МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

ОДЕСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ імені І. І. МЕЧНИКОВА

Факультет романо-германської філології

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МЕТОДИЧНІ РЕКОМЕНДАЦІЇ

з розвитку навичок англомовного професійного спілкування

для студентів біологічного факультету ОНУ

імені І.І. Мечникова

перший (бакалаврський) рівень

за спеціальностями: 091 «Біологія», 014 « Середня освіта » та 162 «Біотехнологія та біоінженерія» біологічного факультету

Одеса

2022

УДК 821.111’243(072)

М545

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Рекомендовано до друку науково-методичною радою ОНУ імені І.І.Мечникова

Протокол № 1 від 22 серпня 2022 р.

Методичні рекомендації з розвитку навичок англомовного професійного спілкування для студентів біологічного факультету ОНУ імені І.І. Мечникова перший (бакалаврський) рівень за спеціальностями 091 «Біологія», 014 « Середня освіта » та 162 «Біотехнологія та біоінженерія» біологічного факультету /уклад.Л.Б.Котлярова; ОНУ ім.І.І.Мечникова.-Одеса: Астропринт,2022.- 43 с.

УДК 821.111’243(072)

Астропринт , 2022

Головна мета методичних порад – сприяти формуванню у бакалаврів-біологів та біотехнологів I-II курсів біологічного факультету навичок англомовного професійного спілкування на основі використання наукової літератури в галузі майбутньої професії.

Друга частина методичних порад Home reading містить наукові тексти, які допоможуть студентам біологічного факультету навчитися працювати з науковими текстами за фахом „Біологія та біохімія, ” «Біотехнологія та біоінженерія», « Середня освіта » та використовувати їх для написання резюме, а також для використання написання доповідей на англомовні наукові конференції, для оволодіння вміннями та навичками професійного англомовного спілкування на міжнародних конференціях, усного спілкування з іноземними колегами. Друга частина порад містить також таблицю хімічних елементів з транскрипцією, приклади читання хімічних формул та опис лабораторного обладнання.

У даних методичних порадах відсутній систематичний граматичний довідник, тому можна рекомендувати паралельно використовувати будь-яку граматику англійської мови.

3MICT

Unit 1

Biology and Biotechnology

How does biology refer to biotechnology?

Why should biotechnologists study biology?

1. Read the first abstract of the text and try to answer

the questions given there.

2. Read the whole text about biology and translate.

The Science of Life

How can there be seedless grapes, and how do they reproduce? Why is carbon

monoxide extremely poisonous

Why can`t you tickle yourself? What causes the smell after rain?

How do vitamins work? What`s all this fuss about stem cells? What`s make us yawn? Why are frogs growing extra legs out of their legs? Which came first, the chicken or the egg?

Biology is the study of living things and their vital processes. Because biology covers such a broad area, it has been traditional to separate the study of plants (botany) from that of animals (zoology), and the study of structure of organisms (morphology) from that of function (physiology). Despite their apparent differences, all the subdivisions are interrelated by basic principles, so current practice investigate those biological phenomena that all living things have in common. The advancement of knowledge and technology has resulted in further categorizations that include: cell biology, population biology, ecology, genetics, biochemistry, molecular biology, microbiology, physical anthropology, etc.

The foundations of modern biology include four components: cell theory; that life is made of fundamental units called cells; evolution, that life is not deliberately designed by rather evolves incrementally through random mutations and natural selection; gene theory, that tiny molecular sequences of DNA dictate the entire structure of an organism and are passed from parents to offspring; and homeostasis, that each organism’s body includes a complex suite of

processes designed to preserve its biochemistry from the entropic effects of the external environment.

It is not known when the study of biology originated, but it can be safely assumed that early humanoids had some experimental knowledge of the

animals and plants around them. One's very survival relied on the recognition of poisonous plants and on the basic understanding of the habits of predators.

Many of the earliest records of biology come from the bas-reliefs left behind by the Assyrians and Babylonians. There is growing evidence from China and India as early as 2500 BC that there were general practices of crops, and agricultural cultivation.

With the arrival of Greek civilization, the study of biology shifted dramatically to a belief that every event has a cause and that a

particular cause produces a particular effect. These philosophers of science assumed the existence of a natural law governing the universe. Although they established the science of biology, their greatest contribution to science was the idea of rational thought.

The basic picture in biology has stayed roughly the same since DNA was first imaged using x-ray crystallography in the 1950s, although there are constant refinements to the details, and life is so complex that it could be centuries or even millennia before we begin to understand it in its entirety. But it should be made clear that we are moving towards complete understanding: life, while complex, consists of a finite amount of complexity that only appreciably increases on relatively long timescales of hundreds of thousands or millions of years. Evolution, while creative, operates slowly.

In recent years, much excitement in biology has centered on the sequencing of genomes and their comparison, called genomics, and the creation of life with custom-written DNA programming, called synthetic biology. These fields are sure to continue grabbing the headlines in the near future.

Vocabulary

cause

cell theory

complex suite

consist of (v)

constant

contribution

dictate (v)

establish (v)

evolution

evolve (v)

finite amount

foundation

fundamental unit

gene theory

homeostasis

in common

morphology

natural selection

offspring

physiology

preserve (v)

recognition

refinement

separate(v)

shift (v)

survival

vital processes

x-ray crystallography

zoology

substance ['sʌbst(ə)n(t)s]

Make up your own sentences with the following word combinations:

chemical substance –хімічна речовина
hard substance –тверда речовина
oily substance –маслянистa речовина
pure substance –чиста речовина, речовина безд омішок
toxic substance –токсична речовина
hazardous substance –небезпечна речовина
ozone-depleting substance –озоноруйнівна речовина
2) зміст, суть, сутність; in substance –посуті
Is there any substance to their claim? –Їх вимоги серйозні? Чи є яке-небудь раціональне зерно в їхніх вимогах?

3. Give Ukrainian equivalents:

A broad area, apparent differences, biological phenomena, the foundations of modern biology, random mutations, tiny molecular sequences of DNA, a complex suite of processes, early humanoids, poisonous plants, the habits of predators, growing evidence,

therapeutic healing, every event has a cause, a natural law, greatest contribution, rational thought, constant refinements to the details, complete understanding, finite amount of complexity, sequencing of genomes, custom-written DNA programming.

4. Translate these sentences using your vocabulary.

1) Ми дивилися передачу про те, як чистити (peel) і розділяти на сегменти цитрусові. 2) Наше тіло – це складний набір органічних молекул. 3) Цей унікальний дієтичний продукт зміцнює імунітет і сприяє нормалізації життєво важливих процесів в організмі. 4) Способом виживання первісної людини стало почуття її споріднення (twinning) з грізною природною стихією. 5) На лекції ми дізналися, що послідовність ДНК визначає структуру всього організму. 6) Вчені знайшли біологічну причину того, що жінки знаходять спокійних, зібраних чоловіків більш привабливими. 7) Рентгенівська кристалографія використовує рентгенівські промені для виявлення молекулярної структури кристала. 8) Андрій Андрійович Сибірний вніс величезний вклад в розвиток мікробіології в Україні.

