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Сборник упражнений по практической грамматике научно-технического текста (английский язык): Учебно-методическое пособие / Сост.: И.Н. Рукина, Л.А. Савина. — М.: МФТИ, 2005.— 112с.

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PASSIVE VOICE

Ex. 1. Put the following statements into the Passive Voice.

Example: New results confirm this idea. – This idea is confirmed by new results.

1. Many laboratories study this effect.
2. The work at the laboratory stimulates students' inventiveness.
3. Edison invented the phonograph in 1877.
4. The researcher made another attempt to find an error.
5. The teacher will explain the phenomenon.
6. Physicists will use a new technique.
7. We have divided the problem into two parts.
8. He has found a new formulation.
9. Now the students are measuring the light velocity.
10. Engineers are widely applying computers in practice.

Ex. 2. Translate into Russian. Mind the translation of the Passive Voice.

A.

1. English classes are always attended by all students.
2. The reaction was watched with great attention.
3. At the beginning of the term our group will be joined by other students.
4. Many important questions dealing with plasma have already been answered.
5. Biochemical processes may be influenced by various factors.

B.

1. Physics is looked at as an ahistorical subject.
2. The accuracy of this method was spoken of at the conference.
3. These measuring instruments were not even thought of twenty years ago.
4. Wait a minute. The microscope has just been sent for.
5. Einstein's theory of relativity can always be relied on.

C.

Example: This law is often referred to. – На этот закон часто ссылаются.

A practical class at the Institute is referred to as a seminar. – Практическое занятие в институте называется семинаром.

1. The Feynman lectures on physics are often referred to at our seminars.
2. Don't include those results in your paper. They have been referred to many times.
3. The experiment destroying the ether-wind theory is referred to as Michelson-Morley experiment.
4. In the 60's the seminar in which many well-known physicists took part was referred to as the Landau seminar.

D.

Remember several meanings of the verbs.

	следовать за кем- / чем-либо
To follow	придерживаться теории / метода и т.п.
	наблюдать / следить за кем- / чем-либо

1. Lectures are always followed by practical work.
2. Thomson's discovery of the electron was followed by new striking discoveries.
3. The same technique was followed in all the experiments.
4. The processes on the earth are being followed from the spaceships.
5. The changes of temperature will be followed by using new methods.

To precede	предшествовать, находиться, идти впереди
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1. The experiment was preceded by a talk with a teacher.

2. Every flight has always been preceded by a thorough control of luggage.
3. A great number of experiments preceded cloning Dolly.
4. Cloning Dolly was preceded by a great number of experiments.
5. According to the plan the lecture will be preceded by a few words of greeting.
6. All the necessary information is located on the preceding pages.
7. The week preceding the court hearings (слушания в суде) had been tense and nervous.
8. The results described in the preceding sections appear to support our conclusion.

Ex. 3. Translate into Russian.

1. The development of this particular problem is included in the plan of our work.
2. The definitions that had been given at the last lecture were involved into this report.
3. The relationship that exists between these two concepts has recently been defined.
4. After his attempts to give a concise description of the method he was asked to describe it more completely.
5. In this experiment they were told to measure certain physical quantities.
6. The history of the development of physical ideas is being studied now.
7. A greater part of the discussion has been devoted to the quantitative methods in science.
8. In this paper some attempts will be made to define the relationships among neighbouring sciences.
9. All even the least complex aspects of the problem had been discussed before they started the experiment.
10. His new invention has been much spoken about.
11. Today electricity and magnetism are thought of as different aspects of a single concept of electromagnetism.

12. It can be seen in the figure that the body is acted upon by several forces.
13. Once a body has been set in motion, it may not stop moving when the force is removed.
14. Their fruitful methods are referred to in different papers.
15. Optical phenomena resulting from the presence of a magnetic field will be referred to in the subsequent sections of the paper.
16. The energy needed to remove one photon or neutron from the nucleus of a particular element is referred to as separation energy.
17. If by convention a qualitative description is followed, the results may become accurate.
18. It is to be emphasized that in our case Ewing's theory of magnetism should be followed.
19. The reduction of gas pressure was followed by the reduction of gas temperature.
20. Every experiment is preceded by a talk with a teacher.
21. The appearance of Bohr's atomic model was preceded by numerous planetary models of the atom.
22. When I entered the laboratory the experiment was still being made.
23. The frictional forces were dealt with in the previous chapter.
24. This problem is dealt with in the last chapter of his book on solid-state physics.
25. In this particular case the random motion of particles is slightly acted upon by temperature changes which may be disregarded in the future analysis.
26. It is quite obvious that science is affecting and being affected by social changes of our time.
27. The phenomenon dealt with in his report is attributed to the formation of ozone.
28. Energy loss has been prevented by maintaining the voltage at the same mean value.

