INGLISE KEELE ÕPPETEKSTID

kaugõppe I kursusele

УЧЕБНЫЕ ТЕКСТЫ ПО АНГЛИЙСКОМУ ЯЗЫКУ

для 1 курса заочного обучения

Tallinn - 1970 - Таллин

TALLINNA POLÜTEHNILINE INSTITUUT
ТАЛЛИНСКИЙ ПОЛИТЕХНИЧЕСКИЙ ИНСТИТУТ

Keelte kateeder
Кафедра языков

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Text 1

QUESTIONS AND ANSWERS

1. What is matter?
1. Matter is the name for anything which has weight and which occupies space.

2. In what form does matter exist?
2. Matter exists in three different states. It exists as a solid, a liquid or a gas. The materials around us such as air, water, metals and minerals are forms of matter.

3. Is heat a form of matter?
3. No, it is not (it isn't). Heat is not matter.

4. Are light and electricity forms of matter?
4. No, they are not (they aren't).

5. What are heat, light and electricity?
5. They are different forms of energy. Energy changes from one form to another.

6. How do scientists define energy? What is energy?
6. Energy is a force which overcomes the inertia of any object.

7. What is inertia? Has it any scientific definition?
7. Yes, it has a definition. Inertia is the property of matter to remain at rest when the object is at rest, or to remain in motion when the object is in motion.

8. What form of energy makes a steam engine go? What makes motor run?
8. Energy exists in many different forms. Steam is one of them. Under pressure steam drives a steam engine.

A motor runs due to the force of an electric current.

9. Where does electricity come from?
9. We get electricity by friction or by chemical action.
10. Who discovered electricity?
10. Benjamin Franklin was the first who gave the theory of electricity.
11. Was he an Englishman or an American?
11. Benjamin Franklin was an American.
12. When did Benjamin Franklin live?
12. He lived from 1706 to 1790.
13. Whom do we call the father of Russian science?
13. M.V. Lomonosov is the father of Russian science.
14. What kind of airships shall we have?
14. They will be rocket ships.

Exercise 1

Täitke lüngad küsivate asesõnadega:
Вставьте вопросительные местоимения:

1. ... do you live? 2. ... do you go to the Institute? 3. ... do you do at the Institute? 4. ... books do you read? 5. ... delivers lectures to you? 6. ... do you meet at the lectures? 7. With ... do you work at the laboratory? 8. ... many students work at the laboratory?

Exercise 2

Täitke lüngad verbide to be, to have ja to do vastavate vormidega:

Вставьте соответствующие формы глаголов to be, to have, to do:

1. How many hours ... you work? 2. How many hours ... you work yesterday? 3. How many lectures ... you every day? 4. What book ... that student on his table? 5. ... this man a teacher? 6. ... you much practice in summer? 7. ... I a student? 8. ... these people workers? 9. Where ... you study?

Text 2

WEATHER FORECASTS

Scientific weather observations are of great importance to our industry and agriculture. They are also important for aviation and navigation. There are many weather observation stations in the USSR. These stations are in different parts of our country. People who work there report scientific weather observations to the central weather bureau. Weather observers determine all the weather factors at regular intervals and send the results of their observations to the centre by telegraph.

At each weather station there hang many different kinds of highly sensitive barometers and thermometers, which determine the air pressure and the air temperature. There stand special devices which record hours of sunshine, wind velocity and wind direction.

There is a special instrument which records the movements of the clouds. In order to foretell successfully the local weather changes, the observers accurately determine all these factors. There are special hours of the day when the central weather bureau reports the state of the weather to all parts of the country over the radio. In their reports there is always a forecast for a day in advance. They base their forecasts upon a knowledge of the weather conditions all over the country.

As they make forecasts for a large region, there are some days when the forecast is incorrect for a particular locality.

The work at the weather observation stations goes on regularly, without any interruption, in spite of any weather conditions. It often needs firmness and selflessness. Meteorologists who work in the Polar regions sometimes make their observations in heavy snow-storms and hard frosts. They are firm and fearless men. There was not a single day when they did not do their duty.

Exercise

Kirjutage laused jutustavas vormis:
Напишите в повествовательной форме:

a) 1. Are there any students here? 2. Is there a lecture on history today? 3. Was there anything at the club yesterday? 4. Was there anybody at home in the evening? Were there many people at the meeting? 6. Will there be much practice in summer?

b) 1. There are no newspapers there. 2. There was nothing in the box. 3. There were no difficult words in the text. 4. There will be nobody there at this time. 5. There are no coal mines in this district. 6. There is no ice on the lake.

Text 3

THE SOLAR SYSTEM

There is nothing more important to life than the sun. It gives us heat, light, power and food and all the beauty of colour and form in nature.

The sun is a star. There are many thousands of stars in the sky that are like the sun. They are as large as the sun, as hot as the sun and contain the same chemical elements. The sun is a great mass of white hot matter. The temperature at the sun's centre is as high as 10,000,000°C.

The sun is much nearer to us than other stars. That is why we think that it is bigger and brighter than other stars. The average distance from the sun to the earth is as much as 150 million kilometres. It is difficult to realize such a distance. But it is much more difficult to realize the distances to the stars which are millions and millions of kilometres still farther away. To express these great distances the astronomers use a very much larger scale than kilometres. Nothing in the world moves faster than light. It moves at the rate of 300,000 kilometres per second. So the astronomer's unit of measure is one light year, the distance that light travels in one year. It is a little less than

9.5 million million kilometres. Most of the stars are thousands of light years away from the earth. It is hard to realize that these are not the greatest distances in the world.

* * *

Our sun and our earth, our moon and the planets, meteors and comets belong to the "family of the sun" which we call our "solar system".

Our solar system consists of nine planets and their moons.

The closest planet to the sun is Mercury. No other planet receives more light and heat than this one. It is the smallest of the planets. Mercury revolves around the sun at a higher rate of speed than other planets. Its speed is much higher than theirs.

Jupiter is the largest planet in the solar system. Venus is not so large as Jupiter, but it is the brightest planet in the sky. We see its quiet light in the morning as well as in the evening. When it is in the West it is the first point of light which we see in the evening. We see it best of all on a dark night. The darker the night grows the brighter it shines and the better we see it. When Venus appears in the East it is possible to see it in the early morning hours as well.

Mars shines with a reddish light. The appearance of Mars varies from year to year. It depends upon the distance of the planet from the earth. It is closest to us every two years and two months. At such times Mars looks like a red lamp in the sky. The telescope reveals bluish markings on the planet. They vary with the changes of seasons. Mars has an atmosphere though it is not so dense as that of the earth. Most astronomers think that there is plant life on Mars.

The last opposition of Mars when it is nearest to the earth took place at the beginning of September 1956. Astronomers of all the world observed Mars and took photographs of the planet.

The results of their most important observations will help them to make a better study of the nature of Mars.

Exercise 1

Tõlkige eesti keelde:

Переведите на русский язык:

1. The nearer the earth the denser the atmosphere. 2.The more we study nature the more we know about it. 3. The stronger the winds the harder the conditions of work for the weather observers. 4. The more metal we produce, the greater will be the strength of our country.

Exercise 2

Vastake küsimustele:

Ответьте на вопросы:

1. Is the sun the biggest star? 2. Why do we think that the sun is the brightest star? 3. How far is the earth from the sun? 4. Which is the nearest planet? 5. At what speed does light travel? 6. Is there any plant life on Mars?

Text 4

NEW METHODS OF COMPUTATION

We live in the age of great developments in science and engineering. More than two hundred years ago the invention of the textile machinery started the industrial revolution. In less than a century machines were in use in all the branches of industry. They were to make all kinds of operations of a factory worker. In fact, they could make them much better, much quicker and at a lower cost than factory workers did. Moreover, a machine could do work which a man was unable to do. Thus the first industrial revolution freed man's hands from hard and monotonous labour.

At the end of World War II a second industrial revolution began. The invention of electronic computers makes it possible to free man's brain from the labour of measurement and computation.

Accurate measurement and exact computation are the bases of modern engineering and scientific research, therefore every engineer must determine accurately the amount of any change that his material has to undergo in different conditions, either in arctic cold or tropical heat.

Every scientist will make numerous computations before he can say that the results of his experiments are correct. Yet there exist complex computations in science and engineering which the scientists are unable to make because they are too long and too complicated. Here is an example which can illustrate how much time some of them may take. For the accurate forecasting of the weather a meteorologist must make about one million of operations. In order to be able to forecast the weather one day in advance, he has to work with a numerous group of assistants for ten days. This is not the only example: there are many others. When the first electronic computers went into operation in 1945, their importance for science and engineering became at once evident. They can work very quickly and make no errors. Any computer is a machine that gives information. This is the only thing a computer does. A computer cannot create any new information, though it may transform it into a more useful form. By analogy we may call a computer a mathematical translator in the same sense that a translator takes information in some language and translates it into another.

We may divide electronic computers into two groups: machines that can measure and those that can count. The latter can add, subtract, multiply and divide. Such machines are to do any operation which we can reduce to arithmetic. Besides they must be able to combine many problems and take them in any order.

Here is an example for illustration: chemists presented to the computer a complicated problem which consisted of about 400,000 arithmetic operations. The machine worked out the problem in a few hours.

The operations of a computer appear so simple that one of the inventors says: "The machine does practically nothing, but it does 'nothing' very well".

Computers are of great help to our specialists, that is why we widely use them in different branches of science and engineering.

Exercise 1

Kirjutage lihtmineviku ja tuleviku vormis:
Напишите в форме простого прошедшего и будущего времени:

1. We must build a new building for our school. 2. The workers can use all the new tools. 3. Every engineer must know the properties of his material. 4. You may take these books. 5. Nobody can read in a dark room.