5. Write all your associations with the words:

1) Botany

2) Zoology

3) Morphology

4) Physiology

6. Answer the following questions according to the ideas of the text.

1) What is biology?2) How is biology traditionally separated?3) How are the subdivisions of biology interrelated?4) What components do the foundations of modern biology include?5) When did the study of biology originate?6) Who were the first people having biological knowledge?7) Where did the first records about biology come from?8) What practiced in China in 2500 BC?9) What did Greek civilization bring to biological knowledge?10) When did the picture in biology become stable?11) When will we probably understand the biological entity?

12) What is the most developing modern area of biology?

7. *Read this text and translate it.*

Cytology as a science.

Cytology means "the study of cells". Cytology is that branch of life science, which deals with the study of cells in terms of structure, function and chemistry.

Based on usage it can refer to cell biology. Cell biology is a scientific discipline that studies cells – their physiological properties, their structure, the organelles they contain, interactions with their environment, their life cycle, division and death. This is

done both on a microscopic and molecular level. Cell biology research encompasses both the great diversity of single-celled organisms like bacteria, as well as the many specialized cells in multicellular organisms such as humans.

The cell is the functional basic unit of life discovered by Robert Hooke. It is the smallest unit of life that is classified as a living thing, and is often called the building block of life. Some organisms, such as

most bacteria, are unicellular (consist of a single cell).Other organisms, such as humans, are multicellular.

Humans have about 100 trillion cells; a typical cell size is 10 micrometersand a typical cell mass is 1nanogram. The largest known cells are unfertilized ostrich egg cells, which weigh 3.3 pounds.

The cell theory, first developed in 1839 by Matthias Jakob Schleiden and

Theodor Schwann, states that all organisms are composed of one or more cells, that all cells come from preexisting cells, that vital functions of an organism occur within cells, and that all cells contain the hereditary information necessary for regulating cell functions and for

transmitting information to the next generation of cells.

The word *cell* comes from the Latin *cellula*, meaning, a small room. The descriptive term for the smallest living biological structure was coined by Robert Hooke in a book he published in 1665 when he

compared the cork cells he saw through his microscope to the small rooms monks lived in.

The cell consists of different proteins. Each type of protein is usually sent to a particular part of the cell. Most proteins are synthesized by ribosomes in the rough endoplasmic reticulum. This process is known as protein biosynthesis.

Appreciating the similarities and differences between cell types is particularly important to cell and molecular biology as well as to biomedical fields such as cancer research and developmental biology. Therefore, research in cell biology is closely related to genetics, biochemistry, molecular biology, immunology and developmental biology.

8. Give English equivalent to the following phrases.

Багатоклітинні організми, молекулярна біологія, розподіл, клітина, спадкова інформація, органели, яйцеклітина, дослідження раку, розділ (науки), матисправу з, бактерії, молекулярний рівень, цитологія.

9. Answer the question according to the text.

1) What is cytology?

2) Is cytology and biology of a cell the same science?

3) What does cell biology study?

4) Who discovered the cell?

5) Is a cell the smallest unit of life?

6) Give examples of unicellular and multicellular organisms.

7) What cells are the largest known cells?

8) Who developed the cell theory?

9) Where does the word *cell* come from?

10) What is it inside the cell?

11) What is biosynthesis?

12) What sciences are related to the cell biology closely?

10. Put the words in the right order and write down the sentences:

1)that studies cells/ is / scientific / a/ cell biology / discipline /

2) basic /the /cell/ life/ functional/ of /is/ the/ unit /

3) of/ called/ life //the cell / often / the building block / is /

4) and/ 10 /mass /a /typical/ size/ nanogram/ is / a cell / is /1/cell /µm/typical/

5) for/ that /the next/ functions/ and /regulating/ all/ the /information /contain /for /cell/ hereditary/ to/ necessary/ generation / cells /cells /information/ of/ transmitting

6) provide/ differences /these /unifying/ similarities /and /theme fundamental /a

101Write out the sentences expressing the main ideas of each logical part of the text.

11. Create the project "Fantastic cells. Think about unreal cells or cells of your dream and describe them (100-150 words). How do they look like? What properties do they have?

12. Give a detailed answer or write an essay on the following questions:

•The future of cytology.

•How cytology can help the mankind?

Unit 2

Education

You study at the university.

Do you know when your university was founded?

Do you think if you have quite modern education or some things here are much to be desired?

1.Read and translate the text.

The History of Education

As long as we live we continue to learn, and the education we receive when we are young helps us to continue learning. We are taught to read and write, and we are taught many of the essential facts about the world and shown how to sort them out so that the later in life, we shall be able to find out things ourselves and not to ask other people.

The first teachers were fathers and mothers, but very early in the history of man children began to be taught by people other than their fathers and mothers.

It is thought that schools first started in Egypt 5,000 to6,000 years ago, and that it was the invention of writing which made them necessary. Reading and writing

were quite different from the skills used in everyday life, and writing made it possible to store up knowledge which grew with each generation. Specially trained people were therefore needed to teach it. Only the sons of nobles attended the first Egyptian schools, which taught reading, physical education and good behavior. In ancient India the priestly caste decided what should be taught to each of the four castes, or groups, into which people were divided.

Only the priestly caste was allowed to learn the Hindu scriptures. In China, until 19th century, education was organized according to social classes, and consisted largely of learning the scriptures by heart.

A clear example of the way in which even neighboring peoples produce different types of education came from ancient Greece. Sparta and Athens were two Greek states. To Spartans, hard and warlike people gave a purely military education to their children.

At the age of seven all boys of noble families were taken from their homes and sent to live inschools. They were kept under a very strict discipline and were taught hunting, military scouting, swimming and the use of weapons. The Spartans despised literature, and some people think they could not even read.

At the very same time, also for the nobles only, the Athenians were building what we call a liberal education– one that helps a man to develop all sides of his

nature, helps him to make and appreciate beautiful things and helps him to find the best way of life. They thought it was important to educate the body as well as the mind, and had a program of physical training which consisted of running, jumping, wrestling and throwing the discus. As time went on Athenian education paid special attention to reading, writing and literature and these were taught by a special teacher, known as the “grammatist”. Common people were not educated; they were trained in craftsmanship, workman ship and trades.

Greek philosophers, or thinkers, always discussed what education should try to do and what it should include. Plato wrote a book called *The Republic*, which

is one of the best books ever written on education, and since those days Greek ideas have influenced European education, especially secondary and university education.

The Romans were very good at organizing, and they were the first people to have schools run by government free of charge. Throughout their great empire

there was a network of these schools which provided for three stages of education.

At six or seven all boys (and some girls) went to primary school, where they learned “three R’s”: reading, writing and arithmetic. Most children were not taught more than this; but at 12 or 13, boys of the rich families went on the “grammar” school to study Greek and Latin languages and literature, that is, what had been written in those languages. At 16, young nobles who wanted to enter politics or the service of their country went to schools of rhetoric to be trained in rhetoric, or public speaking.

In Great Britain the first teachers we read about were craftsmen. They taught children to read, write and count, to cook and mend their own shoes. In early 19th century the main system of teaching was the “Monitor” system. The teacher could manage a class of 100 or more by using older pupils or “monitors” to help him. The schools had long desks which were sometimes arranged in tiers so that the teacher could see every child in a large class.

