**PROFESSIONAL ENGLISH**

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English For Medical Students



Environmental Medicine

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Учебное пособие по профессионально-ориентированному общению предназначено для развития лексических навыков в области специальной терминологии, совершенствовании умений и навыков устной речи, чтения и перевода текстов, имеющих профессиональную значимость для студентов, изучающих экологическую медицину.

Данное пособие предназначено для студентов факультета экологической медицины, а также для разных категорий учащихся, интересующихся проблемами развития медицины в экологическом контексте.

Unit 1

**FOOD**

**Vocabulary**

1. **Match the words with their definitions:**

|  |  |  |
| --- | --- | --- |
| 1. nutrient (n.) | ['njuːtrɪənt] | 1. supply with |
| 1. ingest (v.) | [ɪn'ʤest] | 1. undergo chemical decomposition |
| 1. carbohydrate (n.) | [ˌkɑ͟ː(r)boʊ'ha͟ɪdreɪt] | 1. an odourless, tasteless white substance occurring widely in plant tissue and generally obtained from cereals and potatoes |
| 1. protein (n.) | ['pro͟ʊtiːn] | 1. the smallest part of an animal or plant that is able to function independently |
| 1. absorb (v.) | [əb'zɔːb] or [əb'sɔːb] | 1. take in (energy or a liquid or other substance) by chemical or physical action |
| 1. bloodstream (n.) | ['blʌdstriːm] | 1. a substance containing nitrogen and hydrogen and which can be found naturally in the body |
| 1. digest (v.) | [daɪ'ʤest] | 1. change the form, character, or function of something |
| 1. provide with smth (v.) | [prə'vaɪd] | 1. a substance that provides nourishment essential for the maintenance of life and for growth |
| 1. convert into smth (v.) | [kən'vəːt] | 1. separate food in the stomach and intestines into substances |
| 1. break down (phr.v.) | [ˌbreɪk 'da͟ʊn] | 1. take (food, drink) into the body by swallowing it |
| 1. cell (n.) | [sel] | 1. a substance found in food and drink such as meat, eggs, and milk that people need in order to grow and be healthy |
| 1. amino acid (n.) | [əˌmi͟ːnoʊ 'æsɪd] | 1. the red liquid that circulates through the body of a person or animal, carrying oxygen to and carbon dioxide from the tissues of the body |
| 1. starch (n.) | [stɑ͟ː(r)tʃ] | 1. a substance found in foods such as sugar, bread and potatoes that people need to supply their bodies with heat and energy |

**Watching**

1. **Before you watch, discuss with your partner the saying “You are what you eat”. Do you agree with it?**
2. **Now watch the clip and be ready to say why nutrition is important.**

**Before you read**

1. **You are going to read an article about the basics of food. What do you know about it?**
2. **It is safe to say that one thing you’ll do today is eat some food – food is essential to life. But what is food? What’s in food that makes it so important? What is food made of? How does it fuel our bodies? Discuss with your partner the above-mentioned questions. How many of them can you answer?**
3. **Skim[[1]](#footnote-1) the text to check your ideas.**

**Reading A**

THE BASICS OF FOOD (PART I)

*by Marshall Brain*

Food is any substance consumed to provide nutritional support for the body. Think about some of the things you have eaten today – maybe cereal, bread, milk, juice, ham, cheese, an apple, potatoes... All of these foods are usually of plant or animal origin and contain seven basic components or essential *nutrients*: *carbohydrates* (simple and complex), *proteins*, fats, vitamins, minerals, fiber, and water. The food is *ingested* by an organism and assimilated by the organism’s cells in an effort to produce energy, maintain life, and/or stimulate growth. So, your body’s goal is to *digest* food and use it to keep your body alive. Let’s look at each of these basic components to understand what they really do and why they are so important to your body.

Carbohydrates

Carbohydrates *provide* your body with its basic fuel. The simplest carbohydrate is glucose. Glucose, also called “blood sugar”, flows in the *bloodstream* so that it is available to every *cell* in your body. Your cells *absorb* glucose and *convert* it into energy to drive the cell.

The word “carbohydrate” comes from the fact that glucose is made up of carbon and water. The chemical formula for glucose is: C6H12O6. Glucose is a simple sugar, meaning that to our tongues it tastes sweet. There are other simple sugars: fructose (the main sugar in fruits), sucrose (also known as “white sugar” or “table sugar”), lactose (the sugar found in milk), galactose, and maltose (the sugar found in malt).

Glucose, fructose and galactose are monosaccharides and are the only carbohydrates that can be absorbed into the bloodstream through the intestinal lining. Lactose, sucrose and maltose are disaccharides (they contain two monosaccharides) and are easily converted to their monosaccharide bases by enzymes in the digestive tract. Monosaccharides and disaccharides are called simple carbohydrates and are also sugars. They all digest quickly and enter the bloodstream quickly.

There are also complex carbohydrates, commonly known as “*starches*”. A complex carbohydrate is made up of chains of glucose molecules. Starches are the way plants *store* energy – plants produce glucose and chain the glucose molecules together to form starch. Most grains (wheat, corn, oats, rice) and things like potatoes and plantains are high in starch. Your digestive system *breaks* a complex carbohydrate (starch) back *down* into its component glucose molecules so that the glucose can enter your bloodstream. It takes a lot longer to break down a starch, however. A complex carbohydrate is digested more slowly, so glucose enters the bloodstream at a rate of only 2 calories per minute.

Insulin is incredibly important to the way the body uses the glucose that foods provide. It is a simple protein in which two polypeptide chains of *amino acids* are joined by disulfide linkages. It helps transfer glucose into cells so that they can oxidize the glucose to produce energy for the body. In adipose (fat) tissue, insulin facilitates the storage of glucose and its conversion to fatty acids. Insulin also slows the breakdown of fatty acids. In muscle it promotes the uptake of amino acids for making proteins. In the liver it helps convert glucose into glycogen (the storage carbohydrate of animals) and it decreases gluconeogenesis (the formation of glucose from noncarbohydrate sources). The action of insulin is opposed by glucagon, another pancreatic hormone, and by epinephrine.

Proteins

A protein is any chain of amino acids. An amino acid is a small molecule that acts as the building block of any cell. Carbohydrates provide cells with energy, while amino acids provide cells with the building material they need to grow and maintain their structure. Your body is about 20-percent protein and about 70-percent water by weight. Most of the rest of your body is composed of minerals (for example, calcium in your bones). Amino acids are called “amino acids” because they all contain an amino group (NH2) and a carboxyl group (COOH), which is acidic. The human body is constructed of 20 different amino acids.

As far as your body is concerned, there are two different types of amino acids: *essential* that your body can create out of other chemicals found in your body and *non-essential* that cannot be created, and therefore the only way to get them is through food. Here are the different amino acids: non-essential (alanine, arginine, asparagines, aspartic acid, cysteine, glutamic acid, glutamine, glycine, proline, serine, tyrosine); essential (histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, valine).

Protein in our diets comes from both animal and vegetable sources. Most animal sources (meat, milk, eggs) provide what’s called “complete protein”, meaning that they contain all of the essential amino acids. Vegetable sources usually are low on or missing certain essential amino acids. However, different vegetable sources are deficient in different amino acids, and by combining different foods you can get all of the essential amino acids throughout the course of the day. Some vegetable sources contain quite a bit of protein – things like nuts, beans, soybeans, etc. are all high in protein.

The digestive system breaks all proteins down into their amino acids so that they can enter the bloodstream. Cells then use the amino acids as building blocks.

Carbohydrate, protein, and fat are the main sources of calories in the diet and are called macronutrients. Both carbohydrates and proteins provide 4 calories per gram.

[*http://recipes.howstuffworks.com/food.htm*](http://recipes.howstuffworks.com/food.htm)

**Reading Comprehension**

1. **Read the article again. Write T (true), F (false) or (don’t know) in the boxes next to these statements.**

|  |  |
| --- | --- |
| 1. The most part of our body is protein by weight, the rest is water and minerals. |  |
| 1. Disaccharides such as lactose, sucrose and maltose are readily transformed to their monosaccharide bases and are called complex carbohydrates. |  |
| 1. Plants store energy in the form of starches, but most cereals are deficient in starch. |  |
| 1. Insulin makes it easier to transport glucose into cells so that they can oxidize it to produce energy for the body. |  |
| 1. Protein is any of a class of nitrogenous organic compounds which have large molecules composed of one or more long chains of amino acids and are an essential part of all living organisms. |  |
| 1. Most animal sources of protein provide us with complex protein. |  |
| 1. There is often lack of certain essential amino acids in vegetable sources of protein. |  |

1. **Read the article carefully and answer these questions according to the information in the text.**
2. What do we need food for? Why do we need carbohydrates contained in food?
3. What does the word “carbohydrate” come from? What kinds of carbohydrates are there? (Enumerate them). What is the difference between them?
4. What is insulin? What are its functions?
5. What is a protein look like? Why do we need proteins contained in food?
6. What types of amino acids are there? (Enumerate them). What are the ways to get them?
7. What are the sources proteins come in our diets? What are the ways to supply your diet with all of the essential amino acids?

**Language Development**

! **There** is an adverb meaning ‘in that place’. When you want to say that something exists, begin the sentence with **there + be+** noun phrase. **There** is also used as an introductory subject in sentences beginning *there is/are, there seems to be, there might be* etc. *There* can be used with all tenses of *be* and in tags*.* In the **there + be** pattern, **there** is an ‘empty’ grammatical word (not an adverb of place).

**ǃ** We don’t usually translate this pattern, e.g. ***There are*** *many vitamins in this fruit.* — *В этом фрукте много витаминов.* Sometimes it is translated as *на этом месте, здесь, тут*, *там, есть, имеется, существует.* e.g. ***There*** *is/exists a number of amino acids.* — *Здесь присутствует (имеется) ряд аминокислот.*

1. **Find the sentences beginning with *there + be* in the article and translate them into Russian.**

**ǃ** To talk about repeated actions or habits, permanent situations, general truths, give instructions, fixed future events, make suggestions and commentaries, observations and declarations, we use **the Present Simple Tense (subject + verb).** When the subject is 3rd person singular, we use the –s form of the verb.

The Present Simple is also used with certain verbs not normally used in the progressive forms and refer to states rather than actions.

These are the groups of verbs:

* **verbs of the mind and thinking:** *believe, think, consider, understand, suppose, expect, agree, know, remember; forget, doubt, mean, mind.*
* **verbs of emotion and feeling:** *like, dislike, hate, love, want, wish,* prefer, care.
* **verbs of the senses:** *see, smell, taste, hear.*
* **verbs of possession:** *have, possess, belong to, own.*
* **certain other verbs:** *concern, depend on, include*, *need, owe, seem* and others.

Some of these verbs can be used in the continuous tenses when the verb expresses an activity, not a state. However the meaning changes slightly.

Compare:

I think it's a great idea. *(think* as opinion, i.e. a state).

He's thinking of emigrating. *(think* as mental process, i.e.an activity).

1. **Look at this sentence from the article and underline the Present Simple Tense:** *The word “carbohydrate” comes from the fact that glucose is made up of carbon and water.* Find and underline other examples in the text. Explain the usage.

**ǃ** To emphasize the action in a sentence, rather than the person who carries/carried out the action we use the Passive. To say who does the action of a passive verb, add **by + noun phrase (agent)** after the verb phrase.The passive form of the verb contains this pattern: **subject** +**be + Past Participle + object.**

**Simple .; Modal pattern;**

Note: The passive is rare in ‘speech’, but common in academic ‘writing’.

1. **Look at the sentence from the article:** *The word “carbohydrate” comes from the fact that glucose is made up of carbon and water.* **Find and underline other examples in the text (mind modal pattern).**
2. **Find and learn Russian equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. to be absorbed into the bloodstream through the intestinal lining |  |
| 1. to oxidize the glucose to produce energy for the body |  |
| 1. to be low on or missing certain essential amino acids |  |
| 1. to flow in the bloodstream and be available to every cell in your body |  |
| 1. to promote the uptake of amino acids for making proteins |  |
| 1. to digest food and use it to keep your body alive |  |
| 1. to slow the breakdown of fatty acids |  |
| 1. to be joined by disulfide linkages |  |
| 1. to chain the glucose molecules together to form starch |  |
| 1. to break all proteins down into their amino acids |  |

**5. Find and learn English equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. пищеварительный тракт |  |
| 1. незаменимые (основные) аминокислоты |  |
| 1. накапливать энергию |  |
| 1. иметь высокое (или низкое) содержание крахмала |  |
| 1. требуется намного больше (дольше), чтобы расщепить крахмал |  |
| 1. поступать в кровоток со скоростью только две калории в минуту |  |
| 1. иметь как животный, так и растительный источник происхождения |  |
| 1. обеспечивать клетки строительным материалом |  |
| 1. жировая ткань |  |
| 1. облегчить накопление глюкозы и ее переход в жирные кислоты |  |

**6. Translate the following from English into Russian.**

The **human gastrointestinal tract** refers to the stomach and intestine, and sometimes to all the structures from the mouth to the anus. (The “digestive system’ is a broader term that includes other structures, including the accessory organs of digestion).

The gastrointestinal (GI) tract consists of the upper and lower GI tracts. The tract may also be divided into foregut, midgut, and hindgut. The upper gastrointestinal tract consists of the esophagus, stomach, and duodenum. The lower gastrointestinal tract includes most of the small intestine and all of the large intestine. According to some sources, it also includes the [anus](http://en.wikipedia.org/wiki/Anus).

Small intestine, which has three parts:

* + - Duodenum - Here the digestive juices from pancreas (digestive enzymes) and gallbladder (bile) mix together. The digestive enzymes break down proteins and bile emulsifies fats into micelles. Duodenum contains Brunner's glands which produce bicarbonate and pancreatic juice contains bicarbonate to neutralize hydrochloric acid of stomach.
    - Jejunum - It is the midsection of the intestine, connecting duodenum to ileum. Contain plicae circulares, and villi to increase surface area.
    - Ileum - It has villi, where all soluble molecules are absorbed into the blood (capillaries and lacteals).

Large intestine, which has three parts:

* + - Cecum (the vermiform appendix is attached to the cecum).
    - Colon (ascending colon, transverse colon, descending colon and sigmoid flexure). The main function of colon is to absorb water, but it also contains bacteria that produce beneficial vitamins like Vitamin K.

[*http://en.wikipedia.org/wiki/Human\_gastrointestinal\_tract*](http://en.wikipedia.org/wiki/Human_gastrointestinal_tract)

1. **Translate the following passage from Russian into English.**

***Сколько белка нужно съедать в день***

*АВТОР: Екатерина Максимова*

*Диеты с повышенным содержанием белка в последнее время приобретают все большую популярность. Считается, что он способствует снижению чувства голода и быстрому насыщению. Белки являются основным компонентом, который организм использует для построения, обновления и регенерации тканей (в особенности мышечной и костной). Знаете ли вы, какое количество белка необходимо потреблять ежедневно для нормального функционирования организма и почему это так важно?*

*Для того чтобы рассчитать индивидуальную потребность в белке нужно определить приблизительный уровень физической активности:*

* *сидячий (к примеру, у офисных работников);*
* *активный (есть время на занятия спортом);*
* *спортивный (регулярные занятия спортом);*
* *регулярное выполнение тяжелых физических нагрузок (бодибилдинг и т.д.).*

*Потребность в белках рассчитывается исходя из веса в фунтах (то есть массы в килограммах, разделенной на 0,454). В первом случае (сидячий уровень активности) это число надо умножить на 0,4, во втором – на 0,6, в третьем – на 0,75, в четвертом – на 0,85.*

*Продукты по возможности должны содержать все девять незаменимых (основных) аминокислот (они не синтезируются в организме, но необходимы для его нормального функционирования). Они содержатся в мясе, рыбе, яйцах и соевых продуктах. К прочим ценным источникам относятся лосось, мясо индейки, баранина и бобовые. Фрукты, овощи и зерновые содержат не все незаменимые аминокислоты, но при правильном их комбинировании можно получить полноценный обед.*

[*http://vitaportal.ru/pitanie/zdorovoe-pitanie/skolko-belka-nuzhno-sedat-v-den.html*](http://vitaportal.ru/pitanie/zdorovoe-pitanie/skolko-belka-nuzhno-sedat-v-den.html)

**Over to you**

1. Digestion is the mechanical and chemical breakdown of large food molecules into smaller components that are more easily absorbed into a blood stream. What happens to the food once you eat it? Can you describe the process of digestion? Mind all four steps (1. ingestion, 2. mechanical and chemical breakdown, 3. absorption and 4. egestion). Use the picture and the information in **ex. 7.**
2. Some people see a great benefit eating 6 small meals, at around 3 hours interval, to be in a good shape. However, many people still claim that it is better to eat the traditional breakfast, lunch and supper. What is it better for you? Is it better to eat three large meals, restraining yourself the rest of the day, or are smaller meals, with healthy snacks, the way to go? What do you think? Give your reasons.
3. Find Russian equivalents of these English saying and proverb: ***Live not to eat, but eat to live. The belly carries legs.*** Do you agree with them? Give scientific reasons, using the information of this unit.
4. Prepare a presentation on the topic being discussed.

**Writing**

*What is the most important macronutrient for our body: carbohydrate or protein? Which of them contributes the most to our overall health? Can we live and stay healthy without eating protein foods or food containing carbohydrates? Write an essay about pros and cons of each macronutrient.*

THE BASICS OF FOOD (2)

**Vocabulary**

1. **Match the words with their definitions:**

|  |  |  |
| --- | --- | --- |
| 1. fat (n.) | ['fæt] | 1. provide with something needed or wanted |
| 1. via | ['vaɪə], ['viːə] | 1. substance which people eat |
| 1. nutrition (n.) | [njuː'trɪʃ(ə)n] | 1. the process of providing or obtaining the food necessary for health and growth |
| 1. cause (v.) | [kɔːz] | 1. an inorganic substance needed by the human body for good health |
| 1. mineral (n.) | ['mɪnərəl] | 1. make (something, especially something bad) happen |
| 1. fiber (n.) | ['faɪbə] | 1. a substance that flows freely but is of constant volume, having a consistency like that of water or oil |
| 1. soluble (adj.) | ['sɒljʊb(ə)l] | 1. allow food or drink to enter the body, usually by swallowing |
| 1. take in (phr. v.) | [ˌteɪk 'ɪn] | 1. (of a substance) able to be dissolved, especially in water |
| 1. liquid (n.) | ['lɪkwɪd] | 1. dietary material containing substances such as cellulose and pectin, which are resistant to the action of digestive enzymes |
| 1. bran (n.) | [bræn] | 1. add one or more essential nutrients to a food to make it healthier or stronger |
| 1. foodstuff (n.) | ['fuːdstʌf] | 1. by means of, with the aid of |
| 1. supply (v.) | [sə'plʌɪ] | 1. a natural oily substance occurring in animal bodies, especially when deposited as a layer under the skin or around certain organs |
| 1. fortify (v.) | ['fɔːtɪfaɪ] | 1. the outer skin of grain that is left when the grain has been used to make flour |
| 1. lean (adj.) | [liːn] | 1. having little or no fat |

**Listening & Watching**

1. **Before you watch, discuss with your partner what “metabolism” is. Why is it important to boost or speed up metabolism? What are the ways to boost it?**
2. **Watch the clip “How to speed up your metabolism” and check your ideas.**
3. **Now watch and listen again and mark the statements true (T) or false (F).**

|  |  |
| --- | --- |
| 1. Taking cold shower continuously during a couple of minutes improves blood circulation and can speed up metabolism. |  |
| 1. You should have meals regularly, without having long time intervals between them. |  |
| 1. You should chose foods rich in proteins and carbohydrates to boost your metabolism. |  |
| 1. Doing aerobic exercises for five minutes every day can speed your metabolism in just two weeks. |  |
| 1. Just doing small movements while working on computer has many benefits for metabolism. |  |

**Before you read**

1. **You are going to read an article about other basic nutrients needed by our body. With your partner discuss the following questions:**
2. What nutrients can be stored in the body?
3. What nutrients are required by the body more or less continuously?
4. Which nutrients are needed by the body in relatively large amounts? Which nutrients are needed by the body in smaller quantities?
5. Why do we need them?
6. **Skim the text to check your ideas.**

**Reading B**

THE BASICS OF FOOD (PART II)

*by Marshall Brain*

Fats

We all know about the common *fats* that different foods contain. Meat contains animal fat. Most breads and pastries contain vegetable oils, shortening or lard. You commonly hear about two kinds of fats: *saturated* and *unsaturated*. Saturated fats are normally solid at room temperature, while unsaturated fats are liquid at room temperature. Vegetable oils are the best examples of unsaturated fats, while lard and shortening (along with the animal fat you see in raw meat) are saturated fats. However, most fats contain a mixture. Unsaturated fats are currently thought to be healthier than saturated fats, and monounsaturated fats (as found in olive oil and peanut oil) are thought to be healthier than polyunsaturated fats.

Fats that you eat enter the digestive system and meet with an enzyme called lipase. Lipase breaks the fat into its parts: glycerol and *fatty* acids. These components are then reassembled into triglycerides for transport in the bloodstream. Muscle cells and fat (adipose) cells absorb the triglycerides either to store them or to burn them as fuel.

You need to eat fat for several reasons. Firstly, fats help in the absorption of the fat-*soluble* vitamins A, D, E, and K. Secondly, in the same way that there are essential amino acids, there are essential fatty acids (for example, linoleic acid is used to build cell membranes). You must obtain these fatty acids from food you eat because your body has no way to make them. What is more, fat turns out to be a good source of energy because it contains twice as many calories per gram as do carbohydrates or proteins. So your body can burn fat as fuel when necessary.

Vitamins

The Merriam-Webster Collegiate Dictionary defines “vitamin” as: any of various organic substances that are essential in minute quantities to the *nutrition* of most animals and some plants, act esp. as coenzymes and precursors of coenzymes in the regulation of metabolic processes but do not provide energy or serve as building units, and are present in natural *foodstuffs* or sometimes produced within the body.

Vitamins are smallish molecules (Vitamin B12 is the largest, with a molecular weight of 1,355) that your body needs to keep itself running properly. The human body needs 13 different vitamins: vitamin A (fat soluble, retinol) comes from beta-carotene in plants; vitamin B (water soluble, several specific vitamins in the complex) – vitamin B1 (thiamine), vitamin B2 (riboflavin), vitamin B3 (niacin), vitamin B6 (pyridoxine), vitamin B12 (cyanocobalamin), folic acid; vitamin C (water soluble, ascorbic acid); vitamin D (fat soluble, calciferol); vitamin E (fat soluble, tocopherol); vitamin K (fat soluble, menaquinone); pantothenic acid (water soluble); biotin (water soluble).

In most cases, the lack of a vitamin *causes* severe problems. The diseases associated with the lack of different vitamins are: night blindness, xerophthalmia (the lack of vitamin A); beriberi (the lack of vitamin B1); problems with lips, tongue, skin (the lack of vitamin B2); pellagra (the lack of vitamin B3); pernicious anemia (the lack of vitamin B12); scurvy (the lack of vitamin C); rickets (the lack of vitamin D); malabsorption of fats and anemia (the lack of vitamin E); poor blood clotting and internal bleeding (the lack of vitamin K).

A diet of fresh, natural food usually provides all of the vitamins that you need. Processing tends to destroy vitamins, so many processed foods are “fortified” with man-made vitamins.

Minerals

*Minerals* are elements that our bodies must have in order to create specific molecules needed in the body. Here are some of the more common minerals our bodies need: calcium (used by teeth, bones), chlorine, chromium, copper, fluoride (strengthens teeth), iodine (combines with tryosine to create the hormone thyroxine), iron (transports oxygen in red blood cells), magnesium, manganese, molybdenum, phosphorus, potassium (important ion in nerve cells), selenium, sodium, zinc.

We do need other minerals, but they are *supplied* in the molecule that uses them. For example, sulfur comes in *via* the amino acid methionine, and cobalt comes in as part of vitamin B12.

Food provides these minerals. If they are lacking in the diet, then various problems and diseases arise. However, vitamins and minerals are micronutrients and are required in the human diet in very small amounts.

Water

As mentioned above, your body is about 70-percent water. A person at rest loses about 40 ounces of water per day.

Water leaves your body in the urine, in your breath when you exhale, by evaporation through your skin, etc. Obviously, if you are working and sweating hard then you can lose much more water.

Because we are losing water all the time, we must replace it. We need to *take in* at least 40 ounces a day in the form of moist foods and liquids. In hot weather and when exercising, your body may need twice that amount. Many foods contain a surprising amount of water, especially fruits. Pure water and drinks provide the rest.

Fibers

*Fiber* is the broad name given to the things we eat that our bodies cannot digest. The three fibers we eat on a regular basis are: cellulose, hemicelluloses, pectin.

Hemicellulose is found in the hulls of different grains like wheat. *Bran* is hemicellulose. Cellulose is the structural component of plants and gives a vegetable its familiar shape. Pectin is found most often in fruits, and is soluble in water but non-digestible. Pectin is normally called “water-soluble fiber” and forms a gel. When we eat fiber, it simply passes straight through, untouched by the digestive system.

[*http://recipes.howstuffworks.com/food.htm*](http://recipes.howstuffworks.com/food.htm)

**Reading Comprehension**

**1. Read the article again. Write T (true), F (false) or ? (don’t know) in the boxes next to these statements.**

|  |  |
| --- | --- |
| 1. Among all fats monounsaturated fats are considered to be the most useful for health. |  |
| 1. There are about twenty essential fatty acids. |  |
| 1. Vitamins are organic substances that are needed in tiny quantities and do not supply our body with energy. |  |
| 1. All vitamins needed by our body are either fat or water soluble. |  |
| 1. The deficiency of both vitamins and minerals in the body can bring harm to our health. |  |
| 1. When a person is working and sweating hard he/she loses about one liter or water a day. |  |
| 1. When fiber enters the digestive system it breaks into its parts: cellulose, hemicelluloses, pectin. |  |

**2. Read the article carefully and answer these questions according to the information in the text.**

1. What is the difference between two kinds of fats? Give the examples of foods that contain each kind.
2. What happens with fat once it enters the digestive system?
3. Why are fats important for our organism?
4. What health problems can the lack of certain vitamins lead to? (in your answer try to give both names of each vitamin)
5. What minerals does our body need? And what for?
6. How does our body lose water? How much water do we need to satisfy our daily needs? In what form can we take in water?
7. What are the sources of fibers?

**Language Development**

!The verbs **can**, **could**, **may**, **might**, **will**, **would**, **shall**, **should**, **must** and **ought** are called *'modal auxiliary verbs'* and used before the infinitives of other verbs.

a) They have no **-s** in the third person singular. - She may know well this subject.

b) Questions, negatives, tags and short answers are made without **do**.

- Can you read this food label? - Yes, I can.

c) After them we use the infinitive without **to** of other verbs (**Ought** **to** is an exception).

! Most of the meanings of modal verbs can be divided into two groups. One is to do with ***degrees of certainty***; the other is to do with ***obligation, freedom to act*** and similar ideas.

**I.** Modal verbs can express ***various degrees of certainty*** about facts, situations or events.

a) **complete certainty** (positive or negative**): shall, will, must, can't**

I shall be away tomorrow. There's the phone. That'll be Tony.

It won't rain this evening. You must be tired. That can't be John – he's in Dublin.

b) **probability** (deduction; saying that something is logical or normal): **should**, **ought to**

She should/ought to be here soon. It shouldn't/oughtn't to be difficult to get there.

c) **possibility** (talking about the chances that something is true or will happen): **may**

The water may not be warm enough to swim.

We may be buying a new house.

d) **weak possibility**: **might**, **could**

I might see you again – who knows? She could be slim one day.