Exercise 2

Kirjutage küsivas vormis:
Напишите в вопросительной форме:

1. His biography may illustrate the conditions of life of the working people in America. 2. You shall do as I tell you. 3. The young workers could take part in the discussion on technological problems. 4. The head engineer was to make a report yesterday. 5. The committee had to discuss a difficult problem. 6. The children must do some work themselves.

Exercise 3

Vastake küsimustele:
Ответьте на вопросы:

1. Can theory exist without practice? 2. Is it possible or impossible to measure colours? 3. Why is measurement so important for science? 4. What units do astronomers have to use to measure distances? 5. What units of measurement do you know? 6. What invention started the industrial revolution? 7. When did the first industrial revolution take place? 8. Why did the people start to use machines in all the branches of industry? 9. What were the results of the second industrial revolution? 10. What are the bases of modern engineering and scientific research?

Text 5

COMRADE A's FIRST IMPRESSIONS OF LONDON

"To see London was always my great wish. I wanted to see it and to learn about it for myself as much as possible. People often say that the weather in London is always bad, that London has fog or rain or both every day of the year. But it was not so during our stay there. Most of the days were fine and warm. The sun was bright and the sky was cloudless, and London looked beautiful. We stayed at a hotel near the British Museum and the University of London. The window of my room faced the street. Through that window I could see people and endless lines of buses, motor-cars and taxis. The English buses are different from ours: they are very high, as they are double-decked buses and have seats on top as well as inside. Besides, they are red, fearfully red. The best way to see London is from the top of a bus.

The traffic regulations in England differ from ours: we are to keep to the right but in the streets of London one is to keep to the left.

The street traffic is very heavy; it is much heavier than that in Moscow. The English policemen are active men, always polite and always ready to help any one as much as they can. Besides, there are notice-boards at every crossing which show you the place where to cross the road - "Please, cross here", "Please, drive slowly". The streets of London were always of great interest to us. In some parts of London they look very much alike, as the houses are the same in style and colour. That is why one must be very attentive because one may easily get into the wrong street or into the wrong house. The houses are not very big, they are mostly two-storeyed buildings with as many front-doors and as many little gardens as there are lodgers in the house.

Sometimes the doors of the same house are of different colours.

And sometimes the same street may have different names. For example - Grosvenor Street at Hyde Park is no longer Grosvenor Street a little farther but Grosvenor Place, and when it comes nearer the Thames it is Grosvenor Road."

Exercise 1

Tõlkige eesti keelde:
Переведите на русский язык:

Steel Rail Production
Steel Rails in Production
Timber Floor Boards
Floor Boards of Timber
The British Soviet Friendship
The British Soviet Friendship Month

A Committee Member
A Factory Committee Member
A Steel Factory Committee Member
A Moscow Steel Factory Committee
A Moscow Steel Factory Committee Member's report

Text 6

From "ALL QUIET IN THE KREMLIN"

by George Marrion

During my visit to Russia in 1950 I learned one big thing, learned it beyond any possibility of doubt: no one in the Soviet Union thinks of any war adventures. The Russians think only of work.

The way how people work in the Soviet Union does not suggest a wish to stop where they stand. Quite the contrary, they tell you that they build with their own hands something that did not exist in Russia yesterday, and they know that they will have something tomorrow that does not exist anywhere in the world.

On November 25, 1933 the leading scientists of the Soviet Union met in the Academy of Sciences in Moscow. There were geologists, engineers, agriculturists, economists, physicists, chemists and many other specialists. The subject of discussion was: How to remake the Soviet Union.

Behind the speaker's platform at the very start of the opening session there was a huge map of the Soviet Union which suddenly lighted up and showed everybody what the Soviet Union must look like after the completion of three Five Year Plans. There were black lines showing dams and red lines showing canals. There were blue spaces marking areas which were to become irrigated fields and green spaces marking forests, and blue rivers flowing into new seas and dotted lines showing hydroelectric stations.

The Soviet people could complete only two Five Year Plans. The war interrupted the third.

After the war the Soviet government started its peaceful work anew and put forward a series of projects - the Kara-Kum Canal was one of them. The word Kara-Kum means Black Sands.

There are two big rivers cutting the desert in Turkmenia- the Amu-Darya and the Sir-Darya. They both begin in the mountains. They both flow uselessly into the Aral Sea while the burning tropical sun and strong winds blowing from the East dry up the adjoining land and make it waterless, treeless and lifeless.

The Amu-Darya is the largest river in Central Asia. It is nearly 1,650 miles long, and its flow of water is as great as that of the Nile.

There was a time when the Amu-Darya river flowed into the Caspian instead of the Aral Sea.

From the study of manuscripts - Arabic, Chinese, Persian and Greek - historians were able to establish the fact that the Amu-Darya river changed its sea many times. Last time it left the Caspian and went over to the Aral Sea in 1575. All attempts to turn the river into its former bed gave no practical results.

Now by means of this great waterway the builders of the canal will change the desert into blossoming gardens. The Kara-Kum Canal will be a great irrigation system, providing hundreds of thousands of acres of grassland and new cotton land.

Formerly the Turkmen people used to say: "Life dies out when the water ceases to flow." Today they say: "Life begins where the water begins to flow."

Exercise 1

Vastake küsimustele:
Ответьте на вопросы:

1. What specialists attended the meeting of November 25, 1933? 2. What subject did they discuss? 3. What did the speaker demonstrate to the public? 4. What kind of map was it? 5. What interrupted the completion of the third Five Year Plan? 6. What project did the Soviet government put forward after the war? 7. Why was it so important?

Text 7

From "MARTIN EDEN"

by J.London

In his own small room Martin lived, slept, studied, wrote and kept house. Before the only window looking out on the front porch was the kitchen table serving as desk and library. The bed stood against the back wall occupying two-thirds of the total space of the room. In the corner was the kitchen - the oil-stove standing on a box, a shelf on the wall for provisions and a bucket of water on the floor. A small closet contained his clothes and the books for which there was no room on the table or under the table. Opening the closet door he blocked the way in and out and had to close the closet door first when going out of the room.

While reading Martin used to make notes and there were so many of them that he had to stretch several clothes lines across the room and hang the notes on them. Even so it was impossible for him anywhere to cross the room safely in a straight line, especially in the dark. Going from the door to the head of the bed he had to turn first to the right to avoid the kitchen. Turning next to the left to avoid collision

with the foot of the bed he came into contact with the corner of the table. There was a sort of canal between the bed and the table. The only chair in the room when standing at its usual place before the table made the canal unnavigable. The navigation was open only when the chair was out of use resting on top of the bed. Though sometimes he sat on the chair when cooking, reading a book while the water boiled. The little corner that formed the kitchen was so small that he was able sitting down to reach anything he needed. In fact, it was much better to cook sitting down; standing up, he was too often in his own way.

Exercise 1

Tõlkige eesti keelde:
Переведите на русский язык:

1. Science changes the conditions of man's life: it changes his work and his rest. It changes man's ideas of the world. 2. The first inventor of electric light was Lodygin. 3. Give the simplest formula of water. 4. Which planet is the largest in the solar system? 5. What properties has water? 6. There is probably plant life on some planets.

Text 8

GREEN GOLD

Three hundred years ago when the first emigrants from Europe landed on the territory of the present-day United States they found thick forests which covered almost half of the land. In the east the forests were so thick that a squirrel could travel from the Atlantic as far as the Mississippi river jumping from tree to tree.

The work of clearing an open ground, which the emigrants needed for cultivating crops and building a hut, required much labour.

In the nineteenth century capitalism began to develop in the USA. At that time the country was in great need of all kind of building materials.

Selling timber became a profitable business, exporting it to western Europe brought much profit.

Hundreds of businessmen came to the forests and started the felling of the trees over thousands of acres. Their only purpose was getting dollars. The businessmen took only good and strong timber for building material, while old trees remained lying on the ground. These trees easily caught fire causing still greater damage.

From year to year people living at great distances saw thick clouds of smoke darkening the sky. The fire killed every living thing and turned the land into a desert. The cutting out of the forests resulted not only in the decrease of timber but also in the destruction of the once rich soil.

Unprotected soil easily dries up and becomes unfit for cultivation.

Forests are the best water holders and soil protectors. The thick mass of leaves at the base of the trees quickly absorb the rain falling in sudden storms over a forest.

Later this same water comes to the surface again in the form of streams.

The shade that trees give is another reason why forests help in controlling moisture: delaying the melting of the snow forests help in filling the rivers.

The forest holds the soil in place not letting the rain to wash it away. By saving the soil forests help in keeping the water clear and pure. In places where there are no forests, rain waters quickly find their way into the rivers washing away the rich upper soil and filling rivers with sand and mud.

In the days of the first emigrants, the waters of American rivers were pure and clear. Now the Americans themselves call the Mississippi river "Big Muddy", because of its muddy water.

Forests play an important part in affecting the climate. At night trees make the radiation of heat from the ground under them much slower.

Large groups of trees protect the land from strong winds

and may greatly decrease their strength. Hot winds kill the crops.

Soviet scientists fight against the forces of Nature by remaking Nature. They increase the richness of the soil by planting forests and constructing reservoirs. Soviet cultivators of forests get timber - the green gold of the country - not by felling trees without thinking what damage it may cause to the country, but by planning the work carefully.