Vocabulary

according to

appreciate (v)

as well as

be allowed to

behavior

by heart

common people

consist of (v)

decide (v)

despise (v)

develop (v)

early

essential

find out (v)

free of charge

hard people

include (v)

influence (v)

invention

keep under a discipline

knowledge

liberal education

necessary

pay special attention

possible

produce (v)

provide for (v)

quite different

run by (v)

sort out (v)

store up (v)

the use of weapons

therefore

throw(v)

Make up your own sentences with the following word combinations:

distraction [dɪ'strækʃ (ə) n] 1) відволікання уваги 2) те, що відволікає увагу 3) розвага

harmless distraction –невинна розвага
Syn: amusement, diversion, relaxation

4) безлад; чвари

5) збудження, затьмарення розуму, безумство
to distraction - шалено, відчайдушно
to drive smb. to distraction –зводити кого-л. з розуму; докучати, надокучати, набридати
The Princess loves you to distraction. –Принцеса любить вас до божевілля.
2. Give Ukrainian equivalents for the following words:

Primary school, secondary school, high school, university, undergraduate studies, liberalarts/arts/liberals (humanities), sciences, major/to major, minor, undergrad(uate) students/undergrads.

3. Give detailed answers to the questions.

1) Why do we need to be taught?

2) When and where did the first school start?

3) What made possible to store up knowledge?

4) Who were the pupils of the first schools?

5) What was the organization of education in China until the 19th century?

6) What was the difference between Spartan and Athenian educational system?

7) What are the main principles of liberal education?

8) Who was the “grammatist”?

9) Were common people educated?

10) What is the impact of Greek philosophers into the history of education?

11) Who had the schools run by government free of charge?

12) What were the three stages of Roman education?

13) Who were the first teachers in Britain?

14) What was the main system of teaching in the early 19th century

15) Who were “monitors”?

4. Arrange the following statements in their logical

order. Explain and expand them.

• Spartans gave a military education to theirchildren

• Only the priestly caste was allowed to learn the Hindu scriptures

• Greek ideas influenced European education

• Schools first started in Egypt 5,000 to 6,000years ago

• The Romans were very good at organizing

• The “Monitor” system

• The first teachers were fathers and mothers

• People were divided into the four castes

• In Great Britain the first teachers were craftsmen

• Sometimes neighboring peoples produced different types of education

• Liberal education helped a man to develop all sides of his nature

5. Speak on the new facts you found in the text.

What wondered you or what information was new for you? Can you add some other historical information about the history of education?

6. Think over the ways of retelling the story to stir up the audience.

7. Translate it into English using the words you’ve learned.

Освіта – цецілеспрямований процесс виховання і навчання в інтересах людини, суспільства, держави. Зазвичай освіа передбачає, що вчитель навчає учнів читання, письма, математики, історії та інших наук. Викладачі по вузьких спеціальностях, таким як астрофізика, право, географія або зоологія, можуть навчати тільки даному предмету, зазвичай в університетах і інших вузах. Існує також викладання фахових навичок, наприклад, водіння. Крім освіти в спеціальних установах існує також самоосвіта, наприклад, через Інтернет, читання, відвідування музеїв або особистий досвід.

8. Write the plural form of the following.

story, play, glass, flag, photo, name, match, knife, bush, chief, page, radio, roof, prize, child, goose, man, foot, mouse, woman, sheep, person, deer, tooth, fellow-worker, merry-go-round, man-of-war, passer-by, sister-in-law, forget-me-not, room-mate.

9. Remember the numerals. Answer the questions. Write the numbers in full.

1) How many minutes are there in two hours? 2) How many kilometers are there in a mile? 3) What is your normal temperature? 4) How much do you weigh? 5) How many cents are there in $2, 5? 6) How many days are there in a year? 7) When were you born? 8) What is your telephone number? 9) What is the number of your flat? 10) What is the approximate

population of Ukraine?

10. Write these numbers in English.

1) 567 11) 3 August

2) 6 1/2 12) 969 64 85 (phone)

3) 3,267 13) - 3° C

4) 8.93 14) (In) 1907

5) 0.34 15) +15° F

6) 7 1/2 16) 3,000,000,000

7) 2,359,000 17) 7,082

8) 11.06 18) 40-0 (tennis game)

9) 58% 19) 37%

10) 9 May 20) 4-1 (football match)

Unit 3

Our nutrition

Do you like to eat in restaurants?

How often do you eat out? Is price a consideration when you go out?

Have you ever eaten in a restaurant alone? Did you enjoy it?

1. Read the text about different types of restaurants and translate it.

You are what you eat

All living things need food to sustain life. Plants can make their own food fromsoil, water, and sunshine. Animals eat either other animals or plants. Human beings eat all kinds of different foods from animal and plant sources, depending on what is available where they live and sometimes, too, on the restrictions of religious customs. Food supplies nutrients, the substances needed by the body for life and growth. They are proteins, fats, carbohydrates, vitamins, minerals, and water. A healthy balanced diet must consist of all six. In prehistoric times people ate what they could find by hunting and gathering wild plants. Later they learned to keep animals and grow cereals and vegetables. Settled communities then became established. The plants that were cultivated were the plants that grew naturally in any particular climate.

Nutrition is the process by which plants and animals take in and use food. Food is needed to keep the body running smoothly. It provides energy for work and play, for breathing, and for the heart's beating.

The building material for muscles, bones, and blood comes from food. You cannot have a healthy body without healthy eating and drinking. Not enough of some foods, or too much of others, can lead to illness.

Experts on nutrition are called nutritionists. The *food and* drink you take in are called your *diet*. (This wordis sometimes used in another way, to mean eating less food than normal in order to lose weight, as in "going on a diet".) A person's diet is so important because growth and health depend on it. Dieticians are people with knowledge of special diets (dietetics), such asthose used for sick people in hospital. We should never forget that across the world 40 million people die each year from starvation and the diseases it brings. Fifteen million of them are babies and young children. For the millions more who suffer from malnutrition(not enough of the right foods), healthy eating is out of the question. It is hard enough just to stay alive. The body needs many different nutrients. These are various substances necessary to provide energy and the

materials for growth, body-building, and body maintenance. Every day millions of cells in the body die and must be replaced by new ones. Not all foods contain all nutrients. So it is not just

the quantity of food eaten that is important, but also the variety. People who have enough food available may still become ill because they are eating too much of one kind of food and not enough of another. To stay healthy, we need to eat a balanced diet. This means a diet containing the right proportions of the main nutrients: carbohydrates, proteins, fats, fiber, minerals, vitamins, and fluids. Many foods are a mixture of these basic nutrients.

A balanced diet also contains enough energy (in the form of food) to power the chemical reactions of living.