**II.** ***obligation and freedom to act***

a) **strong obligation**: **must**, **will**, **need**

Students must register in the first week of term.

All sales staff will arrive for work by 8.40 a.m.

Need I get a visa for Hungary?

b) **prohibition**: **must not**, **may not**, **cannot**

Students must not use the staff car park.

Books may not be taken out of the library.

You can't come in here.

c) **weak obligation; recommendation**: **should**, **ought to**, **might**, **shall** (in questions)

You should try to work harder. You might see what John thinks.

She really ought to wash her hair. What shall we do?

d) **willingness, volunteering, resolving, insisting and offering**: **will**, **shall** (in questions)

I'll pay for the drinks. I'll definitely work harder next term.

Shall I give you a hand?

e) **permission**: **can**, **could**, **may**, **might**

You can use the car if you like. Could I talk to you for a minute?

May we use the phone? Do you think I might take a break now?

f) **absence of obligation**: **needn't**

You needn't work this Saturday.

g) **ability**: **can**, **could**

These roses can grow anywhere.

You could get to my old school by bus, but not by train.

1. **Find and underline the examples of modal verbs in the text**. **Define their meaning.**

! -**ing** forms are called *'present participles'*. Forms like **broken**, **gone**, **opened**, **started** are called *'past participles*'. However, both forms can be used to talk about the past, present or future.

She was exercising when I saw her.

Who’s the man talking to Elizabeth?

This time tomorrow I’ll be making a presentation on the topic discussed.

The large molecules were broken into the smaller particles.

The protein food is going to be digested.

Participles can be used:

a) with the auxiliary verbs *be* and *have* **to make progressive, perfect and passive verb forms.**

They were cooking meal when I got home.

I’ve forgotten to defrost meat. You’ll be fed up with this food.

Present and past participles can be put together **to make progressive and perfect forms** (e.g. *being employed, having arrived, having been invited*).

b) like **adjectives**:

I love the noise of falling water. John has become very boring.

She says she’s got a broken heart. The house looked abandoned.

c) like **adverbs**

She ran screaming out of the room.

d) to combine with other words into **clause-like structures**.

Who’s the fat man sitting in the corner? – Кто этот толстый мужчина, сидящий в углу?

Having prepared dinner, I started eating. – Приготовив обед, я начал кушать.

Most of the people invited to the party were late. – Большинство людей, приглашенных на вечеринку, опоздали.

Kept out of the fridge, these foods spoilt quickly. – Хранимые не в холодильнике, эти продукты быстро испортились.

**2. Find and highlight the examples of present and past participles in the text**. **Define their meaning.**

**3. Find and learn Russian equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. minute quantities |  |
| 1. to fortify with man-made vitamins |  |
| 1. diseases associated with the lack of different vitamins: rickets, scurvy, beriberi |  |
| 1. to contain twice as many calories per gram as do carbohydrates or proteins |  |
| 1. saturated, unsaturated, polyunsaturated fats |  |
| 1. precursors of coenzymes in the regulation of metabolic processes |  |
| 1. to need to keep running properly |  |
| 1. to eat on a regular basis |  |
| 1. to be reassembled into triglycerides for transport in the bloodstream |  |
| 1. to pass straight through, untouched by the digestive system |  |

**4. Find and learn English equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. испарение с кожи |  |
| 1. нарушение всасывания жиров |  |
| 1. отсутствовать в рационе (питания) |  |
| 1. быть причиной серьезных проблем |  |
| 1. впитывать триглецириды либо для их накопления, либо для их сжигания в качестве топлива |  |
| 1. плохая свертываемость крови и внутреннее кровотечение |  |
| 1. в виде жидких продуктов и жидкостей |  |
| 1. количество воды |  |
| 1. быть растворимым в воде, но не расщепляемым |  |
| 1. обработанная пища |  |

**5. Translate the following text from Russian into English.**

**Как повысить ежедневное потребление воды**

*Автор:* [*Ольга Лупанина*](http://vitaportal.ru/author/olga-lupanina.html)

*Сколько воды должен выпивать человек ежедневно? Наши потребности в воде зависят от многих факторов, включая состояние здоровья, образ жизни и даже местожительство. В среднем каждый человек состоит на 70-80% из жидкости, поэтому нормальное функционирование каждого органа в нашем теле тоже зависит от воды. Ее недостаток приводит к обезвоживанию. Даже потеря 1% воды по отношению к 2% массы тела влияет негативно, выражаясь в упадке сил и утомляемости. Если у вас усталость; легкая головная боль; сухость во рту; пониженное мочеиспускание; ослабленный мышечный тонус; головокружение, то вашему организму необходимо утолить жажду.*

*Медицинские исследования рекомендуют следовать следующим нормам: 1 мл воды для каждой потребляемой калории в день. То есть человек, который ежедневно получает 2000 ккал, должен выпивать 2 л воды. Существует и другая формула: 30 мл воды на 1 кг веса. При весе 60 кг человек должен выпивать 1,8 л воды. При расчете калорий учитывайте кофе, чай, напитки на основе чая, фруктовые соки, газированную воду.*

*Физические нагрузки и жаркая погода увеличивают потребности в гидратации. К примеру, за один час тренировки нужно выпивать не меньше 1 л воды.Пейте теплую воду или комнатной температуры.*

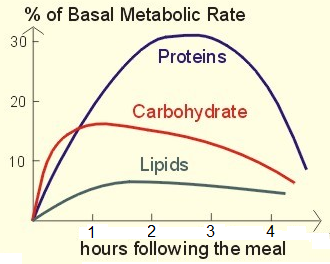
*В дневном рационе 20% жидкости поступает вместе с пищей, остальные 80 % — из супа и различных напитков.*

*Фрукты и овощи, помимо того, что богаты витаминами, минеральными веществами и пищевыми волокнами, содержат много воды. Например, апельсины — на 87%, огурцы – на 95%.*

*Помните, что наш организм состоит главным образом из воды, пополняйте ее запасы.*

[*http://vitaportal.ru/pitanie/zdorovoe-pitanie/kak-pit-bolshe.html*](http://vitaportal.ru/pitanie/zdorovoe-pitanie/kak-pit-bolshe.html)

**Over to you**

1. Humans expend more than 1,000 calories a day for basic functions such as breathing, thinking, circulation and digestion. The number of daily calories it takes just to stay alive is called “basal metabolic rate” (BMR) or “resting metabolic rate” (RMR). Can you comment this scheme?
2. An increased metabolism provides many benefits to help maintain continuous and permanent weight loss. For example, less exercise would be needed – giving you more time; less chance of weight regain later; you can still enjoy some favourite foods – no need to be as strict on the diet. Think of some more benefits.
3. Find Russian equivalents of this English saying: ***An apple a day keeps the doctor away.*** Do you agree with it? Give scientific reasons, using the information of this unit.
4. Fruit diet involves consuming large quantities of fruits. Some types of fruit diets also allow for consumption of limited quantities of protein drinks, vegetables, lean meat, eggs and juice. Fruit diets generally do not include grains, alcohol, caffeine, processed foods and dairy products. Fruit diets also are very low-calorie, with the average daily intake ranging from about 900 calories to 1,500 calories. Are there any dangers of fruit diets? Can they be used for long term? Why? Why not?
5. Prepare a presentation on the topic being discussed.

**Writing**

*Apart from vitamins and minerals, there are other micronutrients which are more recent discoveries and that have not yet been recognized as vitamins or as required. These substances are antioxidants and phytochemicals. Search the information on the Internet (e.g.* [*http://en.wikipedia.org*](http://en.wikipedia.org)*) about these substances – their chemical properties, their most common sources, possible health benefits. Write an essay.*

HEALTHY DIET

**Vocabulary**

**1. Match the words with their definitions:**

|  |  |  |
| --- | --- | --- |
| 1. appropriate (adj.) | [əˈprəʊprɪɪt] | 1. right or suitable |
| 1. maintain (v.) | [meɪnˈteɪn] | 1. to keep in proper or good condition |
| 1. consume (v.) | [kənˈsjuːm] | 1. to take in as a food; to eat or drink |
| 1. expended (pII/v3.) | [ɪkˈspɛndɪd] | 1. used (up), spent |
| 1. result in (phr.v.) |  | 1. to cause something, or to produce something |
| 1. assess (v.) |  | 1. to determine the amount of (calories) |
| 1. adjust (v.) |  | 1. to change something slightly in order to make it better, more accurate, or more effective |
| 1. affect (v.) |  | 1. to act upon or influence |
| 1. emphasize (v.) |  | 1. to give particular importance or attention to something |
| 1. occur (v.) |  | 1. to be found or be present; exist |
| 1. added (PII/v3.) |  | 1. present in larger amounts than usual or than expected |
| 1. contribute *with object* (v.)   contribute to (v.) |  | 1. i) provide something;   ii) to be one of the things that help to make something happen |
| 1. obesity (n.) |  | 1. a condition in which someone is too fat in a way that it is dangerous for their health; fatness |
| 1. exceed (v.) |  | 1. to go beyond the limit or bounds of |
| 1. dietary supplement (n.) |  | 1. a pill or special food that you take or eat when your food does not contain everything that you need |

**Listening and Watching**

**1. Watch the video “How to stay on a diet” and be ready to speak about the tips on how to diet and lose weight.**

**Before you read**

1. **You are going to read an article which provides information and advice for choosing a balanced diet. The terms “eating pattern”, “calorie balance” and “nutrient-dense foods” are essential to understanding the principles and recommendations presented in the article. Discuss with your partner (or in groups) what the terms mentioned above mean.**
2. **Skim the text to check your ideas.**

**Reading C**

HOW TO CHOOSE A HEALTHY EATING PATTERN?

Achieving and sustaining *appropriate* body weight across the lifespan is vital to *maintaining* good health and quality of life. Calorie balance over time is the key to weight management. People cannot control the calories *expended* in metabolic processes, but they can control what they eat and drink, as well as how many calories they use in physical activity. Calories *consumed* must equal calories expended for a person to maintain the same body weight. Consuming more calories than expended will *result in* weight gain. Conversely, consuming over time fewer calories than expended, being more physically active, or, best of all, a combination of the two, will result in weight loss.

The total number of calories a person needs each day varies depending on a number of factors, including the person’s age, gender, height, weight, and level of physical activity. In addition, a desire to lose, maintain, or gain weight *affects* how many calories should be consumed. The best way for people to *assess* whether they are eating the appropriate number of calories is to monitor body weight and *adjust* calorie intake and participation in physical activity based on changes in weight over time. A calorie deficit of 500 calories or more per day is a common initial goal for weight loss for adults. Eating patterns that are low in calorie density improve weight loss and weight maintenance, and also may be associated with a lower risk of type 2 diabetes in adults.

Although total calories consumed is important for calorie balance and weight management, it is important to consider the nutrients and other healthful properties of food and beverages, as well as their calories, when selecting an eating pattern for optimal health. When choosing carbohydrates, people should *emphasize* naturally *occurring* carbohydrates, such as those found in whole grains, beans and peas, vegetables, and fruits, especially those high in dietary fiber, while limiting refined grains and intake of foods with *added* sugars. For protein, plant-based sources and/or animal-based sources can be incorporated into a healthy eating pattern. However, some protein products, particularly some animal-based sources, are high in saturated fat, so non-fat, low-fat, or *lean* choices should be selected. Fat intake should emphasize monounsaturated and polyunsaturated fats, such as those found in seafood, nuts, seeds, and oils.

Certain foods and food components that are consumed in excessive amounts may increase the risk of certain chronic diseases, such as cardiovascular disease, diabetes, and certain types of cancer. These include sodium, solid fats (major sources of saturated and transfatty acids), added sugars, and refined grains. In addition, the diets of most people *exceed* the recommendation for cholesterol. So eating less of these foods and food components can help people meet their nutritional needs within appropriate calorie levels, as well as help reduce chronic disease risk.

If you want to stay healthy eat more vegetables and fruits. Three reasons support this recommendation. First, most vegetables and fruits are major contributors of a number of nutrients, including folate, magnesium, potassium, dietary fiber, and vitamins A, C, and K. Second, consumption of vegetables and fruits is associated with reduced risk of many chronic diseases, such as cardiovascular disease, including heart attack and stroke. Some vegetables and fruits may be protective against certain types of cancer. Third, most vegetables and fruits, when prepared without added fats or sugars, are relatively low in calories. Eating them instead of higher calorie foods can help adults and children achieve and maintain a healthy weight. The majority of the fruit recommended should come from whole fruits, including fresh, canned, frozen, and dried forms, rather than from juice. When juices are consumed, 100% juice should be encouraged. To limit intake of added sugars, fruit canned in 100% fruit juice is encouraged over fruit canned in syrup.

You can either try eating whole grains which are a source of nutrients such as iron, magnesium, selenium, B vitamins, and dietary fiber. Whole grains vary in their dietary fiber content. Wholegrain intake may reduce the risk of cardiovascular disease and is associated with a lower body weight and a reduced incidence of type 2 diabetes.

Don’t forget about milk and milk products which *contribute* many nutrients, such as calcium, vitamin D (for products fortified with vitamin D), and potassium, to the diet. Intake of milk and milk products is linked to improved bone health, especially in children and adolescents. The intake of milk and milk products is also associated with a reduced risk of cardiovascular disease and type 2 diabetes and with lower blood pressure in adults. Dietary potassium can lower blood pressure by blunting the adverse effects of sodium on blood pressure and reduce the risk of developing kidney stones. Dietary sources of potassium are found in all food groups, notably in vegetables, fruits, and milk and milk products. The most important thing for optimal bone health is of course calcium. In addition, calcium serves vital roles in nerve transmission, constriction and dilation of blood vessels, and muscle contraction. Milk and milk products contribute substantially to calcium intake. Calcium recommendations may be achieved by consuming recommended levels of fat-free or low-fat milk and milk products and/or consuming alternative calcium sources.

Some people can’t live without protein foods such as seafood, meat, poultry, eggs, beans and peas, soy products, nuts, and seeds. In addition to protein, these foods contribute B vitamins (e.g., niacin, thiamine, riboflavin, and B6), vitamin E, iron, zinc, and magnesium to the diet. However, protein also is found in some foods that are classified in other food groups (e.g., milk and milk products). The fats in meat, poultry, and eggs are considered solid fats, while the fats in seafood, nuts, and seeds are considered oils. Meat and poultry should be consumed in lean forms to decrease intake of solid fats. Because nuts and seeds are high in calories, they should be eaten in small portions and used to replace other protein foods. In addition, people should choose unsalted nuts and seeds to help reduce sodium intake. Seafood contributes a range of nutrients, notably the omega-3 fatty acids, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). The consumption of a variety of seafood *contributes to* the prevention of heart disease.

The other question is oils. Oils are not a food group, but are emphasized because they contribute essential fatty acids and vitamin E to the diet. Replacing some saturated fatty acids with unsaturated fatty acids lowers both total and low-density lipoprotein (LDL) blood cholesterol levels. Oils are naturally present in foods such as olives, nuts, avocados, and seafood. Many common oils are extracted from plants, such as canola, corn, olive, peanut, safflower, soybean, and sunflower oils. Foods that are mainly oil include mayonnaise, oil-based salad dressings, and soft (tub or squeeze) margarine with no transfatty acids.

Dietary fiber is the non-digestible form of carbohydrates and lignin. Dietary fiber naturally *occurs* in plants, helps provide a feeling of fullness, and is important in promoting healthy laxation. Some of the best sources of dietary fiber are beans and peas, such as navy beans, split peas, lentils, pinto beans, and black beans. Additional sources of dietary fiber include other vegetables, fruits, whole grains, and nuts. Bran, although not a whole grain, is an excellent source of dietary fiber. Dietary fiber that occurs naturally in foods may help ensure normal gastrointestinal function and reduce the risk of cardiovascular disease, *obesity*, type 2 diabetes.

Do not forget about vitamin D which is also important for health (e.g. vitamin D can help reduce the risk of bone fractures.). Vitamin D is unique in that sunlight on the skin enables the body to make vitamin D. Natural sources of vitamin D include some kinds of fish (e.g., salmon, herring, mackerel, and tuna) and egg yolks, which have smaller amounts. It also is available in the form of dietary *supplements*.

Nutrient-dense foods provide vitamins, minerals, and other substances that may have positive health effects, with relatively few calories. They are lean or low in solid fats, and minimize or exclude added solid fats, added sugars, and added refined starches, as these add calories but few essential nutrients or dietary fiber. Nutrient-dense foods also minimize or exclude added salt or other compounds high in sodium.

So, as you can see, eating foods in nutrient-dense forms and physical activity patterns that are focused on consuming fewer calories, making informed food choices, and being physically active can help people attain and maintain a healthy weight, reduce their risk of chronic disease, and promote overall health.

*[www.dietaryguidelines.gov](http://www.dietaryguidelines.gov)*

**Reading Comprehension**

**1. Read the article again. Write T (true), F (false) or ? (don’t know) in the boxes next to these statements.**

|  |  |
| --- | --- |
| a) We can monitor the number of calories used in major body processes and in physical activity. |  |
| b) If people consume more calories than they expend over time, this can lead to weight gain and obesity. |  |
| c) Some protein foods which are high in saturated fat should be excluded from the diet. |  |
| d) The consumption of vegetables and fruits is associated with reduced risk of certain types of cancer. |  |
| e) Many behavioural, environmental, and genetic factors have been shown to affect a person’s body weight. |  |
| f) A healthy eating pattern contributes to achieving and maintaining a healthy weight and focuses on nutrient-dense foods and beverages. |  |
| g) Those who do not consume milk or milk products should consume foods that provide the range of nutrients generally obtained from the milk group. |  |

**2. Read the article carefully and answer these questions according to the information in the text.**

1. Why is calorie balance important?
2. Which foods should be incorporated into a healthy eating pattern? What are they rich in?
3. Which foods should be excluded from the diet or consumed in small amounts? Why?
4. Why is it important to supply the diet with fruits and vegetables?
5. What nutrients are supplied with milk and milk product? Which health benefits are provided by milk and milk product?
6. What essential nutrients are contributed to the diet with seafood, beans and peas, soy products, nuts, and seeds? Are there any restrictions while consuming meat and poultry, nuts and seeds? What are they, if there are any?
7. Why are oils important to the diet? What are food sources of oils?
8. What are health benefits provided by dietary fiber?
9. What foods are considered to be nutrient dense foods? Give the examples. What are they rich in?

**Language Development**

! Participles (-**ing** and -**ed** forms)

-**ing** forms used like adjectives or adverbs have similar meanings to **active** verbs.

falling leaves (= leaves that fall)

a meat-eating animal (= an animal that eats meat)

She walked out smiling. (= She was smiling.)

most **past participles** have **passive** meanings when they are used like **adjectives** or **adverbs**.

a broken heart (= a heart that has been broken)

He lived alone, forgotten by everybody. (= He had been forgotten by everybody.)

*Interested, bored, excited* etc say how people feel.

*Interesting, boring* etc describe the people or things that cause the feelings.

Compare: I was very **interested** in the lesson. So the lesson was really **interesting**.

*exceptions*: A few **past** participles can be used as adjectives with **active** meanings, especially before nouns. Examples:

a fallen leaf (= a leaf that has fallen)

advanced students (= students who have advanced to a high level)

developed countries a grown-up daughter

increased activity an escaped prisoner

vanished civilisations faded colours

a retired general swollen ankles

Participles can often be used as **adjectives** before nouns, or after **be** and other link verbs.

an interesting book a lost dog a falling leaf screaming children

The upstairs window is broken. His idea seems exciting.

Participles used as adjectives can have **objects**. Note the word order.

English-speaking Canadians. a fox-hunting man

We often use participles after nouns in order **to define** or identify the nouns, in the same way as we use identifying relative clauses.

We couldn't agree on any of the problems discussed.

The people questioned gave very different opinions.

I watched the match because I knew some of the people playing.

! A few participles change their meaning according to their position. Compare:

- a concerned expression (= a worried expression)

the people concerned (= the people who are/were affected)

When a **past participle** is part of a **passive verb**, we can put **much** or **very much** before it, but not **very**.

He’s (very) **much** admired by his students.

Britain’s trade position has been (very) **much** weakened by inflation.

When a past participle is used as an **adjective**, use **very**.

a **very** frightened animal a **very** shocked expression

1. **Look at the sentence from the article:** *When* ***choosing*** *carbohydrates, people should emphasize naturally occurring carbohydrates.* **Find and underline other examples of participle clauses in the text.**

**ǃ** Gerunds are – **ing** forms of the verb that are used as nouns. Gerunds name actions. Although gerunds are used in a clause as nouns, they keep the qualities of verbs. Many compound nouns are made from a gerund and another noun. They usually show the purpose to which the head noun is put, e.g. *los****in****g excess weight – excess weight for los****in****g.*

**ǃ** To translate the gerund you need some rules. If gerund is:

1. **Subject**, you translate it as a noun or infinitive.

e.g. *Eating* the right foods that give your body the nutrients you need makes you healthy. – **Употребление в пищу** продуктов, которые дают вашему организму все необходимые питательные вещества, способствует хорошему здоровью.

1. **Predicate Nominative**, you translate it as a noun or infinitive.

e.g. The main goal for me *is being* healthy***.*** – Для меня главная цель – это **быть** здоровым.

1. **Compound Predicate**, you translate it as complement infinitive.

e.g. The dietician finished ***talking*** to the patient. Диетолог закончил **беседовать** с пациентом.

1. **Direct and indirect object,** you translate it as a noun or infinitive or subordinate clause.

e.g. I simply **love eating** bananas. – Я просто обожаю **есть бананы**.

e.g. In muscle insulin promotes the uptake of amino acids *for making* proteins.– В мышечной ткани инсулин способствует поглощению аминокислот **для получения** белка.

1. **Attribute,** you translate it as a noun or infinitive.

e.g. There are different ways **of solving** this problem. – Имеются различные способы **решения** этой проблемы.

1. **Adverbial modifier,** you translate it as an adverbial participle.

e.g. One can understand this **by making** a very simple experiment. – Можно понять это, **проведя** очень простой эксперимент.

**2. Find and underline other examples in the text. Explain the usage of ing-forms. Translate the sentences into Russian.**

**3. Find and learn Russian equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. weight management |  |
| 1. to monitor body weight |  |
| 1. nutrient-dense foods |  |
| 1. to meet nutritional needs within appropriate calorie levels |  |
| 1. to promote overall health |  |
| 1. to contribute substantially to calcium intake |  |
| 1. to serve vital roles in nerve transmission, constriction and dilation of blood vessels, and muscle contraction |  |
| 1. to lower both total and low-density lipoprotein (LDL) blood cholesterol levels |  |
| 1. to lower blood pressure by blunting the adverse effects of sodium on blood pressure |  |
| 1. oil-based salad dressing |  |

**4. Find and learn English equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. налаживать (улучшать) потерю веса и поддержание веса |  |
| 1. полезные для здоровья свойства пищи и напитков |  |
| 1. нежирный, с низким содержанием жира, или постный (3 слова) |  |
| 1. способствовать предотвращению заболеваний сердца |  |
| 1. необработанное зерно, очищенное зерно |  |
| 1. меньший риск многих хронических заболеваний, таких как сердечнососудистые заболевания, включая сердечный приступ |  |
| 1. достичь и поддерживать здоровый вес |  |
| 1. обеспечивать чувство сытости (насыщения) |  |
| 1. обеспечивать нормальное функционирование желудочно-кишечного тракта |  |
| 1. иметь положительное влияние на здоровье |  |

**5. Translate the article from Russian into English.**

*Здоровое питание: основы основ*

Автор: Фролова Елена

*Рацион человека зависит от пола, возраста, состояния здоровья, физических нагрузок. Но есть базовые принципы питания, которых должен придерживаться каждый человек, заботящийся о своем здоровье.*

*Ключевое понятие здорового образа жизни – диета. Но не в том понимании, к которому мы все привыкли – как нечто временное и изнурительное. Слово «диета» происходит от греч. díaita – образ жизни, режим питания, и нужно вернуться к этому первоначальному смыслу. Диета – это то, как нужно питаться постоянно в течение всей жизни.*

***Продукт на первом месте***

*Здоровая диета исключает такие продукты, как полуфабрикаты, газированные напитки, продукты с большим содержанием насыщенных жиров – это то, что нельзя никому, даже худым людям. При здоровом образе жизни ограничивается потребление таких веществ, как соль, сахар, жиры. Зато практически без ограничений разрешается есть крупы, овощи, кисломолочные продукты, травы – соблюдать диету вовсе не значит голодать. Предпочтение следует отдавать свежим продуктам и свежеприготовленным блюдам.*

***Здоровый сон***

*Золотое правило – не есть ночью. В ночном перекусе нуждаются только маленькие (грудные) дети, все остальные вполне могут и должны обходиться без него. Дайте организму отдохнуть. Желание поесть ночью – это следствие другой проблемы, искать нужно причины вашей бессонницы или стресса.*

<http://vitaportal.ru/pitanie/zdorovoe-pitanie/zdorovoe-pitanie-osnovy-osnov.html>

**Over to you**

1. The opposite of “nutrient-dense foods” are “junk foods” or “empty-calorie foods”. Have you got any idea what “junk foods” are? What can you say about their nutritional value? Which foods are considered to provide “empty calories”?

2. There are lots of diets and eating patterns. Can you name any? What are they based on? What does each of them emphasize? What do they include (exclude)? Are they healthy eating patterns? Can they be followed for a long time? What is a “crash diet”?

1. The food label provides detailed guidance that can help people make healthy food choices. Discuss with your partner who it is important to. Why (not)?
2. Find Russian equivalents of these English proverbs: ***To lengthen your life, lessen you meals. Diet cures more than lancet. After dinner sit a while, after supper walk a mile.*** Do you agree with them? Give scientific reasons, using the information of this unit.
3. Prepare a presentation on the topic being discussed.

**Writing**

There are several guidelines available to help a person plan their balanced diet. What recommendations would you give to a person who wants to lose weight (about 10-15 kg) and stay healthy? Give your recommendations in writhing. Don’t forget to explain why you think so. In your essay use as many modals as possible.

What are the healthiest ways of dieting? What do you think people should include in their diet? Consult the site *<http://healthguide.howstuffworks.com>*

UNIT 2

PHYSICAL AND MENTAL HEALTH

MENTAL HEALTH

**Vocabulary**

**1. Match the words with their definitions and write the transcription of the words in column 2. Translate the words in column 1 into Russian:**

|  |  |  |
| --- | --- | --- |
| **1** | **2** | **3** |
| 1) well-being (n.) |  | a) a feeling of worry, nervousness, or unease |
| 2) awareness (n.) |  | b) difficulties; misfortune |
| 3) anxiety (n.) |  | c) to deal effectively with something difficult |
| 4) contentment (n.) |  | d) confidence in one's own worth or abilities; self-respect |
| 5) adversity (n.) |  | e) reasonable; sensible |
| 6) self-esteem(n.) |  | f) the state of being comfortable, healthy, or happy |
| 7) sane (adj.) |  | g) a person’s consciousness or perception of something |
| 8) cope with (v.) |  | h) a state of happiness and satisfaction |

**Listening**

1. **Before you listen, think about mental health. Do you think that a person with good mental health always has good physical health?**
2. **Now listen to a story and mark the statements true (T) or false (F).**

|  |  |
| --- | --- |
| 1. The author worries about his mental health. |  |
| 1. Everything has to be done tomorrow. |  |
| 1. Life wasn’t so stressful a hundred years ago. |  |
| 1. There are not any good mental health specialists in our country. |  |
| 1. People’s mental health was probably better. |  |
| 1. To be mentally healthy we need to laugh more and care more. |  |

**Before you read**

1. **Before you read think and say your ideas of what mental health is**

**2. Work in pairs. Agree or disagree with the following statements:**

|  |  |  |
| --- | --- | --- |
| **Statement** | **True** | **False** |
| Mental health concerns feelings, attitudes, and abilities. It is a way a person reacts to other people and situations. |  |  |
| Good mental health is just the absence of mental health problems. |  |  |
| Mental health is as equally important as physical health. |  |  |

1. **Read the first sentences and identify the core issue of the text.**
2. **Skim the text to check your ideas.**

WHAT IS MENTAL HEALTH

The World Health Organization defines mental health as “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community”. This definition of mental health highlights emotional well-being, the capacity to live a full and creative life, and the flexibility to deal with life’s inevitable challenges. 