Exercise 1

Vastake küsimustele:
Ответьте на вопросы:

1. Why does unprotected soil become unfit for cultivation? 2. How do trees help in controlling moisture? 3.How do forests help in keeping the water clear and pure? 4. In what way can forests affect the climate? 5. What do large groups of trees protect the land from? 6.How do Soviet scientists fight against the forces of Nature? 7. What do people call the green gold?

Text 9

METALS

Metals are elements. Mendeleyev,the great Russian scientist, was the first chemist who showed the elements arranged according to a definite system. Arranging them according to their atomic weights we find similar elements at certain definite intervals. Mendeleyev's system is called the Periodic Law. The Periodic Law as stated by Mendeleyev is of great importance for science. It allowed to put into one orderly table almost all known chemical elements and enabled Mendeleyev to make several bold suppositions proved later by experiments. In arranging the table the Russian chemist was obliged to leave several blanks in order to put the elements of similar properties in the same group. These blanks

stood for undiscovered elements. Mendeleyev predicted not only the existence of these elements but their physical and chemical properties as well. He predicted the properties of what he called eko-aluminium, which when finally discovered was called gallium. Titanium, discovered 40 years after Mendeleyev's death, found its place in the great scientist's periodic table.

The first amount of titanium produced when examined indicated that the metal had promising properties. The rapid growth of the industry of titanium is clearly illustrated in the following table.

1947 - 2 tons	1954 - 5,000 tons
1951 - 500 tons	1956 - 35,000 tons
1953 - 3,300 tons	1960 - 200,000 tons

As seen from the above table increased need for titanium drove its production from two tons in 1947 to 500 tons in 1951 and to 5,000 tons in 1954. The figure for 1960 rose to 200,000 tons.

There are large deposits of titanium located all over the world. It is the fourth most abundant structural material in nature. The Soviet Union possesses rich sources of titanium. In fact, "ilmenite" is the name given to titanium, for the Ilmen mountains in the Urals are very rich in this metal. Titanium has many advantages over other metals. Titanium is light-weight, strong and corrosion-resistant. It has a high melting point of 3,135 ^{o}F. Its melting point is 2,000^{o}F above that of aluminium.Engineers find wide use for this high-strength metal and prefer it to aluminium which loses its strength rapidly when subjected to high temperatures. Titanium is one of the most useful structural materials applied for making ships, airplanes, cars, bridges, turbines. Engineers believe that it will find many other fields for its application.

Exercise 1

Täitke lüngad keskmõnadega I või II:
Заполните пропуски причастиями I или II:

1. The instruments ... on the table belong to comrade N. (to leave). 2. A barometer is an instrument ... atmospheric pressure (to measure). 3. There are different kinds of plants ... in the Polar regions (to grow). 4. The work ... by the Soviet scientists on the ... ice is of great importance (to do, to drift). 5. The new canals ... the rivers form good water-ways (to join). 6. The results ... varied with the material ... (to obtain, to use).

Exercise 2

Vastake küsimustele:
Ответьте на вопросы:

1. What are metals? 2. According to what property did Mendeleyev arrange elements in his periodic system? 3. What is Mendeleyev's system called? 4. In what way did Mendeleyev prove his suppositions? 5. For what purpose did Mendeleyev leave the blanks in his table? 6. Did Mendeleyev predict physical or chemical properties?

Text 10

SALT

Salt is one of the most common minerals used in everyday life. Primitive people that lived mainly upon raw meat did not need salt. Meat itself retained natural salts. When people passed on to the agricultural stage and began to raise crops, salt became a necessity. Bread and vegetables were not only improved in taste, but the salt itself was required for the body's well-being.

Primitive people believed that good crops depended on the gods' good will. So salt was offered to the gods together with bread and wine.

The fact that salt could preserve food made it the symbol of lasting quality. To offer salt to somebody at one's table was a sign of friendship.

Some of the great roads in ancient time were built to make the transportation of salt easier. One of the oldest roads in Italy was called "Via Salaria" - "The Salt Road".

In Abyssinia and Tibet where salt was greatly needed, it was used as money.

Common salt consists of two elements - sodium, a bright, soft metal, which takes fire in contact with water, and of chlorine, a greenish-yellow gas. It is therefore called sodium chloride.

Salt can be dissolved in water and obtained again unchanged by evaporating the water. It forms the greater part of the dissolved material in sea water and in certain lakes.

Rock-salt is a kind of salt left when sea water evaporates. In places separated from the sea by sandbanks the sea water evaporated and left layers of salt crystals. Then the sea covered these places again, again the water evaporated and left more salt. This process was repeated many times and resulted in beds of pure salt, sometimes 100 feet thick, which were finally covered by mud and sand.

In Abyssinia there is a lake, 7 miles across. Half the bed of this lake is dry and consists of white sea salt.

Salt can be obtained either by mining rock-salt or by evaporating sea water in the salt wells situated near salt deposits. Sometimes the sea salt is frozen out of the solution. But usually the solution is evaporated under reduced pressure. The pure salt crystallizes out first and if necessary can be collected and recrystallized.

When salt is to be used for industrial purposes it is generally taken as mined.

Exercise 1

Täitke lüngad verbidega aktiivis või passiivis:
Заполните пропуски глаголами действительного или страдательного залогов:

1. Much salt ... in nature (to find). 2. Last year our expedition ... a salt lake in the North (to find). 3. Most of our rivers ... by canals (to connect). 4. The Soviet people ... the Volga and the Don in 1952 (to connect). 5. We ... to the river in a few minutes (to run). 6. The water ... into a shallow basin, where it ... by the heat of the sun (to run, to evaporate).

Exercise 2

Vastake küsimustele:
Ответьте на вопросы:

1. Why was salt unnecessary for primitive people? 2. When did salt become a necessity? 3. In what way did it improve people's food? 4. Why did the primitive man offer salt to the gods? 5. What is common salt? 6. How can salt be obtained? 7. Due to what process can rock-salt be found in nature?

Text 11

TIMBER

All the Northern regions of the U.S.S.R. both in Europe and Asia are covered with large forests which give us many different kinds of timber.

Timber is one of the most important materials used in all branches of industry, manufacture and engineering. Iron is looked upon as the most useful of metals. Wood is not a metal, but in its usefulness it may be placed on a level with iron, which it replaces in many cases. It serves so many purposes that it is impossible to speak about all of them.

Most of the houses in which we live are partly built of timber: they all have wooden floors, wooden doors and wooden window frames. The floor space is divided into rooms by wooden partitions.

Various things made of wood are in everyday use. We sit at wooden tables, on wooden chairs. Our books are kept in book-cases or on shelves made of wood. We use pencils for writing, matches for lighting a fire: we write on paper manufactured from wood or on wooden blackboards which are found in every classroom.

Artificial textiles are manufactured from cellulose, a substance produced from the woody fiber of plants. Cellulose is much worked at and experimented upon in the laboratories of the research institutes. Many things composed of cellulose are used in different branches of industry. Several medicines are obtained from different trees whose medicinal nature is widely known to modern chemists. In short, wood is found in endless variety of forms.

Timber was widely used for construction purposes and home needs in prehistoric times. We are told by archaeologists that things made of wood were used over 3,500 years ago. Timber was referred to as the best structural material

by the Greeks and Romans, who applied it for construction purposes and whose engineering skill is often spoken about in special literature.

A scientific study of the properties and qualities of wood however was started only at the beginning of the 18th century. The first researches were devoted to the study of the strength of timber. They were followed by further research work. As a result of this research work, a considerable amount of data was collected giving an idea of the properties of different kinds of timber. Much attention was paid to the conditions of the growth of the tree, which helped to establish the connection between the mechanical properties and the structure of timber.

The scientific study of timber, started in the 18th century, is now fully developed. The manufacture of paper and artificial textiles, the production of synthetic rubber are the achievements of modern research work.

Timber grows in importance from day to day. New uses of timber will be made popular in the nearest future. Boards will be made of ground-up wood; sawdust mixed with mineral matter will be formed into a hard strong material applicable for many purposes.

The importance of our forests for our economy can be clearly seen from the following: out of the timber resources of the world 26 - 28 per cent of forest land belong to the U.S.S.R. Besides in all timber-producing countries the timber areas become smaller, whereas the annual growth of timber in the U.S.S.R. is not used in full.

Exercise 1

Kirjutage aktiivis:
Перепишите в действительном залоге:

Most of the materials are obtained directly or indirectly from the earth's crust.

About a thousand separate kinds of minerals are known

to us. Minerals are attentively studied and experimented with. Then they are classified into groups.

All this work was done by slaves.

Exercise 2

Vastake küsimustele:
Ответьте на вопросы:

1. Why is wood looked upon as one of the most useful materials? 2. What parts of the room are made of wood? 3.What wooden things of everyday use do you know? 4. What are artificial textiles manufactured from? 5. What is cellulose? 6. Was wood used by primitive people? 7. When did a really scientific study of the qualities and properties of wood begin? 8. What is paper manufactured from? 9. Will wood as structural material be popular in future?

Text 12

CAMBRIDGE

Cambridge is situated at a distance of 70 miles from London; the greater part of the town lies on the left bank of the river Cam crossed by several bridges.

Cambridge is one of the loveliest towns of England; it is not a modern industrial city and looks much more like a country town.

It is very green presenting to a visitor a series of beautiful groupings of architecture, trees, gardens, lawns and bridges. The main building material is stone having a pinkish colour which adds life and warmth to the picture at all seasons of the year. The dominating factor in Cambridge is its world-known University, a centre of education and learning, closely connected with the life and thought of Great Britain. Newton, Byron, Darwin, Rutherford and many other scientists and writers were educated at Cambridge. In Cambridge everything centers on the University and its

colleges, the eldest of which was founded in 1284. They are 27 in number. There is a close connection between the University and colleges, though they are quite separate in theory and practice.