Some people worry that a vegetarian diet will be short of protein, but this is not the case. Plenty of protein can be obtained from the great variety of nuts, seeds, pulses, cereals, and soy products (such as tofu)which are now widely available, and from eggs and milk products. It was once thought that plant proteins were inferior to animal proteins, being deficient in some amino acids. It is now known that a mixture of plant proteins complement one another. For example, a shortage of an amino acid in one plant food, such as pulses, is counterbalanced by an excess of that amino acid in a different plant food, such as a cereal. Protein combinations such as beans on toast, rice and lentils, bean stew with pot barley, oats and nuts (as in muesli),provide very high quality protein. All other nutrients are present in adequate quantities in the lactovegetarian diet. If dairy products are not eaten, a supplement of vitamin B12 becomes essential. Many vegetarian foods are fortified with this vitamin (yeast extracts, some soy milks, some breakfast cereals, and so on). Vegetarians obtain iron from dried fruit, leafy green vegetables, whole meal flour, pulses, oats, nuts, and brown rice. They obtain calcium from cheese, nuts, sesame seeds, leafy green vegetables, and soy. Vegetarians have been responsible for the invention of foods such as peanut butter; cornflakes, muesli, and high-protein vegetable foods made to taste like meat.

Vocabulary

amino acids

available

bone

carbohydrates

cereals

dairy products

diet

diseases

dried fruit

fats

fiber

fluids

maintenance

malnutrition

minerals

nutrients

nutrition

oat

proteins

pulses

responsible

seeds

shortage

soil

source

soy products

starvation

substance

complement (v)

keep the body running

smoothly

sustain (v)

Make up your own sentences with the following word combinations:

vitamin ['vɪtəmɪn], [' vaɪ -] / вітамін
vitamin tablets –вітаміни в таблетках
to take vitamins –приймати вітаміни
Lack of vitamin D is another factor to consider. –Нестача вітаміну D –ще один фактор, який слід взятии до уваги.
vitamin deficiency - авітаміноз

2. Give Ukrainian equivalents for the following words:

to sustain life, restriction, supply, nutrients, proteins, fats, carbohydrates, vitamins, minerals, consist of, cereals, nutrition, take in, to keep the body running smoothly, muscles, bones, blood, illness, starvation,

substance, to provide, body maintenance, replace, fiber, minerals, vitamins, fluids, chemical reaction, inferior, deficient, mixture, complement, counter balance, excess, supplement, essential.

3. Are the following statements true or false? Correct the false ones.

1) Human beings eat all kinds of different foods from animal and plant sources.

2) In prehistoric times people ate what they could find in the shop.

3) Nutrition is the process 'by which plants and animals take in and use food.

4) The building material for muscles, bones, and blood comes from fluid.

5) Experts on nutrition are called dieticians.

6) Every day millions of cells in the body die and must be replaced by new ones.

7) People who have enough food available may still become ill because they are eating too much different kind of food.

8) Plenty of protein can be obtained from the meat.

9) If dairy products are not eaten, a supplement of vitamin B12 becomes essential.

10) Vegetarians have been responsible for the invention of foods such as milk, sugar, butter

4. Retell the text “You are what you eat”.

5. Make a special diet for 3 types of people. Make up the checklist the things you can and you can’t eat. Take care about all necessary vitamins and elements.

a) **Vegan**. You strongly disagree with people eating meat, fish, eggs, cheese or milk.

b) **Vegetarian**. You do not eat fish or meat but see nothing wrong in eating dairy products.

c) **Gourmet**. You love good food, including meat, fish and dairy products.

6. Look at the following article’s headline and guess whether these sentences are true or false from your point of view:

1) Scientists have discovered a pizza that helps you lose weight.

2) The secret to the new pizza is in how to bake the base.

3) Antioxidants in food help fight some life threatening diseases.

4) Cooking the pizza at a low temperature means it is healthier.

5) Diet experts said the new pizza is healthier than eating fruit.

6) Another expert said people should choose their toppings carefully.

7) The expert said this research teaches us about healthy eating.

8) This study is good news for deep-pan pizza lovers.

7. Read this text and translate it properly. While reading, agree or disagree with the statements from the previous exercise. Also put the words into the gaps in the text. Read and translate it.

disease

leaving

welcome

heat

found

amount

different

weight

author

expert

better

although

likely

sales

outside

choose

Scientists discover healthier pizza

Food scientists and dieticians have _____new ways to make pizza that is good for you. This is very _____ news for overweight pizza lovers and those who worry about their _____. Researchers inthe USA looked at different ways of baking the pizza base. The team from

Maryland University discovered that _____ pizza dough in the oven for a longer time made it healthier to eat. They said that doubling the _____ of baking time increased the levels of antioxidants in the mix by up to 100 percent. Antioxidants help fight cancer and heart _____ and found in most healthy food. Furthermore, the team experimented with _____ cooking temperatures. Their results showed a higher _____ also made the dough healthier to eat.

This new research may help pizza _____around the world. However, some diet experts warned that even though this research looks good, it is still_____ to eat fruit and vegetables. In addition, pizza that is baked longer may not be so healthy if people _____ unhealthy toppings. Jacqui Lowdon, a British dietarian _____, warned that although thepizza base might be good for you, people might be“more _____ to choose extra cheese”. She added:"This isn't teaching people about healthy eating."

Nevertheless, the study’s _____, Jeffrey Moore, said his findings were good for people who like deepan pizzas. Meanwhile, _____ London’s Pizza Hut today, choose, conclusions, author, also, findings, good, fan, select.

8. This is the next chapter of one scientist’s diary. Translate it into English using the words you’ve learned.

17.11.2022

Цього ранку я виявив, що забув у керівника лист з планом експерименту на наступні чотири дні. Об'єктом нашого дослідження є миша. Після попереднього аналізу ми прийшли до висновку, що тварину необхідно посадити на дієту для проведення подальших етапів діагностики впливу досліджуваного препарату. Я подзвонив моєму керівнику і попросив дати рекомендації ще раз. Він був кілька засмучений моєї неуважністю (distraction), проте дав досить чіткі вказівки. З цього дня я перекладаю миша на білкову дієту, яка передбачає зниження споживанняв углеводів. Крім того, щоденним продуктом харчування для неї стане соя. Цікаво, як

вплине ця дієта на тварину? Побачимо через кілька днів. Хоча, я сподіваюся, що наші очікування виправдаються.

9. Correct the mistakes (if any) in these sentences.

1) The radio said that there were more than ten thousand people taking parts in the meeting.

2) She bought two dozens eggs. 3) My birthday is on twenty-one of March. 4) His telephone number is four,six ,seven, five, naught, nine, two. 5) There are two hundred fifteen pages in this book. 6) Write down the following: zero point six hundred and twelve plus six point naught two. 7) This is twenty-five per cents of the total. 8) The game ended with the score three zero.

Unit 4

Immune System. Immunology

Why do we need an immune system?

Nowadays we have many supplements (БАД) on the market. Can all they replace our immune system?

In what context have you heard about immune system in your everyday life?

1. *Read the text and translate it properly.*

A magnificent protector

Inside your body there is an amazing protection mechanism called the immune system. It is designed to defend you against millions of bacteria, microbes,

viruses, toxins and parasites that would love to invade your body. To understand the power of the immune system, all that you have to do is to have a

look at one's death. That sounds gross, but it will show you important things about your immune system.