29. In a diatomic molecule the force pulling the atoms together may be thought of as proportional to the distance between the atoms.
30. This problem cannot be dealt with unless more precise data are obtained.
31. Careful attention must be paid to the algebraic signs when using the equation.
32. Care should be taken to conserve the distribution of the charge placed in the immediate vicinity of the probe one.
33. Maxwell's law of distribution of velocities may be relied upon in determining the positions and energy distribution of gas molecules.

Ex. 4. What should you begin the translation with?

Example: Нужно будет дано определение нового термина. — The definition of a new term...

1. В первый параграф включена общая классификация физических наук.
2. Здесь не обсуждаются основные величины измерений.
3. В конце статьи рассматриваются преимущества данного метода и приводятся (даются) интересные экспериментальные наблюдения.
4. Сейчас в биологии широко (widely) применяется этот метод.
5. Каждый вторник в нашей лаборатории проводились (to give) научные семинары.
6. В то время было сделано много попыток объяснить этот парадокс.
7. В данной работе будут описаны новые теории и гипотезы.
8. Во время опыта будут определены новые параметры.
9. Статья этого ученого делится на две части.
10. Мы уверены, что в ближайшем будущем будет разработана новая теория.
11. Об этом открытии много говорят.

12. В данный момент вычисляется распределение молекул.
13. Напряженность электрического поля измерялась посредством пробного заряда (a probe charge).
14. На эти данные не следует ссылаться.
15. В последнем эксперименте были исследованы тепловые и механические свойства газа.

MODAL VERBS

Ex. 1. Mind the translation of 'one' before the Modal Verbs.

One can (may) use...	Можно использовать...
One could (might) use...	Можно было бы использовать...
One must (should, ought to) use...	Надо (следует) использовать...
One can't (mustn't) use...	Нельзя использовать...
One shouldn't (oughtn't to) use...	Не следует использовать...
One needn't use...	Не надо использовать...

1. One can make another attempt and carry out a more precise measurement.
2. One must describe these events as concisely as possible.
3. One may use more fruitful methods this time.
4. One should clearly distinguish the fundamental science from the neighbouring ones.
5. One could admit (допускать) all possible hypotheses in our case.
6. One might devote more time to the development of new ideas.
7. One shouldn't look only on the dark side of things.
8. One oughtn't to interfere with their plans.
9. One needn't give a quantitative analysis of the process.

10. One can't attribute the failure only to inadequate accuracy of the apparatus.

Ex. 2. Translate into Russian. Mind the translation of the Modal Verbs with Perfect Infinitive.

must attend	должен посетить
must have attended	должно быть, посетил
should attend	следует посетить
should have attended	следовало бы посетить (в прошлом)
could attend	смог посетить, смог бы (в будущем)
could have attended	смог бы посетить (в прошлом)
can't attend	не может посетить
can't have attended	не может быть, что посетил (вряд ли посетил)
may (might) attend	вероятно, возможно посещает (посетит)
may (might) have attended	вероятно, возможно посетил

1. You could have found a lot of applications of your discovery.
2. Scientists must have made numerous attempts to explain how nature operates.
3. Walter was in a terrible mood today. He must have got up on the wrong side of the bed.
4. Henry looks so embarrassed. He must have failed his exam.
5. He can't have failed his exam. He is so industrious and hardworking.
6. The students may have been reading for an exam since morning.
7. Michael rode his bicycle downtown yesterday. He could have been knocked down.

8. You didn't get the job. You should have spoken more confidently at the job interview.
9. Why does Fred look so exhausted (tired)? He may have worked overtime last week.
10. Do you realize now that you should have done a few things differently to be promoted to a new position?
11. George didn't come to his English class and all the students think he might have gone to the airport to meet his relatives.
12. You could have got to the University by bus. Why did you hitchhike?