A college is a place where you live no matter what profession you are trained for: so that students studying literature and those trained for physics may belong to one and the same college.

However the fact is that you are to be a member of a college in order to be a member of the University.

Every college is headed by a dean. Discipline is looked after by Proctors and numerous minor officials called beadles (bulldogs).

If you are undisciplined you are fined or you may be "gated", that is not allowed to go out of college gate.

In some cases you are expelled for a given period of time. A college is a group of buildings forming a square with a green lawn in the centre. An old tradition does not allow the students to walk on the grass: this is the privilege of professors and head-students only.

There is another tradition which the students are to follow: after sunset they are not allowed to go out without wearing a black cap and a black gown.

The University existed before the colleges. It has the power to grant degrees, it defines courses of study, and organizes most of the formal teaching.

The various subjects of study are controlled by a series of faculties and the teaching is provided by professors, readers and lecturers.

The University trains about 7,000 students in different specialities.

You study at the University for 4 years, 3 terms a year. The long vacation lasts 3 months. You are trained by a tutor: each tutor has 10-12 students reading under his guidance.There are many libraries at Cambridge; some of them have rare collections of books. In one of them among the earliest books by

Shakespeare and other great writers one may see an early description of Russia by an Englishman on diplomatic service there (1591) and a Russian reading book of the seventeenth century.

Exercise 1

Tõlkige eesti keelde:
Переведите на русский язык:

1. Measuring the temperature of the dew-point we determine relative humidity. 2. The first step in measuring a physical quantity consists in choosing a corresponding unit of that quantity. 3. The electrodes consisting of tungsten coil are heated electrically for starting the arc. 4. The gas formed by burning sulphur in air was used for bleaching before our era. 5. The barked wood goes to the chipper mounted on a platform. 6. The amount of reagent used depended upon the material selected.

Text 13

SOVIET EXPLORATION

In recent years Soviet explorers have been especially active. It is difficult to say which of their explorations has been the most successful. The Russians have made great progress in each field: political, industrial, agricultural, physical, and many others; they have given intensive attention to all of them. Soviet explorers have applied the results of their explorations more energetically than in any other country.

The Russians have done much in both Arctic and Sub-Arctic. They have done more to the development and exploitation of their Arctic lands and waters than has either the United States or Canada in their northern territories.

The developments that have taken place are of great value to the Russians. From northern territories they have taken much of the timber and the mineral.

An enormous wealth of supplies has come to them from the north.

Rivers which a few years ago were only shown vaguely as irregular lines on an almost featureless map have opened great possibilities for traffic in the Soviet Arctic. They have also supplied the power to produce millions of feet of sawn timber for home use and export, and to operate mines in areas almost quite unknown until Soviet geologists surveyed them.

With airplanes suitably winterized for operation in northern areas the Soviet aviators have carried out the aerial mapping of the Russian Arctic and Sub-Arctic areas on such a scale as no one has ever applied to outlying regions in any other country.

With the help of observation from airplanes the Soviet ships have made the north-east passage an established fact.

The soundings of the Arctic Ocean made by courageous Soviet airmen who have to land on ice far from shore are of the greatest importance to geophysicists who study the structural formation of the world. The soundings of the Arctic Ocean have offered a new aspect of the earth's outline.

Exercise 1

Täitke lüngad to have või to be vastavate vormidega:
Вставьте соответствующие формы глаголов to be или to have:

1. When ... the structure of elements discovered? 2.The astronomers ... determined the distance between the earth and the moon. 3. Soviet ships ... established the north-east passage. 4. New seas and new canals ... opened in our country for traffic. 5. New seas and new canals ... opened great possibilities for traffic. 6. Soviet explorers ... brought many important data. 7. What ... Franklin discovered? 8. Who ... made the first radio-set? 9. What invention ...demonstrated in Petersburg in 1895?

Exercise 2

Vastake küsimustele:
Ответьте на вопросы:

1. In what fields of science have the Soviet explorers made great progress in recent years? 2. Have the developments

in North exploration been of any importance? 3. Why is it necessary to study the Northern territories? 4. How have the Soviet aviators carried out the aerial mapping of the Russian Arctic and Sub-Arctic? 5. Who helped the Soviet ships to establish the north-east passage? 6. Who is most interested in the soundings of the Arctic Ocean? 7. Why are the soundings of the Arctic Ocean so valuable?

Text 14

BERNARD SHAW

July 26, 1956 is the date of the centenary of George Bernard Shaw's birth. Bernard Shaw was a realistic writer who was always on the side of advanced ideas and loved people with great warmth.

Shaw was born in Dublin, on 26th of July 1856 of a middle-class family. He attended school which he hated and which he remembered as a "boy prison". He went to school as a "day boy" which meant that he had his afternoons free. Shaw used to say that he had wasted his time at school as it had not taught him anything. And at home there was music - always music. His mother had a beautiful voice, he himself and his sisters could sing well enough, and there were, besides the piano, many other musical instruments always lying about. The front sitting-room was seldom silent in the evening, and music came to play an important educative part in young Shaw's life.

Suddenly a new figure appeared in the family - Mr. Lee, a professional music master. His appearance at Shaw's house was due to the fact that Mrs. Shaw had gone to him to have her voice trained. Since the day of his coming nothing counted except music. Young George Bernard took part in all the musical activities, though he had never been trained before.

By the time he was fifteen two important events had happened. Mrs. Shaw had gone to London where she decided to earn a living by teaching singing; George Bernard had finished his schooling and got his first job. The job he had

been given was that of a clerk in an office. The world that the new clerk found there was to him as alarming as it was strange. The monotonous daily routine, the endless figures and forms, the feeling that he had become an insignificant part of a machine, all that alarmed the youth. In many things he was better informed than most of his fellow clerks.

Shakespeare, Byron, Shelley and many other great poets and writers had been read and re-read by him. He could discuss art, for he had studied the best works at the Ireland National Gallery, which even then was one of the world important collections. And when it came to music he could, of course, leave them all far behind. At his job he was quite efficient and his starting salary had increased by the time he was nineteen to £ 80 a year. He had mastered the problems of his work without any difficulty. Yet he was far from being happy. Though the office was not such a "prison" as his school, but a prison it was for all that. Shaw felt that he had to leave. So in 1876 he said good-bye to Ireland and went to London where he became a journalist and wrote music and dramatic critiques for various periodicals.

George Bernard Shaw started his literary work with a few novels which had little success and in 1892 turned to dramatic writing. Shaw had an easy command of wit in all its forms. In his works he exposes the capitalist society and his exposure is very significant and places him among the most important representatives of critical realism in modern English literature. Yet, limited by his bourgeois outlook Shaw could never understand the Marxist point of view though he had read Marx in his youth.

Bernard Shaw loved the Russian realistic drama and with a few English writers and actors of his time brought the plays by Chekhov, Gorki and Tolstoy onto the English stage.

In his old age Shaw visited the Soviet Union. When he came back to England he spoke of the U.S.S.R. as of a country which shows Man his way into the Future.

His plays are always a success on the Soviet stage. In 1955 "Pygmalion" was staged over 200 times.

George Bernard Shaw is widely popular and beloved in the Soviet Union.

No wonder that the decision of the World Peace Council to mark the centenary of Shaw's birth was met with a great response.

Exercise 1

Tõlkige eesti keelde:
Переведите на русский язык:

1. Next year by this time we shall have constructed the new House of Culture in our city. 2. By the end of next summer the navigation along the new canal will have been opened. 3. By the time of your coming we shall have finished our work. 4. By the first of October all the materials will have been systematized.

Exercise 2

Vastake küsimustele:
Ответьте на вопросы:

1. When was George Bernard Shaw born? 2. Where did he spend his childhood? 3. Did he like his school? 4. At what age did he get his first job? 5. Why did his work alarm him? 6. Did he like reading books? 7. Where did he study art? 8. Was he an efficient clerk? 9. When did Shaw leave Dublin? 10. What did he do in London? 11. Whom did Shaw expose in his works? 12. Have you read any plays by Shaw? 13. Which of his plays have you seen? 14. Which of his works do you like best?

Text 15

ACROSS THE BORDERS OF SPACE

We are living at the bottom of a great envelope of air which provides us with oxygen and water, protects us from the harmful effect of the sun's ultra-violet rays. Without this envelope life on earth would never exist. This protecting covering around the earth is the atmosphere; it separates us from airless vacuum that we know as space. But for the atmo-

sphere the rays of the sun would strike the earth with great intensity, but as the heat would instantly be dissipated in space, the earth would be covered with ice in spite of the fact that during the day the surface would be exposed to the full glare of the sun. For the atmosphere absorbs its rays and reduces the intensity of the sun's power.

On the other hand the earth's atmosphere even on clear days prevents the scientists from learning many of the secrets of the universe.

Only a few years ago some people said: "Imagine space travelling were possible for man. That would be wonderful. Scientists could learn more about other planets and that might offer evidence concerning the possibility of life there. Great results in different fields of science might be obtained from an observatory in space".

"That can never be. It is a fantastic dream," said the pessimists.

Yet, that most fantastic dream came true on April 12, 1961. Moscow Radio proclaimed that the world's first spaceship, with a man on board, was placed in orbit in the Soviet Union. The pilot of the space-ship was Soviet Air-Force Major Yuri Alexeyevich Gagarin. Constant radio contact was established with the astronaut throughout the flight. He was launched at 9.07 a.m. Moscow time in a rocket-propelled five-ton Sputnik space-ship. The launching was completed without any difficulty. The spaceship was circling the earth at 17,000 miles an hour. The astronaut came down safely at 10.55 a.m. Moscow time, and immediately reported to the government that the assignment was carried out, the landing was normal and that he felt fine.