When something dies, its immune system (along with everything else) shuts down. In a matter of hours, the body is invaded by all sorts of bacteria, microbes,

parasites... None of these things are able to get in when your immune system is working, but the moment your immune system stops the door is wide open. Once you die it only takes a few weeks for these organisms to completely dismantle your body and carry it away, until all that's left is a skeleton. Obviously your immune system is doing something amazing to keep all of that dismantling from happening

when you are alive. When a virus or bacteria (also known generically as a germ) invades your body and reproduces, it normally causes problems. Generally the germ's presence produces some side effect that makes you sick. For example, the strep throat bacteria (Streptococcus) releases a toxin that causes inflammation in your throat.

The polio virus releases toxins that destroy nerve cells (often leading to paralysis). Some bacteria are benign or beneficial (for example, we all have millions of bacteria in our intestines and they help digest food), but many are harmful ones; they get into the body or the bloodstream.

The job of your immune system is to protect your body from these infections. The immune system protects you in three different ways. First and foremost, it

creates a barrier that prevents bacteria and viruses from entering your body. Then, if a bacteria or virus does get into the body, the immune system tries to detect

and eliminate it before it can make itself at home and reproduce. Thirdly, when the virus or bacteria is able to reproduce and start causing problems, your

immune system is in charge of eliminating it.

There are many diseases that, if you catch them once, you will never catch again. Measles is a good example, as is chicken pox. What happens with these

diseases is that they make it into your body and start reproducing. The immune system gears up to eliminate them. Cells recognize the virus and produce antibodies for it. This process takes time, but the disease runs it course and is eventually eliminated.

A vaccine is a weakened form of a disease. It is either a killed form of the disease, or it is a similar but less virulent strain. Once inside your body your immune system mounts the same

defense, but because the disease is different or weaker you get few or no symptoms of the disease. Now, when the real disease

invades your body, your body is able to eliminate it immediately.

Many diseases cannot be cured by vaccines, however. The common cold and influenza are two good examples. These diseases either mutate so quickly or

have so many different strains in the wild that it is impossible to inject all of them into your body. Each time you get the flu, for example, you are getting a different strain of the same disease. Thus, it's only our immune system which helps us to be defended.

Vocabulary

a matter of hours

adenoids

amazing

antibody

appendix

be in charge of

benign

beneficial

bloodstream

bone marrow

catch a disease

cold

cure (v)

defend (v)

defended

defense

detect (v)

digest (v)

dismantle (v)

flu

germ

harmful

infection

inflammation

influenza

invade (v)

large intestine

lymph nodes

lymphatic duct

makesmb sick

mutate (v)

payer’s patches

prevent (v)

protection

release (v)

reproduce (v)

shut down (v)

small intestine

spleen

subclavian vein

thoracic duct

throat.

thymus

tonsil

vaccine [vǽksi:n]

virulent strain

Make up your own sentences with the following word combinations:

vaccine ['væksiːn] / 1.; вакцина

living vaccine –жива кцина

influenza vaccine –протигрипозна вакцина

polio vaccine –вакцина проти поліомієліту

rabies vaccine –вакцина проти сказу; to come down with / get rabies –захворіти на сказ

smallpox vaccine –вакцина проти віспи

tetanus vaccine –протиправцева вакцина

yellow-fever vaccine –вакцина проти жовтої лихоманки

2. 1) відноситься до коров'ячої віспи

vaccine disease - коров'яча віспа

2) вакцинний; вакцинальний

vaccine therapy –вакцинотерапія

2.Give the definitions to at least three of the following terms:

Adenoids, bone marrow, large intestine, lymph nodes, lymphatic duct, payer's patches, small intestine, spleen, subclavian vein, thoracic duct, throat, thymus.

3. *Fill in the gaps in these sentences:*

1) Inside your body there is an amazing_____called the immune system.

2) Obviously your immune system is doing something amazing to keep all of that _____from happening when you are alive.

3) When _____or ____ invades your body and reproduces, it normally causes problems.

4) The strep throat bacteria releases a _____ that causes inflammation in your throat.

5) The job of your immune system is to protect your body from these_____.

6) If a bacteria or virus does get into the body, the immune system tries to _____ and _____it before it can make itself at home and reproduce.

7) _____recognize the virus and produce antibodies for it.

8) A vaccine is a weakened form of a_____.

9) Many diseases cannot be _____by vaccines

10) These diseases either _____quickly or have so many different strains in the wild.

4. *Answer the questions about this text.*

1) What is the immune system? What is the basic function of the immune system?2) How can we understand the power of the immune system?

3) What happens when somebody dies?

4) What are the synonyms of the word "virus"?

5) What happens when the germ invades one's body?

6) What are benign bacteria?

7) How many ways of the immune system protection can you name?

8) Are there the diseases which you catch once and then never again?

9) What is a vaccine? How does it work?

10) Are there any vaccines unable to be cured by vaccines?

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11) What happens each time you get flu?

5. *Speak on the new facts you found in the text. What wondered you or what information was new for you? Can you add any other information about the*

immune system?

6. *Do you agree with the following statements?*

Choose one of them, explain and expand your idea and create a small report.

1) The strep throat bacteria (Streptococcus) releases a toxin that causes inflammation in your throat.

2) The Immune system doesn't work against viruses.

It deals only with cells.

3) Bacteria have no nucleus.

4) Erythrocytes are not the part of immune system.

5) Bacteria and viruses work in the same way.

6) A vaccine is a form of a disease.

7) Make a plan of this text. Add key words in it if necessary.

8) Retell this text using your plan.

9)Read the text and translate.

Immunology

Immunology is a branch of biomedical science that covers the study of all aspects of the immune system in all organisms. It deals with the physiological functioning of the immune system in states of both

health and disease; malfunctions of the immune system in immunological disorders; the physical, chemical and physiological characteristics of the components of the immune system in vitro, in situ, and in vivo.

Even before the concept of immunity was developed, numerous early physicians characterized organs that would later prove to be part of the immune system.

When health conditions warrant, immune system organs including the thymus, spleen, portions of bone marrow, lymph nodes and secondary lymphatic tissues can be surgically excised for examination while patients are still alive.

Classical immunology studies the relationship between the body systems, pathogens, and immunity. The earliest written mention of immunity can be traced back to the plague of Athens in 430 BCE.

The study of the molecular and cellular components that comprise the immune system, including their function and interaction, is the central science of immunology.

In the 21st century, immunology has broadened its horizons with much research being performed in the more specialized niches of immunology. This includes the immunological function of cells, organs and systems not normally associated with the immune system, as well as the function of the immune system outside classical models of immunity.

10. Give the definitions to at least three of the following words:

- immunology

- immune system

- in vitro

- in vivo

- classical immunology

11. Write out the sentences expressing the main ideas of each logical part of the text.

12. Check your knowledge about the immune system? Do you know the answers to these questions?

1) Is a monocyte a red or white blood cell?

2) What is the largest lymphoid structure?

3) What common allergic disorder was named for the illness first described in those exposed to the farmlands of England?

4) What is a substance that can cause a person to become sensitive to, and produce antibodies against it?

5) What type of immunity is developed through exposure to a disease?

6) Which part of the body does NOT contain lymph nodes?

7) Which organ is NOT part of the immune system?

8) What is a specialist in immunology called?