Ex. 3. Translate into Russian. Mind the translation of *to be + Infinitive*.

a) to be + Infinitive –	действие должно совершиться согласно плану, договоренности, инструкции и т.д.
b) to be + Perfect Infinitive –	действие должно было совершиться согласно плану, договоренности, инструкции и т.д., но не совершилось.

1. What am I to do next?
2. By convention we are not to violate (нарушать) the instructions given below.
3. No doubt this field of science is to provide opportunities for first class research.
4. In the near future such devices are to be used to advance many fields of science.
5. Liquid crystal devices were to perform extremely important functions.
6. They agreed that she was to put off the investigation.
7. John was to have taken part in the competition. He is still in bed with the flu.

8. The test was to have been performed by the end of the month.

Ex. 4. Translate into Russian. Mind the translation of the Modal Verbs.

1. We have thus been able to make our own contribution to the new invention.
2. We are unable to solve the problem directly; we have to seek other ways.
3. Nothing can be done in addition to what has already been done.
4. In future we shall have to do nothing but to repeat the measurements.
5. I don't have to explain that working contacts with other laboratories ought to be developed.
6. For writing a program a scientific problem has to be stated clearly.
7. The test might last a month but we had to complete it much sooner.
8. Unless he is allowed to work under your guidance he won't be able to carry out this research.
9. He needn't be told that an interferometer is an instrument which uses the phenomenon of interference.
10. His invention was to result in great achievements in space technology.
11. All your remarks are to be pertinent to practical applications rather than (a не) to the theory itself.
12. If you seek to determine the temperature of the sea you are to investigate the influence of the winds.
13. One mustn't forget that learning English involves certain difficulties and a great deal of training.
14. One should mention that the confirmation of a new hypothesis will require much more effort.
15. There can be no doubt that his results coincide with mine.
16. There may exist a great number of means to prevent the trouble (поломка).

17. In addition there should be an experimental confirmation of your predictions.
18. I shall be able to devote you some time, if nothing interferes with my plans.
19. One should distinguish clearly the nature of these physical phenomena.
20. In this particular case one has to seek for a more precise formulation of the topic.
21. Like mathematicians the physicists have to express their physical ideas as concisely as possible.
22. In addition to the main aspects of physics the students are to study the neighbouring sciences.
23. Complex measurements of physical quantities must be made as accurately as possible.

INFINITIVE

Ex. 1. Translate into Russian. Analyze the function of the Infinitive.

1. To gain (получать) experience is only a matter of time.
2. To solve a particular problem is necessary for future investigations.
3. To solve a particular problem we ought to divide it into subproblems.
4. In order to understand the phenomenon scientific intuition is required rather than (а не) experiments.
5. The history of science should be studied to avoid (избегать) the mistakes of the past.
6. In many cases the force that acts on the body to produce the motion is not directly discernible.
7. In ionization the outer (внешние) electrons leave the atom to form a positive ion.
8. The problem to be developed at our laboratory is pertinent to the question of accuracy.

9. The seminar to be held in a week will be devoted to the theory of the experiment.
10. The student to do the lab is to read its description in the manual.
11. Lobachevsky was the first to develop the principles of non-Euclidean geometry in 1826.
12. Johann Bernoulli was the first to introduce the concept of function in 1667.
13. Our aim is to express the idea in a concise form.
14. To propose a solution to this problem is to create a method of solving a whole class of problems.
15. His first success was to inspire him to further attempts.
16. It is to be mentioned that the theory stimulates experimentation and vice versa (наоборот).
17. The student has enough experience to distinguish clearly between random (случайный) and systematic errors.
18. Your hypothesis is too contradictory to be accepted (принимать).
19. This particular theorem was sufficiently complicated to be used in the Olympiad.

Ex. 2. Mind the difference in translating the Infinitive depending on the function.

A	
Подлежащее (что?)	Обстоятельство (для чего?)
<u>To analyze</u> the above results is our aim. Проанализировать (анализ)...	<u>To analyze</u> the above results we shall use the previous experience. Для того чтобы проанализировать...
1. <u>To start</u> an experiment with a right idea is necessary for any experimenter.	1. <u>To start</u> an experiment with a right idea a student should have some experience.
2. <u>To supply</u> science with more precise measurements is a task	2. <u>To supply</u> the town with water they will have to start build-

of present-day technology.