At a press conference after the flight Gagarin said: I was able to see with my own eyes the spherical form of the earth. The light side of the earth was visible very clearly. The contours of land, islands, big rivers, seas and large lakes could be clearly distinguished. I could work while weightless. I wrote down my observations. My handwriting was the same, though my hands weighed nothing. But

the notebook had to be held, otherwise it would float away. I could stay in flight as long as it was necessary to carry out the assignment. I might have stayed considerably longer in the space-ship. I did not feel alone in space. I knew very well that my friends and the entire Soviet people were following my space flight.

The whole world greeted the triumphant flight of the Soviet space-ship as the greatest scientific achievement of Man.

Exercise 1

Tõlkige eesti keelde:
Переведите на русский язык:

1. In order to come to the Institute in time, I take the tram. 2. It is necessary that the students should master their speciality. 3. It is important that the work should be done in time. 4. Michurin grew different kinds of fruit so that he might provide the people of his country with such fruit as they had never tasted before. 5. To master Nature people should never stop studying her laws. 6. We send all kinds of agricultural machinery to the collective farms so as to improve the conditions of their work and raise better crops.

Exercise 2

Vastake küsimustele:
Ответьте на вопросы:

1. How is the earth protected from the harmful effect of the ultra-violet rays? 2. Would people be able to live without the atmosphere? 3. What is the aim of the development of the research planes? 4. What do we call "space"? 5. Who should solve the problems of air, water and food supply for a satellite inhabited by human beings? 6. What does the earth's atmosphere prevent the astronomers from? 7. What would space travel help us to learn? 8. What might people see while travelling across space?

Text 16

THOMAS ALVA EDISON

(1847 - 1931)

(A Few Facts of His Life)

Edison is known as one of the greatest inventors of his time. He invented so much that it is difficult to say which of his achievements is the greatest. He was an experimenter and a practical man more than an ingenious theoretician. In his sixty years of inventing he patented over a thousand inventions, most of them in the various fields of electrical engineering.

Edison was born in Milan, Ohio. Even when a small boy, he was always trying out things. His father once came upon his six-year-old "Al" sitting on eggs. When the father asked him what it all meant, the boy answered that he had seen a goose hatching eggs. Why couldn't he?

At seven Al entered public school but left it after three months. The reason was that the teacher considered him a dull boy. His mother became his teacher. The boy loved books, and his mother said that he had a wonderful memory.

One day he learned that balloons could fly because they were filled with gas. So he thought he would fly too. For this purpose he took a triple dose of soda powders. He was sure he would start flying at once. But the result was that after some time he lay on the ground sick, and it seemed to him the world was rotating round him.

At the age of twelve Edison began to make his own way in the world. He became a railway newsboy. That was his first job. On his first coming to Detroit he visited the public library and was deeply impressed by the rows and rows of books. He decided that he would read all the books and then he would know everything in the world. Measuring off the shelf he decided to read a foot of books every week.

One winter night as Edison was selling his newspapers he did not hear the conductor's call "all aboard".

The train started, the boy caught the hand-rail of the

last car and was dragged along. The conductor seized him by the ears and pulled him up into the car. The boy suddenly felt that something had happened to his ear. From that moment Edison began to grow deaf.

Before Edison was fifteen be established a "laboratory" in the baggage car of his train. No one knew what he was doing there. The boy kept regular records of all his experiments. This accuracy was one of the characteristic features of Edison's methods of work. Yet, in spite of all his carefulness, one day a bottle of phosphorus overturned and set the car in fire. The conductor threw the boy, his newspapers and his "laboratory" off the train.That he thus put a sudden end to Edison's career with the railroad never occurred to him.

One day Edison saved the life of a child playing on the rail-bed.The father of the child, a telegraph operator gave Edison lessons in telegraphy, and the next five years Edison was working as a telegraph operator in various cities of the United States and Canada.

In 1868 while working at an office in Boston Edison built his first patented invention - an electromagnetic device.

The story is told that he planned to ask 3,000 dollars for his invention, though he secretly decided he would sell it for 2,000, if necessary. He attended a meeting of businessmen who were interested in buying his invention, but when he was asked to name the price he was very nervous and quite unable to speak. "It is no use asking us a big price," said one of the businessmen, "we have already decided how much we will pay. Forty thousand dollars is our limit."

With this money Edison established a workshop and began his career as a professional inventor at the age of twenty two.

His workshop gradually grew into factories and laboratories.

All his inventions were the result of ceaseless work. He sometimes made thousands of experiments. That a genius works only by inspiration was absurd to his way of thinking. "Genius is 2 per cent inspiration and 98 per cent perspiration", was what he used to say.

Exercise 1

Kirjutage mineviku vormis:
Перепишите в форме прошлого времени:

1. He says that he will leave for Moscow in the morning. 2. We hope that we shall reach home before night. 3. I cannot understand what you mean. 4. I know that my friend studied chemistry. 5. Astronomers believe that they may build an observation station in space. 6. Can you tell me whether we shall have our meeting in the evening? 7. The workers explain to the delegates how they have got such incredible results in their work.

Exercise 2

Vastake küsimustele:
Ответьте на вопросы:

1. What was Edison by profession? 2. In what field of science did he work? 3. When was Edison born and when did he die? 4. What school did he attend first? 5. Why had he to leave school? 6. Who taught him? 7. What was Edison's first job? 8. What was the cause of his becoming deaf? 9. What were the characteristic features of his experimental work. 10. Were the conditions of his work always good? 11. Who gave him lessons in telegraphy? 12. What event was the beginning of his career as a professional inventor? 13. Did he get a good education or was he a self-educated man? 14. What inventions by Edison do you know?

Text 17

THE ATOM AND ITS NUCLEUS

Most people are familiar with the idea that the chemical elements which constitute the matter of the universe, are made up of particles called atoms and that an atom is the smallest recognizable particle of an element. These atoms are extremely small; it is impossible to convey an idea of their size in any ordinary simple terms. One can say that they are about a hundred millionth part of a centimetre in diameter or, put another way, that ten million could be placed across a pin's head, but it is questionable whether these expressions convey much to anyone who is unaccustomed to scientific measurements.

For long the atom was considered indivisible; actually, this is the meaning of the Greek word the name is derived from (atomos - indivisible). During the last fifty years, however, it has been shown that this idea is untrue and that the atom is itself a complicated structure of very much smaller constituent particles the total volume of which is only a very small part of the total volume of the atom.

These ideas have led to the present conception of the general structure of the atom, that it consists of a kind of solar system in which particles called electrons play the part of planets and move in orbits round a central sun called the nucleus.

The electrons are extremely light and each carries a negative charge of electricity. The nucleus on the other hand is very heavy compared with the electrons; actually, the whole mass of the atom is concentrated in it. The nucleus carries a positive electrical charge which is of greatest importance as it determines the chemical nature of the atom. In a normal atom the total of all the charges on the planetary electrons is equal to the charge of the nucleus, so that the atom is electrically neutral.

The nucleus is itself made up of elementary particles of which there are two principal sorts: protons and neutrons.

Proton is the basic particle of all atomic nuclei. It has a single positive charge equal to that of an electron which is negative.

It is a comparatively heavy particle. Neutron is a particle which is present in all nuclei except hydrogen. It has a mass slightly larger than that of a proton, but no charge, either positive or negative, a property which allows it, when free, to penetrate all nuclei. All substances on the earth as well as out of it whether gaseous, liquid or solid, are made up of atoms. There are 92 elements including all matter as found in nature, and the difference between one element and another is in the structure of its atoms. Thus, an atom of hydrogen, the lightest element, consists of a nucleus of only one proton, around which revolves one electron. Helium, the next lightest element, is made up of atoms whose nuclei consist of two protons and two neutrons, with two electrons encircling it.

The number of protons in the nucleus of an element determines its atomic number, whereas the total of protons and neutrons determines its atomic weight.

Exercise 1

Tõlkige eesti keelde:
Переведите на русский язык:

a) 1. Timiryazev was the professor the students highly respected. 2. The primitive man lived in a hut he built of branches. 3. Mathematics is the subject I like most. 4. A machine should be neither too small nor too large for the work it does. 5. One of the first things man needed was food. 6. In his letters the traveller described all the countries he had seen.

b) 1. The facts the newspaper referred to were very important. 2. Tell me the name of the student you work with. 3. Give me the pencil you are writing with. 4. The passage we had to pass through was long and dark. 5. You should not choose a profession you are not interested in. 6. The professor the students were speaking about is a great scientist.

Text 18

RADIOACTIVE ELEMENTS

The term "X-ray" is familiar to the civilized world and there are few of us who have not been subjected to these radiations by the doctor when he wants to know more about broken bones or organic disorders within our bodies.

The discovery and recognition of X-rays as electromagnetic waves was made by W.K.Roentgen in 1895. While he was working on a high voltage vacuum he noticed that some photographic plates enclosed in a box placed near frequently became cloudy and unfit for use though they were never exposed to light. When trying to find a reason he soon discovered that this clouding occurred whenever a discharge took place in the tube. The right conclusion was that some sort of extremely penetrating radiation emanated from the tube during its discharge. Since nothing had been known about it at that time Roentgen called this phenomenon "X-radiation" or "X-rays".

Million-volt X-rays are applied extensively in industry where metal hardening is accomplished with high heat and a consequent change in the crystalline structure of the metal. Due to X-ray analysis of this sort it is possible to obtain much more efficient production of much higher quality metals.