If there are problems in answering this, you can find the solutions in the end of this unit.

13. Speak on the new facts you found. What wondered you or what information was new for you? Can you add some other information about the history of immunology or some interesting immunological facts?

14. Read the text.

A useful vitamin

You'd have to eat a couple dozen oranges to get the same effect as one Vitamin C tablet that contains 500 mg of Vitamin C. Perhaps everyone knows that vitamin C and immune system of

humans are interconnected principles. Ascorbic acid is a nutrient that has been shown to have a strong jolt on human health.

Researchers originally intended that considerable doses of Vitamin C can reduce the severity and the rate of the common cold due to its using in oxidation-reduction in the human body.

Vitamin C is on the top of immune boosters list and there are many reasons for that. Perhaps, the greatest number of nutrient investigations

was devoted to vitamin C and immune system. Ascorbic acid addendums are inexpensive to make, and it is very good that vitamin C is available naturally in many vegetables and fruits. There is another

possibility to get Ascorbic acid - you can buy at any chemist's shop vitamin-C-fortified version. Now let's take a brief review of vitamin C and immune system benefit of it.

Ascorbic acid increases the infection-fighting production antibodies and white blood cells and increases interferon levels, the antibody that covers surface of cells, which are favorable for the viruses` entry.

Vitamin C diminished the cardiovascular disease risk with the help of raising HDL levels cholesterol while decreasing blood pressure and importunate with the proceeding during which fat is transformed to

plaque in the human arteries. It is also interesting about vitamin C and immune system that people who have diets with higher vitamin C concentration have lower rates of prostate, colon and even breast cancer.

15. Study this text and express it in your words not using any plan.

16. Study the list of vitamins and explain in your words what vitamins we need for healthy lifestyle and what problems the lack or overdose of vitamins can cause.

17. Make a conversation according to this situation:

You are working out a new supplement (БАД) for stimulating human's immune system. You have to assure your colleagues that your medicine is the most effective one. Your partner's aim is to ask you as much as possible about the supplement`s effects on immune system.

18. Creative composition.

You are one of the white blood cells. Some antigen has infiltrated your master's body. What are your actions?

19. *Answers to the questions in exercise 10. Read and translate them.*

a. **White.** A monocyte is a white blood cell found in lymph nodes, the spleen, and bone marrow. It is a phagocytic cell that engulfs and kills

bacteria and plays a role in killing tumor cells.

b. **Spleen.** The spleen is located in the upper left quadrant of the abdomen, behind the stomach. Red blood cells are filtered through the spleen, where old blood cells are destroyed.

c. **Hay fever.** It was originally called 'farmer's lung' and was caused by an allergic reaction to thefungi and spores in the hay.

d. **Antigen**.

e. **Acquired active immunity.** In acquired active immunity, antibodies are produced that protect the body upon second exposure.

f. **Feet.** Lymph nodes provide one of the most important defense mechanisms for the body.

g. Brain.

h. **Immunologist**. The emergence of AIDS in the 1980s has prompted extensive research and an expanded understanding of the immune system.

Home reading

BIOTECHNOLOGY

Biotechnology is technology based on biology, especially when used in agriculture, food science, and medicine. The United Nations Convention on Biological Diversity defines biotechnology as:

Any technological application that uses biological systems, living organisms or their derivatives to make or modify products or processes for specific use.

Biotechnology is often used to refer to genetic engineering technology of the 21st century, however, the term encompasses a wider range and history of procedures for modifying

biological organisms according to the needs of humanity. It goes back to the initial modifications of native plants into improved food cultures through artificial selection and hybridization. Bioengineering is the science upon which all biotechnological applications are based. With the development of new approaches and modern techniques traditional biotechnology industries are also acquiring new horizons which enable them to improve the quality of their products and increase the productivity of their systems.

Biotechnology combines disciplines like genetics, molecular biology, biochemistry, embryology and cell biology, which are in turn linked to practical disciplines like chemical engineering, information technology, and robotics. Patho-biotechnology describes the exploitation of pathogens or pathogen derived compounds for beneficial effect.

TYPES OF BIOTECHNOLOGY.

A series of derived terms have been coined to identify several branches of biotechnology, for example.

- **Red biotechnology** is applied to medical processes. Some examples are the designing of organisms to produce antibiotics, and the engineering of genetic cures through genomic manipulation.
- **Green biotechnology** is biotechnology applied to agricultural processes. An example would be selection and domestication of plants via micropropagation. Another example is the designing of transgenic plants to grow under specific environmental conditions or in the presence (or absence) of certain agricultural chemicals. One hope is that green biotechnology might produce more environmentally friendly solutions than traditional industrial agriculture. An example of

this is the engineering of a plant to express a pesticide and thus eliminate the need for external application of pesticides.

- **White biotechnology**, also known as industrial biotechnology, is applied to industrial processes. An example is the designing of an organism to produce a useful chemical. Another example is the using of enzymes as industrial catalysts to either produce valuable chemicals or destroy hazardous/polluting chemicals. White biotechnology tends to consume less in resources than traditional processes used to produce industrial goods.
- **Blue biotechnology** is a term that has been used to describe the marine and aquatic applications of biotechnology, but its use is relatively rare.
- -36-
- The investments and economic output of all these types of applied biotechnologies form what has been described as the bioeconomy.
- **Bioinformatics** is an interdisciplinary field which addresses biological problems using computational techniques, and makes the rapid organization and analysis of biological data possible. The field may also be referred to as computational biology. Bioinformatics plays a key role in various areas, such as functional genomics, structural genomics, and proteomics, and forms a key component in the biotechnology and pharmaceutical sector.

Glimse of History

Bacteria were first observed by Anton van Leeuwenhoek in 1676 using a single-lens microscope of his own design. The name "bacterium" was introduced much later, by Ehrenberg in1828, derived from the Greek wordβακτηριον meaning "small stick". While Antony van Leeuwenhoek is often cited as the first microbiologist, the first recorded microbiological observation, that of the fruiting bodies of molds, was made earlier in 1665 by Robert Hooke.

The field of bacteriology (later a subdiscipline of microbiology) is generally considered to have been founded by Ferdinand Cohn (1828-1898), a botanist whose studies on algae and photosynthetic bacteria led him to describe several bacteria including *Bacillus* and *Beggiatoa*. Ferdinand Cohn was also the first to formulate a scheme for the taxonomic classification of bacteria.

Louis Pasteur (1822-1895) and Robert Koch (1843-1910) were contemporaries of Cohn's and are often considered to be the founders of medical microbiology. Pasteur is most famous for his series of experiments designed to disprove the widely held theory of spontaneous generation. Pasteur also designed methods for food preservation (pasteurization) and vaccines against several diseases such as anthrax, fowl cholera and rabies. Robert Koch is best known for his contributions to the germ theory of disease, proving that specific diseases were caused by

specific pathogenic microorganisms. He developed a series of criteria that have become known as the Koch's postulates. Koch was one of the first scientists to focus on the isolation of bacteria in pure culture resulting in his description of several novel bacteria including *Mycobacterium tuberculosis*, the causative agent of tuberculosis.