An entire model of mental health generally includes concepts based upon anthropological, educational, psychological, religious and sociological perspectives, as well as theoretical perspectives from personality, social, clinical, health and developmental psychology.

An example of a wellness model includes one developed by Myers, Sweeney and Witmer. It is known to include five life tasks — essence or spirituality, work and leisure, friendship, love and self-direction — and twelve sub tasks — sense of worth, sense of control, realistic beliefs, emotional awareness and coping, problem solving and creativity, sense of humour, nutrition, exercise, self care, stress management, gender identity, and cultural identity — which are identified as characteristics of healthy functioning and a major component of wellness. The components are thought to provide a means of responding to the circumstances of life in a manner that promotes healthy functioning.

Mental health is how we think, feel and act as we cope with life. It also helps determine how we handle stress, relate to others and make choices. Like physical health, mental health is important at every stage of life, from childhood and adolescence through adulthood.

Good mental health isn’t just the absence of mental health problems. Being mentally healthy is much more than being free of depression, anxiety, or other psychological issues. Rather than the absence of mental illness, mental health refers to the presence of positive characteristics.

People who are mentally healthy have:

- a sense of contentment;

- a zest for living and the ability to laugh and have fun;

- the ability to deal with stress and bounce back from adversity;

- a sense of meaning and purpose, in both their activities and their relationships;

- the flexibility to learn new things and adapt to change;

- a balance between work and play, rest and activity, etc;

- the ability to build and maintain fulfilling relationships;

- self-confidence and high self-esteem.

These positive characteristics of mental and emotional health allow you to participate in life to the fullest extent possible through productive, meaningful activities and strong relationships. These positive characteristics are certain to also help you cope when faced with life’s challenges and stresses.

Mental health is as equally important as physical health. While physical health helps keep our bodies strong and fit, mental health helps keep us sane, rational and headstrong.

Being mentally fit allows us to enjoy life and the environment, helps us overcome life’s trials and tribulations and prevents us from getting a breakdown. We can be creative, learn, try new things, and take risks. Having good mental health is sure to helps us become better people and gives us the positive attitude we need when faced by doubt and hardships in our personal and professional life.

*[http://www.nlm.nih.gov](http://www.nlm.nih.gov/)*

**Reading Comprehension**

1**. Complete the sentences according to the text:**

1) This definition of mental health highlights ...

a) life and the environment;

b) a sense of contentment;

c) emotional well-being, the capacity to live a full and creative life.

2) Good mental health isn’t just ...

a) self-confidence and high self-esteem;

b) the absence of mental health problems;

c) as equally important as physical health.

3) Positive characteristics of mental health allow you ...

a) to participate in life to the fullest extent;

b) to become better people;

c) to determine how we handle stress.

4) Mental health helps ...

a) think, feel and act;

b) keep us sane, rational and headstrong;

c) provide a means of responding to the circumstances of life.

5) An entire model of mental health includes ...

a) doubt and hardships in our personal and professional life;

b) a zest for living and the ability to laugh and have fun;

c) concepts based upon psychological, and sociological perspectives.

**Language Development**

* Dependent prepositions (1)

In English there are many words which are used with particular prepositions. Because the choice of preposition depends on the word and meaning, the prepositions are called dependent. For example, *a contribution to* (not *in, at*, or *by*), *prevent from.*

Read this sentence from the text and pay your attention to the dependent prepositions*to* and*from***.**

...*can work productively and fruitfully, and is able to make a contribution to his or her community”.*

*Being mentally fit allows us to enjoy life and the environment, helps us overcome life’s trials and tribulations and prevents us from getting a breakdown.*

Note that *to* can be a dependent preposition!

If an adjective is related to a noun or verb which takes a preposition, the adjective usually takes the same preposition.

For example: *I expressed my* ***gratitude for*** *their assistance. I was* ***grateful for*** *their assistance.*

If a noun is related to a prepositional verb, the noun often takes the same preposition.

For example: *Being mentally fit allows us to enjoy life and the environment, helps us overcome life’s trials and tribulations and prevents us from getting a breakdown. Being mentally fit is a way of prevention us from getting a breakdown.*

! To use the right dependent preposition consult *Appendix 1.*

1. **Find and underline all examples with verbs, nouns or adjectives with dependent prepositions in the text and try to learn them.**

**2. Fill each gap with one suitable preposition from the box:**

|  |
| --- |
| **to upon to from with to with** |

1. Some individuals cannot cope ... the normal stresses of life.

2. Selma was under pressure because she was told she should make a contribution ... his or her community.

3. An adult has to be able to deal ... life’s inevitable challenges.

4. Her depression is based ... everyone’s opinion that she’s been the reason Mark committed suicide.

5. Nobody knows how she relates ... her colleagues because she’s incredibly reserved.

6. We haven’t bounced back ... the shock of 11th September yet.

7. Wesley is desperately shy and it’s very difficult for him to adapt ... any changes in his boring life.

* Look at the sentence from the article. *It is known to include five life tasks….* It is translated into Russian as: *Известно, что она (модель) включает в себя пять жизненно важных задач*….

The verbs *believe, expect, know, report, think, say, feel, hope* etc and the adjectives *sure, certain, likely and unlikely* with **to be** are used in the passive patterns in personal and impersonal constructions called COMPLEX SUBJECT

Their translation is the following:

*- считается, что…(be thought to...)*

*Известно, что….(be known to…)*

*Говорят, что….(be said to….)*

*Вероятно/маловероятно, что (be likely/unlikely to…)*

*Обязательно, наверняка (be sure/certain to …)*

**3. Look through the text and find some examples of complex subject and translate them into Russian.**

**4. Find and learn Russian equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. to be able to make a contribution to smth. |  |
| 1. an entire model |  |
| 1. to bounce back from adversity |  |
| 1. gender identity |  |
| 1. the absence of mental health problems |  |
| 1. to refer to |  |
| 1. life’s trials and tribulations |  |
| 1. to adapt to changes |  |
| 1. sense of worth |  |
| 1. to participate in life |  |

**5.** **Find and learn English equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1)способность справляться со стрессом |  |
| 2)самоуверенность и высокая самооценка |  |
| 3)работать плодотворно |  |
| 4) отводить главное место, выделять; |  |
| 5) в полной мере |  |
| 6)рисковать |  |
| 7)быть свободным от депрессии |  |
| 8)отсутствие умственного заболевания |  |
| 9)позитивное отношение |  |
| 10)сомнения и трудности |  |

6. **Translate the following passage from Russian into English.**

*Считается, что физические упражнения положительно влияют на мозг. Ученые университета в Дьюке несколько лет назад доказали, что физические упражнения обладают свойствами антидепрессантов. Другое исследование показало, что физические упражнения могут улучшить мозговую деятельность пожилых людей и даже предотвратить развитие слабоумия.*

*Одна из теорий положительного воздействия физических упражнений включает тот факт, что упражнения дают толчок выработке эндорфинов. Эти естественные успокаивающие вещества похожи на морфин. Они, вероятно, могут вырабатываться как естественные болеутоляющие в ответ на ударную нагрузку, которую организм получает во время физических упражнений. Однако ученые-исследователи начинают сомневаться улучшают ли эндорфины настроение. Исследования показывают, что обмен эндорфинов в организме сложный процесс и, вероятно, здесь подключаются дополнительные механизмы, которые оказывают влияние на психическое здоровье во время физических упражнений.*

**Over to you**

* 1. **Discuss with your partner the following questions**
* How does exercise improve mental health?
* What biological factors are involved in mental illness?
* What psychological factors contribute to mental illness?
* What environmental factors contribute to mental illness?

**2. Prepare a presentation on one of the following topics**

* **How Can You Use Your Mental Health to Improve Your Physical Health?**
* How Can You Prevent Mental Health Issues In Your Own Body?
* What are the Causes of Mental Illness?

**Writing**

Imagine you work for Health Maintenance Organization. Your patient can’t cope with stresses of life and has depression. Give him advice, help him to find positive attitude to his personal and professional life.

PHYSICAL HEALTH

**Vocabulary**

1. **Match the words with their definitions and write the transcription of the words in column 2. Translate the words in column 1 into Russian:**

|  |  |  |
| --- | --- | --- |
| **1** | **2** | **3** |
| 1. soundness (n.) |  | 1. failure to function normally or satisfactorily |
| 1. malfunctions (n.) |  | 1. to be connected |
| 1. nutrition (n.) |  | c)a hormone secreted within the brain |
| 1. be linked (v.) |  | d) a medicine or treatment for a disease or injury |
| 5)endorphin (n.) |  | e)the quality or state of being strong |
| 6)remedy (n.) |  | f) a thing added to something else as a supplementary |
| 7) adjunct (n.) |  | g) food; nourishment |

**Listening**

1. **Before you listen, read the instructions for the listening task below and answer these questions**:

* How many speakers will you hear?
* What is the topic?

1. **Read the statements 1-7. Whose opinion is being reported in each statement?**
2. **Mark the main ideas in each sentence (the first one has been done for you.) Think about each statement. Do you agree or disagree?**
3. **Listening for opinions. Listen once and decide whether the sentences match exactly what is said on the recording.**
4. **Listen again to check your answers.**

|  |
| --- |
| You will hear part of radio programme in which a famous sportsman is being interviewed about the training for various types of challenging physical activities. For questions 1-7, decide which of the statements are TRUE and which are FALSE. |

1. Malcolm sees training as the key to success in a range of physical activities.
2. Malcolm wishes he could have been a jockey.
3. Malcolm thinks it can be harder for adults to find the motivation for training.
4. Malcolm warns against unrealistic expectations in training.
5. Malcolm feels that a set training routine can be a bad thing.
6. Malcolm recommends keeping a constant check on your progress as

you train.

1. Malcolm mentions some disadvantages of training with a friend.

**Before you read**

**1. You are going to read an article about physical health and its connection to mental health**

**2. What keeps people healthy?**

**3. Discuss with your partner the following statements.**

* Health is when your body functions as it is supposed to. You need nutrition and exercise to maintain your health. Your body defends against illness and disease, but you must use caution to avoid injury and poison. If you are healthy, you will heal quicker.
* No one perfect and many people have defects in their bodies.
* The body is a simple mechanism.

**4. Skim the text to check your ideas.**

**Reading B**

**Physical Health and its Connection to Mental Health**

Physical health is the overall condition of a living organism at a given time, the soundness of the body, freedom from disease or abnormality, and the condition of optimal well-being. People want to function as designed, but environmental forces can attack the body or the person may have genetic malfunctions. The main concern in health is preventing injury and healing damage caused by injuries and biological attacks.

Each one of us was born with a body that is a highly complex mechanism. It is amazing that it operates as well as it does. Good health is really defined as being able to function according to the way the body has been designed to function.

Unfortunately, no one is perfect and many people have defects in their bodies. Some people have defects that can be life-threatening. Fortunately, the body can compensate for defects and a person may easily live a long life with a body that is only partially functioning. An example is how a blind person or crippled person can compensate for the handicap and simply turn it into a challenge.

Not only should the all body parts work well and work together, but they also need proper nutrition for energy and to continue to operate effectively. In general, humans and animals seem to be able to tell what foods their bodies need to function properly and to be healthy.

If you have a Ferrari sports car, it does no good to be driving it to and from the supermarket. The car was made for high speeds. Likewise with your body. It was made to be used. The human body was made to be physically active. The heart needs to pump fast once in a while to keep its muscle tone. Your lungs need exercise to function the way they were made to function. Exercise and using the body is important to maintaining your health.

Physical health is connected to mental and emotional health. Taking care of your body is a powerful first step towards mental and emotional health. The mind and the body are linked. When you improve your physical health, you’ll automatically experience greater mental and emotional well-being. For example, exercise not only strengthens our heart and lungs, but also releases endorphins, powerful chemicals that energize us and lift our mood.

Each element influences the other. For example, someone who is working long hours in an office expending much mental energy and heading toward “burnout” may be advised to incorporate more physical exercise into his/her lifestyle in order to bring the wellness system into balance.

It is important to keep in mind that the positive impact of physical exercise on mental health or wellbeing is relevant for mental health but not necessary mental ill-health. It would be unlikely that someone suffering from a mental illness, such as schizophrenia, would be prescribed exercise as a remedy. If it was as simple as physical health = mental health, there would be little need for psychologists. However, most health practitioners would agree that physical exercise is often a useful adjunct to therapy for mild mental conditions where physical exercise has been linked to positive treatment outcomes.

[*http://www.school-for-champions.com*](http://www.school-for-champions.com/)

**Reading Comprehension**

**1. Read the article again. Write T (true), F (false) or ? (don’t know) in the boxes next to these statements.**

|  |  |
| --- | --- |
| 1. The body is a highly complex mechanism. |  |
| 1. The body can’t compensate for defects people have. |  |
| 1. Our body need any nutrition for energy to operate effectively. |  |
| 1. Physical health is hardly linked to mental health. |  |
| 1. Physical health influences mental health and vice verse. |  |
| 1. There is no use in physical exercises during a treatment. |  |

**Language Development**

! Negation.

There are many different ways of forming negatives in English. Although the most common way is with *not*, we can also use adverbs, quantifiers and prefixes to make the meaning of a sentence or a word negative.

We use *not/n’t* with verbs to make the meaning of a sentence negative. We add an auxiliary (*do, does,* etc) in the negative present simple or past simple of all verbs except *be*, and the negative imperative of all verbs;

|  |  |  |
| --- | --- | --- |
|  | **affirmative** | **negative** |
| **imperative** | *Go back!* | *Don’t go back!* |
| **be** | *Motivation was the same in both trials and* ***was*** *a factor.* | *Motivation was the same in both trials and* ***was not*** *a factor.* |
| **present or past**  **simple** | *Most people work at such an intensity, which* ***gives*** *plenty of physiological and psychological benefit.*  *The study also found that mental fatigue* ***caused*** *the heart or muscles to perform any differently* | *Most people work at such an intensity, which* ***doesn’t give*** *plenty of physiological and psychological benefit.*  *The study also found that mental fatigue* ***did not cause*** *the heart or muscles to perform any differently* |
| **perfect tenses** | We’**ve** long **known** that even techniques such as [psychotherapy](http://psychcentral.com/psychotherapy/) can alter brain structures | *We* ***haven’t known*** *for along time that the techniques such as* [*psychotherapy*](http://psychcentral.com/psychotherapy/) *can alter brain structures*. |
| **modal verbs** | *Human beings* ***can*** *long remain healthy in an environment in which they are in harmony with other living things.* | *Human beings* ***cannot*** *long* ***remain*** *healthy in an environment in which they are out of harmony with other living things.* |
| **infinitives** | *He told me to “rest up” before a big day.* | *He told me* ***not to “rest up”*** *before a big day.* |
| **participles** | *People* ***having*** *problems with coping with their anger or aggravation are at ten times heightened risk for future heart arrhythmias than those without such anger problems* | *People* ***not having*** *problems with coping with their anger or aggravation aren’t at ten times heightened risk for future heart arrhythmias than those without such anger problems* |

*Not* is used in front of positive quantifiers (*much, many, a lot of*) to make the meaning of a clause or phrase negative:

*Not many people want to be scientists – it’s a lot of hassle and not much money*.

There are a number of expressions which we use to give negative meaning to a sentence, e.g. *never, neither …nor, none, not only*, etc

Look at this sentence from the text: *For example, exercise not only strengthens our heart and lungs, but also releases endorphins, powerful chemicals that energize us and lift our mood.*

One more example: *The study also found that mental fatigue caused neither the heart nor muscles to perform any differently*.

Many English words have a negative or restrictive meaning, i.e. they reduce the amount, frequency or degree of the word they qualify.

|  |  |  |
| --- | --- | --- |
| **Type of word** | examples | example sentences |
| **quantifiers** | *few, little* | There are *few* people who believe you.  I have *little* time to go to aerobics. |
| **adverbs of frequency** | *rarely, hardly, hardly ever* | Bad sleeping habits *hardly ever* simply a symptom of physical health concerns. |
| **adverbs of degree** | *hardly, scarcely, barely* | Your sense of balance has *barely* anything to do with anxiety |

We can make verbs, nouns and adjectives negative with a negative prefix/

To use negative prefixes correctly consult *Appendix 2*

1. **Choose the verbs in the text that can be examples of the rules and make them negatives.**
2. **Find and underline the mistakes in this dialogue. (The first one is given as an example). Correct the mistakes. Role play the dialogue.**

Louisa(L) Hi, Martin! What’s wrong? You look awful.

Martin (M) Oh, I’ve had that horrible flu. It lasted for ages.

L Didn’t you go to the doctor?

M No, I did. I went last week, but my doctor doesn’t know nothing. I asked for that new flu drug – what’s’ it called?

L Do you mean Relenza?

M That’s it. I asked, but he wouldn’t give me none.

L Why?

M He said that the tests haven’t hardly proved that it works. He didn’t refuse me not only to give me Relenza, but also he wouldn’t’ give me none other medicine. I think it’s because the surgery is over-budget and he doesn’t want to spend any more money!

L If that’s the case, it’s really unhonest! Have you thought about complaining?

M No, what’s the use? Complaints about doctors rarely have an effect. Anyway, I suppose there is not much you can do about a virus. He said I should drink plenty of fluids and he didn’t tell me to go out until I felt better.

L How are you feeling now?

M Not too bad, but I can’t taste hardly anything. Well, I think that’s an effect of the flu and not a problem with my taste buds!

L Oh, I don’t hope it is. It would be awful not to taste things.

M I’ve still got a few chest problems, too. I suppose O should stop smoking.

L What! Have you stopped smoking through this flu, then? You are crazy, Martin!

M I know. I guess, I’ll never be a no-smoker.

L Perhaps not. Anyway, it lasts a ling time, this flu. Not many people don’t appreciate that. You think it’s gone and toy try to get back to normal, then it hits you again.

M Yes, you are right.

L Look, I must be going. I don’t hope it lasts much longer. Bye!

1. **Find in the text and learn Russian equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1) abnormality | a) |
| 2) to heal damage | b) |
| 3) to keep muscle tone | c) |
| 4) to maintain the health | d) |
| 5) to release | e) |
| 6) to improve physical health | f) |
| 7) the positive impact | g) |
| 8) may be advised | h) |
| 9) to be connected to smth | i) |

1. **Find in the text and learn English equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1) свобода от болезни | a) |
| 2) функционировать | b) |
| 3) генетические сбои | c) |
| 4) удивительно | d) |
| 5) слепой или хромой человек | e) |
| 6) для поддержания здоровья | f) |
| 7) связано с умственным и эмоциональным здоровьем | g) |
| 8) психолог | h) |
| 9) «перегорание» | i) |

1. **Translate the following passage from English into Russian.**

How to achieve a better mental and physical health?

*Daily life, work, family and household responsibilities can cause us health problems such as stress and physical problems such as tiredness. So it is good to practice different ways to counteract the harsh daily tasks, meditating, exercising and making everyday life better. In an era when our world is going through a bad economic situation is sometimes difficult to solve our money problems and needs, so we need to know that stress does not solve these problems and our mental and physical health is important, therefore. We must do our best to avoid worrying so much because most problems can be solved. Here are some tips that can help us better health.*

*Stress is one of the things affecting our health in these times. Among the concerns and obligations of everyday life it can be increasingly more difficult to disconnect us from our routine and escape from stress.*

*When a person is stressed, he/she can suffer from anxiety, nervousness and even depression, therefore is good to have someone to talk to and so make our burden lighter, it is also good to put into practice some things like a walk in the park and by doing so we can enjoy a good day and it helps us to meditate and to relax by being outdoors, something like going fishing can be relaxing and healthy.*

*Other things like exercising can help improve our physical health and make our lives better. Listening to music can be relaxing as well as a massage session make stress go away.*

*If we choose a quiet place to sit or lie down and close our eyes while we close our toes hard for several minutes this will help us to relax. We can also focus and think positive things like, good health is vital for a pleasant and enjoyable life.*

*We must not forget that aerobic exercise keeps our mind and healthy body, a daily routine of exercise help us strengthen our body.*

[*http://www.win-back-your-good-health.com*](http://www.win-back-your-good-health.com/)

**Over to you**

1. **Comment on the following situations:**

* Have you ever noticed that when a person reaches 50s on her/his birthday, people start greeting *“wish you health but more than wealth”*
* Poetry can cure people

1. **Prepare a presentation on one of the topics**

* Biological determinants of health
* Behavioral determinants of health
* Social factors that influence or determine health
* Culture and health

**Writing**

You are keen on joining a health and fitness club, but the annual subscription seems very expensive. You’ve just seen the advertisement of a very good health and fitness club *Renaissance* which is offering free life membership to two lucky people. Write to the Renaissance Club explaining why you deserve to be chosen. In your letter you should answer these questions:

* Why do you value good health?
* Why do you try to keep fit?
* Why do try to follow a healthy diet?
* How would joining the RENAISSANCE Club change your life?

Unit 3

**BAD HABITS**

**SMOKING**

**Vocabulary**

**1. Match the words with their definitions:**

|  |  |  |
| --- | --- | --- |
| 1. alter (v.) | ['ɔːltə] | 1. a poisonous gas that is produced especially by the engines of vehicles |
| 1. belligerent (adj.) | [bɪ'lɪʤər(ə)nt] | 1. breath out |
| 1. inhalation (n.) | [ˌɪnhə'leɪʃ(ə)n] | 1. stop or discontinue (an action or activity) |
| 1. carbon monoxide (n.) | ['kɑːbənmɔ'nɔksaɪd] | 1. change or cause to change in character or composition, typically in a comparatively small but significant way |
| 1. susceptible (adj.) | [sə'septəbl] | 1. feel a powerful desire for (something) |
| 1. ambient (adj.) | ['æmbɪənt] | 1. a cavity within a bone or other tissue, especially one in the bones of the face or skull connecting with the nasal cavities |
| 1. spouse (n.) | [spauz] | 1. the process or act of breathing in, taking air and sometimes other substances into your lungs. |
| 1. exhale (v.) | [eks'heɪl] | 1. relating to the immediate environs of something |
| 1. sinus (n.) | ['saɪnəs] | 1. a husband or wife, considered in relation to their partner |
| 1. quit (v.) | [kwɪt] | 1. likely or liable to be influenced or harmed by a particular thing |
| 1. crave(v.) | [kreɪv] | 1. hostile and aggressive |

**Listening & Watching**

**1. Watch the clip and say what it is about. Discuss with your partner your attitude to what you’ve seen.**

**Before you read**

**1.Before you read, discuss with your partner the reasons people like smoking and how it can affect health.**

1. **Skim the text to check your ideas.**

**Reading A**

SMOKING AND THE EFFECTS OF CIGARETTES

*by Dan Buglio*

The effects of smoking are countless. From the impact to your health, the health of those around you and even the damage it can do to your home, it blows my mind that smoking is still so popular. While the popularity is on a decline, it’s still estimated that 35% of men and 22% of women worldwide still smoke.

Tobacco smoke contains over 4000 chemicals including more than 40 cancer causing agents and 200 known poisons. Nicotine is comparable to heroine in terms of addiction. The nicotine released in gas form from smoke is easily absorbed through the lungs and into the blood stream. These chemicals *alter* the chemistry in the brain within seconds of *inhalation*. This causes a temporary euphoric sensation - which is why people *crave* nicotine so much.

*Carbon monoxide* impairs the bloods ability to carry oxygen to the body including vital organs like the brain and heart. Smokers are in a constant state of oxygen deprivation because of the high amounts of carbon monoxide in their blood (4 to 15 times more than nonsmokers). The average cigarette has more than 600 times the concentration that is considered safe in industrial plants, where carbon monoxide poisoning is a constant danger.

Nicotine has historically been one of the toughest addictions to break, but here are six reasons why *quitting* is worth the battle.

-People who smoke spend 27% more time in hospitals and nearly 2 times the amount of time in intensive care units compared to non-smokers.

- A smoker is at twice the risk of dying before age sixty-five as a non-smoker.

- The risk of lung cancer increases 50% to 100% with every cigarette that a person smokes per day.

- Smoking filter tipped cigarettes cuts the risk of lung cancer by up to 20%, but still does not eliminate the danger involved.

- Each cigarette costs the smoker 5 to 25 minutes of life.

- The risk of Heart Disease increases 50% with every pack of cigarettes a person smokes per day.

Non-smokers exposed to second hand smoke are at greater risk for many of the health problems associated with direct smoking. Over the past two decades, research has shown that non-smokers suffer many of the diseases of active smoking when they breathe secondhand smoke. Passive smoking (also known as environmental tobacco smoke (ETS), involuntary smoking or second hand smoke) occurs when the *exhaled* and *ambient* smoke from one person's cigarette is inhaled by other people. Children exposed to secondhand smoke are more likely to experience increased frequency of: asthma, colds, bronchitis, pneumonia and other lung diseases. *Sinus* infection and middle ear infections. When a pregnant woman is exposed to secondhand smoke, the nicotine she *ingests* is passed on to her unborn baby. Secondhand smoke causes lung cancer and contributes to the development of heart disease.

Non smoking women who live with a smoker have a 91% greater risk of heart disease. They also have twice the risk of dying from lung cancer. Non-smoking *spouses* who are exposed to secondhand smoke have about 20% higher death rates for both lung cancer and heart disease.

Studies show a correlation between second hand smoke and certain forms of cancer in pets. In a study done by Tufts University and the University of Massachusetts researchers found a direct link between a cat’s chances of developing lymphoma and the number of smokers living in the home. A cat exposed to secondhand smoke had double the risk of getting lymphoma. If the cat had lived with a smoker for five years or more, the risk would have tripled. If there were two smokers in the house the risk increased four times. Birds with their tiny lungs are particularly *susceptible* to lung illness, cancers and even death from living in a smoky home.

Homes owned by smokers are historically difficult to sell. These smoked in homes often take 2-3 times longer to sell, or require tens of thousands in new carpets, paint and clean up before selling. A home smoked in for many years will often sell for 5-15% less than a home that hasn't been smoked in.

If you or a family member insists on smoking indoors, set up a closed room as a “smoking room”. Do not smoke or allow family members to smoke if children are present (particularly infants and toddlers, who are especially susceptible to the effects of tobacco smoke). Sometimes smoking family members may be *belligerent* of such a rule—but smoking around children is a life or death situation. You would not let your child play with a gun because of the potential danger of it firing—why you would feel any differently about secondhand smoke, which is statistically much more dangerous?

Do not allow babysitters or other people who work in your home to smoke indoors. For families with heavy smokers or multiple smokers, you should consider a comprehensive approach to smoke removal. A quality smoke eater in the dedicated smoking room coupled with effective whole house filtration and air purification to help clean the air of the multiple pollutants.

Smoking is still a personal choice. If you want to smoke, knowing all of the health hazards (risks), go for it. But please consider the harmful effects of smoking on others. Perhaps even your loved ones. You may try to delude yourself into thinking that all the anti-smoking in the media along with complaints from family members are simply discrimination, but the facts are indisputable. Smoking and even second hand smoke is not just uncomfortable but downright dangerous.