In ordinary medical work X-rays are used to pass through the body and strike a photographic plate where the amount of radiation penetrating is recorded similar to the way a camera records the visible light passing through a translucent solid.

Bones or foreign objects which may be present in the body do not permit transmission; they show up on the photographic plate as shadows. Thus broken bones, bullets, pins and similar objects can be easily located.

Such shadow pictures are also used in many industries to locate defects in products made of wood, rubber, plastics and even metal.

Shortly after Roentgen's discovery of X-rays, in Paris professor Antoine Becquerel began a series of experiments with a number of substances. He wanted to see if these substances also give rise to X-rays. Becquerel chose the salt of uranium for his experiment. Like Roentgen he used photographic plates and found out that uranium emitted radiations which fogged them. Here was a discovery as important as the discovery of X-rays made by Roentgen.

Working in Becquerel's laboratory at the time were Pierre Curie, a young instructor in physics, and his wife, Marie Curie.

Marie Curie asked Becquerel's permission to go on with his experiments, as she wanted to find whether any substances besides the salts of uranium gave off the same rays.

After many experiments she found that the ore from which uranium is obtained, gave off rays four times as strong as those of pure uranium. She was not wrong when she concluded that it could mean only one thing. The ore must contain some unknown chemical element which was far richer in these rays than was uranium.

When Pierre Curie learned about his wife's discovery, he decided to leave his own researches and both he and his wife began finding this unknown element.

In 1898 the Curies obtained a new element whose radioactivity was several million times stronger than that of uranium.

They named this new substance "radium". Radium is very expensive, as it is extremely rare. Several tons of rich ore are required in order to obtain one ounce of radium worth many thousands of dollars.

Radium possesses many interesting properties. It liberates heat, electrifies the air; it causes many substances to become phosphorescent when brought near it; it kills bacteria and other tiny organisms. Radium is used for medical purposes, as it helps to locate and diagnose different growths. There are many other applications of radium and more are developing each year.

Exercise 1

Tõlkige eesti keelde:
Переведите на русский язык:

1. When people lived most of their lives in the open air there was not much need for artificial light. 2. Trees need much water when planted. 3. Plants must be watered when dry. 4. As shown in the diagram, the sun radiates its energy in visible light and heat. 5. Ice melts when heated. 6. When the air in the tube was heated, the air molecules moved faster. 7. When ready the work was shown to the head engineer.

Exercise 2

Vastake küsimustele:
Ответьте на вопросы:

1. When did Roentgen make his discovery? 2. What did he notice when working? 3. Where are X-rays applied? 4. Is it possible or impossible to locate metallic objects in a body? 5. What did Becquerel discover? 6. Who worked in Becquerel's laboratory? 7. How did the Curies discover radium? 8. Why is radium so expensive? 9. What properties does radium possess?

Text 19

MEASURING TIME

If two alternating current generators are coupled together to carry a load, they run at exactly the same speed if they have the same number of magnetic poles.

If one of them makes 90,000 revolutions per hour then the other one will make 90,000 revolutions in the same time, neither more nor less. They work as if they were geared together. If the load were transferred to one machine the other would continue to run and if we no longer drove the second machine, the first would continue to drive it as a motor. Those two machines would continue to run in step so

long as they are connected together unless the rotation were resisted by excessive force. We say that the machines are "in synchronism" if they are in step with one another.

Certain motors which are used in industry are designed to run in step (to be in synchronism) with the supply and are called synchronous motors.

On a large electrical system all the synchronous motors must run uniformly at synchronous speed. Even if they ran at different speeds the speeds would be in an exact ratio, and a six-pole machine would turn at precisely two-thirds of the speed of a four-pole one.

It was realized years ago that if the frequency of the supply were controlled carefully, the synchronous motors could be used as clocks. The next obvious thought was naturally that if the frequency were so controlled, the clocks could be fitted with little synchronous motors. Today we consider the electric clock, driven from the supply by means of a tiny synchronous motor quite an ordinary thing.

But suppose we were in a small country town of England some time before 1830. At that time there was a town clock, and most of the townspeople had clocks in their houses and even carried fine watches. These were mechanisms of great accuracy; still they lost and gained time and had to be reset from time to time, but reset to what?

Had the telegraph existed at that time it would have been easy to know the time. If the radio had been invented it would have informed you of the exact hour. Had the telephone been in everyday use you could have inquired and got a ready answer. But there were no radio-sets, no telephone, nor even a telegraph. You could reset your clock by direct observation of the sun or by a sun-dial. However, the time given by a sun-dial does not keep in step with the time given by a clock, as the sun-dial shows the time proper to the place where you live.

When the railways had been invented, an idea was put forth in 1841 - to use the electric telegraph to transmit time for clocksetting purposes.

els into the specimen. If it comes across an air bubble, a crack or some other defect it is reflected from that region, thus locating the defect. If the specimen has no defects the signal is not reflected back until it reaches the opposite surface of the specimen.

Ultrasonic method is applied to study the ocean bottom, to locate shoals of fish or to detect some danger to navigation. People might have avoided many accidents if ultrasonic methods had been known before. However the early wish to detect icebergs by ultrasonic equipment failed to be realized. The reason for the failure is to be explained by the following acoustic fundamentals - water and ice have nearly the same density, sound travelling at nearly the same speed through both. Thus a sound wave passes freely from one medium into the other with only a small amount of reflection.

Ultrasonic waves are used in various industries. Ultrasonic cleaning promises to revolutionize the washing of metal parts. Various machine parts can now be washed cleaner than they could have been washed by all the known methods before. Besides the washing is done at a lower cost and in much less time. It is sufficient to put them into an appropriate solvent while agitating the solvent at quartz crystal frequency.

Ultrasonic cleaning proves to be especially successful in treating metal parts of irregular shape. The cracks which are inaccessible to cleaning by all the usual methods come out clean when treated by ultrasonics.

To clean by ultrasonics seems to be very simple. But a physicist knows that in attempting to explain this "simple" process of ultrasonic cleaning he has to go into the fundamentals of acoustics and thermodynamics.

Looking into the future we can reasonably expect a considerable further development of ultrasonics in various fields of science and industry.

Exercise 1

Kirjutage aktiivis:
Напишите в действительном залоге:

1. You should be examined by the doctor. 2. The new machine parts must be tested by the head engineer. 3. This work ought to have been done by the students yesterday. 4. The machine could have been removed by them.

Exercise 2

Vastake küsimustele:
Ответьте на вопросы:

1. What sounds are called audible? 2. What is the range of sounds audible to the human ear? 3. What is a transducer? 4. What do we use ultrasonics for? 5. How does a quartz crystal detect defects in metals? 6. Why is it difficult to detect an iceberg?

V o c a b u l a r y

Text 1

Questions and Answers

to change	muutma , muutuma	менять, изменять(ся)
current	vool	ток
different	erinev, mitmesugune	различный
discover	avastama	открывать, обнаруживать
drive	ajama, käivitama	двигать, приводить в движение
engine	mootor, masin	мотор, машина
exist	olelema, eksisteerima	существовать
force	jõud	сила
friction	hõõrdumine	трение
heat	soojus	теплота
liquid	vedelik	жидкость
matter	aine, mateeria	материя, вещество
in motion	liikumas	в движении
occupy	hõivama	занимать
overcome	ületama	преодолевать
property	omadus	свойство
remain	jäämа	оставаться
at rest	paigal	в состоянии покоя
rocket	rakett	ракета
science	teadus	наука
solid	tahke keha	твердое тело
space	ruum	пространство
state	olek	состояние
steam	aur	пар
weight	raskus, kaal	вес, тяжесть

Text 2

Weather Forecasts

aviation	lennundus	авиация
cloud	pilv	облако
determine	kindlaks määrama	определять,устанавливать
device	seade, aparaat	установка, прибор
factor	tegur	фактор
firmness	meelekindlus	стойкость, устойчивость
forecast	ennustus	предсказание
foretell	ennustama	предсказывать
frost	külm, pakane	мороз
hang	rippuma, riputama	висеть
importance	tähtsus	значение
in advance	ette	вперед, заранее
in spite of	hoolimata	несмотря на
interruption	katkestus	перерыв
observation	vaatlus	наблюдение
particular	eraldi võetud	отдельно взятый
record	registreerima	записывать
region	piirkond	сфера, область
scientific	teaduslik	научный
selflessness	ennastsalgavus	самоотверженность
sensitive	tundlik	чувствительный
single	ainus, üksik	единый
state	seisund	состояние
successfully	edukalt	успешно
velocity	kiirus	скорость
weather	ilm, ilmastik	погода

Text 3

The Solar System

appear	ilmuma	появляться
appearance	ilme; ilmumine	вид; появление
as well	samuti	также
average	keskmine	средний
closest	lähim	ближайший
consist of	koosnema	состоять из
contain	sisaldama	содержать
measure	mõõt	мера
opposition	vastasseis	противостояние
point	punkt	точка
power	energia	энергия
rate	määr; kiirus	норма; скорость
realize	mõistma, kujutlema	понимать, ясно представлять
reveal	ilmutama, avastama	обнаруживать
revolve	tiirlema	вращаться
scale	mõõtkava	масштаб, размер
solar	päikese-	солнечный
study	uurimine, tundmaõppimine	изучение
unit	ühik	единица