While Louis Pasteur and Robert Koch are often considered the founders of microbiology, their work did not accurately reflect the true diversity of the microbial world because of their exclusive focus on microorganisms having medical relevance. It was not until the work of MartinusBeijerinck (1851-1931) and Sergei Winogradsky (1856-1953), the founders of general

microbiology (an older term encompassing aspects of microbial physiology, diversity and ecology), that the true breadth of microbiology was revealed. Martinus Beijerinck made two major contributions to microbiology: the discovery of viruses and the development of enrichment culture techniques. While his work on the Tobacco Mosaic Virus established the basic principles of virology. Sergei Winogradsky was the first to develop the concept of chemolithotrophy and to reveal the essential role played by microorganisms in geochemical processes. He was responsible for the first isolation and description of both nitrifying and nitrogen-fixing bacteria.

How to read chemical formulas and equations.

H**+**- hydrogen ion / univalent positive hydrogen ion

Cu**++**- divalent positive cuprum ion

Al**++** - trivalent positive aluminum ion

Cl**-** - negative chlorine ion / negative univalent

Chlorineion

“-“/ “**:**” – не читается

“**=**”/ “**::**” – не читается

Знаки:

“+” – plus/ and/ together with

“=” – give/ form

“→” – give/ pass over to/ lead to

“↔” – forms/ is formed from

Proper reading of chemical formulae :

HCl — [eitʃsi: el]

HBr — [eitʃ bi: a:]

H2SO4 — [eitʃtu: esoufɔ:]

CF4 — [si: effɔ:]

Cu2O — [si: ju: tu: ou]

Task. Make up your own formulae and read them.

Laboratory equipment

Explaine in English what parts the equipment consists of and how it can be used.

stand – лабораторний штатив, складається з:

base [beɪs] - підстава, металева плита

rod [rɔd] - вертикальна стійка, стрижень

При проведенні експериментів на штатив закріплюється різна хімічна посуд.

Petridish ['petrɪdɪʃ] – чашка Петрі

Її використовують для вирощування культур бактерій.

holder ['həuldə] - тримач

З його допомогою на штатив кріпляться колби, мензурки тощо

clamp / holder [klæmp] / ['həuldə] - пробіркадержатель

gasburner [gæs 'bɜ:nə] - газовий пальник

straightstopcockburette [streɪt 'stɔpkɔkbju (ə)' ret] - пряма бюретка з краном

Застосовується для вимірювання рідин з високою точністю; забезпечена вентилем для ручного регулювання потужності потоку рідини.

Graduated cylinder ['grædʒueɪtɪd' sɪlɪndə] - Мензурка, вимірювальний циліндр

Потрібна для вимірювання малої кількості рідини з високою точністю.

Test tube ['testju:b] - пробірка

Широко застосовується в хімії при проведенні різних дослідів, коли необхідно змішувати речовини один з одним або проводити будь-які маніпуляції з речовиною (ами).

Serological pipette [serɔ'lɔʤık (ə) lpı'pet] – серологічна піпетка

Градуйована трубка з двома відкритими кінцями, застосовується при точному переливанні необхідного малої кількості рідини з однієї ємності в іншу.

Erlenmeyer flask [flɑ:sk] - колба Ерленмейера.

Градуйована конічна колба, яка широко застосовується в хімічних дослідах, особливо при змішуванні рідин.

beaker ['bi:kə] - хімічний / лабораторний стакан

Градуйований стакан з носиком; використовується при проведенні реакцій (які, наприклад, супроводжуються випаданням осаду); шкала необхідна для вимірювання приблизної кількості рідини.

round-bottomflask [raund 'bɔtəmflɑ:sk] - круглодонная колба

Колба сферичної форми, головним чином використовується для нагрівання рідин.

washbottle [wɔʃ 'bɔtl] - промивалка

Використовується при митті піпеток, пробірок і т.д.

bottle ['bɔtl] - колба, склянка, пляшка.

Table of chemical elements. Task. Read the names of chemical elements, mind the pronunciation.

No.	Сим-вол	Латинское название	Русское название	Английское название	Транскрипция
1	**H**	Hydrogenium	Водород	**Hydrogen**	[ˈhaɪdrədʒən]
2	**He**	Helium	Гелий	**Helium**	[ˈhiːlɪəm]
3	**Li**	Lithium	Литий	**Lithium**	[ˈlɪθiəm]
4	**Be**	Beryllium	Бериллий	**Beryllium**	[bəˈrɪliəm]
5	**B**	Borum	Бор	**Boron**	[ˈbɔːrɒn]
6	**C**	Carboneum	Углерод	**Carbon**	[ˈkɑːbən]
7	**N**	Nitrogenium	Азот	**Nitrogen**	[ˈnaɪtrədʒən]
8	**O**	Oxygenium	Кислород	**Oxygen**	[ˈɒksɪdʒən]
9	**F**	Fluorum	Фтор	**Fluorine**	[ˈflʊəriːn]
10	**Ne**	Neon	Неон	**Neon**	[ˈniːɒn]
11	**Na**	Natrium	Натрий	**Sodium**	[ˈsəʊdɪəm]
12	**Mg**	Magnesium	Магний	**Magnesium**	[mægˈniːzɪəm]
13	**Al**	Aluminium	Алюминий	**Aluminum**	[əˈluːmɪnəm]
14	**Si**	Silicium	Кремний	**Silicon**	[ˈsɪlɪkən]
15	**P**	Phosphorus	Фосфор	**Phosphorus**	[ˈfɒsfərəs]
16	**S**	Sulfur	Сера	**Sulfur**	[ˈsəlfə]
17	**Cl**	Chlorum	Хлор	**Chlorine**	[ˈklɔːriːn]
18	**Ar**	Argon	Аргон	**Argon**	[ˈɑːgɒn]
19	**K**	Kalium	Калий	**Potassium**	[pəˈtæsɪəm]
20	**Ca**	Calcium	Кальций	**Calcium**	[ˈkælsɪəm]