*<http://ezinearticles.com/>*

**Reading Comprehension**

**1. Read the article carefully and answer these questions according to the information in the text.**

1. How does smoking affect health?
2. What are some diseases and disorders associated with smoking?
3. How long do you need to smoke before it becomes dangerous?
4. Is smoking really that harmful if you don’t smoke steadily?
5. Do filters reduce the dangers of cigarette smoking?
6. Does smoking really help a person to relieve a stress?
7. What effects of second hand smoke are non-smokers exposed to?
8. Is it difficult to quit smoking?
9. If smokingis so dangerous, then why is it legal?

**2. Retell the text using this plan:**

1. The effects of smoking.
2. A couple of smoking facts.
3. A sobering experiment.
4. Addictive power of smoking.
5. Effects of secondhand smoke.
6. Are your pets safe from the effects of smoke?
7. Effects of smoking on your home and eventually your wallet.
8. Tips to minimize the effects of smoking.

**Language Development**

**ǃ** Look at the sentence from the text.*While the popularity is on a decline, it’s still estimated that 35% of men and 22% of women worldwide still smoke.* To balance two facts or ides that contrast, but do not contradict each other we use **while**. (for more information look at Unit 3/Text B/ Language development/Discourse markers).

**While** is a polysemantic conjunction. We translate it into Russian as *в то время как, пока; хотя, тогда как, несмотря на то что; и, а*, e.g. ***While*** *the negotiations on ecology aspects have been protracted, there is no evidence that deadlock has been reached.—****Хотя*** *переговоры затянулась, нет основания считать, что они зашли в тупик.*

**While** +Participle is usually not translated, e.g. *He had health problems* ***while*** *smoking so many cigarettes.—Выкуривая много сигарет у него были проблемы со здоровьем.*

**ǃ** Look at the following sentence from the article. ***If*** *you or a family member insists on smoking indoors,* ***set up*** *a closed room as a “smoking room”.*

This is the example of a conditional clause **(if + subject + present simple, + bare infinitive); (Imperative + if + present simple)**, the 1st type of adverbial clause *(real present).* The event described in the main clause *(set up)* depends on the condition described in the conditional clause (*if… insists)*. You can either use other conjunctions: *unless (if not), provided/ing that, so long as, as long as, on condition that.*

Remember the following structures of the 1st type:

**If + any present form (Present Simple, Present Progressive. or Present Perfect), Future/Imperative/modals (can/ may/ might/ must/ should + bare Infinitive)/ Present Simple.**

**1. Find and underline other examples of 1st Conditional in the text.**

**ǃ** To talk about imaginary situation or action (*unreal present*), we use the 2nd Conditional. Often there is an If-clause with the Simple Past Tensein the same sentence **(If + subject + Past Simple/Past Progressive + object, subject + would/could/might + bare Infinitive)**.

1. **Look at this sentence from the article and highlight the 2nd Conditional:**

If there were two smokers in the house the risk increased four times.

**ǃ** To talk about imaginary situation contrary to facts in the past or to express regrets and criticism (*unreal past*), we use the 3nd Conditional.

Remember the following structures of the 3rd type:

**(If + subject + Past Perfect/Past Perfect Progressive + object, subject + would/could/might + have + Participle II/V3)**.

1. **Find and underline other examples of 3rd Conditional in the text.**
2. **Find and learn Russian equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. twice the chances of living |  |
| 1. sinus infection |  |
| 1. habit-forming substances |  |
| 1. temporary euphoric sensation |  |
| 1. try to delude yourself |  |
| 1. physical dependence |  |
| 1. inhale the smoke |  |
| 1. toughest addictions |  |
| 1. downright dangerous |  |
| 1. be belligerent of such a rule |  |

1. **Find and learn English equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. изменять химический состав мозга |  |
| 1. восприимчивый к болезням |  |
| 1. высокий риск |  |
| 1. агрессивно настроенный |  |
| 1. побороть тягу к сигаретам |  |
| 1. вдыхать табачный дым |  |
| 1. выдыхаемый и обволакивающий вас дым |  |
| 1. угроза здоровью |  |
| 1. постоянный недостаток кислорода |  |
| 1. некурящие супруги, которые подвергаются воздействию табачного дыма |  |

1. **Translate the following passage from English into Russian.**

…*In the past, I used to smoke heavily, and I continued this habit for years. It’s really a very difficult one to break once you’ve started, but it is becoming more common knowledge now that smoking is a very damaging thing to do, and takes away a lot of physical energy as well as slowly eroding the physical health. It can be very difficult to stop, and if you smoke for any significant period of time, then having given it up it can still be very easy to start again…*

1. **Translate the following passage from Russian into English.**

*В университете я курила 5 лет, но теперь уже давно не курю. Я бросила курить очень легко, как это ни странно. Просто в одно прекрасное утро я проснулась и поняла, что ненавижу курение. С тех пор я не выкурила ни одной сигареты. Сейчас меня тошнит от одной мысли о курении, но теперь я вдыхаю очень грязный воздух города. Когда я хожу в паб, то на другой день чувствую себя так, будто я сама курила, там столько дыма, и меня это так расстраивает. По крайней мере, когда люди пьют и напиваются, они не вливают вам в кровь алкоголь, а вот курильщики вынуждают вас вдыхать дым.*

**Over to you**

1. Has this article changed your attitude to smoking?
2. Why is there so much concern about teen-age smoking?
3. What do you think about the points of view of two people from the previous exercises 3 and 4? Who do you agree with? Why?
4. Prepare a presentation on the topic being discussed.

**Writing**

*Design an anti-smoking poster for colleges and universities. Sketch a picture or use photos from a magazine; write a slogan and a couple of sentences to go with it.*

**ALCOHOL**

**Vocabulary**

**1. Match the words with their definitions:**

|  |  |  |
| --- | --- | --- |
| 1) overlooked (V3) | [ˌəuvə'lukt] | a)embryonic |
| 2) hangover (n.) | ['hæŋˌəuvə] | b)a disease which destroys a person's liver and which can kill them |
| 3) contemporaries (n.) | [kən'temp(ə)r(ə)rɪs] | c)inflammation of the pancreas |
| 4) full of yourself (inf) | [fuləvjəself] | d) to hit sb. many times, using fists or a heavy object |
| 5) inhibition (n.) | [ˌɪnhɪ'bɪʃ(ə)n] | e)fail to function normally or satisfactorily |
| 6) blurred vision | [blɜːd 'vɪʒ(ə)n] | f)the experience of seeing something that is not really there because you are ill or have taken a drug |
| 7) remorse (n.) | [rɪ'mɔːs] | g)people of the same age |
| 8) hallucination (n.) | [həˌluːsɪ'neɪʃ(ə)n] | h)(make or become unclear or less distinct |
| 9) batter (v.) | ['bætə] | i)very self-confident |
| 10)fetal (adj.) | ['fiːt(ə)l] | j)missed, not noticed |
| 11) pancreatitis (n.) | [ˌpæŋkrɪə'taɪtɪs] | k)a strong feeling of sadness and regret about something wrong that you have done |
| 12) malfunction (n.) | [ˌmæl'fʌŋkʃ(ə)n] | l)feelings of fear or embarrassment that make it difficult for you to behave naturally |
| 13)cirrhosis (n.) | [sɪ'rəusɪs] | m)headache and tiredness a few hours after drinking too much |

**Listening**

**1. Before you listen, think about alcohol. Do you think there is an alcohol problem among young people?**

**2. Now listen to a story and mark the statements true (T) or false (F).**

|  |
| --- |
| 1. Sarah Watson doesn’t like drink, but she likes its effects. |
| 1. 26% of children aged 14 have never tried alcohol. |
| 1. Almost 50 % of nine-year-olds have had an alcoholic drink. |
| 1. Young children usually get their first drink from their brothers or sisters. |
| 1. According to Drinkline, everybody is now talking about alcohol problems. |
| 1. Sharon thinks that drugs are worse than alcohol. |

**Before you read**

**1. You are going to read an article about effects of alcohol picture.**

**2. Before you read discuss with your partner the following questions.**

* Everyone who takes an alcoholic drink is an alcoholic.
* Alcoholism is an illness which can be treated but not cured.

**3. Skim the text to check your ideas.**

**Reading B**

EFFECTS OF DRINKING ALCOHOL

The alcohol effects on the body are widespread and range from relatively mild effects such as mile euphoria at one extreme, to alcohol abuse and intoxication in the middle, to unhealthy and destructive effects and drinking problems at the other extreme, such as alcohol dependency, alcohol poisoning, coma, and death.

Alcohol is a central nervous system depressant. In small quantities, alcohol results in a mild euphoria and usually removes *inhibitions*. This can be described as one of the psychological effects of alcohol.

Typically, but not always, the short term effects of alcohol are less critical and less damaging than the long term effects of alcohol. Alcohol has a biphasic effect on the body, meaning that its effects change over time. Initially, alcohol typically produces feelings of relaxation and cheerfulness. Increased consumption, however, can lead to dehydration, coordination problems, *blurred* *vision*, and a great number of health, medical, and social issues and other drinking problems caused by alcoholism.

Perhaps the most logical way to discuss this complex topic is to focus first on the classic alcoholic behaviors and effects of alcohol in the four states of alcoholism; then examine some of the "social effects" of alcohol and alcoholism and finally, discuss the medical conditions that are caused directly or indirectly by alcoholism.

In the first stage of alcoholism, drinking is no longer social but becomes a means of psychological escape from stress, inhibitions, anxiety, and problems.

That is, early in the disease the individual with the drinking problem starts to depend on the "mood altering" aspects of alcohol.

In the second stage, the need to drink becomes more intense for the problem drinker. In this stage, the individual typically starts to drink earlier in the day. As tolerance increases, moreover, the person drinks because of his or her dependence on alcohol, rather than because of psychological stress or tension relief.

In the third stage, the loss of control becomes more obvious, meaning that the problem drinker is unable to drink according to his or her intentions. For instance, once the individual has had the first drink, he or she can no longer control what will happen, even though the intention might have been to have only one or two drinks. During this stage of the disease, the person typically starts to experience serious work-related, financial, relationship, and perhaps legal problems.

The fourth and final stage of alcoholism is distinguished by a chronic loss of control. In the earlier stages of the disease, the problem drinker may have been able to maintain a job. Now, however, drinking starts earlier in the day and usually continues all day long. Without a doubt, few, if any, full-time jobs can be sustained once a person reaches this state of difficulty.

In the earlier stages of the disease, moreover, the alcoholic had a choice whether he or she would take the first drink. After taking the first drink, the alcoholic typically lost all control and would then continue drinking. In the last stage of alcoholism, conversely, alcoholics no longer have a choice: they must drink in order to function. The following list represents some of the drinking problems, effects of alcohol, and classic alcoholic behaviors in the fourth stage of alcoholism:

Persistent *remorse*

Moral deterioration

Devaluation of personal relationships

The possibility of alcoholic psychosis

Impaired thinking

Loss of tolerance for alcohol

Auditory and visual *hallucinations*

Nameless fears

Continual loss of control

The collapse of the alibi system

Alcoholism not only effects the person with the drinking problem, but it also affects those who are closest to the alcoholic, that is, his family, friends, relatives, work associates, and perhaps his neighbors. The following list is a representation of the "social effects" of alcohol addiction:

Broken, dysfunctional homes

Traffic fatalities or injuries on the highways

Birth defects such as *fetal* alcohol syndrome

Wife *battering*

Destroyed relationships

Work-related injuries and accidents

Child abuse

Destroyed lives

Alcoholism causes a number of medical conditions, diseases, and health problems that are seen as both short term effects of alcohol dependency and long term effects of alcohol addiction. Chronic, excessive drinking results in a number of alcohol health effects that are exhibited by long-term problem drinkers. Perhaps the worst of these alcohol health effects is cancer.

Unfortunately, the different types of cancer are not the only negative alcohol effects on the body. Indeed, excessive drinking not only manifests itself as various physical effects of alcohol abuse, but also as psychological effects of alcohol addiction. The following alcohol consumption effects represent some of the various non-cancerous medical conditions, drinking problems, and health issues that are caused directly or indirectly by alcoholism:

Harm to the fetus while the mother is pregnant

Cardiovascular problems

Severe thiamine deficiency

Problems with the immune system

Impaired learning ability

*Pancreatitis*

Memory loss

Dehydration

Kidney failure

Coma

Organ and system *malfunction*

Inflammation of the digestive system

Vitamin deficiencies

Infections

Mental confusion

Kidney and urinary tract infections

Death (from alcohol poisoning, excessive intoxication, and organ malfunction)

Loss of intellectual abilities

Diabetes

Destruction of brain cells

Alcohol poisoning

Gastritis (inflammation of the stomach)

Numbness of the feet and hands

Nervous system damage

*Cirrhosis* of the liver

[*http://www.about-alcohol-info.com/*](http://www.about-alcohol-info.com/)

**Reading Comprehension**

1. **Read the article carefully and answer these questions according to the information in the text.**
2. Is alcoholism a disease that causes people to lose control of their drinking?
3. Why someone else is always involved with a drinker’s problem?
4. How might a person know if he or she has an alcohol problem?
5. How is alcohol involved in many automobile accidents?
6. People, who are under stress need to relax, some of them think alcohol will help relive stress. Are you of the same opinion?
7. Have you ever seen an advertisement about alcohol? If yes, are you for or against this advertisement?
8. Is alcoholism a disease that must be treated by qualified personnel?
9. Do you agree that alcoholic anonymous has had a successful history of treating alcoholics?

**Language Development**

**ǃ** Look at the sentence from the article*. The alcohol effects on the body are widespread and range from relatively mild effects such as mile euphoria…*

We use **such as** with a noun to introduceexamples.

1. **Find the other example in the text and highlight it.**

**ǃ Discourse markers**

**Discourse** means ‘pieces of language longer than a sentence’. Some words and expressions are used to show how discourse is constructed. They can show the connection between what the speaker is saying and what has already been said or what is going to be said; they can help to make clear the structure of what is being said; they can indicate what speakers think about what they are saying or what others have said. There a very large number of them. Here a few most common examples. Some of these words and expressions have more than one use; for more information, look in a good dictionary. Some discourse markers are used mostly in informal speech or writing; others are more common in a formal style. Note that a discourse marker usually comes at the beginning of a clause.

To balance two contrasting facts or ideas we use *on the other hand, while, whereas.*

To emphasise a contrast we use *however, nevertheless.*

To point that the main point is as follows we use *anyway, anyhow, at least.*

To show the structure of what we are saying we use *first(ly), first of all, second(ly), third(ly) etc; lastly, finally, to begin/start with; in the first/second/third place.*

When you want to add something you say *moreover (very formal), in addition, another thing is, besides, in any case.*

To generalize things use *on the whole, in general, generally speaking=virtuallyl.*

To give examples use *for instance, for example, e.g., in particular.*

To show logical consequence use  *therefore, as a result, consequently, so, then.*

To persuade use  *after all, no doubt.*

To sum up the ideas use  *in conclusion, to sum up, briefly, in short.*

1. **Look through the text, find and underline the markers. Translate the sentences.**

**ǃ** Look at the sentence from the article. *The effects of drinking alcohol in the form of alcoholism are wide-spread as well as extremely damag****ing****.*

**As well as** has a similar meaning to ‘not only…but also’. Usually it introduces information which is already known to the listener/reader; The rest of the sentence gives new information.

When we put a verb after **as well as**, we most often use the **–ing** form. After an infinitive in the main clause, an infinitive without **to** is possible, but not the difference in the meaning and translation. We usually translate it into Russian as *так же как, как…так и…*, e.g.

*Drinking parents must think about their health* ***as well as*** *looking after their children.—Пьющие родители должны подумать как о своем здоровье, так и о своих детях (т.е. и о здоровье, и о детях).*

*Drinking parents must think about their health* ***as well as*** *look after their children.—Пьющие родители должны думать о своем здоровье так же как о своих детях (т.е.в равной степени).*

**ǃ** Look at the sentence from the article. *For instance, once the individual has had the first drink, he or she can no longer control what will happen, even though the intention might have been to have only one or two drinks.*

We can use **even** to talk about surprising extremes – when people do more than we expect, or go too far, for example. **Even** most often goes in mid-position. (**auxiliary verb +even; be + even).Even** is not used as a conjunction, but we can use **even** before **if** and  **though**. **Also** is not used to talk about surprising extremes.

**ǃ** Look at the sentence from the article*. After taking the first drink, the alcoholic typically lost all control and would then continue drinking*

The modal verb **would** is used here to say that the situation is probable. If it has a negative form it means weak probability.

1. **Think about other examples to the given rule.**
2. **Find and learn Russian equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1)biphasic effect | a) |
| 2)mental confusion | b) |
| 3)nameless fears | c) |
| 4)impaired thinking | d) |
| 5)excessive drinking | e) |
| 6)mild euphoria | f) |
| 7)alcohol abuse | g) |
| 8) vitamin deficiencies | h) |
| 9)long-term problem | i) |
| 10) debilitating disease | j) |

1. **Find and learn English equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. сердечнососудистые проблемы |  |
| 1. серьезный недостаток витамина B1 |  |
| 1. доброкачественная опухоль |  |
| 1. вредить зародышу |  |
| 1. воспаление пищеварительной системы |  |
| 1. сбои в работе органов |  |
| 1. внушающий ужас |  |
| 1. подавляющий; превосходящий (по количеству, качеству, влиянию) |  |
| 1. сниженная способность к обучению |  |
| 1. обезвоживание |  |

1. **Translate the following passage from English into Russian.**

*Indeed, the effects of alcohol on the body and the effects of alcohol on the brain manifest themselves in an incredible number of diseases, drinking problems, and medical conditions that are suffered by the alcoholic.*

*In fact, it is almost overwhelming when first looking at the number, variety, and the seriousness of the damaging effects of alcohol related illnesses and ailments that are caused by abusive and hazardous drinking. After the alcohol consumption effects are examined more closely, however, the alcohol health effects, the destructive drinking problems, and the medical consequences of alcoholism become less awe-inspiring and more logical.*

*More explicitly, over time, alcoholism progressively breaks down the proper functioning of the body's main organs and systems.*

*In addition, the problem drinker cannot replenish the vitamins, minerals, and other essential nutrients his or her body requires because of poor eating habits and, perhaps more significantly, because the body's malfunctioning organs and systems prevent the proper absorption, digestion, utilization, and metabolism of the nutrients necessary for growth, repair, and general maintenance.*

*Thus, over time, the alcoholic, because of the alcohol effects on the body and on the brain, gradually kills himself or herself by his or her alcoholic behavior.*

**Over to you**

1. Do a drinking/smoking survey of the students in your group.
2. Drinking alcohol is an accepted social practice in most world countries. But in Libya, Saudi Arabia and other Islamic countries, alcohol is illegal. Make a list of pros and cons about alcohol.
3. Prepare a presentation on the topic being discussed.

**Writing**

*You work for an advertising agency, and you have to create a campaign against Drinking and Driving (driving a car being drunk). In groups, prepare a poster – with a picture and a slogan. Compare your work with other groups and vote for the best campaign.*

**DRUGS**

**Vocabulary**

1. **Match the words with their definitions:**

|  |  |  |
| --- | --- | --- |
| 1) analgesic (adj.) | [ˌænəl'ʤiːzɪk] | a) is used to produce hemp fibre and as a psychotropic drug |
| 2) barbiturate (n.) | [bɑː'bɪtjurət] | b) an infusion of one thing into another |
| 3) remedy | ['remədɪ] | c) the leaves of an Arabian shrub, which are chewed (or drunk as an infusion) as a stimulant |
| 4) rite (n.) | [raɪt] | d) a synthetic, addictive, mood-altering drug, used illegally as a stimulant |
| 5)medicinal (adj.) | [mə'dɪs(ə)n(ə)l] | e)make excessive and habitual use of |
| 6) cannabis (n.) | ['kænəbɪs] | f) a medicine or treatment for a disease or injury |
| 7) solvent (n.) | ['sɔlvənt] | g) having healing properties |
| 8) khat (n.) | [kɑːt] | h) a person or thing that is likely to cause harm; a threat or danger |
| 9) amphetamine (n.) | [æm'fetəmiːn] | i) a religious or other solemn ceremony or act |
| 10) injection (n.) | [ɪn'ʤekʃ(ə)n] | j)a liquid, typically one other than water, used for dissolving other substances |
| 11) menace (n.) | ['menɪs ], ['menəs] | k) a drug which people take to make them calm or to help them to sleep |
| 1. abuse (v.) | [ə'bjuːs] | 1. acting to relieve pain |

**Listening & Watching**

1. **Watch the clip and say what it is about. Discuss in groups your attitude to what you’ve seen.**
2. **Before you listen, think about heroin. It is derived from opium and is in the same family of drugs as morphine. What is the medical use of these drugs? Do you know anything about heroin addiction?**
3. **Now listen to Mike talking about being a heroin addict, and answer these questions.**
4. How does Mike take the drug?
5. How did he use to take it?
6. How long has he been taking it?
7. **Why did he start taking heroin? The words in brackets will help you.**
8. (social)
9. (attitude to adults)
10. (school/job)
11. feeling about himself
12. **Why is it hard for Mike to give up?**
13. (physical)
14. (social)
15. ( daily life)

**Before you read**

**1. You are going to read an article written by a mental health consultant. He was former Regional Adviser in Mental Health for WHO (World Health Organization) in Alexandria. What do you know you about drugs?**

**2. Discuss with your partner the following questions.**

* Does the problem of narcotics exist in your country?
* What must be done (measures, policy) not to make the situation worse?
* What do you feel towards the drug-takers: hate, sympathy, fear, irritation, admiration?

**3. Skim the text to check your ideas.**

**Reading C**

# **PROBLEMS WITH DRUGS**

by Dr Taha Baasher

# For centuries men and women have been seeking not only the euphoric, but also the *analgesic* effects of narcotics. In the last century, Sir William Osler described this situation so well when he said, "The desire to take medicine is, perhaps, the greatest feature which distinguishes man from animals".

Throughout the history of mankind, nearly all countries and cultures have had problems with the use and [abuse](#_For_centuries_men) of drugs. Since the earliest recorded times, drugs have been used for different reasons – mainly religious, *medicinal* and pleasure. For example, alcohol and opium were both well known in ancient Egyptian culture. Cannabis was commonly used in Hindu ceremonial [rites](#_For_centuries_men) as well as in Indian and Chinese medicine. Drug related problems, therefore, are not new.

Today, drug problems have become more varied, becoming both more complicated and more global in character. Natural drugs – such as [cannabis](#_For_centuries_men), cocaine, *khat* (qat) and opium – which had previously only been used in certain cultures and within traditional ways of life, have been increasingly exploited and their use now reaches epidemic level. Also, manufactured drugs such as *amphetamine*, *barbiturates* and a wide range of sedatives and tranquillizers have become more easily available, both through legal and illegal markets.

Added to these is the growing habit among young people in some countries of sniffing *solvents* in paints and glues. Levels of drug abuse are rising in most countries. Drugs are taken more often and in greater quantities. There is also a trend towards using a mixture of different drugs or combining drugs with alcohol. Cocaine misuse needs special attention. It is the most dependence-producing drug available. Currently its misuse is reaching epidemic levels in some parts of the world and it is rapidly spreading to other areas. Traditional coca chewing in the Andes is being replaced by coca paste smoking in cities in South America. Opium eating among rural cultures in South Asia has developed into the much more dangerous use of heroin in the form of smoking or by *injection*. Drugs are supposed to do wonderful things but all they really do is ruin the person.

The drug scene brings with it a wide range of social and economic problems, including crime, violence and neglect of family life. Concern is growing in many countries over levels of drug abuse.

In order to prevent drug abuse it is important to identify the main reasons for using a drug. Next, practical efforts should be made to overcome this motivation. The reasons for using drugs are very varied within each culture. Even within the same country, preventative programmes may need to vary according to local problems.

In north east Afghanistan and in some areas of Pakistan, India, Myanmar and Thailand where rural health services are lacking, opium is used as a household *remedy* and for overcoming pain and discomfort caused by cold weather and the hardships of life. Emphasis must therefore be given to these priority needs before the drug problem can be dealt with.

What should be prevented? Who should do the preventing? On an official level there are international agreements to control the movement and export of drugs. On a national level, control depends on the police and customs and government measures. On the whole, the best preventative measures are those which are developed by people within their own culture and social life. Religious groups can play an effective preventative role against the abuse of alcohol and tobacco through their teaching about moral values and self discipline.

Drug abuse problems are among the most damaging [menaces](#_For_centuries_men)of modern life. Their effective prevention calls for huge efforts from government authorities, widespread education and awareness raising campaigns and active community participation.

*[http://tilz.tearfund.org](http://tilz.tearfund.org/)*

**Reading Comprehension**

**1. Read the article again. Write T (true), F (false) or ? (don’t know) in the boxes next to these statements.**

|  |
| --- |
| * 1. Drug problem has recently arisen. |
| * 1. People use drugs for medicinal purposes. |
| * 1. Narcotics are sold through illegal markets. |
| * 1. Amphetamine is the most dependence producing drug. |
| * 1. Drugs are used in the form of smoking, sniffing or by injection. |
| * 1. The reasons are always the same in all parts of the world. |
| * 1. Church mustn’t deal with the drug-taking. |

**2. Read the article carefully and answer these questions according to the information in the text.**

* + 1. What do you think is meant by the term drugs?
    2. What are some things you think you and others ought to know about drugs?
    3. Why do people take drugs if they aren’t sick?
    4. Why combining of alcohol and drugs is very dangerous?
    5. What could be the consequences of drug abuse?
    6. Why can we call coffee, tea, cola drugs too?
    7. Why may people sometimes use drugs in unsupervised, disapproved ways?
    8. How does a person get addicted to a drug?

**Language Development**

**ǃ**To talk about a period of past time which is related to the present, we use the Present Perfect Tense **(have/has + Participle II).** This is very useful when discussing changes in the environment.

1. **Look at this sentence from the article and underline the Present Perfect Tense**:

*Throughout the history of mankind, nearly all countries and cultures have had problems with the use and abuse of drugs.*

**ǃ** To talk about events in the past which are now finished and there is no connection to the present, we use the Simple Past Tense **(regular verb + ed** or **the second form of the irregular verb)**.

1. **Look at these sentences from the article and underline the Simple Past Tense:**

# ***In the last century, Sir William Osler described this situation so well when he said, "The desire to take medicine is, perhaps, the greatest feature which distinguishes man from animals".***

1. **Find and underline other examples in the text.**
2. **Fill in the gaps with the proper Present Perfect or Past Simple Tense.**
3. Thanks to medical and drug research, there are thousands of drugs that help people, e.g. antibiotics and vaccines \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (revolutionize) the treatment of infections.
4. Mixing of some drugs might be be fatal mistake, e.g. people \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (die) after mixing alcohol with sleeping pills.
5. Dr. Sidney Cohen, a drug abuse expert, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (describe) alcohol as "the most dangerous drug on earth".
6. Heavy drinkers tend to starve - they \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (use up) their nutrient stores and are often drawing on their own tissues for fuel.
7. Researchers \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (survey) 1,339 oncology nurses in one state who work in outpatient chemotherapy infusion centers and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (find) that nearly 17 percent \_\_\_\_\_\_\_\_\_\_ (say) their skin or eyes had been exposed to the drugs.