Text 4

New Methods of Computation

add	liitma	складывать
amount	hulk	количество
analogy	sarnasus	аналогия
brain	peaaju	мозг
complex	keeruline, kompleksne	сложный, составной
complicated	keeruline	сложный, запутанный
computer	arvuti	вычислительная машина, счетно-решающее устройство
computation	arvutus	вычисление
cost	hind, kulu, maksumus	цена, стоимость

development	areng	развитие
divide	jagama	делить
engineering	tehnika	техника
error	eksitus, viga	ошибка
evident	ilmne	очевидный
invention	leiutus	изобретение
measurement	mõõtmine	измерение
multiply	korrutama	умножать
reduce	taandama	сводить к, приводить к
research	uurimine	исследование
subtract	lahutama	вычитать
translator	tõlk	переводчик
undergo	läbi tegema	подвергаться

Text 5

Comrade A's First Impressions of London

attentive	tähelepanelik	внимательный
cross here	ülekäik	переход
crossing	ristumiskoht	перекресток
double-decked	kahekorruseline	двухъярусный
fog	udu	туман
impressions	muljed	впечатления
inside	sees(pool)	внутри
lodger	elanik	жилец
motor-car	auto	автомобиль
notice-board	hoiatussilt	предупреждающая доска
on top	ülal	наверху
polite	viisakas	вежливый
regulations	määrused, reeglid	правила, предписания
stay	peatuma, viibima; viibimine	останавливаться; пребывание, остановка
street traffic	tänavaliiklus	уличное движение
face the street	tänava poole olema	выходить на улицу (об окне)
two-storeyed	kahekorruseline	двухэтажный
wrong	vale, väär	неправильный, ошибочный

Text 6

From "All Quiet in the Kremlin"

adjoining	kõrvalolev	смежный
adventure	seiklus, julge üritus, risk	приключение, смелое предприятие, риск
area	maa-ala	пространство
attempt	katse	попытка
beyond	väljaspool	вне
blossoming	õitsev	цветущий
cease	lakkama	переставать
completion	lõpuleviimine, täitmine	завершение, выполнение
contrary	vastupidine	противный, противоположный
cotton	puuvill	хлопок
dam	pais, veesulg	плотина, запруда
discussion	arutlus	обсуждение
dotted line	punktiirjoon	точечная линия
doubt	kahtlus	сомнение
establish	kindlaks tegema	устанавливать
former	eelmine, endine	прежний, бывший
huge	hiiglaslik, tohutu	гигантский, огромный
irrigate	niisutama	орошать
manuscript	käsikiri	рукопись
map	maakaart	географическая карта
quiet	vaikne	спокойный, тихий
quite	täitsa	вполне
river bed	jõesäng	русло
spaces	laigud	полосы
suggest	sisendama	внушать

Text 7

From "Martin Eden"

a sort of	taoline	что-то вроде
avoid	vältima	избегать
block	tõkestama	преграждать
boil	keema	кипеть
bucket	ämber	ведро

collision	kokkupõrge	столкновение
come into contact	kokku puutuma	соприкасаться
cook	toitu valmistama	приготовлять пищу
closet	seinakapp	стенной шкаф
clothes line	pesunöör	веревка для сушки белья
in the way	teel ees	на пути, мешать
keep house	maja pidama	вести хозяйство
oil-stove	keeduaparaat, priimus	примус, прибор для приготовления пищи
look out on	väljavaatega...	выходить на (об окне)
make notes	märkmeid tegema	делать заметки
porch	veranda	веранда
provisions	toiduvaru, proviant	провиант, съестные припасы
serve	teenima, teenindama; kasutama	служить, обслуживать; использоваться
several	mitu	несколько
straight line	sirgjoon	прямая линия
stretch	tõmbama	тянуть, натягивать
total	kogu	весь, целый
unnavigable	läbipääsmatu, mittelaevatatav	непроходимый (несудоходный)

Text 8

Green Gold

absorb	imama, absorbeerima	всасывать, поглощать
affect	mõjustama	влиять, воздействовать
base	alus	основание, подножие
cause	tekitama	причинять
crops	põlluvili	посев
damage	kahju	вред, убыток
decrease	vähenemine	уменьшение
delay	viivitama	замедлять, задерживать
desert	kõrb	пустыня
destruction	häving	разрушение, уничтожение
hut	hütt, onn	хижина
melting	sulamine	таяние

moisture	niiskus	влага, сырость
mud	muda	грязь
plant	istutama	сажать
profit	kasum	прибыль, выгода
profitable	kasutoov	выгодный
radiation	kiirgamine	излучение, радиация
remake	ümber kujundama	преобразовать
shade	vari	тень
sell	müüma	продавать
soil	pinnas	почва
squirrel	orav	белка
strength	tugevus	сила
timber	metsamaterjal	лесоматериал

Text 9

Metals

abundant	rikkalik	обильный, богатый
according to	vastavalt	соответственно
advantage	eelis	преимущество
application	tarvitamine, rakendamine	применение
apply	tarvitama, rakendama	применять
arrange	korrastama	приводить в порядок
blank	tühik, lünk	пробел
bold	julge	смелый
corrosion-resistant	korrosioonikindel	коррозионностойкий
enable	võimaldama	давать возможность
field	ala	сфера, область
growth	kasv	рост
indicate	osutama, näitama	показывать, указывать
in order to	et	чтобы
law	seadus	закон
melting-point	sulamispunkt	точка таяния
orderly	korrapärane	регулярный, методичный
predict	ennustama	предсказывать
promising	paljutõotav	многообещающий

prove	tõestama	доказать
rapid	kiire	быстрый, скорый
scientist	teadlane	ученый
similar	sarnane	сходный
state	sõnastama	формулировать
structural material	ehitusmaterjal	строительный материал
subject	allutama	подвергать
supposition	oletus	предположение

Text 10

Salt

ancient	vanaaegne, antiikne	древний, античный
believe	uskuma, arvama	верить, полагать
chloride	kloriid	хлорид
chlorine	kloor	хлор
common	harilik	обыкновенный
common salt	keedusool	поваренная соль
cover	katma	покрывать
crops	põllukultuurid	хлебные злаки, полевые культуры
depend on	sõltuma	зависеть
deposit	sadestunud lademik	отложение
dissolve	lahustama, lahustuma	растворять(ся)
evaporate	aurustuma	испаряться
form	moodustama	образовать
improve	paranema, parandama	улучшать(ся)
lake	järv	озеро
lasting	kestev	прочный
layer	kiht, lade	пласт, слой
mainly	peamiselt	главным образом
mining	kaevandamine	разработка недр
meat	liha	мясо
obtain	saama	получать, добывать
offer	ohverdama, pakkuma	жертвовать, предлагать, подносить

preserve	säilitama	сохранять
primitive	ürgaegne	первобытный
pure	puhas	чистый
quality	omadus	качество
raise	kasvatama	выращивать
raw	toores	сырой
reduce	vähendama, alandama	уменьшать, понижать
require	vajama; nõudma	нуждаться; требовать
road	maantee	шоссе
rock-salt	kivisool	каменная соль
salt	sool	соль
sandbank	leetseljak	песчаная отмель
separate	eraldama, lahutama	отделять(ся)
sign	märk, tunnus	признак, знак
situated	asetsev	расположенный
sodium	naatrium	натрий
soft	pehme	мягкий
solution	lahus	раствор
stage	aste	стадия, ступень
well	allikas, kaev	колодец, буровая скважина

Text 11

Timber

achievement	saavutus	достижение
annual	iga-aastane	ежегодный
artificial	kunstlik, tehislik	искусственный
board	saelaud	доска
bookcase	raamatukapp	книжный шкаф
case	juhk(um)	случай
compose	koostama	составлять
connection	seos	связь
considerable	tunduv, märkimisväärne	значительный
construction	ehitus	строительство
data	andmed	данные

devote	pühendama	посвящать
engineering	tehnika	техника
establish	kindlaks määrama	установить
fibre	kiud	волокно
floor	põrand	пол
forest	põlismets, mets	лес
further	edasine	дальнейший
grind up	purustama, jahvatama	измельчать, размалывать
level	tase	уровень
manufacture	tootmine	производство
match	tuletikk	спичка
purpose	otstarve	цель
partition	vahesein	простенок
replace	asendama	замещать, заменять
research	teaduslik uurimine	научное исследование
resources	ressursid, tagavarad, reservid	ресурсы, богатства
rubber	kumm	резина
sawdust	saepuru	опилки
shelf	riiul	этажерка, полка
substance	aine	вещество
skill	oskus, osavus	мастерство
timber	puitmaterjal	строевой лес, лесоматериал
various	mitmesugune	различный

Text 12

Cambridge

beadle	pedell, korrarikkujate jälitaja	педель
bridge	sild	мост
cap	akadeemiline barett	берет (акад.)
dean	dekaan	декан
expel	välja heitma	исключать
faculty	teaduskond	факультет
fine	trahvima	штрафовать
gate	värav	ворота

gown	talaar	талар, плащ, мантия
grant	andma, annetama	дарить, жаловать
guidance	juhendamine	руководство
lawn	muru	газон
library	raamatukogu	библиотека
minor	väiksem	меньший, второстепенный
official	ametnik	должностное лицо
proctor	proktor, sisekorra ülem	проктор
pinkish	roosakas	розоватый
reader	dotsent	доцент (в Англии)
rare	haruldane	редкий
term	semester	семестр
tutor	juhendaja	руководитель
vacation	vaheaeg	каникулы