21	Sc	Scandium	Скандий	**Scandium**	[ˈskændɪəm]
22	Ti	Titanium	Титан	**Titanium**	[t(a)ɪˈteɪnɪəm]
23	V	Vanadium	Ванадий	**Vanadium**	[vəˈneɪdiəm]
24	Cr	Chromium	Хром	**Chromium**	[ˈkrəʊmɪəm]
25	Mn	Manganum	Марганец	**Manganese**	[ˈmæŋgəniːz]
26	Fe	Ferrum	Железо	**Iron**	[ˈaɪən]
27	Co	Cobaltum	Кобальт	**Cobalt**	[ˈkəʊbɔːlt]
28	Ni	Niccolum	Никель	**Nickel**	[ˈnɪkəl]
29	Cu	Cuprum	Медь	**Copper**	[ˈkɒpə]
30	Zn	Zincum	Цинк	**Zinc**	[zɪŋk]
31	Ga	Gallium	Галлий	**Gallium**	[ˈgæliəm]
32	Ge	Germanium	Германий	**Germanium**	[dʒɜːˈmeɪniəm]
33	As	Arsenicum	Мышьяк	**Arsenic**	[ˈɑːsnɪk]
34	Se	Selenium	Селен	**Selenium**	[sɪˈliːnɪəm]
35	Br	Bromum	Бром	**Bromine**	[ˈbrəʊmiːn]
36	Kr	Krypton	Криптон	**Krypton**	[ˈkrɪptɒn]
37	Rb	Rubidium	Рубидий	**Rubidium**	[rʊˈbɪdiəm]
38	Sr	Strontium	Стронций	**Strontium**	[ˈstrɒntɪəm]
39	Y	Yttrium	Иттрий	**Yttrium**	[ˈɪtriəm]
40	Zr	Zirconium	Цирконий	**Zirconium**	[zɜːˈkəʊniəm]
41	Nb	Niobium	Ниобий	**Niobium**	[naɪˈəubɪəm]
42	Mo	Molybdaenum	Молибден	**Molybdenum**	[məˈlɪbdənəm]
43	Tc	Technetium	Технеций	**Technetium**	[tekˈniːʃɪəm]
44	Ru	Ruthenium	Рутений	**Ruthenium**	[ruːˈθiːnjəm]
45	Rh	Rhodium	Родий	**Rhodium**	[ˈrəʊdiəm]
46	Pd	Palladium	Палладий	**Palladium**	[pəˈleɪdiəm]
47	Ag	Argentum	Серебро	**Silver**	[ˈsɪlvə]
48	Cd	Cadmium	Кадмий	**Cadmium**	[ˈkædmɪəm]
49	In	Indium	Индий	**Indium**	[ˈɪndiəm]
50	Sn	Stannum	Олово	**Tin**	[ˈtɪn]
51	Sb	Stibium	Сурьма	**Antimony**	[ˈæntɪməni]
52	Te	Tellurium	Теллур	**Tellurium**	[teˈlʊriəm]
53	I	Jodum	Иод	**Iodine**	[ˈaɪədiːn]

54	Xe	Xenon	Ксенон	**Xenon**	[ˈzenɒn] [ˈziːnɒn]
55	Cs	Caesium	Цезий	**Cesium**	[ˈsiːziəm]
56	Ba	Barium	Барий	**Barium**	[ˈbeəriəm]
57	La	Lanthanum	Лантан	**Lanthanum**	[ˈlænθənəm]
58	Ce	Cerium	Церий	**Cerium**	[ˈsɪərɪəm]
59	Pr	Praseodymium	Празеодим	**Praseodymium**	[ˌpreɪziːəʊˈdɪmɪəm]
60	Nd	Neodymium	Неодим	**Neodymium**	[ˌniːəu'dɪmɪəm]
61	Pm	Promethium	Прометий	**Promethium**	[prəˈmiːθiəm]
62	Sm	Samarium	Самарий	**Samarium**	[səˈmeɪrɪəm]
63	Eu	Europium	Европий	**Europium**	[jʊˈropiəm]
64	Gd	Gadolinium	Гадолиний	**Gadolinium**	[ˌgædɒˈlɪnɪəm]
65	Tb	Terbium	Тербий	**Terbium**	[ˈtɜːbɪəm]
66	Dy	Dysprosium	Диспрозий	**Dysprosium**	[dɪsˈprəʊʃɪəm]
67	Ho	Holmium	Гольмий	**Holmium**	[ˈholmiəm]
68	Er	Erbium	Эрбий	**Erbium**	[ˈɜːbiəm]
69	Tm	Thulium	Тулий	**Thulium**	[ˈθjuːlɪəm]
70	Yb	Ytterbium	Иттербий	**Ytterbium**	[ɪˈtɜːbjəm]
71	Lu	Lutetium	Лютеций	**Lutetium**	[luːˊtiːʃjəm]
72	Hf	Hafnium	Гафний	**Hafnium**	[ˈhæfniəm]
73	Ta	Tantalum	Тантал	**Tantalum**	[ˈtæntələm]
74	W	Wolfram	Вольфрам	**Tungsten**	[ˈtʌŋstən]
75	Re	Rhenium	Рений	**Rhenium**	[ˈriːniəm]
76	Os	Osmium	Осмий	**Osmium**	[ˈɒzmiəm]
77	Ir	Iridium	Иридий	**Iridium**	[ɪˈrɪdɪəm]
78	Pt	Platinum	Платина	**Platinum**	[ˈplætɪnəm]
79	Au	Aurum	Золото	**Gold**	[gəʊld]
80	Hg	Hydrargyrum	Ртуть	**Mercury**	[ˈmɜːkjʊri]
81	Tl	Thallium	Таллий	**Thallium**	[ˈθæliəm]
82	Pb	Plumbum	Свинец	**Lead**	[led]
83	Bi	Bismuthum	Висмут	**Bismuth**	[ˈbɪzməθ]
84	Po	Polonium	Полоний	**Polonium**	[pəˈləʊniəm]
85	At	Astatium	Астат	**Astatine**	['æstətiːn]
86	Rn	Radon	Радон	**Radon**	[ˈreɪdɒn]

87	Fr	Francium	Франций	**Francium**	[ˈfrænsɪəm]
88	Ra	Radium	Радий	**Radium**	[ˈreɪdɪəm]
89	Ac	Actinium	Актиний	**Actinium**	[ækˈtɪnɪəm]
90	Th	Thorium	Торий	**Thorium**	[ˈθɔːriəm]
91	Pa	Protactinium	Протактиний	**Protactinium**	[ˌprəʊtækˈtɪniəm]
92	U	Uranium	Уран	**Uranium**	[jʊˈreɪnɪəm]
93	Np	Neptunium	Нептуний	**Neptunium**	[nepˈtjuːniəm]
94	Pu	Plutonium	Плутоний	**Plutonium**	[pluːˈtəʊnɪəm]
95	Am	Americium	Америций	**Americium**	[ˌæməˈrɪsiəm]
96	Cm	Curium	Кюрий	**Curium**	[ˈkjʊərɪəm]
97	Bk	Berkelium	Берклий	**Berkelium**	[bɜːˈkiːlɪəm]
98	Cf	Californium	Калифорний	**Californium**	[ˌkælɪˈfɔːnjəm]
99	Es	Einsteinium	Эйнштейний	**Einsteinium**	[ˌaɪnˈstaɪnɪəm]
100	Fm	Fermium	Фермий	**Fermium**	[ˈfermiəm]
101	Md	Mendelevium	Менделевий	**Mendelevium**	[ˌmendəˈliːviəm]
102	No	Nobelium	Нобелий	**Nobelium**	[nəʊˈbeliəm]
103	Lr	Lawrencium	Лоуренсий	**Lawrencium**	[lɒˈrensiəm]
104	Rf	Rutherfordium	Резерфордий	**Rutherfordium**	[ˌrʌðəˈfɔːdɪəm]
105	Db	Dubnium	Дубний	**Dubnium**	[ˈdʌbnɪəm]
106	Sg	Seaborgium	Сиборгий	**Seaborgium**	[ˈsiːbɔːgɪəm]
107	Bh	Bohrium	Борий	**Bohrium**	[ˈbɔrɪəm]
108	Hs	Hassium	Хассий	**Hassium**	[ˈhæsɪəm]
109	Mt	Meitnerium	Мейтнерий	**Meitnerium**	[ˌmaɪtˈnɪərɪəm]