**ǃ** It is difficult to translate Subjunctive Mood into Russian, just follow some rules.

Indefinite Subjunctive (**should/would + Infinitive**) in subordinate clause *(it) is recommended / suggested that…*, after verbs *to recommend, to suggest, to demand,* we translate as (бы + глагол в прошедшем времени)e.g.  *It was necessary that the child’s history* ***should be known*** *to none.—Надо было,* ***чтобы*** *историю этого ребенка* ***никто не узнал****.*

1. **Find and highlight the other examples in the text. Translate the sentences.**
2. **Find and learn Russian equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. increasingly exploited |  |
| 1. a wide range of sedatives and tranquillizers |  |
| 1. dependence-producing drug |  |
| 1. a household remedy |  |
| 1. abuse of drugs |  |
| 1. crime, violence and neglect of family life |  |
| 1. to be rapidly spreading |  |
| 1. ceremonial rites |  |
| 1. lacking rural health services |  |
| 1. damaging menaces of life |  |

1. **Find and learn English equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. на государственном уровне |  |
| 1. натуральные и синтетические наркотики |  |
| 1. предупредительные меры |  |
| 1. в пределах каждой культуры |  |
| 1. преодоление боли |  |
| 1. токсичны по своим свойствам |  |
| 1. запрещенный наркотик |  |
| 1. уменьшая воспаление |  |
| 1. развитие болезнетворных микроорганизмов |  |
| 1. подавлять иммунную систему |  |

**Over to you**

1. Has this article changed your attitude to drugs?

2. Why is there so much concern about teen-age drugs?

3. ‘Addictive’ means ‘very difficult to give up’. Do you think nicotine (in cigarettes) is addictive? Why is tobacco legal, when most of the other drugs on the chart are illegal? Would it be a good idea to make tobacco illegal?

4. Some people say that it would be better to legalise all drugs. In that case, you could buy cannabis and other drugs from shops. What would be the advantages and disadvantages of such a chanhe?

5. Prepare a presentation on the topic being discussed.

**Writing**

*Design an anti-smoking poster for schools or universities. Sketch a picture or use photos from a magazine; write a slogan and a couple of sentences to go with it.*

UNIT 4

# MEDICAL ADVANCES IMPROVING LIVES

**Vocabulary**

**1. Match the words with their definitions and write the transcription of the words in column 2. Translate the words in column 1 into Russian:**

|  |  |  |
| --- | --- | --- |
| **1** | **2** | **3** |
| 1) rabies |  | a) an acute highly contagious viral disease characterized by high fever, severe prostration, and a pinkish rash changing in form from papules to pustules, which dry up and form scabs that are cast off, leaving pitted depressions |
| 2) tetanus |  | b) a highly contagious viral disease commonin children, characterized by fever, profuse nasal discharge of mucus, conjunctivitis, and a rash of small red spots spreading from the forehead down to the limbs |
| 3) [diphtheria](http://www.infoplease.com/cgi-bin/id/A0815595) |  | c) a disease caused by a lack of vitamin C, characterized by anaemia, spongy gums, bleeding beneath the skin, and (in infants) malformation of bones and teeth |
| 4) [typhoid fever](http://www.infoplease.com/cgi-bin/id/A0849855) |  | d) a contagious viral disease of cows  characterized by vesicles on the skin, esp on the teats and udder. Inoculation of humans with this virus provides temporary immunity to smallpox. It can be transmitted to other species, esp. cats |
| 5) malaria |  | e) n acute intestinal infection characterized by severe diarrhoea, cramp, etc.: caused by  ingestion of water or food contaminated with the bacterium Vibrio comma |
| 6) anthrax |  | f) a highly infectious and often fatal disease of herbivores, esp cattle and sheep, characterized by fever, enlarged spleen, and swelling of the throat. Carnivores are relatively resistant. It is  caused by the spore-forming bacterium  Bacillus anthracis and can be transmitted to man |
| 7)smallpox |  | g) an acute infectious viral disease of the nervous system transmitted by the saliva of infected animals, esp dogs. It is characterized by excessive salivation, aversion to water, convulsions, and paralysis |
| 8) measles |  | h) Also called: lockjaw an acute infectious disease in which sustained muscular spasm, contraction, and convulsion are caused by the release of exotoxins from the bacterium, Clostridium tetani: infection usually occurs through a contaminated wound |
| 9) scurvy |  | i) an acute contagious disease caused by the bacillus Corynebacterium diphtheriae, producing fever, severe prostration, and difficulty in breathing and swallowing as the result of swelling of the throat and formation of a false membrane |
| 10)cowpox |  | j) an acute infectious disease characterized by high fever, rose-coloured spots on the chest or abdomen, abdominal pain, and occasionally intestinal bleeding. It is caused by the bacillus Salmonella typhosa ingested with food or water. Also called: enteric fever |
| 11) cholera |  | k) an infectious disease characterized by  recurring attacks of chills and fever, caused by the bite of an anopheles mosquito infected with any of four protozoans of the genus Plasmodium |
| 12) mumps |  | l) a disease mainly of children, characterized by softening of developing bone, and hence bow legs, malnutrition, and enlargement of the  liver and spleen, caused by a deficiency of vitamin D |
| 13) [tuberculosis](http://www.infoplease.com/cgi-bin/id/A0849618) (TB) |  | m)1) any widespread and usually highly  contagious disease with a high fatality rate  2) an infectious disease of rodents, esp rats, transmitted to man by the bite of the rat flea (Xenopsylla cheopis) |
| 14)[pertussis](http://www.infoplease.com/cgi-bin/id/A0737751) (whooping cough) |  | o) an acute infectious disease characterized by coughing spasms that end with a shrill crowing sound on inspiration: caused by infection with  the bacillus Bordetella pertussis. Technical name: pertussis |
| 15)plague |  | p) a communicable disease caused by infection with the tubercle bacillus, most frequently affecting the lungs (pulmonary tuberculosis) |
| 16) [hepatitis A](http://www.infoplease.com/cgi-bin/id/A0474157) |  | q) a disease of domestic animals and humans, caused by the spirochaete Borrelia burghdorferi and transmitted by ticks, and variously affecting the joints, heart, and brain |
| 17) rubella |  | r) any one of a group of acute infectious  rickettsial diseases characterized by high fever, skin rash, and severe headache. Also called: typhus fever |
| 18) typhus |  | s) a mild contagious viral disease, somewhat similar to measles, characterized by cough, sore throat, skin rash, and occasionally vomiting. It can cause congenital defects if caught during the first three months of pregnancy. Also called: German measles |
| 19) [lyme disease](http://www.infoplease.com/cgi-bin/id/A0830721) |  | t) a form of hepatitis caused by a virus transmitted in contaminated food or drink |
| 20) rickets |  | u)an acute contagious viral disease of the parotid salivary glands, characterized by swelling of the affected parts, fever, and pain beneath the ear: usually affects children Also called: epidemic parotitis |

**Listening**

1. **You are going to watch a presentation about medical advances of the 21 century. Want do you think they are.**
2. **What can you tell about synthetic stem cell research, genetic engineering and the artificial heart? What is your opinion of these advances? Can you see some of their disadvantages or even dangers?**
3. **Watch the presentation and check if you were right.**

**Before you read**

1. **You are going to read an article in the form of a chart about the revolutionary discoveries that transformed the world of medicine to what it is today. Think of five greatest discoveries on the field of medicine and put them in order of importance for you. What do you think is the most important medical discovery in the last 100-200 years and why? Give your reasons.**

* **Compare your answers with a partner**

1. **Skim the text to check your ideas.**

**Reading A**

# MEDICAL ADVANCES TIMELINE

|  |  |
| --- | --- |
| 460 BCE | Birth of [Hippocrates](http://www.infoplease.com/cgi-bin/id/A0823777), Greek physician and founder of the first university. Considered the father of medicine. Hippocrates bases medicine on objective observation and deductive reasoning, although he does accept the commonly held belief that disease results from an imbalance of the four bodily [humors](http://www.infoplease.com/cgi-bin/id/A0824524) (an idea that persists for centuries). |
| c.130 CE | Birth of [Galen](http://www.infoplease.com/cgi-bin/id/A0820031), considered by many to be the most important contributor to medicine following Hippocrates. Born of Greek parents, Galen resides primarily in Rome where he is physician to the gladiators and personal physician to several emperors. He publishes some 500 treatises and is still respected for his contributions to anatomy, physiology, and pharmacology. |
| 910 | Persian physician [Rhazes](http://www.infoplease.com/cgi-bin/id/A0841687) is the first to identify smallpox, as distinguished from measles, and to suggest blood as the cause of infectious disease. |
| 1590 | Dutch lens grinder Zacharius Jannssen invents the [microscope](http://www.infoplease.com/cgi-bin/id/A0833056) |
| 1628 | [William Harvey](http://www.infoplease.com/cgi-bin/id/A0822883) publishes *An Anatomical Study of the Motion of the Heart and of the Blood in Animals,* describing how blood is pumped throughout the body by the heart, and then returns to the heart and recirculates. The book is very controversial but becomes the basis for modern research on the heart and blood vessels. |
| 1656 | Experimenting on dogs, English architect [Sir Christopher Wren](http://www.infoplease.com/cgi-bin/id/A0852781) is the first to administer medications intravenously by means of an animal bladder attached to a sharpened quill. Wren also experiments with canine blood transfusions (although safe human blood transfusions only became feasible after Karl Landsteiner develops the ABO blood-typing system in 1900). |
| 1670 | [Anton van Leeuwenhoek](http://www.infoplease.com/cgi-bin/id/A0829258) refines the microscope and fashions nearly 500 models. Discovers blood cells and observes animal and plant tissues and microorganisms. |
| 1747 | [James Lind](http://www.infoplease.com/cgi-bin/id/A0829844) , a Scottish naval surgeon, discovers that citrus fruits prevent [scurvy](http://www.infoplease.com/cgi-bin/id/A0844162). He publishes his *Treatise of the Scurvy* in 1754, identifying the cure for this common and dangerous disease of sailors, although it takes another 40 years before an official Admiralty order dictates the supply of lemon juice to ships. |
| 1796 | [Edward Jenner](http://www.infoplease.com/cgi-bin/id/A0826167) develops a method to protect people from [smallpox](http://www.infoplease.com/cgi-bin/id/A0845577) by exposing them to the cowpox virus. In his famous experiment, he rubs pus from a dairymaid's cowpox postule into scratches on the arm of his gardener's 8-year-old son, and then exposes him to smallpox six weeks later (which he does not develop). The process becomes known as [vaccination](http://www.infoplease.com/cgi-bin/id/A0876007) from the Latin *vacca* for cow. Vaccination with cowpox is made compulsory in Britain in 1853. Jenner is sometimes called the founding father of immunology. |
| 1800 | [Sir Humphry Davy](http://www.infoplease.com/cgi-bin/id/A0814815) announces the anesthetic properties of nitrous oxide, although dentists do not begin using the gas as an anesthetic for almost 45 years. |
| 1816 | [René Laënnec](http://www.infoplease.com/cgi-bin/id/A0828572) invents the stethoscope. |
| 1818 | British obstetrician James Blundell performs the first successful transfusion of human blood. |
| 1842 | American surgeon [Crawford W. Long](http://www.infoplease.com/cgi-bin/id/A0830218) uses ether as a general anesthetic during surgery but does not publish his results. Credit goes to dentist William Morton. |
| 1844 | Dr. Horace Wells, American dentist, uses nitrous oxide as an anesthetic. |
| 1846 | Boston dentist [Dr. William Morton](http://www.infoplease.com/cgi-bin/id/A0834146) demonstrates ether's anesthetic properties during a tooth extraction. |
| 1849 | [Elizabeth Blackwell](http://www.infoplease.com/cgi-bin/id/A0807815) is the first woman to receive a medical degree (from Geneva Medical College in Geneva, New York). |
| 1867 | [Joseph Lister](http://www.infoplease.com/cgi-bin/id/A0829958) publishes *Antiseptic Principle of the Practice of Surgery,* one of the most important developments in medicine. Lister was convinced of the need for cleanliness in the operating room, a revolutionary idea at the time. He develops antiseptic surgical methods, using carbolic acid to clean wounds and surgical instruments. The immediate success of his methods leads to general adoption. In one hospital that adopts his methods, deaths from infection decrease from nearly 60% to just 4%. |
| 1870s | [Louis Pasteur](http://www.infoplease.com/cgi-bin/id/A0837811) and [Robert Koch](http://www.infoplease.com/cgi-bin/id/A0827972) establish the germ theory of disease. According to germ theory, a specific disease is caused by a specific organism. Before this discovery, most doctors believe diseases are caused by spontaneous generation. In fact, doctors would perform autopsies on people who died of infectious diseases and then care for living patients without washing their hands, not realizing that they were therefore transmitting the disease. |
| 1879 | First vaccine for [cholera](http://www.infoplease.com/cgi-bin/id/A0812027) |
| 1881 | First vaccine for [anthrax](http://www.infoplease.com/cgi-bin/id/A0804203) |
| 1882 | First vaccine for [rabies](http://www.infoplease.com/cgi-bin/id/A0840879) |
| 1890 | Emil von Behring discovers [antitoxins](http://www.infoplease.com/cgi-bin/id/A0804279) and uses them to develop [tetanus](http://www.infoplease.com/cgi-bin/id/A0848273) and [diphtheria](http://www.infoplease.com/cgi-bin/id/A0815595) vaccines. |
| 1895 | German physicist [Wilhelm Conrad Roentgen](http://www.infoplease.com/cgi-bin/id/A0842231) discovers [X rays](http://www.infoplease.com/cgi-bin/id/A0852903). |
| 1896 | First vaccine for [typhoid fever](http://www.infoplease.com/cgi-bin/id/A0849855). |
| 1897 | [Ronald Ross](http://www.infoplease.com/cgi-bin/id/A0842459), a British officer in the Indian Medical Service, demonstrates that [malaria](http://www.infoplease.com/cgi-bin/id/A0831320) parasites are transmitted via mosquitoes, although French army surgeon Charles Louis [Alphonse Laveran](http://www.infoplease.com/cgi-bin/id/A0829069) identified parasites in the blood of a malaria patient in 1880. The [treatment](http://www.infoplease.com/cgi-bin/id/A0859439) for malaria was identified much earlier (and is still used today). The Qinghao plant (Artemisia annua) was described in a Chinese medical treatise from the 2nd century BCE; the active ingredient, known as artemisinin, was isolated by Chinese scientists in 1971 and is still used today. The more commonly known treatment, quinine, was derived from the bark of a tree called Peruvian bark or Cinchona and was introduced to the Spanish by indigenous people in South America during the 17th century. |
| 1897 | First vaccine for [plague](http://www.infoplease.com/cgi-bin/id/A0839266). |
| 1899 | Felix Hoffman develops [aspirin](http://www.infoplease.com/cgi-bin/id/A0805047) (acetyl salicylic acid). The juice from willow tree bark had been used as early as 400 BC to relieve pain. 19th century scientists knew that it was the salicylic acid in the willow that made it work, but it irritated the lining of the mouth and stomach. Hoffman synthesizes acetyl salicylic acid, developing what is now the most widely used medicine in the world. |
| 1901 | Austrian-American [Karl Landsteiner](http://www.infoplease.com/cgi-bin/id/A0828780) describes blood compatibility and rejection (i.e., what happens when a person receives a blood transfusion from another human of either compatible or incompatible [blood type](http://www.infoplease.com/cgi-bin/id/A0877658)), developing the ABO system of [blood typing](http://www.infoplease.com/cgi-bin/id/A0807940). This system classifies the bloods of human beings into A, B, AB, and O groups. Landsteiner receives the 1930 Nobel Prize for Physiology or Medicine for this discovery. |
| 1906 | [Sir Frederick Gowland Hopkins](http://www.infoplease.com/cgi-bin/id/A0824153) suggests the existence of vitamins and concludes they are essential to health. Receives the 1929 Nobel Prize for Physiology or Medicine. |
| 1907 | First successful human [blood transfusion](http://www.infoplease.com/cgi-bin/id/A0807948) using Landsteiner's ABO blood typing technique |
| 1913 | Dr. Paul Dudley White becomes one of America's first cardiologists, a doctor specializing in the heart and its functions, and a pioneer in use of the [electrocardiograph](http://www.infoplease.com/cgi-bin/id/A0422665), exploring its potential as a diagnostic tool. |
| 1921 | Edward Mellanby discovers [vitamin D](http://www.infoplease.com/cgi-bin/id/A0861826) and shows that its absence causes [rickets](http://www.infoplease.com/cgi-bin/id/A0841858). |
| 1922 | [Insulin](http://www.infoplease.com/cgi-bin/id/A0858847) first used to treat [diabetes](http://www.infoplease.com/cgi-bin/id/A0815395). |
| 1923 | First vaccine for [diphtheria](http://www.infoplease.com/cgi-bin/id/A0815595). |
| 1926 | First vaccine for [pertussis](http://www.infoplease.com/cgi-bin/id/A0737751) (whooping cough). |
| 1927 | First vaccine for [tuberculosis](http://www.infoplease.com/cgi-bin/id/A0849618). |
| 1927 | First vaccine for [tetanus](http://www.infoplease.com/cgi-bin/id/A0848273). |
| 1928 | Scottish bacteriologist [Sir Alexander Fleming](http://www.infoplease.com/cgi-bin/id/A0818904) discovers [penicillin](http://www.infoplease.com/cgi-bin/id/A0838154). He shares the 1945 Nobel Prize for Physiology or Medicine with [Ernst Chain](http://www.infoplease.com/cgi-bin/id/A0811220) and [Sir Howard Florey](http://www.infoplease.com/cgi-bin/id/A0818961). |
| 1935 | First vaccine for [yellow fever](http://www.infoplease.com/cgi-bin/id/A0853029). |
| 1935 | [Dr. John H. Gibbon, Jr.](http://www.infoplease.com/cgi-bin/id/A0931151), successfully uses a heart-lung machine for extracorporeal circulation of a cat (i.e., all the heart and lung functions are handled by the machine while surgery is performed). Dr. Gibbon uses this method successfully on a human in 1953. It is now commonly used in open heart surgery. |
| 1937 | First vaccine for [typhus](http://www.infoplease.com/cgi-bin/id/A0849858). |
| 1937 | Bernard Fantus starts the first [blood bank](http://www.infoplease.com/cgi-bin/id/A0807935) at Cook County Hospital in Chicago, using a 2% solution of sodium citrate to preserve the blood. Refrigerated blood lasts ten days. |
| 1943 | Microbiologist [Selman A. Waksman](http://www.infoplease.com/cgi-bin/id/A0932280) discovers the antibiotic [streptomycin](http://www.infoplease.com/cgi-bin/id/A0846951), later used in the treatment of tuberculosis and other diseases. |
| 1945 | First vaccine for [influenza](http://www.infoplease.com/cgi-bin/id/A0825194). |
| 1952 | Paul Zoll develops the first cardiac [pacemaker](http://www.infoplease.com/cgi-bin/id/A0574890) to control irregular heartbeat. |
| 1953 | [James Watson](http://www.infoplease.com/cgi-bin/id/A0851637) and [Francis Crick](http://www.infoplease.com/cgi-bin/id/A0814036) at Cambridge University describe the structure of the [DNA](http://www.infoplease.com/cgi-bin/id/A0860072) molecule. [Maurice Wilkins](http://www.infoplease.com/cgi-bin/id/A0852274) and Rosalind Franklin at King's College in London are also studying DNA. (Wilkins in fact shares Franklin's data with Watson and Crick without her knowledge.) Watson, Crick, and Wilkins share the Nobel Prize for Physiology or Medicine in 1962 (Franklin had died and the Nobel Prize only goes to living recipients). |
| 1954 | [Dr. Joseph E. Murray](http://www.infoplease.com/cgi-bin/id/A0834511) performs the first kidney transplant between identical twins. |
| 1955 | [Jonas Sal](http://www.infoplease.com/cgi-bin/id/A0843239)k develops the first [polio](http://www.infoplease.com/cgi-bin/id/A0839526). |
| 1957 | Dr. Willem Kolff and Dr. Tetsuzo Akutzu implant the first [artificial heart](http://www.infoplease.com/cgi-bin/id/A0823119) in a dog. The animal survives 90 minutes. |
| 1962 | First oral polio vaccine (as an alternative to the injected vaccine). |
| 1964 | First vaccine for [measles](http://www.infoplease.com/cgi-bin/id/A0832420). |
| 1967 | First vaccine for [mumps](http://www.infoplease.com/cgi-bin/id/A0834419). |
| 1967 | South African heart surgeon [Dr. Christiaan Barnard](http://www.infoplease.com/cgi-bin/id/A0900570) performs the first human heart transplant. |
| 1970 | First vaccine for [rubella](http://www.infoplease.com/cgi-bin/id/A0842606). |
| 1974 | First vaccine for [chicken pox](http://www.infoplease.com/cgi-bin/id/A0811805). |
| 1977 | First vaccine for [pneumonia](http://www.infoplease.com/cgi-bin/id/A0839417). |
| 1978 | First [test-tube baby](http://www.infoplease.com/cgi-bin/id/A0825396) is born in the U.K. |
| 1978 | First vaccine for [meningitis](http://www.infoplease.com/cgi-bin/id/A0832692). |
| 1980 | W.H.O. ([World Health Organization](http://www.infoplease.com/cgi-bin/id/A0852734)) announces smallpox is eradicated. |
| 1981 | First vaccine for [hepatitis B](http://www.infoplease.com/cgi-bin/id/A0474159). |
| 1982 | Dr. William DeVries implants the [Jarvik-7](http://www.infoplease.com/cgi-bin/id/A0499264) artificial heart into patient Barney Clark. Clark lives 112 days. |
| 1983 | HIV, the virus that causes [AIDS](http://www.infoplease.com/cgi-bin/id/SPOT-AIDSTIMELINE1), is identified. |
| 1992 | First vaccine for [hepatitis A](http://www.infoplease.com/cgi-bin/id/A0474157). |
| 1996 | Dolly the sheep becomes the first mammal [cloned](http://www.infoplease.com/cgi-bin/id/A0906940) from an adult cell (dies in 2003). |
| 1998 | First vaccine for [lyme disease](http://www.infoplease.com/cgi-bin/id/A0830721). |
| 2007 | Scientists discover how to use human skin cells to create embryonic stem cells. |

[*http://www.infoplease.com/ipa/A0932661.htm*](http://www.infoplease.com/ipa/A0932661.htm)

**Reading Comprehension**

**1. Read the article carefully and answer these questions according to the information in the text.**

1. Fleming was not the first to observe the inhibition of bacterial growth by fungi. Who were some other people that made the same observation??
2. In World War I and World War II, many soldiers wounded in battle died, not as the result of their wounds, but for another reason. What was the main reason that these soldiers were dying after their wounds had been successfully treated?
3. Why was knowledge of the Germ Theory necessary?
4. How many types are there in a system for classifying human blood on the basis of the presence or absence of two antigens on the red cell membrane? Why are they important? When were they used for the first time?
5. How old is acetyl salicylic acid?
6. What is the first organ having been transplanted?
7. Why is Dolly the sheep known all over the world?
8. What kind of a machine has been used to maintain the circulation and oxygenation of the blood during heart surgery since the beginning of the 20th century?
9. What plants and trees were used in the history of medicine for changing the way to treat diseases?
10. Why are you alive right now? What discovery do you owe your life to? Give your reasons.

**Language Development**

! Dependent prepositions

**1. Find and underline all examples with verbs, nouns or adjectives with dependent prepositions in the text and try to learn them.**

**2. Complete the sentences using one of the following prepositions**

TO (5) FOR(3) WITH (2) IN (1) FROM (3)

1. Penicillin is one of the earliest discovered and widely used antibiotic agents, derived \_\_\_\_\_\_\_\_\_\_ the Penicillium mold.
2. This principle later led \_\_\_\_\_\_\_\_\_ medicines that could kill certain types of disease-causing bacteria inside the body.
3. Alexander Fleming observed that a plate culture of Staphylococcus had been contaminated by a blue-green mold and that colonies of bacteria adjacent \_\_\_\_\_\_\_\_\_ the mold were being dissolved
4. As the war with Germany continued to drain industrial and government resources, the British scientists could not produce the quantities of penicillin needed \_\_\_\_\_\_\_\_\_\_ clinical trials on humans and turned to the United States for help. They were quickly referred \_\_\_\_\_\_\_\_\_\_\_ the Peoria Lab where scientists were already working on fermentation methods to increase the growth rate of fungal cultures.
5. The surgeon [Joseph Lister](http://inventors.about.com/library/inventors/blantisceptics.htm), began researching the phenomenon that urine contaminated \_\_\_\_\_\_\_\_\_\_ mold would not allow the successful growth of bacteria.
6. Since the first pioneering efforts of [Florey](http://en.wikipedia.org/wiki/Howard_Florey,_Baron_Florey) and [Chain](http://en.wikipedia.org/wiki/Ernst_Boris_Chain) in 1939, the importance of antibiotics, including antibacterials, to [medicine](http://en.wikipedia.org/wiki/Medicine) has led \_\_\_\_\_\_\_ intense research into producing antibacterials at large scales.
7. Koch was also famous \_\_\_\_\_\_\_\_\_\_\_ the discovery of the [tubercle bacillus](http://en.wikipedia.org/wiki/Mycobacterium_tuberculosis) (1882) and the [cholera bacillus](http://en.wikipedia.org/wiki/Vibrio_cholerae) (1883) and for his development of [Koch's postulates](http://en.wikipedia.org/wiki/Koch%27s_postulates)
8. However, medical conservatism on new breakthroughs in pre-existing science prevented them \_\_\_\_\_\_\_\_\_\_\_ being generally well received during the 19th century.
9. However the decline \_\_\_\_\_\_\_\_\_\_ many of the most lethal diseases was more due \_\_\_\_\_\_\_ improvements in public health and nutrition than to medicine.
10. At the start of the 20th century, many people still died \_\_\_\_\_\_\_\_ infectious diseases that today are easily cured
11. Vaccines or other medicines may be added \_\_\_\_\_\_\_\_ foods.
12. But amazingly the real secret to good health lies not in science or technology. It resides \_\_\_\_\_ the individual, who needs to take responsibility \_\_\_\_\_\_\_\_ exercising and making healthy choices at mealtimes.
13. **Find and learn Russian equivalents for the following words and expressions**

|  |  |
| --- | --- |
| 1. the father of medicine |  |
| 1. the modern research on the heart and blood vessels |  |
| 1. to administer medications intravenously |  |
| 1. blood transfusions |  |
| 1. the founding father of immunology |  |
| 1. the anesthetic properties of nitrous oxide |  |
| 1. the germ theory of disease |  |
| 1. perform autopsies on (people) |  |
| 1. to irritate the lining of the mouth and stomach |  |
| 1. blood compatibility and rejection |  |

1. **Find and learn English equivalents for the following words and expressions**

|  |  |
| --- | --- |
| 1. являться результатом/вытекать |  |
| 1. тканевая жидкость организма |  |
| 1. научный труд, трактат |  |
| 1. причина инфекционных заболеваний |  |
| 1. предотвращать |  |
| 1. подвергая чему-то |  |
| 1. эфир |  |
| 1. карболовая кислота |  |
| 1. хинин |  |
| 1. облегчать боль |  |

1. **Translate the following passage from Russian into English.**

*Стволовые клетки обладают потенциалом в различных областях здоровья и медицинских исследований. Прежде всего, изучение стволовых клеток поможет нам понять, как они трансформируются в невероятное множество специализированных клеток, которые делают нас такими, какие мы есть. Некоторые из наиболее серьезных медицинских состояний, таких как рак или врожденные дефекты, обязаны проблемам, которые случаются где-то в этом процессе. Лучшее понимание нормального клеточного развития позволит нам понять и, возможно, исправить ошибки, которые вызывают эти медицинские состояния.*

*Другим потенциальным применением стволовых клеток является создание клеток и тканей для медицинской терапии. Сегодня донорские органы и ткани используются для замещения тех, которые больны или повреждены. К сожалению, число людей, нуждающихся в трансплантатах, значительно превышает число органов, доступных для пересадки. Плюрипотентные стволовые клетки представляют возможность возобновляемого источника пересаживаемых клеток и тканей для лечения бесчисленных заболеваний, состояний и недомоганий, включая болезнь Паркинсона, амиотрофического латерального склероза, повреждений спинного мозга, ожогов, сердечных заболеваний, диабета и артрита.*

**Over to you**

1. **Discuss the following questions**:

### Why do we need vaccines? What is immunization? What is immunity?

* What is a clone? Has someone really cloned a person? Is it possible?
* **Have human embryonic stem cells been used successfully to treat any human diseases yet?**
* What are different uses for aspirin?
* How is the blood group related to the immune system?