Text 13

Soviet Exploration

aerial	õhu-, aero-	аэро-, воздушный
airman	lendur	летчик
aviator	lendur	летчик
carry out	läbi viima	проводить, выполнять
enormous	tohutu	огромный
explorer	maadeuurija	исследователь (неизв. стран)
exploration	maade uurimine	исследование
featureless	ilmetu	без характерных черт
mapping	kaardistamine	съемка
mine	kaevandus	шахта
outline	kontuur	очертание, контура
outlying	kauge	дальний
recent	hiljutine, viimane	недавний
sawn	saetud	распиленный
soundings	sügavusemõõtmine	измерение глубины
suitable	sobiv	подходящий
to supply	varustama	снабжать
to survey	mõõtma ja kaardistama	производить съемку

traffic	liiklus	транспорт, движение
vaguely	ebamäääraselt	неопределенно, неясно, смутно
value	väärtus	ценность
wealth	rikkus	богатство
winterize	külmakindlaks tegema, talviseks tööks kohandama	приспособлять к зимней работе

Text 14

Bernard Shaw

advanced	eesrindlik, progressiivne	передовой, прогрессивный
alarming	erutav, ärevust tekitav	тревожный, волнующий
appearance	ilmumine	появление
attend school	koolis käima	посещать школу
centenary	100.aastapäev	столетняя годовщина
clerk	kontoriametnik	конторский служащий
due to	tõttu	благодаря
decide	otsustama	решить
earn	teenima	зарабатывать
efficient	võimekas	умелый
event	sündmus	событие
expose	paljastama	разоблачать
figures	numbrid	цифры
hate	vihkama	ненавидеть
insignificant	tähtsusetu	незначительный
job	töö	работа
living	elatis	пропитание
music master	muusikaõpetaja	учитель музыки
office	kontor	контора, канцелярия
periodical	ajakiri	журнал, периодическое изд.
salary	aasta- või kuupalk	жалованье, зарплата
sitting-room	elutuba	общая комната
waste	raiskama	тратить
wit	teravmeelsus, vaimukus, leidlikkus	остроумие

Text 15

Across the Borders of Space

air force	lennuväg**i**	военно-воздушные силы
assignment	ülesanne	задание
bottom	põhi	дно
circle	ringlema	вращаться вокруг
complete	lõpule viima	завершать
concerning	suhtes	относительно
contours	piirjooned	очертания
distinguish	eristama	различать
dissipate	hajuma	рассеивать(ся)
envelope	ümbrik, kest	оболочка
evidence	tõendus	показание
flight	lend	полет
float	ujuma, ujuvil olema	плыть
glare	helk	блеск
the greatest scientific achievement	suurim teaduslik saavutus	величайшее научное достижение
greet	tervitama	приветствовать
harmful	kahjulik	вредный
imagine	kujutlema	представлять
launch	välja saatma (kosmoselaeva)	запускать (ракету, спутник)
spherical	kerakujuline	шарообразный
prevent	takistama	препятствовать
proclaim	välja kuulutama, avalikult teada andma	объявлять, провозглашать
protecting covering	kaitsekate	защитный покров
space ship	kosmoselaev	космический корабль
surface	pealispind	поверхность
triumphant	võidukas	торжествующий, победоносный
visible	nähtav	видимый
wonderful	imehea	удивительный, замечательный
weightless	kaaluta	невесомый

Text 16

Thomas Alva Edison

all aboard	ärasõit	посадка закончена
ceaseless	lakkamatu	непрерывный
deaf	kurt	глухой
device	aparaat, seade	аппарат, прибор, механизм, устройство
drag	lohistama	волочить, тащить
dull	rumal, nürimeelne	глупый, тупой
establish	asutama	основать, организовать
foot	jalg (mõõtühik)	фут (30,5 см)
hand-rail	käsipuu	перила
hatch	hauduma	высиживать
impress	muljet avaldama	произвести впечатление
ingenious	leidlik	находчивый
inspiration	innustus	вдохновение
keep records	ülestähendusi tegema	вести записи
limit	piir	предел, граница
newsboy	ajalehepoiss	разносчик газет
price	hind	цена
perspiration	higistamine	потение
rotate	pöörlema	вращаться
row	rida	ряд
save	päästma	спасать
seize	haarama	схватывать
sell	müüma	продавать
sick	haige	больной
triple	kolmekordne	тройной
workshop	töökoda	мастерская

Text 17

The Atom and the Nucleus

to be familiar	tuttav olema	быть знакомым
charge	laeng	заряд
concentrate	keskendama	сосредоточить(ся)
conception	kontseptsioon, käsitusviis, mõistmine	концепция, понимание

constituent part	koostisosa	составная часть
constitute	moodustama	составлять
convey	tähendama, mõista andma	выражать, сообщать, передавать
derive	tuletama	производить
encircle	ümbritsema	окружать
extremely	äärmiselt	чрезвычайно
for long	kaua aega	в течение долгого времени
indivisible	jagamatu	неделимый
nucleus	tuum	ядро
on the other hand	teisest küljest	с другой стороны
particles	osakesed	частицы
penetrate	läbima	проникать
put another way	teisiti (teiste sõnadega) ütlema	выразить иными словами
pin	nöörpõel	булавка
recognizable	äratuntav	признаваемый, опознаваемый
size	suurus, mõõtmed	величина, размер
substance	aine	вещество
volume	maht	объем

Text 18

Radioactive Elements

bone	luu	кость
box	karp, kast	ящик, коробка
bullet	kuul	пуля
consequent	järgnev; järelduv	последующий
discharge	laengut tühjendama	разряжать
disorder	haigus	болезнь, расстройство
efficient	efektiivne, tõhus	действенный, эффективный
emanate	välja voolama	истекать, исходить
emit	kiirgama	испускать, излучать
enclosed	sulustatud	вложенный
extensively	ulatuslikult	широко
fog	uduseks tegema	затуманить
frequently	sageli	часто

growth	kasvaja	нарост
hardening	karastamine	закал, закалка, закаливание
instructor	õpetaja	преподаватель
liberate	vabastama, eraldama	выделять, освобождать
locate	avaldama	обнаруживать, определять место
occur	esinema, juhtuma	случаться, встречаться
ore	maak	руда
permission	luba	разрешение
plate	plaat	пластинка
plastics	plastmass	пластмасса
reason	põhjus	причина
recognition	äratundmine	опознавание, признание
rubber	kumm	резина
shadow	vari	тень
show up	välja paistma	выделяться (на фоне)
tiny	pisikene	крошечный
translucent	läbikumav	просвечивающий, полупрозрачный
transmission	ülekanne siin: läbivalgustamine	передача, здесь: просвечивание
tube	elektronlamp	радиолампа, электронная лампа, электроннолучевая трубка
unfit	ebasobiv, kõlbmatu	негодный
visible	nähtav	видимый

Text 19

Measuring Time

alternating	vahelduv	переменный
couple	sidurdama, seostama, paaritama	соединять, сцеплять, спаривать
era	ajastu, ajaarvamine	эпоха, летосчисление
exact	täpne	точный
excessive	liigne	чрезмерный
fit	sobitama, kohandama	устанавливать, приспособлять
gain	ette käima	спешить, ходить вперед
geared	jõuülekandeseadisega ühendatud, hambunud	сцепленный, в зацеплении

in step	kooskôlas	согласованно
in synchronism	samaaegne, sünkroonine	одновременный, синхронный
load	koormus	нагрузка
lose siin:	maha jääma	здесь: отставать
obvious	ilmne, silmnähtav, selge	очевидный, ясный
pole	poolus	полюс
practically	tegelikult	фактически
precisely	täpselt	точно
proper	sünnis, sobiv	подходящий
radio-set	raadiovastuvôtja	радиоприемник
ratio	suhe	пропорция, отношение
re-set	taasreguleerima	снова регулировать
revolution	pööre, tiir	оборот
sun-dial	päikesekell	солнечные часы
suppose	oletama	предполагать
timekeeper	ajamôôtja, ajanäitaja, ajakontrollija	хронометр
transfer	üle kandma	передавать
transmit	üle kandma, edasi andma	передавать
watch	tasku- vôi käekell	карманные или ручные часы

Text 20

Ultrasonics

accident	ônnetusjuhtum	несчастный случай
agitate	ergutama	возбуждать, мешать
appropriate	vastav, kohane, sobiv	соответствующий, подходящий
audible	kuuldav	слышный
avoid	väitima	избегать
bat	nahkhiir	летучая мышь
bubble	mull	пузырек
burst	pahvak, pahvatus	вспышка, взрыв
cost	kulu, maksumus	цена, стоимость, расход
density	tihedus	плотность

detect	tabama	обнаруживать
dimensions	suurus, mõõtmed, ulatus	величина, размеры
echo	kaja	эхо
equipment	seadmed	оборудование
frequency	sagedus	частота
fundamentals	printsiibid, alused	основы
high-frequency	kõrgsagedus	высокая частота
iceberg	jäämägi	ледяная гора
inaccessible	ligipääsmatu	недоступный
inaudible	mittekuuldav	неслышимый
insect	putukas	насекомое
means	vahend	средство
medium	keskkond	среда
mix	segama	мешать, смешивать
obstacle	takistus	препятствие
pulsed	pulseeriv, impulss-	пульсирующий, импульсный
reflect	peegeldama	отражать
shoal of fish	kalaparv	стая рыбы
solve	lahendama	решать
solvent	lahusti, lahustusvahend	растворитель
sonic	heliline	звуковой
source	allikas	источник
specimen	proovikeha, mudel, näidis	образец
sufficient	küllaldane	достаточный
surface	pealispind	поверхность
test	proovima	испытывать
travel	levima	распространяться
transducer	andur	датчик, преобразователь
treat	töötlema	обрабатывать
vibrate	vibreerima, võnkuma	вибрировать, колебаться
ultrasonic	ultraheliline	ультразвуковой
utter	väljendama	выражать
ultrasonics	ultraakustika	ультраакустика

Hind 12 kop.