3. To make our work more effective was not easy.

4. To encourage active contacts among scientists was the purpose of the last conference.

5. To develop a new technique requires a joint effort.

6. To continue our experiment in this direction is to repeat the mistakes of the previous investigators.

7. To illustrate the above statement means to show a number of entirely new diagrams.

8. To make a contribution to science means first of all to discover a previously unknown phenomenon.

ing a canal directly towards the town.

3. To make our work more effective your interference was needed.

4. To encourage active contacts among scientists the international conference will be necessarily held this decade.

5. To develop a new technique more complicated equipment is required.

6. To continue our experiment we have to recall that the above effect is due to radiation.

7. To illustrate the above statement a single example is not sufficient.

8. To make a contribution to science, it is sometimes necessary to spend years of intensive research (and sometimes in vain)

B

Глагол – связка

His aim was to set a new record.

Его цель заключалась в том, чтобы поставить новый рекорд.

Модальный глагол

He was to set a new record.

Он должен был поставить новый рекорд.

1. The purpose of his paper is to show that the change and progress go hand in hand.

2. The object of physics is to give quantitative descriptions of nature.

3. The task of a scientist is not only to explain well-known facts but also to make new predictions.

4. The problem was to diminish the speed of the body.

5. The next step was to reduce the temperature of the transformer.

6. His intention was to stop the experiment due to inadequate conditions.

7. The task of the student is to exert every effort to become a good specialist.

8. Another way to consider the effect of a force on a body is to study the effects produced.

1. The lecturer is to show that change and progress go hand in hand.

2. Physics is to give quantitative descriptions of nature.

3. An English teacher is not only to explain grammar rules but also to illustrate them by examples.

4. The force of friction was to diminish the speed of the body.

5. The assistant was to reduce the temperature of the transformer.

6. He was to stop the experiment due to inadequate conditions.

7. Every student of our Institute is to exert every effort to become a good specialist.

8. Science is to study natural phenomena and find ways of their practical use.

Ex. 3. Replace the attributive clauses by the Infinitive.

Example:

The professor	who will give	a lecture is here.
	to give	
That is not the question	which must be discussed.	
	to be discussed.	

1. The problem which must be considered deals with the acceleration of free fall.
2. The difficulties that will be encountered later can be removed in either event (случай).
3. The diagram that is to illustrate this event has been discussed above.
4. In the galvanic battery the electric charges that are to be produced are equal and opposite.
5. Any action that will change a body's state of rest or its motion in a straight line is referred to as a force.
6. The method which must be followed by the students is sufficiently complicated.
7. There are instructions that are to be followed by any experimenter.
8. Heating (нагревание) which will be followed by cooling will change the structure of the substance entirely.
9. Any student who will follow these recommendations must obtain accurate results.

FOR-PHRASE

Ex. 4. Translate into Russian. Mind the translation of the for-phrase.

1. For the train to move in the forward direction the locomotive supplies a force.
2. Certain changes were introduced (вводить) into the design of the device for its weight to be diminished.

3. For the energy level of an atom or a molecule to be changed, the energy needed must be equal to the difference in energy of the levels.
4. The task is too complicated for one to be able to solve it.
5. The tendency is for a body to continue to move in a straight line when it is not acted upon by a force.
6. It is for you to know that programmers invented modern techniques of their own that are elegant and powerful (мощный).
7. It is important for him to find the error in the final results.
8. It is necessary for the experimenter to estimate (оценить) the magnitudes of the errors in each part of the experiment.
9. It is possible for the phenomenon of resonance to be due to geometric properties of space itself.
10. The best thing for you to do is to recognize your failure at the exam.
11. This is not a book of problems (мат. задача) for you to solve but rather a collection of beautiful mathematical ideas for you to enjoy.

Ex. 5. Translate into Russian. Mind the meanings of 'for'.

Example: The temperature must be high for the reaction to take place.

Температура должна быть высокой, для того чтобы произошла реакция.

The temperature is high, for the reaction is taking place.

Температура высокая, т.к. происходит реакция.

1. Some force is required for a body to be set in motion.
2. Now the kinetic energy of the body isn't equal to zero, for the body has been set in motion.
3. For the results of Michelson-Morley experiment to be explained Einstein developed the first part of his theory.
4. It is possible for the gas to be removed from the lamp with the help of chemical reactions.