1. **Prepare your projects on one of the following topics:**

* Anticancer effects of aspirin.
* **Why do scientists want to use stem cells?**
* About any disease mentioned in the article.

**Writing**

1. Decide which you think the ten top medical advances of the last 50 years or less and write a report describing one of them and explain why you consider it to be important.

THE DISCOVERY OF ANTIBIOTICS

**Vocabulary**

**1. Match the words with their definitions and write the transcription of the words in column 2. Translate the words in column 1 into Russian:**

|  |  |  |
| --- | --- | --- |
| **1** | **2** | **3** |
| 1)inhibit (v.) |  | 1. excessive use |
| 1. in vitro (adv.) |  | 1. effective against a wide variety of diseases or   microorganisms |
| 1. [pharmacokinetic](http://en.wikipedia.org/wiki/Pharmacokinetics)s(n.) |  | 1. to stop, prevent, or decrease the rate of (a chemical reaction) |
| 1. cephalosporin (n.) |  | 1. any of a group of synthetic antibiotics, including ciprofloxacin, that inactivate an enzyme required for the replication of certain microorganisms |
| 1. enzyme (n.) |  | 1. to intensify or increase in quality, value, power, etc. |
| 1. quinolone (n.) |  | 1. to take, carry, or transport from one place to another |
| 1. broad-spectrum(adj.) |  | 1. within a vein |
| 1. enhance (v.) |  | 1. by way of; by means of; through |
| 1. [plasmid](http://en.wikipedia.org/wiki/Plasmids) (n.) |  | 1. the branch of pharmacology concerned with the way drugs are taken into, move around, and are eliminated from, the body |
| 10) convey (v.) |  | 1. any of a group of complex proteins or conjugated proteins that are produced by living cells and act as catalysts in specific biochemical reactions |

**Before you read**

1. **You are going to read an extract from Wikipedia the encyclopedia about the discovery of antibiotics, the powerful substances that saved the world. So, first of all, discuss with your partner the following questions.**

* Why antibiotics can be called one of the advances in medicine?
* [What are antibiotics and how do they work?](http://www.drreddy.com/antibx.html)
* What outstanding scientists discovered antibiotics?
* When and how was the discovery made?

**2. Skim the text to check your ideas.**

**Reading B**

## ANTIBIOTICS

Before the early twentieth century, treatments for infections were based primarily on [medicinal folklore](http://en.wikipedia.org/wiki/Folk_medicine). Mixtures with antimicrobial properties that were used in treatments of infections were described over 2000 years ago. Many ancient cultures, including the [ancient Egyptians](http://en.wikipedia.org/wiki/Ancient_Egyptian_medicine) and [ancient Greeks](http://en.wikipedia.org/wiki/Ancient_Greek_medicine) used specially selected [mold](http://en.wikipedia.org/wiki/Mold) and plant materials and extracts to treat [infections](http://en.wikipedia.org/wiki/Infection). More recent observations made in the laboratory of antibiosis between micro-organisms led to the discovery of natural antibacterials produced by microorganisms. The term antibiosis, meaning "against life," was introduced by the French bacteriologist [Vuillemin](http://en.wikipedia.org/wiki/Vuillemin) as a descriptive name of the phenomenon exhibited by these early antibacterial drugs.

Antibiosis was first described in 1877 in bacteria when Louis Pasteur and [Robert Koch](http://en.wikipedia.org/wiki/Robert_Koch) observed that an airborne bacillus could inhibit the growth of [Bacillus anthracis](http://en.wikipedia.org/wiki/Bacillus_anthracis). These drugs were later renamed antibiotics by [Selman Waksman](http://en.wikipedia.org/wiki/Selman_Waksman), an American microbiologist in 1942.

The successful outcome of antimicrobial therapy with antibacterial compounds depends on several factors. These include [host defense mechanisms](http://en.wikipedia.org/wiki/Immune_system), the location of infection, and the pharmacokinetic and pharmacodynamic properties of the antibacterial. A bactericidal activity of antibacterials may depend on the bacterial growth phase, and it often requires ongoing metabolic activity and division of bacterial cells. These findings are based on laboratory studies, and in clinical settings have also been shown to eliminate bacterial infection. Since the activity of antibacterials depends frequently on its concentration, in vitro characterization of antibacterial activity commonly includes the determination of the [minimum inhibitory concentration](http://en.wikipedia.org/wiki/Minimum_inhibitory_concentration) and minimum bactericidal concentration of an antibacterial. To predict clinical outcome, the antimicrobial activity of an antibacterial is usually combined with its [pharmacokinetic](http://en.wikipedia.org/wiki/Pharmacokinetics) profile, and several pharmacological parameters are used as markers of drug efficacy.

Like antibiotics, antibacterials are commonly classified based on their mechanism of action, chemical structure, or spectrum of activity. Most antibacterial antibiotics target bacterial functions or growth processes. Antibiotics that target the bacterial cell wall (such as penicillins and cephalosporins), or cell membrane (for example, polymixins), or interfere with essential bacterial enzymes (such as quinolones and sulfonamides) have bactericidal activities. Those that target protein synthesis, such as the aminoglycosides, macrolides, and tetracyclines, are usually bacteriostatic. Further categorization is based on their target specificity. "Narrow-spectrum" antibacterial antibiotics target specific types of bacteria, such as Gram-negative or Gram-positive bacteria, whereas broad-spectrum antibiotics affect a wide range of bacteria. Following a 40-year hiatus in discovering new classes of antibacterial compounds, three new classes of antibiotics have been brought into clinical use. These new antibacterials are cyclic lipopeptides (including [daptomycin](http://en.wikipedia.org/wiki/Daptomycin)), glycylcyclines (e.g., [tigecycline](http://en.wikipedia.org/wiki/Tigecycline)), and oxazolidinones (including [linezolid](http://en.wikipedia.org/wiki/Linezolid)).

The emergence of resistance of bacteria to antibacterial drugs is a common phenomenon. Emergence of resistance often reflects [evolutionary](http://en.wikipedia.org/wiki/Evolution) processes that take place during antibacterial drug therapy. The antibacterial treatment may select for bacterial strains with physiologically or genetically enhanced capacity to survive high doses of antibacterials. Under certain conditions, it may result in preferential growth of resistant bacteria while growth of susceptible bacteria is inhibited by the drug. For example, antibacterial selection within whole bacterial populations for strains having previously acquired antibacterial-resistance genes was demonstrated in 1943 by the [Luria–Delbrück experiment](http://en.wikipedia.org/wiki/Luria%E2%80%93Delbr%C3%BCck_experiment). Survival of bacteria often results from an inheritable resistance. Resistance to antibacterials also occurs through [horizontal gene transfer](http://en.wikipedia.org/wiki/Horizontal_gene_transfer). Horizontal transfer is more likely to happen in locations of frequent antibiotic use.

Antibacterials like penicillin and erythromycin, which used to have high efficacy against many bacterial species and strains, have become less effective, because of increased resistance of many bacterial strains. Antibacterial resistance may impose a biological cost thereby reducing [fitness](http://en.wikipedia.org/wiki/Biological_fitness) of resistant strains, which can limit the spread of antibacterial-resistant bacteria, for example, in the absence of antibacterial compounds. Additional mutations, however, may compensate for this fitness cost and can aid the survival of these bacteria.

Several molecular mechanisms of antibacterial resistance exist. Intrinsic antibacterial resistance may be part of the genetic makeup of bacterial strains. For example, an antibiotic target may be absent from the bacterial [genome](http://en.wikipedia.org/wiki/Genome). Acquired resistance results from a mutation in the bacterial chromosome or the acquisition of extra-chromosomal DNA.Antibacterial-producing bacteria have evolved resistance mechanisms that have been shown to be similar to, and may have been transferred to, antibacterial-resistant strains. The spread of antibacterial resistance often occurs through vertical transmission of mutations during growth and by genetic recombination of DNA by [horizontal genetic exchange](http://en.wikipedia.org/wiki/Horizontal_gene_transfer). For instance, antibacterial resistance genes can be exchanged between different bacterial strains or species via [plasmids](http://en.wikipedia.org/wiki/Plasmids) that carry these resistance genes. Plasmids that carry several different resistance genes can confer resistance to multiple antibacterials. Cross-resistance to several antibacterials may also occur when a resistance mechanism encoded by a single gene conveys resistance to more than one antibacterial compound.

Antibacterial-resistant strains and species, sometimes referred to as "superbugs", now contribute to the emergence of diseases which were for a while well-controlled. For example, emergent bacterial strains causing [tuberculosis](http://en.wikipedia.org/wiki/Tuberculosis) (TB) that are resistant to previously effective antibacterial treatments pose many therapeutic challenges. Every year, nearly half a million new cases of [multidrug-resistant tuberculosis](http://en.wikipedia.org/wiki/Multidrug-resistant_tuberculosis) (MDR-TB) are estimated to occur worldwide. For example, [NDM-1](http://en.wikipedia.org/wiki/NDM-1) is a newly identified enzyme conveying bacterial resistance to a broad range of [beta-lactam](http://en.wikipedia.org/wiki/Beta-lactam) antibacterials. United Kingdom [Health Protection Agency](http://en.wikipedia.org/wiki/Health_Protection_Agency) has stated that "most isolates with NDM-1 enzyme are resistant to all standard intravenous antibiotics for treatment of severe infections."

Antibiotic resistance is a problem because infections due to resistant bacteria are more difficult to treat, may result in longer and more severe illness, or expensive hospitalizations, and may need treatment with stronger antibiotics that can cause more serious side-effects. The problem of antibiotic resistance is getting worse. As the number of resistant bacteria grows, we may lose the ability to cure bacterial infections and people may die from common infections like pneumonia.

The misuse and overuse of antibiotics in humans, animals, and agriculture is responsible for the current problem of antibiotic resistance. Humans contribute to the problem in several ways:

* Taking antibiotics when they are not necessary, such as for viral infections.
* Demanding antibiotics when antibiotics are not appropriate OR insisting on a prescription for an antibiotic when your   doctor says they are not necessary.
* Not taking your prescribed antibiotic for the full course of treatment.
* Using antibiotics without a doctor's care or using leftover antibiotics.

It is estimated that up to 50% of antibiotics used in humans may be inappropriate. Most of this inappropriate use is for illnesses due to viruses-- against which antibiotics are ineffective. It is very important to do what we can to slow resistance now. The best way to do that is to reduce inappropriate antibiotic use.

*From Wikipedia, the free encyclopedia*

**Reading Comprehension**

1. **Read the article carefully and answer these questions according to the information in the text.**
2. **What are the main factors the** antimicrobial therapy success depends on?
3. **What are the genetics mechanisms of** antibacterial resistance?
4. **Who were the first to describe the antibiosis and how did they do it?**
5. **What** antibiotics targets can you name?
6. **Why is antibiotic resistance a problem today?**
7. **What examples of antibiotics misuse do you know?**
8. **What can people do today to reduce** antibiotic use?
9. **Read the article again and decide if the following statements are true (T), false (F) or not stated (NS). Find in the article the sentences that can prove the true statements and correct the false statements.**
10. The antibiotic therapy goes back to ancient medicine.
11. The immune system doesn’t play any role in the successful result of antimicrobial therapy.
12. The activity of antibacterials depends only on their concentration.
13. Antibacterial resistance is genetically proved.
14. Bacteria mutations can contribute into antibiotic resistance.
15. Today there are different ways to avoid antibiotic resistance.
16. Doctors should always prescribe antibiotics.

**Language Development**

**ǃ** Participles

1. **Combine the following pairs of sentences into one using a participle.**
2. The first antibiotic was penicillin. It was discovered accidentally from a mold culture.
3. Most antibiotics have 2 names. One on them includes the trade or brand name of the company that manufactures the drug.
4. Another name of antibiotic is its generic name. The name is based on the antibiotic's chemical structure or chemical class.
5. A person may have allergies that eliminate a class of antibiotic from consideration, such as a penicillin allergy. It must prevent your doctor from prescribing [amoxicillin](http://www.emedicinehealth.com/script/main/art.asp?articlekey=102046).
6. One of the most important concerns is antibiotic overuse. This includes the common practice of prescribing antibiotics for the common cold or flu
7. **Underline the correct participle**

# A New Approach for the Discovery of Antibiotics by Targeting Non-Multiplying Bacteria: A Novel Topical Antibiotic for *Staphylococcal* Infections

*Abstract by Medical Author: Everett Stephens, MD*

In a clinical infection, **1.** \_\_\_\_\_\_\_\_\_ **multiplying/multiplied** and **2.** \_\_\_\_\_\_\_\_\_\_\_\_\_\_**non-multiplied/non-multiplying** bacteria co-exist. Antibiotics kill **3.** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **multiplied/multiplying** bacteria, but they are very inefficient at killing non-multipliers which leads to slow or partial death of the total target population of microbes in an **4.** \_\_\_\_\_\_\_\_\_**infecting/infected** tissue. This prolongs the duration of therapy with **5**. \_\_\_\_\_\_\_\_\_\_\_\_\_\_**increased/increasing** emergence of resistance, and so contributes to the short life span of antibiotics after they reach the market. Targeting non-multiplying bacteria from the onset of an antibiotic development program is a new concept. This paper describes the proof of principle for this concept, **6.** \_\_\_\_\_\_\_\_\_**resulting/ resulted** in the development of the first antibiotic using this approach. The antibiotic, **7.** \_\_\_\_\_\_\_\_\_**calling/called** HT61, is a small **8.** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_quinolone-**derived/deriving** compound with a molecular mass of about 400 Daltons, and is active against **9.** \_\_\_\_\_\_\_\_\_ **non-multiplied/non-multiplying** bacteria, including methicillin sensitive and resistant, as well as Panton-Valentine leukocidin-**10.** \_\_\_\_\_\_\_\_\_\_\_\_\_**carrying /carried** Staphylococcus aureus. It also kills mupirocin resistant MRSA. The mechanism of action of the drug is depolarization of the cell membrane and destruction of the cell wall. The speed of kill is within two hours. In comparison to the conventional antibiotics, HT61 kills 11. \_\_\_\_\_\_\_\_\_\_**non-multiplied/non-multiplying** cells more effectively, 6 logs versus less than one log for major **12.** \_\_\_\_\_\_\_\_\_\_**marketing/marketed** antibiotics. HT61 kills methicillin sensitive and resistant S. aureus in the murine skin bacterial colonization and infection models. No resistant phenotype was produced during 50 serial cultures over a one year period. The antibiotic caused no adverse affects after application to the skin of minipigs.

*http://www.emedicinehealth.com/antibiotics/article\_em.htm*

**3. Find and learn Russian equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. [host defense mechanisms](http://en.wikipedia.org/wiki/Immune_system) |  |
| 1. metabolic activity |  |
| 1. the [minimum inhibitory concentration](http://en.wikipedia.org/wiki/Minimum_inhibitory_concentration) |  |
| 1. drug efficacy |  |
| 1. essential bacterial enzymes |  |
| 1. to be brought into clinical use |  |
| 1. to survive high doses of antibacterials |  |
| 1. [horizontal gene transfer](http://en.wikipedia.org/wiki/Horizontal_gene_transfer). |  |
| 1. bacterial strains |  |
| 1. [horizontal genetic exchange](http://en.wikipedia.org/wiki/Horizontal_gene_transfer) |  |
| 1. cross-resistance |  |
| 1. antibacterial-resistant strains and species |  |
| 1. the full course of treatment |  |
| 1. to reduce inappropriate antibiotic use |  |

**4. Find and learn English equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. антимикробные свойства |  |
| 1. народные методы лечения |  |
| 1. плесенный грибок |  |
| 1. бацилла, передающаяся воздушным путем |  |
| 1. фармакокинетические и фармакодинамические свойства |  |
| 1. устранить бактериальную инфекцию |  |
| 1. клинический результат |  |
| 1. нацеливаться |  |
| 1. грамотрицательные и грамположительные бактерии |  |
| 1. антибиотики широкого спектра действия |  |
| 1. существенный, важный |  |
| 1. при определенных условиях |  |
| 1. помочь выжить |  |
| 1. вирусные инфекции |  |

**5. Translate the following passage from Russian into English**

***Побочные эффекты антибиотиков***

*Антибактериальные препараты подвергаются скринингу на любой негативный эффект, который может быть оказан на человека или млекопитающее, перед тем как быть утвержденным для клинического использования, и обычно считаются безопасными и большинство из них хорошо переносимы. Однако, некоторые из антибактериальных препаратов связаны с рядом неблагоприятных эффектов.*

*Побочные эффекты варьируют от легких до очень серьезных в зависимости от используемого антибиотика, от микроорганизма-мишени и от индивидуальных особенностей пациента. Критерии безопасности более новых лекарств часто установлены не настолько хорошо, как для препаратов с длительной историей применения. Неблагоприятные эффекты варьируют от лихорадки и тошноты доглавных аллергических реакций, включая фотодерматит и анафилактический шок. Обычные побочные эффекты включают диарею, вызванную нарушением видового состава кишечной микрофлоры, проявляющуюся усиленным ростом патогенных видов, таких как Clostridium difficile..*

**Over to you**

1. **Role play**

**Work in pairs or small groups and make up conversations on one of the situations.**

#### Your doctor wants to give you an antibiotic, you need to ask him the questions

#### You have a runny nose with a cold and the drainage turns green or yellow, do you need an antibiotic?

#### You've taken antibiotics in the past for a cold and I felt better quickly. Should you take them for a cold now?

1. **Prepare a presentation on one of the alternative strategies to treat bacterial diseases.**

## THE DISCOVERY OF THE HUMAN GENOME

**Vocabulary**

**1. Match the words with their definitions and write the transcription of the words in column 2. Translate the words in column 1 into Russian:**

|  |  |  |
| --- | --- | --- |
| **1** | **2** | 3 |
| 1)the DNA sequence |  | the immediate descendant or descendants of a person, animal, etc. |
| 1. endeavor(n.) |  | 1. to develop or cause to develop gradually |
| 1. diploid(n.) |  | 1. having a single set of unpaired chromosomes |
| 1. nucleus(n.) |  | a unit that consists of three adjacent bases on a DNA molecule and that determines the position of a specific amino acid in a protein molecule during protein synthesis |
| 1. codon (n.) |  | any of a group of basic proteins present in cell nuclei and implicated in the spatial organization of DNA |
| 1. histone (n.) |  | a large compartment, bounded by a double membrane, that contains the chromosomes and associated molecules and controls the characteristics and growth of the cell |
| 1. nucleotide (n.) |  | 1. to join together again |
| 1. adenine (n.) |  | the procedure of determining the order of base pairs in a section of DNA |
| 1. guanine (n.) |  | 1. a purine base present in tissues of all living organisms as a constituent of the nucleic acids DNA and RNA ; 6-aminopurine. Formula: C5H5N5; melting pt.: 360-365°C |
| 1. cytosine (n.) |  | 1. having pairs of homologous chromosomes so that twice the haploid number is present |
| 1. thymine (n.) |  | 1. a white almost insoluble compound: one of the purine bases in nucleic acids. Formula: C5H5N5O |
| 1. anthropology(n.) |  | 1. to try to do something |
| 1. offspring (n.) |  | 1. a white crystalline pyrimidine occurring in nucleic acids; 6-amino-2- hydroxy pyrimidine. Formula: C4H5N3O |
| 1. recombine (v.) |  | 1. the study of humans, their origins, physical characteristics, institutions, religious beliefs,etc |
| 1. evolve (v.) |  | 1. a white crystalline pyrimidine base found in DNA. Formula: C5H6N2O2 |
| 1. haploid (n.) |  | 1. a compound consisting of a nucleoside linked to phosphoric acid |

**Listening & Watching**

1. **You are going to watch and listen to a science lecturer giving explanation how to make a DNA model. Can you explain what DNA is?**
2. **Before you listen, think of the main components of DNA. What are they? Do you think it is complicated?**
3. **Watch the presentation and check whether you were right.**
4. **Now listen to the professor again and fill in the gaps with one of these words or expressions of the part of the presentation**

COME FROM BASES HELIX TWIST A LADDER NUCLEOTIDES BACKBONE HYDROGEN BONDS SUGAR MOLECULE DIFFERENT COLOURS

## DNA is twisted up, we call this a double 1.\_\_\_\_\_, two strands that twist around each other. And these two strands are connected by something that's called 2.\_\_\_\_\_. So, it's important to recognize that a DNA model 3.\_\_\_\_\_\_\_. If you were to untwist it it would look like 4.\_\_\_\_\_. DNA is made up of small components called 5.\_\_\_\_\_\_\_. Well, each nucleotide has got a sugar, it's got a phosphate, what we call 6.\_\_\_\_\_\_, and then it's got one of four different bases that could be attached to it. So if you're making a DNA model, you would have to use four 7.\_\_\_\_ to represent Adenine, Guanine, Cytosine, and Thymine. The four 8.\_\_\_\_\_\_ that make up DNA. Then you'd need to connect them with a phosphate backbone and 9.\_\_\_\_\_them to a little tiny sugar molecule. This sugar molecule is called Deoxyribose which is the D, where the D in DNA 10.\_\_\_\_\_\_.

**Before you read**

**1. You are going to read an article about the greatest development in the history of science**. **Before you read discuss with your partner the following questions.**

### [How many genes are there in the human body?](http://www.perfectdna.com/faq.htm)

* How can you be identified by your DNA?
* If we are 99% alike, won't two people likely have the same DNA makeup?

1. **Skim the text to check your ideas.**

**Reading C**

## THE GREATEST BIOLOGICAL DEVELOPMENT IN SCIENCE HISTORY

Scientists have cracked the code, the longest, tiniest imaginable, most important, oldest code: the code of human life, the DNA sequence of humanity. The numerics are staggering: written in just a four-letter alphabet (A, T, C, G), the human genome is around 3 billion letters long (or about one billion "words" in length since each word (a codon) is three letters long), and there are around 600 billion-trillion copies of it on Earth (6 billion people times 100 trillion cells per person). It took about 3 billion years to create (the age of life on Earth) and only 15 years to decipher if one starts at the beginning of the Human Genome Project. Alternatively, it might be argued that it has taken several 100,000 years (the age of *Homo sapiens*) for humans to look inside themselves and figure out their vital essence.   
     The human genome is the crown jewel of 20 years of biological research, the most important accomplishment in the field to date. On a scale unmatched in the history of biology, it has been a massive project built on the scientific endeavors of decades of dedicated investigators. In effect, biologists have climbed Mount Sinai and brought back the hitherto secret scriptures of life.

The genome encodes the proteins that form the structural elements of life and that regulate numerous biological processes. Genes provide the characteristics that distinguish one individual from another and allow these features to be passed from one generation to the next through reproduction, thereby providing the microscopic mechanism for evolution. For these reasons, the genome is often called the blueprint for life. In short, the sequence of the human genome and similar sequences for other organisms comprise the Books of Life, the Bible of Biology so to speak.

The genome is composed of chromosomes. In humans, there are 24 four different types, which are labeled chromosome 1, chromosome 2, . . ., chromosome 22, X and Y. Thus, the Great Code is contained in 24 volumes.

Humans, like other higher forms of life, are diploid (that is, their chromosomes are duplicated in the nucleus of a cell). There are 23 pairs, 22 of which are matched: There are two copies of chromosomes 1 through 22, and then either an XX pair for females or an XY pair for males. Each chromosome consists of a long DNA molecule wrapped into a compact form around proteins known as histones – roughly like the way thread is wound about a bobbin. DNA is comprised of two long chains of nucleotides bound and twisted about each other to form a helix. The nucleotides are of four types: adenine (symbol A), guanine (symbol G), cytosine (symbol C) and thymine (symbol T). Specifying the nucleotide sequence as a series of "biological letters," such as CTATGAT . . ., determines the DNA molecule.

Genes are certain sections of the DNA that code proteins. Messenger ribonucleic acid, abbreviated mRNA, transports the information in the DNA to the protein-producing machinary of a cell. In a given cell, certain genes are turned on, meaning that they are allowed to generate the proteins that they code, while other genes are switched off. The genes that are turned on determine the function of a cell.

The amino acid sequence of a protein coded by a gene is determined from the [genetic code](http://www.jupiterscientific.org/sciinfo/geneticcode.html). Less than 1.5% of the genome encodes proteins; the rest consists of non-coding sequences, a sizeable fraction of which is junk, meaning that it appears to have no present biological purpose.

Feminists will be happy to learn that the male-defining Y chromosome is a junkyard, full of repetitive, non-functional nucleotide sequences. Furthermore, there are many copies of sperm-production genes in the Y chromosome; it is as though males are afraid of sterility or trying to defend themselves against female invasion. What is worse is that evolution has reduced it to a little stump in comparison with the other chromosomes and that it will be stuck with these features for a long time: Because the Y chromosome does not recombine (that is, it does not undergo sequence shuffling during reproduction), it is slow to evolve. On the other hand, this renders it useful in molecular anthropology, which uses DNA to deduce various relations among *Homo sapiens* during the past 200,000 years.

With the annotation of the human genome, a lot of progress had been made. What is the next great challenge for genetic biologists?

Unfortunately, biologists do not presently know how to combine a specific set of proteins to provide a cell with a particular function. Nature miraculously does this automatically. So the next great goal in understanding life is to figure out how proteins collectively interact to carry out cellular processes. At the genetic level, biologists must learn to deduce the biological consequences of having a whole ensemble of genes turned on.

We are already entering the age of genetic-based medicine. The new knowledge of the human nucleotide sequences will accelerate the development of therapeutic drugs that function at the molecular level. More accurate medical diagnoses will be available. Doctors will be able to address the fundamental causes of countless human disorders and will have a better change of predicting the side effects of drugs. On the horizon are cures for cancer and heart disease.

Eventually, scientists will be able to identify all of the genes contributing to a given disease. Individuals will know which sicknesses they are most at risk, giving them the possibility of making health-driven lifestyle changes or of taking preventative medical steps. Doctors will be able to tailor treatment to individuals.

The human genome sequence is a powerful tool for gaining insight into our genetic heritage and where we stand in the evolutionary scheme of things. The evolutionary tree can be determined by comparing the genomes of Earth's species. Eventually, we shall be able to take control of our own biological destiny when scientists learn to manipulate the human genome at will. No longer will we be at the mercy of the forces of natural selection. We shall be able to modify in part our vital essence. Initially, the goal will be to correct defective genes. But gradually genetic manipulation will expand to allow couples to select features of their offspring. "Pro-choice" will take on a new meaning. At some point, scientists will have almost complete mastery of the genome. Moreover, genetic manipulation will not be only confined to humans. Long before it is used on mankind, it will applied to animals and plants.

One can imagine the genetics-dominated world of the late 21st century: There will be fruits, vegetables and meats that are genetically modified for higher nutritional value. Sheep, mink, pigs, cows and other livestock will have their genes adjusted to yield higher output. Zoos will house unusual animals that differ notably from the animals from which they were derived. In place of refineries will be vast vats of swamp-like liquids containing bacteria, who, like domesticated farm animals, will produce high-tech genetically designed products that will provide a wide range of humanity's needs: food, energy, chemicals and medicines.   
Manipulating the genes of humans and living creatures will allow mankind to do what has been traditionally attributed to God. Indeed, President Clinton described the human genome as "the language in which God created Man." In response, Sydney Brenner of the Salk Institute for Biological Studies in San Diego said, "Perhaps now we can view the Bible as the language in which Man created God."

