, thank you very much for coming and I hope you have found this presentation useful.

Invitation to ask questions.
Does anyone have any questions or comments?
Please feel free to ask questions.
If you would like me to elaborate on any point I've made today, please

ask. Would you like to ask any questions?
Any questions?

Checking comprehension.
Does that answer your question?
Is that clear?
May we go on then to the next question?
I hope I've made that clear.
So what you're saying is,...
...is that right?
It seems I don't have time to answer any more of your questions now.
But please feel free to come and talk to me later on today.

4. THE VISUAL AIDS

These are things (resources) you could use to present your message. It is important to use visual aids because they can: help the audience focus on what you are saying, make the presentation more interesting, help to explain the points you make more clearly, provide variety.

• Preparing your visual aids
When preparing your visual aids make sure you do these things:
– Check that the size of the print is large enough for the audience to see.
– Don't type all your text in capital letters as this makes it more difficult to read.
– Don't use long sentences – use bullet points and numbers to organize your key points.
– Use a type of text that is easy to read (e.g. Arial)
Add pictures, illustrations, diagrams to make it more interesting and use color.

• USEFUL LANGUAGE: *Referring to photos, graphs or tables.*
If you'd like to look at this graph, you'll see...
Take a look at this table. Here, we can see quite clearly that...
This chart illustrates...
Let me show you a pie-chart that will make everything much clearer.

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АНГЛИЙСКИЙ ЯЗЫК
БАЗОВЫЙ КУРС

Учебное пособие