5. Each book of the new Mathematical Library includes problems, for the best way to learn mathematics is to do mathematics.
6. It is easy for them to confirm their postulates, for they know the fundamental laws of physics.
7. The exercises are sufficiently elementary for the students to understand and enjoy.
8. It makes no difference which term to choose, for the acceleration of free fall is often called the acceleration due to gravity.
9. For the temperature to be reduced it is necessary to increase the volume (объем) of the gas.
10. The efforts of many researchers have not been in vain, for they have led to the revision (пересмотр) of our earlier concept of nuclear matter.
11. For the magnitude of acceleration of free fall to be determined at any point you must not necessarily measure it, you may consult the table, it equals 9.80665 ms^{-2} in Europe.

THE EMPHATIC CONSTRUCTION: *IT IS ... THAT, WHO, WHICH*

Ex. 6. Translate into Russian.

1. It is a high level of radioactivity that shows: there are radioactive elements in a substance.
2. It is at the velocity of light that all electromagnetic radiation travels in a vacuum.
3. It is just for this reason that Newton introduced the concept of absolute space.
4. It is in this way that vector symbols can be readily distinguished from scalar symbols in reading.
5. It was Pierre Herigone who first used the symbol \angle for angle in 1634.

6. The force acting on a moving charge in magnetic and electric fields is given by $F = q (E + [vB])$. It is the magnetic contribution to the force that is called the Lorenz force.

Ex. 7. Translate into Russian.

1. To push a heavy block is not easy.
2. To analyze this case we must treat the previous one.
3. To produce the motion some force is required.
4. The problems to be considered in our analysis are very complicated.
5. The law to be stated and discussed is very complicated and sufficiently important to be treated once more.
6. The speed to be reduced is great.
7. The rules to obey were written on the notice-board.
8. His aim was to analyze this new relationship.
9. His wish is to make an independent research.
10. The situation encountered is too complicated to explain it in detail.
11. Mendeleyev was the first to recognize the dependence of the properties of the elements upon their atomic weight.
12. These forces are too small to oppose the action of the frictional forces.
13. For a body to remain at rest the resultant of all the external forces must be equal to zero.
14. For the reaction to take place the temperature must be increased.
15. The first thing for you to do is to compare the results of the calculations.

Ex. 8. Translate into English.

1. Мы увеличиваем силу трения, чтобы уменьшить скорость.
2. Чтобы произвести ускорение, мы прикладываем некоторую силу.
3. Вот новые идеи, которые надо развить в этой работе.

4. Эффект, который нужно устранить, обусловлен силой трения.
5. Примеры, которые надо будет проиллюстрировать, представляют огромный интерес.
6. Задача состоит в том, чтобы проанализировать предыдущие случаи.
7. Цель вышеприведенных примеров состоит в том, чтобы показать действие магнетизма.
8. Ньютон первый сформулировал три закона движения.
9. Для того чтобы выполнить эти требования (to meet the requirements), им пришлось дать более глубокий анализ выполненной работы.
10. Принципы, которые должны лечь в основу (to underlie) работы прибора, знакомы всем студентам.
11. Чтобы избежать ошибок, давайте изменим условия эксперимента.
12. Цель моей беседы с преподавателем состояла в том, чтобы уменьшить количество ошибок.
13. Для того чтобы эти условия были выполнены (to fulfill the conditions), давайте обратим внимание на предполагаемые ошибки.
14. Известно, что сила (действующая) на заряженную частицу не зависит (to be independent of) от скорости частицы.
15. Вам необходимо много работать, чтобы хорошо овладеть английским языком.

COMPLEX OBJECT

Ex. 1. Translate into Russian. Pay attention to the Complex Object.

Example: I know him. – Я знаю его.

I know him to support a new theory. – Я знаю, что он поддерживает новую теорию.

1. All engineers know it.
All engineers know it to be the case due to inaccurate measurements.
2. He proved the theorem.
He proved the hypothesis to be correct.
3. The scientist found a new quantitative description of the phenomenon.
The scientist found a new quantitative description of the phenomenon to be more fruitful in this case.
4. They calculated the total force.
They calculated the total force to be equal to zero.
5. A barometer shows atmospheric pressure.
The barometer shows the atmospheric pressure to fall.
6. We don't believe this statement.
We don't believe this statement to be the only one.
7. In the first case the experimenters expected a high speed.
In the first case the experimenters expected a high speed to be detected.
8. The author considered an alternative concept.
The author considered an alternative concept to contradict (противоречить) the initial one.
9. Let us take the potential energy of a body as an example.
Let us take the potential energy of a body to be equal to zero.