*http://www.jupiterscientific.org/sciinfo/genome.html*

**Reading Comprehension**

1. **Read the article carefully and answer these questions according to the information in the text.**

1) Why do parents and children usually look so much alike but still different?

2) What is the main rule about the humane genome which makes it possible for potential parents to share their chromosomes with their offsprings?

3) How is the DNA helix formed?

4) What is the mechanism of the activation of the protein production?

5) What is the amount of “useful” genes?

6) What is the scientific usage of the male chromosome?

7) How is it possible to make the genes serve for medicine?

8) What can the prospective result be in case scientists have almost complete mastery of the genome?

9) How does the genetics-dominated world look like today?

10) Who is Sydney Brenner?

1. **Read the article again and decide if the following statements are true (T), false (F) or not stated (NS). Find in the article the sentences that can prove the true statements and correct the false statements**

1. There are about 3 billion genes in human genome.

2. The human genome consists of proteins and encodes various classes of organic substances.

3. There are 44 chromosomes in the cell nucleus.

4. Human DNA formulates a circular structure.

5. Nowadays it’s impossible to select the offspring sex.

6. Y-chromosome is nonfunctional.

7. Scientists can create different protein combinations so that it can make the cell change its function.

8. DNA consists of two long chains of proteins called histones.

9. Chromosomes are situated in genes.

10.Each chromosome is duplicated in the nucleus.

**Language Development**

1. **Review the use of TENSES in English and put the verb in brackets in the correct form active or passive**

The work of many scientists 1)\_\_\_\_\_(pave) the way for the exploration of DNA. Way back in 1868, almost a century before the Nobel Prize 2)\_\_\_( award) to Watson, Crick and Wilkins, a young Swiss physician named Friedrich Miescher,3)\_\_\_\_\_ (isolate) something no one 4)\_\_\_\_ (see) before from the nuclei of cells. He 5)\_\_\_(call) the compound "nuclein." This is today called nucleic acid, the "NA" in DNA (deoxyribo-nucleic-acid) and RNA (ribo-nucleic-acid).

Two years earlier, the Czech monk Gregor Mendel, 6)\_\_\_(finish) a series of experiments with peas. His observations 7)\_\_\_\_\_ (turn) out to be closely connected to the finding of nuclein. Mendel 8)\_\_\_(to be able) to show that certain traits in the peas, such as their shape or color, were inherited in different packages. These packages 9)\_\_\_\_(to be) what we now call genes.

The remarkable scientific accomplishment that 10)\_\_\_\_ (achieve) is to provide nearly complete DNA sequences for the 24 human chromosomes. Within a relatively short period of time, these sequences 11)\_\_\_\_\_( be ) precisely known. Eventually, the genomes of almost every living creature on Earth 12)\_\_\_(be) part of the scientific data bank, the sum of which constitutes the Library of Life.

1. **Find and learn Russian equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. To crack the code |  |
| 1. distinguish one individual from another |  |
| 1. the sequence of the human genome |  |
| 1. Messenger ribonucleic acid |  |
| 1. the protein-producing machinary of a cell |  |
| 1. The amino acid sequence of a protein |  |
| 1. the male-defining Y chromosome |  |
| 1. repetitive, non-functional nucleotide sequences |  |
| 1. development of therapeutic drugs |  |
| 1. to make health-driven lifestyle changes |  |
| 1. to tailor treatment to individuals |  |
| 1. be at the mercy of the forces of natural selection |  |
| 1. the genetics-dominated world |  |

1. **Find and learn English equivalents for the following words and expressions**

|  |  |
| --- | --- |
| 1. Сущность жизни |  |
| 1. Достижение, успех |  |
| 1. Кодировать белки |  |
| 1. Передаваться от одного поколения к следующему |  |
| 1. Программа (модель) жизни |  |
| 1. Состоять из |  |
| 1. Более высокие формы жизни |  |
| 1. Удивительным образом |  |
| 1. Медицина, основанная на генетике |  |
| 1. Бесчисленные заболевания людей |  |
| 1. Прогнозировать побочные эффекты от лекарств |  |
| 1. Мощное средство\инструмент |  |
| 13) По желанию, по своему усмотрению |  |

1. **Translate the following passage from English into Russian.**

### *A New Biological Era*

*The knowledge of how genetic material is stored and copied has given rise to a new way of looking at and manipulating biological processes, called molecular biology. With the help of so-called restriction enzymes, molecules that cut the DNA at particular stretches, pieces of DNA can be cut out or inserted at different places.*

*In basic science, where you want to understand the role of all the different genes in humans and animals, new techniques have been developed. For one thing, it is now possible to make mice that are genetically modified and lack particular genes. By studying these animals scientists try to figure out what that gene may be used for in normal mice. This is called the knockout technique, since stretches of DNA have been taken away, or knocked out.*

*Scientists have also been able to insert new bits of DNA into cells that lack particular pieces of genes or whole genes. With this new DNA, the cell becomes capable of producing gene products it could not make before. The hope is that, in the future, diseases that arise due to the lack of a particular protein could be treated by this kind of gene therapy.*

**Over to you**

* 1. Is DNA effective in identifying persons?
  2. Is gene therapy being used to cure diseases? What is its promise for the future of medicine?
  3. What some recent developments in gene therapy research do you know?
  4. What are the potential benefits of human genome research?
  5. Prepare presentations on some recent developments in gene therapy research.

**Writing**

### [Do you believe that human behavior is determined by our evolution and our genes*?*](http://faculty.washington.edu/dpbarash/faq.html)Write an essay*.*

UNIT 5

**GENETIC ENGINEERING**

**AN OVERVIEW**

**Vocabulary**

1. **Match the words with their definitions and write the transcription of the words in column 2. Translate the words in column 1 into Russian:**

|  |  |  |
| --- | --- | --- |
| **1** | **2** | **3** |
| 1. inovation (n.) |  | 1. a group of products, thoughts, people, etc., appearing at one time or in one season |
| 1. crop (n.) |  | 1. the generation, usually intentional, of mutations |
| 1. breeding (n.) |  | 1. (of machines, methods, etc.) complex and refined • |
| 1. mutagenesis (n.) |  | 1. a result or effect of some previous occurrence |
| 1. insect (n.) |  | 1. to make or become greater in extent, volume, size, or scope; increase |
| 1. sophisticated (adj.) |  | 1. a person or thing that is regarded as dangerous or likely to inflict pain or misery |
| 1. consequence (n.) |  | 1. any small air-breathing arthropod of the class *Insecta*, having a body divided into head, thorax, and abdomen, three pairs of legs, and (in most species) two pairs of wings. |
| 1. harm (n.) |  | 1. the process of producing plants or animals by sexual reproduction |
| 1. expand (v.) |  | 1. something newly introduced, such as a new method or device |

**Listening**

1. **You are going to watch a video about cloning. Before you watch, think about cloning and tell if cloning is the same as genetic engineering. Then use your ideas to finish the statements**

* You, probably, know that is a tool used within genetic engineering to….
* Cloning is used to study……
* Cloning is very important to research…..

1. **Now listen to a biochemistry professor in this video on genetic engineering and finish the statements according to what the professor is talking**

* Cloning is the act of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and making another \_\_\_\_\_\_\_\_\_\_
* It’s not like in the movies where someone\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* All what has to be done is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* As soon as you have the copies of DNA, you can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* The type of cloning described is the same type \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Put two or three questions of your own to the professor**

**Before you read**

1. You are going to read an article about genetic engineering. Work in pairs and discuss your answers to the following questions. When you finish, talk together, compare your answers and try to persuade each other to see your point of view.

* What do you know about genetic engineering?
* In what areas of life is it being used today?
* What are advantages and disadvantages of genetic engineering?

1. **Skim**  **the text to check your ideas.**

**Reading A**

WHAT ARE GENETIC ENGINEERING AND GMO?

Just as the twentieth century was a golden age of computing, the twenty-first century is the DNA age. The innovations of the computer revolution helped bring about the current genetic revolution, which promises to do for life what computing did for information. We are on the verge of being able to transform, manipulate, and create organisms for any number of productive purposes. Technology is rapid and new ways of manipulation and experimentation are being made. Also it can be applied to the human species. Biotechnology, specifically genetic engineering, is already a beneficial resource, employed in medicine, manufacturing, and agriculture. Genetic engineering is considered special because often the techniques involve manipulating genes in a way that is not expected to occur ordinarily in nature, allowing characters to be changed, not just between the species but also between kingdoms. We have begun reaping the practical rewards of genetic engineering such as new medical therapies and increased crop yields and so far only a few instances of measurable harm have resulted. Genetic engineering has the potential to improve our health and well-being dramatically, revolutionize our manner of living, help us to conserve limited resources, and produce new wealth.

Genetic engineering, also called genetic modification is the process of recombining DNA, but does not include traditional animal and plant breeding or mutagenesis. Any organism that is generated using these techniques is considered to be a genetically modified organism (GMO). The first organisms genetically engineered were bacteria in 1973 and then mice in 1974. Insulin producing bacteria were commercialized in 1982 and genetically modified food has been sold since 1994.

Producing genetically modified organisms is a multi-step process. However, the process is not so simple as precisely cutting out one gene and putting it into another place in the DNA, since genes are surrounded by other sequences in the DNA that determine whether or not a gene from one organism can function in another organism. So a careful study of the GMO is needed to be sure of its safety.

Various industries have been successfully applying genetic engineering techniques for more than ten years. Medicines such as insulin and human growth hormone are now produced in bacteria, experimental mice such as the oncomouse and the knockout mouse are being used for research purposes and insect resistant or herbicide tolerant crops have been commercialized.

Scientists are currently developing plants that contain drugs and vaccines, animals with beneficial proteins in their milk and stress tolerant crops. Genetic engineering also holds the promise of creating new, more productive strains of farm animals for meat and milk production. These new strains may be more resistant to infections, reducing the need for large, unhealthy doses of antibiotics. They may also be engineered to produce more meat, so we need not slaughter as many animals, or they may produce milk or other products with vital nutrients otherwise not found in those products, ensuring a healthier source of such nutrients, animal variants used as food sources might even be engineered without anything more than an autonomous nervous system, arguably eradicating many of the ethical concerns involved with the wholesale slaughter of large mammals for food.

Genetic engineering has been particularly successfully used and applied in food and agriculture to produce genetically modified food. Much of the so-called “green revolution” of the past few decades has been fueled by standard chemical technologies. New pesticides and remote sensing have already enabled reductions in the amount of hazardous chemicals entering the ecosystem, and allowed farmers faced with an ever-expanding human population to meet the food needs of a planet. Nonetheless, insects and fungi, through evolutionary dynamics, are developing resistance to pesticides. Moreover, even the best modern pesticides enter the food chain and the ecosystem, harming generations of humans and animals alike.

It is a sophisticated technology and needs developed laboratory facilities and particular environmental conditions that require investment.

However, there are reasons to doubt and fear. The novelty of the technology is one of the reasons why people think there are many ethical issues, as they have concerns about health impacts and other potential dangers. In addition, there are concerns about the centralization of economic control over living things, such as the patenting of life. Of course, we need to assess our actions in light of both short and long-term consequences to the biosphere. Although the scientific consensus is that genetic engineering poses few, if any, short-term threats to the environment, long-term threats, known and unknown, must be considered as we move forward with research and genetic technologies.

*http://www.evolutionary-metaphysics.net/advancing\_technology.html*

**Reading Comprehension**

1. **Read the text carefully and answer these questions according to the information in the text.**

1. What is genetic engineering?

2. What is GMO?

3. When were the first genetically engineered organisms?

4. Why is genetic engineering a beneficial resource?

5. Where have genetic engineering techniques been successfully used and applied?

6. Are there any reasons to doubt and fear? What fears might genetic engineering provoke in people?

7. What are advantages and disadvantages of genetic engineering?

**Language Development**

Present Tenses

**ǃ** There are four present tenses:

The Present Simple Tense, which describes general truths, complete events and unchanging or regular events or actions

Look at this sentence from the article and underline the Present Simple Tense: *Genetic engineering has the potential to improve our health and well-being dramatically, revolutionize our manner of living, help us to conserve limited resources, and produce new wealth.*

The Present Continuous Tense, which describes events happening at this moment or which haven’t finished happening

Look at this sentence from the article and underline the Present Continuous Tense: *Scientists are currently developing plants that contain drugs and vaccines, animals with beneficial proteins in their milk and stress tolerant crops.*

The Present Perfect Tense, which refers to actions or situations that began in the past and which are still true or relevant now, or are now finished

Look at this sentence from the article and underline the Present Perfect Tense: *New pesticides and remote sensing have already enabled reductions in the amount of hazardous chemicals entering the ecosystem, and allowed farmers faced with an ever-expanding human population to meet the food needs of a planet.*

The Present Perfect Continuous Tense, which refers to actions or events which started in the past and haven’t finished happening

Look at this sentence from the article and underline the Present Perfect Continuous Tense: *Various industries have been successfully applying genetic engineering techniques for more than ten years.*

For more on the Present Tenses and their use refer to *English Grammar in Use* by R.Murphy Units1-4 and Units 13-19

**1. Fill in the gaps with the proper Present Tense. Don’t forget about the passive forms of the verb.**

Another technology which **1**.\_\_\_\_\_\_\_\_\_ (transform) our world is genetic engineering. The most common form of genetic engineering **2**.\_\_\_\_\_\_\_\_\_\_\_ (copy) segments of DNA from one species of plant or animal and **3**.\_\_\_\_\_\_\_\_\_\_\_ (insert) them into another. Future generations then 4.\_\_\_\_\_\_\_\_ (continue) to carry the modification, leading to a new plant or animal variety.

Unlike most other technologies, genetic engineering is too dangerous to allow mistakes. But mistakes **5**.\_\_\_\_\_\_\_\_\_\_\_\_\_(make) already, and some genetically modified plants **6.\_\_\_\_\_\_\_\_\_\_** (interbreed) accidentally with native varieties, causing genetic contamination that can never be repaired.

The worldwide protest against genetically modified food **7**. \_\_\_\_\_\_\_\_\_\_( be) successful in forcing governments to impose strict laws and regulations.

But many governments **8.** \_\_\_\_\_\_\_\_\_\_\_ (compromise) still on safety. The worst case is their failure to label food products containing genetically modified ingredients. Part of the reason for this is because contamination **9.** \_\_\_\_\_\_\_\_\_\_ (occur) already, and it is now too difficult to determine the actual percentage of genetic modification in every day food products.

Nevertheless, many varieties of genetically modified plants and animals **10.**\_\_\_\_\_\_\_\_\_(be) commercially successful, and the food that they produce **11**.\_\_\_\_\_\_\_\_\_\_\_\_ (prove) to be safe so far. New genetically modified foods more and more**12.**\_\_\_\_\_\_\_\_\_\_\_(approve) for sale every year.

Cloning is another form of genetic engineering. The DNA from one animal **13.** \_\_\_\_\_\_\_\_\_\_(insert) into the egg of another. But current cloning techniques have a very low chance of success. Most clones **14.** \_\_\_\_\_\_\_\_\_\_(fail) to develop inside the mother, many **15.** \_\_\_\_\_\_\_\_\_\_\_\_(die) during pregnancy, and many also **16.** \_\_\_\_\_\_\_\_\_\_\_\_\_(kill) the mother. Those that survive usually **17.** \_\_\_\_\_\_\_(die) at birth, or are so deformed that they die soon after birth. Clones that survive long enough to breed often have genetic defects that are passed on to their young.

The most promising applications for genetic engineering are in medicine. The first breakthrough came in the early 1980s when a harmless bacteria was engineered to produce insulin for diabetics. Since then, the scientists **18**.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (engineer) successfully hundreds of plants and animals to produce a wide range of medicines and vaccines.

1. **Find and learn Russian equivalents for the following words and expressions**:

|  |  |
| --- | --- |
| 1. bring about | a) |
| 1. productive purposes | b) |
| 1. to reap the practical rewards | c) |
| 1. the process of recombining DNA | d) |
| 1. Insulin-producing bacteria | e) |
| 1. the oncomouse | f) |
| 1. insect resistant | g) |
| 1. the knockout mouse | h) |
| 1. stress tolerant crops | i) |
| 1. hazardous chemicals entering the ecosystem | j) |

1. **Find and learn English equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. урожайность | a) |
| 1. Быть на грани | b) |
| 1. полезный ресурс | c) |
| 1. происходить естественным образом | d) |
| 1. вопросы, вызывающие беспокойство | e) |
| 1. многоступенчатый процесс | f) |
| 1. устойчивый к | g) |
| 1. производительный породы сельскохозяйственных животных | h) |
| 1. пищевая цепь | i) |
| 1. сложная технология | j) |

**Over to you**

**1. Work in groups. Read the following proposals for experiments involving genetic engineering. Note the public’s concern about the danger of each experiment.**

**Decide which experiments should be conducted. Rank these choices from the one you think is the most important (number 1) to the one you think is the least important (number 4) for improving today’s world.**

**Try to reach a group consensus.**

* Character trait selection

These experiments would attempt to transfer genes to embryos and develop the cloning process. By selecting and transferring special genes to animals, farmers could develop a system for human gene selection. Parents would be able to .choose the genetic traits of their children.

*Public concern*: Choosing character traits is not ethical. It is cruel to animals to use them for this experimentation

* Cure for diseases

These experiments would develop a cure for diseases by manipulating genes in humans. Scientists hope to clone virus genes in order to treat patients and eventually develop a cure for the disease.

*Public concern:* The treatment could affect normal cells in the body and hurt the patient. Side effects from these drugs might be passed on to future generations.

* Military development

These experiments would attempt to create biological weapons by means of gene splicing and recombining DNA. Some countries are already working on these experiments and could take a lead in military power with these new weapons.

*Public concern: The development of these weapons could increase the possibilities of biological warfare.*

* Fertility regulation

These experiments would attempt to clone hormones to regulate fertility in humans. Experiments would also develop techniques for artificial insemination and embryo transfer.

*Public concern:* The hormones could get out of control and a person might become “too fertile”, conceiving more children than desired. Fertilization experiments tamper with nature.

**2. Prepare a presentation on the topic being discussed.**

**Writing**

**Write your composition answering one of the following questions**

1. Why don't people like Genetic Engineering?
2. What vaccines were found from Genetic Engineering?
3. What’s wrong with genetic engineering?

# GENETIC ENGINEERING TECHNIQUES

**Vocabulary**

1. **Match the words with their definitions and write the transcription of the words in column 2. Translate the words in column 1 into Russian:**

|  |  |  |
| --- | --- | --- |
| **1** | **2** | **3** |
| 1. restriction (n.) |  | a)the capacity of a microorganism for causing disease |
| 1. cut up (v.) |  | b)a virus that is parasitic in a bacterium and multiplies within its host, which is destroyed when the new viruses are released |
| 1. incorporated (adj.) |  | c)to perform better than (someone or something) |
| 1. appropriate (adj.) |  | d)lacking one or more physical powers, such as the ability to walk or to coordinate one's movements, as from the effects of a disease or accident, or through mental impairment |
| 1. outperform (v.) |  | e)something that restricts |
| 1. virulence (n.) |  | f)united or combined into a whole |
| 1. bacteriophage (n.) |  | g)right or suitable; fitting |
| 1. disabled (adj.) |  | h)to cut into pieces |
| 1. alter (v.) |  | i)to make or become different in some respect; change |

**Listening and Watching**

1. **Do you know how genetic engineering is performed**?
2. **Understand the details of how genetic engineering happens with information from a biochemistry professor in video on genetic engineering.**

## Listen to the professor again and complete this part of his presentation with a word or word combination

## And from that point on, it's a part of the \_\_\_\_\_\_\_\_\_\_. So, every time the cell \_\_\_\_\_\_\_\_ or is even around it should read passed the DNA and \_\_\_\_\_\_\_ exactly what we wrote. Now, to do it on the \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_, it's pretty much the same thing except now they have tanks full of the \_\_\_\_\_\_\_\_\_\_ instead of little bottles of the enzymes, and they have \_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_ growing or whatever cell growing instead of little bits of cells growing. The biggest thing issue comes into \_\_\_\_\_\_\_\_\_\_\_\_ 'cos anytime \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ is what it reads the DNA, it's not going to do just create what you wrote. It's going to create everything else that's written on that \_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_, too.

## You are going to read an article about the basic [genetic](http://en.wikipedia.org/wiki/Genetics) techniques and how a GMO is made. Before you read discuss with your group mate the following questions.

**Before you read**

## Can you name the main methods in genetic engineering?

## Can you describe them?

1. **Skim**  **the text to check your ideas.**

## GENETIC ENGINEERING TECHNIQUES

Recently, we have begun to learn how to take evolution into our own hands through **genetic engineering**, which involves altering or manipulating an organism's genome to create a new and useful result. The methods often used by genetic engineers are many and varied, but generally fall under one of three categories: the **plasmid method**, the **vector method**, and the **biolistic method**.

## The Plasmid Method

The first technique of genetic engineering, the plasmid method, is the most familiar technique of the three, and is generally used for altering microorganisms such as bacteria. In the plasmid method, a small ring of DNA called a **plasmid** (generally found in bacteria) is placed in a container with special **restriction enzymes** that cut the DNA at a certain recognizable sequence. The same enzyme is then used to treat the DNA sequence to be engineered into the bacteria; this procedure creates "sticky ends" that will fuse together if given the opportunity.

Next, the two separate cut-up DNA sequences are introduced into the same container, where the sticky ends allow them to fuse, thus forming a ring of DNA with additional content. New enzymes are added to help cement the new linkages, and the culture is then separated by molecular weight. Those molecules that weigh the most have successfully incorporated the new DNA, and they are to be preserved.

The next step involves adding the newly formed plasmids to a culture of live bacteria with known genomes, some of which will take up the free-floating plasmids and begin to express them. In general, the DNA introduced into the plasmid will include not only instructions for making a protein, but also antibiotic-resistance genes. These resistance genes can then be used to separate the bacteria which have taken up the plasmid from those that have not. The scientist simply adds the appropriate antibiotic, and the survivors are virtually guaranteed (barring spontaneous mutations) to possess the new genes.

Next, the scientist allows the successfully altered bacteria to grow and reproduce. They can now be used in experiments or put to work in industry. Furthermore, the bacteria can be allowed to evolve on their own, with a "selection pressure" provided by the scientist for producing more protein. Because of the power of natural selection, the bacteria produced after many generations will outperform the best of the early generations.

Many people strongly object to the plasmid method of genetic engineering because they fear that when the engineered plasmids are transferred into other bacteria it will cause problems if they express the gene. Lateral gene transfer of this type is indeed quite common in bacteria, but in general the bacteria engineered by this method do not come in contact with natural bacteria except in controlled laboratory conditions. Those bacteria that will be used in the wild - for example, those that could clean up oil spills - are generally released for a specific purpose and in a specific area, and they are carefully supervised by scientists.

## The Vector Method

The second method of genetic engineering is called the vector method. It is similar to the plasmid method, but its products are inserted directly into the genome via a viral vector. The preliminary steps are almost exactly the same: cut the viral DNA and the DNA to be inserted with the same enzyme, combine the two DNA sequences, and separate those that fuse successfully. The only major difference is that portions of the viral DNA, such as those that cause its virulence, must first be removed or the organism to be re-engineered would become ill. This does yield an advantage - removal of large portions of the viral genome allows additional "space" in which to insert new genes.

Once the new viral genomes have been created, they will synthesize protein coats and then reproduce. Then the viruses are released into the target organism or a specific cellular subset (for example, they may be released into a bacterium via a bacteriophage, or into human lung cells as is hoped can be done for cystic fibrosis patients). The virus infects the target cells, inserting its genome - with the newly engineered portion - into the genome of the target cell, which then begins to express the new sequence.

With vectors as well, marker genes such as genes for antibiotic resistance are often used, giving scientists the ability to test for successful uptake and expression of the new genes. Once again, the engineered organisms can then be used in experiments or in industry. This technique is also being studied as a possible way to cure genetic diseases.

Many people object to this type of genetic engineering as well, citing the unpredictability of the insertion of the new DNA. This could interfere with existing genes' function. In addition, many people are uncomfortable with the idea of deliberately infecting someone with a virus, even a disabled one.

## The Biolistic Method

The biolistic method, also known as the gene-gun method, is a technique that is most commonly used in engineering plants - for example, when trying to add pesticide resistance to a crop. In this technique, pellets of metal (usually tungsten) coated with the desirable DNA are fired at plant cells. Those cells that take up the DNA (again, this is confirmed with a marker gene) are then allowed to grow into new plants, and may also be cloned to produce more genetically identical crop. Though this technique has less finesse than the others, it has proven quite effective in plant engineering.

Objections to this method arise for many of the same reasons: the DNA could be inserted in a working gene, and the newly inserted gene might be transferred to wild plants. Additionally, this technique is commonly opposed because of its association with genetically modified foods, which many people dislike.

**Reading Comprehension**

1. **Read the article carefully and decide if the following statements are true (T), false (F) or not stated (NS). Find in the article the sentences that can prove the true statements and correct the false statements.**
2. The widely-spread technique of Genetic Engineering is the vector method.
3. A plasmid is a small ring of DNA.
4. The final step of plasmid method is when the altered bacteria grow and reproduce.
5. The molecules with the least weight have to be preserved after the successful incorporation the new DNA in one of the stages of plasmid method.
6. The plasmid with the introduced DNA includes instructions for making protein but doesn’t’ have antibiotic-resistance genes.
7. The successfully altered bacteria grow, reproduce and used in experiment and industry.
8. There are many objections to plasmid method because of ethical issues.
9. The vector method is entirely different from the plasmid method, but its preliminary steps are similar to the vector method.
10. In accordance with the vector method technique, if certain portions of the viral DNA are not removed from the organism, it will become ill.

10) The vector method has been successfully applied to cure genetic diseases.

11) People are opposed to this method because it can lead to some virus diseases*,*

12) The biolistic method is used in agribusinesses.

13) The biolistic method is supported by many people for many reasons.

**Language Development**

**ǃ** The Future Tenses

For predictions and general statements about the future *will* or *will be doing* are used.

Look at these sentences from the article and underline the future forms of the verb: *The next step involves adding the newly formed plasmids to a culture of live bacteria with known genomes, some of which will take up the free-floating plasmids and begin to express them.*

*In general, the DNA introduced into the plasmid will include not only instructions for making a protein, but also antibiotic-resistance genes.*

Remember that *will* is not normally used in a clause following a time conjunction: *when, if, until, before, after, while*, *provided*, *as soon as*, *once, by the time* etc

*Once the new viral genomes have been created, they will synthesize protein coats and then reproduce.*

*Many people strongly object to the plasmid method of genetic engineering because they fear that when the engineered plasmids will be transferred into other bacteria it will cause problems if they express the gene.*

For more information refer to English Grammar in Use by R.Murphy Un.6, 7, 9

1. **Complete the sentences with a verb adding *will* if it is needed.**

PROVIDE BECOME BE PERFECTED POLLINATE IMPROVE DEPEND BE BE RESTORED DEVELOP PRACTICE TELL COMPLETE

### 1. The precise nature of the future society in regards to the look of its members \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on an unpredictable factor - the relative success of different development approaches.

### 2. It is clear that virtual reality, cyborgisation and genetic engineering all \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ almost unlimited possibilities for human expression. But which of the three methods \_\_\_\_\_\_\_\_\_\_\_ more popular (at certain point) is hard to predict, because it depends on which one will be more advanced, more efficient, safer, cheaper, more available, easier to use, etc

3. Once this research\_\_\_\_\_\_\_\_\_\_\_\_\_ and scientists understand each step in the life cycle of plants and animals, and once computers \_\_\_\_\_\_\_\_\_ powerful enough to simulate the consequences of any changes to DNA, then humans will be able to safely engineer almost any imaginable type of plant or animal.

4. If the tools and techniques \_\_\_\_\_\_\_\_\_\_ and all of the problems associated with food production can be solved, the world environment \_\_\_\_\_\_\_\_\_\_, and our human health and lifestyle \_\_\_\_\_\_\_\_\_\_\_ beyond imagination.

5. If super-plants cross \_\_\_\_\_\_\_\_\_\_\_\_ with weeds, will we get super-weeds?

6. If we \_\_\_\_\_\_\_\_\_\_\_ super intelligent species or machines that are smarter than human beings, will we be replaced?

7. Only if humanity \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ practice extremely stringent methods of preventing these technologies from getting out of control, it will be guaranteed a future. Either way, these news reports rightfully predict that these new technologies are the future, unavoidable, somewhat unpredictable, and everyone should heavily invest in the companies researching these technologies to make a small fortune. Only time \_\_\_\_\_\_\_\_\_\_\_ who is right.

1. **Find and learn Russian equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| **1)restriction enzymes** | a) |
| 2)to fuse together | b) |
| 3)to weigh | c) |
| 4)free-floating plasmids | d) |
| 5)to possess the new genes | e) |
| 6)to put to work in industry | f) |
| 7)to express the gene | g) |
| 8)lateral gene transfer | h) |
| 9)in the wild | i) |
| 10)to yield an advantage | j) |

1. **Find and learn English equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. cеквенирование ДНК | a) |
| 1. новые соединения | b) |
| 1. молекулярная масса | c) |
| 1. гены, устойчивые к антибиотику | d) |
| 1. возражать | e) |
| 1. исключая спонтанные мутации | f) |
| 1. сталкиваться с | g) |
| 1. вирусная ДНК | h) |
| 1. непредсказуемость | i) |
| 1. быть против, возражать | j) |

1. **Translate the following article from English into Russian.**

*Newer gene transfer techniques are* [*electro- and chemical poration*](http://www.ucsusa.org/food_and_agriculture/science_and_impacts/science/genetic-engineering-techniques.html#electro)*,* [*microinjection*](http://www.ucsusa.org/food_and_agriculture/science_and_impacts/science/genetic-engineering-techniques.html#microinj)*, and* [*bioballistics*](http://www.ucsusa.org/food_and_agriculture/science_and_impacts/science/genetic-engineering-techniques.html#bioball)*.*

**Microinjection**

*Other methods do not rely on biological vectors like plasmids and viruses. One of these is called microinjection and involves simply injecting genetic material containing the new gene into the recipient cell. Where the cell is large enough, as many plant and animal cells are, the injection can be done with a fine-tipped glass needle. Somehow the injected genes find the host cell genes and incorporate themselves among them.*

**Electro- and Chemical Poration**

*Other methods for direct gene transfer involve creating pores or holes in the cell membrane to allow entry of the new genes. This can be done by bathing cells in solutions of special chemicals—so-called chemical poration—or subjecting cells to a weak electric current—so-called electroporation.*

[*http://www.ucsusa.org/food\_and\_agriculture/science\_and\_impacts/science/genetic-engineering-techniques.html*](http://www.ucsusa.org/food_and_agriculture/science_and_impacts/science/genetic-engineering-techniques.html)

**Over to you**

**1. Discuss in pairs or small groups the answers to following questions**

* What is horizontal gene transfer, and why is it dangerous?
* What are the possible applications of recombinant- DNA techniques?

**Prepare a presentation on the topic**

* Experiments in Cloning. Are Humans Next

**THE ADVANTAGES AND DISADVANTAGES OF GM FOOD**

**Vocabulary**

1. **Match the words with their definitions:**

|  |  |  |
| --- | --- | --- |
| 1. consumption (n.) |  | 1. fit to be eaten |
| 1. improve (v.) |  | 1. easily to be afflicted by |
| 1. fertilizer (n.) |  | 1. an indication of imminent harm, danger, or pain |
| 1. tolerate (v.) |  | 1. a group of organisms within a species or variety, distinguished by one or more minor characteristics |
| 1. edible (adj.) |  | 1. sufficient to be easily seen, measured, or noticed |
| 1. threat (n.) |  | 1. expenditure on goods and services for final personal use |
| 1. susceptible (adj.) |  | 1. to be able to bear; put up with |
| 1. strain (n.) |  | 1. to make or become better in quality; |
| 1. appreciable (adj.) |  | 1. any substance, such as manure or a mixture of nitrates, added to soil or water to increase its productivity |

**Listening**

1. **You are going to listen to the interview with an owner of a restaurant in San Francisco. Before you listen, in groups discuss your answers to the following questions. When you have finished, talk together, compare your answers and try to persuade each other to see your point of view.**

- In buying fruits and vegetables, which is more important: taste, texture, color, nutritional value, price, or shelf life? Why?

- Have you ever eaten food that was genetically engineered? What did it look like? What did it taste like?

1. **Listen to the interview. Find the answers to the following question:**

* **Is Joyce Goldstein more in favor of or more against genetically engineered food?**

1. **Read the statements for Part 1. Then listen to Part 1 and decide whether the statements are true or false. Write *T* or *F* next to each statement.**

**Part 1**

* Genetically designed tomatoes are now available in the supermarket.
* Genetically engineered sheese can now be purchased.
* World hunger may be halped with genetically engineered food.
* Last week 1000 chefs decided not to serve genetically engineered food.
* Special labeling is required for genetically engineered food.
* Goldstein owns a restaurant in San Francisco.

**Repeat the same procedure for Part 2-4**

**Part 2**

Goldstein believes…

* The genetically engineered tomato is being produced for flavor.
* The use of fish genes in tomatoes is a good idea.
* These foods should ne thoroughly tested and labeled before they are sold.

**Part 3**

According to Goldstein…

* “progress” os our enemy.
* The methods of the old days were better than those today.
* Genetically bred roses are very beautiful and smell good.
* Restaurants shouldn’t serve genetically engineered food until it is tested.
* We should about corporate profit.
* People who don’t understand her boycott wouldn’t be welcome to eat in her restaurant
* The Food and Drug Administration does a good job of regulating these foods.

**Part 4**

According to Goldstein…

* Pesticide residue in foods is a problem.
* Genetic manipulation of foods to reduce their dependence on pesticides is a good thing.
* The crossing of trout with tomatoes is a good thing.
* Genetic experimentation should work on improving the taste of foods.
* What is good for agribusiness is generally good for consumer.
* Consumers are given the information they need in purchasing food.

**Before you read**

1. **You are going to read an article about genetically modified foods**. **Discuss with your partner the following questions.**

**What are genetically-modified foods?**

**What are some of the advantages and disadvantages of GM foods?**

* **Do genetically engineered foods pose risks to human health and safety?**
* **Do genetically engineered foods pose risks to the environment?**

1. **Skim**  **the text to check your ideas.**

**Reading C**

HARMFUL OR HELPFUL?

*by Deborah B. Whitman*

1. The term GM foods or GMOs (genetically-modified organisms) is most commonly used to refer to crop plants created for human or animal consumption using the latest molecular biology techniques. These plants have been modified in the laboratory to enhance desired traits such as increased resistance to herbicides or improved nutritional content. [Genetic engineering](http://www.csa.com/discoveryguides/gmfood/gloss.php#gee) can create plants with the exact desired trait very rapidly and with great accuracy

The world population has topped 6 billion people and is predicted to double in the next 50 years. Ensuring an adequate food supply for this booming population is going to be a major challenge in the years to come. GM foods promise to meet this need in a number of ways.

1. First of all, crop losses from insect pests can be staggering, resulting in devastating financial loss for farmers and starvation in developing countries. Farmers typically use many tons of chemical pesticides annually. Consumers do not wish to eat food that has been treated with pesticides because of potential health hazards, and run-off of agricultural wastes from excessive use of pesticides and fertilizers can poison the water supply and cause harm to the environment. Growing GM foods can help eliminate the application of chemical pesticides and reduce the cost of bringing a crop to market.
2. Moreover, for some crops, it is not cost-effective to remove weeds by physical means such as tilling, so farmers will often spray large quantities of different herbicides (weed-killer) to destroy weeds, a time-consuming and expensive process that requires care so that the herbicide doesn't harm the crop plant or the environment. Crop plants genetically-engineered to be resistant to one very powerful herbicide could help prevent environmental damage by reducing the amount of herbicides needed.
3. Furthermore, there are many viruses, fungi and bacteria that cause plant diseases. Plant biologists are working to create plants with genetically-engineered resistance to these diseases.
4. Unexpected frost can destroy sensitive seedlings. An antifreeze gene from cold water fish has been introduced into plants such as tobacco and potato. With this antifreeze gene, these plants are able to tolerate cold temperatures that normally would kill unmodified seedlings.
5. Medicines and vaccines often are costly to produce and sometimes require special storage conditions not readily available in third world countries. Researchers are working to develop edible vaccines in tomatoes and potatoes. These vaccines will be much easier to ship, store and administer than traditional injectable vaccines.
6. In addition, not all GM plants are grown as crops. Soil and groundwater pollution continues to be a problem in all parts of the world. Plants such as poplar trees have been genetically engineered to clean up heavy metal pollution from contaminated soil.
7. But environmental activists, religious organizations, public interest groups, professional associations and other scientists and government officials have all raised concerns about GM foods, and criticized agribusiness for pursuing profit without concern for potential hazards, and the government for failing to exercise adequate regulatory oversight. Most concerns are dealing with human health risks and economic interests.
8. Some years ago many children in the US and Europe developed life-threatening allergies to peanuts and other foods. There is a possibility that introducing a gene into a plant may create a new [allergen](http://www.csa.com/discoveryguides/gmfood/gloss.php#all) or cause an allergic reaction in susceptible individuals. A concern was growing at that time that introducing foreign genes into food plants might have an unexpected and negative impact on human health. And a proposal to incorporate a gene from Brazil nuts into soybeans was abandoned because of the fear of causing unexpected allergic reactions.
9. A recent article published in Lancet examined the effects of GM potatoes on the digestive tract in rats. This study claimed that there were appreciable differences in the intestines of rats fed with GM potatoes. The scientists told that they had been feeding one group of rats with unmodified potatoes and another one with modified potatoes. The gene introduced into the potatoes was a snowdrop flower lectin, a substance known to be toxic to mammals. The scientists had created this variety of potato to test the methodology, and these potatoes were never intended for human or animal consumption.

On the whole, with the exception of possible allergenicity, scientists believe that GM foods do not present a risk to human health.

1. Bringing a GM food to market is a lengthy and costly process, and of course agri-biotech companies wish to ensure a profitable return on their investment. Many new plant genetic engineering technologies and GM plants have been patented, and patent infringement is a big concern of agribusiness. Yet consumer advocates are worried that patenting these new plant varieties will raise the price of seeds so high that small farmers and third world countries will not be able to afford seeds for GM crops, thus widening the gap between the wealthy and the poor.

Patent enforcement may also be difficult, as the contention of the farmers that they involuntarily grew genetically-engineered strains when their crops were cross-pollinated shows. One way to combat possible patent infringement is to introduce a "suicide gene" into GM plants. These plants would be viable for only one growing season and would produce sterile seeds that do not germinate. Farmers would need to buy a fresh supply of seeds each year. However, this would be financially disastrous for farmers in third world countries who cannot afford to buy seed each year and traditionally set aside a portion of their harvest to plant in the next growing season.

[*http://www.ncbe.reading.ac.uk/NCBE/GMFOOD/techniques*](http://www.ncbe.reading.ac.uk/NCBE/GMFOOD/techniques)*.*

**Reading Comprehension**

1. **Read this article carefully and choose the most suitable heading from the list A – K for each paragraph in the article. The first is given as an example.**
2. C
3. Disease Resistance
4. Pharmaceuticals
5. What are genetically modified foods?
6. Herbicide Tolerance
7. Cold Tolerance
8. Pest Resistance
9. Allergeniity
10. Phytoremediation
11. Some Criticism Against GM Foods
12. Unknown Effects On Human Health
13. Economic Concerns
14. **Read the text carefully once again and answer these questions according to the information in the text.**

1. Why do farmers use a lot of pesticides?

2. What are the three effects of treating crops with pesticides?

3. Why do farmers use weed-killers?

4. What has been done to some plants to help them tolerate cold weather conditions?

5. If a GM plant is planted, is it obviously grown as crop?

6. What types of concerns are raised about GM foods? Why?

7. Do scientists think that GM foods are dangerous to humans?

8. How can introducing GM food into the market widen the gap between the wealthy and the poor?

9. What is the possible way to avoid cross-pollinating?

10. What is bad about using the suicide gene technology?

**Language Development**

**ǃ** Past Tenses

The Simple Past is the tense most commonly used to refer to events that happened at a particular time in the past. This is very useful in science and engineering for explaining processes and procedures to show the sequence of events.

Look at this sentence from the article and underline the Past Simple Tense: *Some years ago many children in the US and Europe developed life-threatening allergies to peanuts and other foods*.

The Past Continuous is used to refer to activities that hadn’t been finished at the time mentioned.

Look at this sentence from the article and underline the Past Continuous Tense: *A concern was growing at that time that introducing foreign genes into food plants might have an unexpected and negative impact on human health.*

The Past Perfect and Past Perfect Continuous Tense are normally used to emphasize that one past event happened before another. They are very common in reported speech

Look at these sentences from the article and underline the Past Perfect Tense and Past Perfect Continuous Tenses: *The scientists had created that variety of potato to test the methodology, and these potatoes were never intended for human or animal consumption.*

*This study claimed that there were appreciable differences in the intestines of rats fed with GM potatoes, although the scientists told that they had been feeding the rats with unmodified potatoes.*

For more information refer to English Grammar in Use by R. Murphy Un.11, 12 and Un. 22, 23

1. **Fill in the gaps with the proper Past Tenses. Don’t forget to put the verb into Active or Passive Voice.**

Let’s review the history of genetic engineering. A scientist named Werner Arber 1. \_\_\_\_\_\_\_\_\_\_(study) bacterial viruses. As a graduate student at the University of Geneva in the 1950’s, he studied with a physics professor who 2. \_\_\_\_\_\_\_\_\_\_\_\_(convert) from doing pure physics to biophysics. This was the 1950’s, the DNA structure and the double helix just 3. \_\_\_\_\_\_\_\_\_\_\_\_\_ (announce), and genes were the rage in science. Even physicists 4. \_\_\_\_\_\_\_\_\_\_(catch) the biology bug at that period of time.

During the period of from 1960 to 1970 the scientists 5. \_\_\_\_\_\_\_\_\_\_(undertake) experiments with viruses and bacteria. Experiments 6.\_\_\_\_\_\_\_\_\_\_\_\_(include) the cloning of mice and the adding of genes to bacteria for the purposes of reproduction.

By the 1980's, scientists 7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_(introduce) positive proof that genes could be transferred from one plant to another and 8.\_\_\_\_\_\_\_\_\_\_\_\_(patent) the first genetically engineered plant. This decade 9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_(produce) many advances in the field.

In the early 1990s California company 10. \_\_\_\_\_\_\_\_\_\_\_\_(create) a tomato, which was the first commercially grown genetically modified food crop. The tomato 11. \_\_\_\_\_\_\_\_\_\_\_(use) to make tomato puree that 12.\_\_\_\_\_\_\_\_\_\_\_\_(sell) in Europe in the mid-1990s.

In 1997, a lamb born in Scotland 13.\_\_\_\_\_\_\_\_\_\_\_\_(become) an instant celebrity. An exact duplicate of her six-year-old mother, Dolly was the first animal cloned from the cells of an adult. Other animals previously 14. \_\_\_\_\_\_\_\_\_\_(clone) from the cells of embryos, but Dolly was the first animal to come from an adult. The cloning of Dolly 15. \_\_\_\_\_\_\_\_\_\_\_\_(involve) several steps. First, the scientists previously 16. \_\_\_\_\_\_\_\_\_\_\_\_\_\_(take) the cells from Dolly’s mother and the cells 17. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(starve) for five days, which 18. \_\_\_\_\_\_\_\_\_\_\_\_(cause) them to stop dividing. The interruption of the cells’ division cycle 19. \_\_\_\_\_\_\_\_\_\_\_\_\_(make) it easier for them to reprogram themselves to start growing a new organism. After five days, the nuclei of these cells 20. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(remove) and transferred into an unfertilized sheep egg, from which the natural nucleus previously 21. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(remove). In the next step, the egg was grown in the laboratory for a period of time. Then the egg was implanted into a different sheep, where it 22. \_\_\_\_\_\_\_\_\_\_\_\_\_\_(grow) normally for the certain period of time. When the sheep finally 23. \_\_\_\_\_\_\_\_\_\_\_\_\_(give) birth, the lamb was an exact genetic copy, or clone, of the sheep that 24 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(provide) the transferred nucleus, not the sheep that 25. \_\_\_\_\_\_\_\_\_\_\_\_\_\_(provide) the egg.

**2. Find and learn Russian equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1)for human or animal consumption |  |
| 2)improved nutritional content |  |
| 3)devastating financial loss |  |
| 4)the food treated with pesticides |  |
| 5)eliminate the application of |  |
| 6)a time-consuming and expensive process |  |
| 7)sensitive seedlings |  |
| 8)an antifreeze gene |  |
| 9)edible vaccines |  |
| 10)an unexpected and negative impact on human health |  |
| 11)agri-biotech companies |  |

1. **Find and learn English equivalents for the following words and expressions:**

|  |  |
| --- | --- |
| 1. самые последние технологии молекулярной биологии | a) |
| 1. быстро растущее население | b) |
| 1. голод в развивающихся странах | c) |
| 1. возможная опасность для здоровья | d) |
| 1. чрезмерное употребление пестицидов и удобрений | e) |
| 1. полоть сорняки | f) |
| 1. разбрызгивать\распылять большое количество гербицидов | g) |
| 1. переносить холодные температуры | h) |
| 1. угрожающая жизни аллергия | i) |
| 1. представлять риск для здоровья | j) |
| 1. помещать «ген-самоубийцу» в |  |

**4. Translate the following passage from Russian into English.**

*Генетически модифицированные продукты имеют потенциальные возможности, чтобы решить проблемы голодания и недоедания в мире и помочь защитить и сохранить окружающую среду путем увеличения урожайности и уменьшения доверия к химическим пестицидам и гербицидам. Хотя есть еще много задач, стоящих перед правительствами, особенно в области безопасного тестирования, регулирования, международной стратегии и нанесения маркировочных знаков на продукты. Многие люди считают, что генная инженерия – это неизбежное будущее, и мы не можем позволить себе игнорировать технологию, которая может принести огромную пользу. Однако мы должны действовать осторожно, чтобы избежать причинения непреднамеренного вреда здоровью человека и окружающей среде*

**Over to you**

1**. Work in mini-groups and prepare short presentations answering one of the following questions:**

* Do consumers have a right to know that their food has been genetically engineered? Why? Why not?
* Won’t genetically engineered foods cure world hunger?
* What can we expect in the future from GM crops?
* **What are the potential dangers of eating GM foods?**

**Writing**

**1. Write an essay in which you express your opinion.**

* Genetically engineered foods raise some ethical considerations.
* Genetically modified Food: Panacea or Poison?

**Unit 6**

**Ethics in medicine**

**EUTHANASIA**

**Vocabulary**

**1. Match the words with their definitions and write the transcription of the words in column 2. Translate the words in column 1 into Russian:**

|  |  |  |
| --- | --- | --- |
| **1** | **2** | **3** |
| 1)suicide (n.) |  | 1. performed, undertaken, or brought about by free choice, willingly |
| 2)relief (n.) |  | 1. carried out without one’s conscious wishes unintentional |
| 3)palliative (adj.) |  | 1. A feeling of cheerfulness or optimism that follows the removal of pail or distress |
| 4)voluntary (adj.) |  | 1. to further or encourage the progress or existence |
| 5)promote (v.) |  | 1. to give permission, agree |
| 6)disabled (adj.) |  | 1. the act of killing oneself intentionally |
| 7)consent (n.) |  | 1. lacking one or more physical powers |
| 8)terminally-ill (adv.) |  | 1. serving to palliate, relieving without curing |
| 9)justifiable (adj.) |  | 1. incurably ill |
| 10)involuntary (adj.) |  | 1. understandable |

**Listening**

1. **Read the newspaper article quickly before listening and say if Dr Kevorkian a saint or a monster?**

* *In the USA, a doctor is facing trial for helping a woman kill herself. Mrs Atkins, aged 54, contacted Dr Jack Kevorkian and explained that she wanted to end hoer life because she was suffering from an incurable disease. The doctor put his suicide machine into a van and he drove to a park where he told Mrs Atkins how to administer the fatal injection. In his defense the doctor said:’ She knew what she was doing, she wanted to end her life. I asked her if she knew what that meant. She said, “Yes, I’m going to die. There’s nothing for me. There’s no life.”*

1. **Robert, Jasmine and Thomas are discussing the Kevorkian case. Answer questions 1-7 by writing/saying R (for Robert), J (for Jasmine) and T (for Thomas)** 
   1. Who completely disagrees with what the doctor did?
   2. Who claims that Mrs Atkins killed herself?
   3. Who thinks the quality of a patient’s life is an important issue?
   4. Who thinks sick people aren’t always able to make good decisions?
   5. Who is worried about what might happen in the future?
   6. Who believes doctors already make life and death decisions for patents?
   7. Who thinks the doctor may escape justice?

*From Think Ahead to First Certificate by Jon Naunton*

**Before you read**

1. **You are going to read an article about euthanasia, which is the termination of a very sick person's life in order to relieve them of their suffering. Why is there so much opposition to this presumably humane idea?**
2. **Discuss with your partner the following questions.**

**-** On whose request does a doctor agree to euthanasia?

- Is euthanasia unethical?

- What does the law say about euthanasia?

1. **Skim the text to check your ideas.**

**Reading A**

The term euthanasia comes from the Greek words "eu"-meaning good and "thanatos"-meaning death, which combined means “well-death” or "dying well". Hippocrates mentions euthanasia in the Hippocratic Oath, which was written between 400 and 300 BC The original Oath states: “To please no one will I prescribe a deadly drug nor give advice which may cause his death.” Despite this, the ancient Greeks and Romans generally did not believe that life needed to be preserved at any cost and were, in consequence, tolerant of suicide in cases where no relief could be offered to the dying or, in the case of the Stoics and Epicureans, where a person no longer cared for his life.

Since the 19th Century, euthanasia has sparked intermittent debates and activism in North America and Europe. According to medical historian Ezekiel Emanuel, it was the availability of anesthesia that ushered in the modern era of euthanasia. In 1828, the first known anti-euthanasia law in the United States was passed in the state of New York, with many other localities and states following suit over a period of several years. After the Civil War, voluntary euthanasia was promoted by advocates, including some doctors. Support peaked around the turn of the century in the US and then grew again in the 1930s.

In an article in the Bulletin of the History of Medicine, Brown University historian Jacob M. Appel documented extensive political debate over legislation to legalize physician-assisted suicide in both Iowa and Ohio in 1906. Appel indicates social activist Anna S. Hall was the driving force behind this movement. According to historian Ian Dowbiggin, leading public figures, including Clarence Darrow and Jack London, advocated for the legalization of euthanasia.

Euthanasia societies were formed in England in 1935 and in the USA in 1938 to promote euthanasia. Although euthanasia legislation did not pass in the USA or England, in 1937, doctor-assisted euthanasia was declared legal in Switzerland as long as the doctor ending the life had nothing to gain. During this same era, US courts tackled cases involving critically ill people who requested physician assistance in dying as well as “mercy killings”, such as by parents of their severely disabled children.

Euthanasia may be classified according to whether a person gives informed consent into three types: voluntary, non-voluntary and involuntary.

There is a debate within the medical and bioethics literature about whether or not the non-voluntary (and by extension, involuntary) killing of patients can be regarded as euthanasia, irrespective of intent or the patient's circumstances. In the definitions offered by Beauchamp & Davidson and, later, by Wreen, consent on the part of the patient was not considered to be one of their criteria. However, others see consent as essential. For example, in a discussion of euthanasia presented in 2003 by the European Association of Palliative Care (EPAC) Ethics Task Force, the authors offered the unambiguous statement: “Medicalized killing of a person without the person's consent, whether nonvoluntary (where the person in unable to consent) or involuntary (against the person's will) is not euthanasia: it is murder. Hence, euthanasia can be voluntary only.”

Voluntary, non-voluntary and involuntary euthanasia can all be further divided into passive or active variants. A number of authors consider these terms to be misleading and unhelpful.

Euthanasia raises a number of agonizing moral dilemmas: is it ever right to end the life of a terminally ill patient who is undergoing severe pain and suffering? Under what circumstances can euthanasia be justifiable, if at all? Is there a moral difference between killing someone and letting them die? At the heart of these arguments are the different ideas that people have about the meaning and value of human existence.

Should human beings have the right to decide on issues of life and death?

**1. Read the article carefully and answer these questions according to the information in the text.**

1. What does Hippocrates say about euthanasia in the Hippocratic Oath?

2. Is physician-aid-in-dying a violation of the Hippocratic Oath?

3. Where does the support for euthanasia come from?

1. What did Brown University historian Jacob M. Appel document in 1906?
2. Why were euthanasia societies formed in England?
3. According to the person’s consent how can euthanasia be classified?
4. What do a number of authors think of the further division of involuntary euthanasia?
5. How would you answer the questions of the last paragraph?

**Language Development**

**1. Review Past Tenses. Open the brackets using the correct past tense active or passive.**

On March 26, 1999, Kevorkian (1. **to charge)** with first-degree murder and the delivery of a controlled substance. Kevorkian's license to practice medicine **(2. to** **revoke)** eight years previously; he was not legally allowed to possess the controlled substance. As homicide law is relatively fixed and routine, this trial was markedly different from earlier ones that involved an area of law in flux (assisted suicide). Kevorkian **(3. to** **discharge)** his attorneys and (**4. to** **proceed)** through the trial representing himself. The judge **(5. to** **order)** a criminal defense attorney to remain available at trial as standby counsel for information and advice. Inexperienced in law and persisting in his efforts to represent himself, Kevorkian encountered great difficulty in presenting his evidence and arguments. In particular, he was not able to call any witnesses to the stand because the judge did not deem the testimony of any of his witnesses relevant.

The Michigan jury (**6. to find)** Kevorkian guilty of second-degree homicide. It **(7. to** **prove)** that he (**8. to kill)** a person because Youk was not physically able to kill himself. Youk, unable to assist in his suicide, agreed to let Kevorkian kill him using controlled substances. The judge **(9. to** **sentence)** Kevorkian to serve 10–25 years in prison.

In the course of the various proceedings, Kevorkian made statements under oath and to the press that he **(10. to** **consider)** it his duty to assist persons in their death. He **(11. to** **indicate)** under oath that because he thought laws to the contrary were archaic and unjust, he **(12. to persist**) in civil disobedience, even under threat of criminal punishment. Future intent to commit crimes is an element parole boards may consider in deciding whether to grant a convicted person relief. After his conviction (and subsequent losses on appeal), Kevorkian **(13.** **to deny)** parole repeatedly.

In an MSNBC interview aired on September 29, 2005, Kevorkian said that if he **(14. to grant)** parole, he **(15. to** **not resume)** directly helping people die and **(16. to restrict)** himself to campaigning to have the law changed. On December 22, 2005, Kevorkian was denied parole by a board on the count of 7-2 recommending not to give parole.

**2. Find and learn Russian equivalents for the following words and expressions**

|  |  |
| --- | --- |
| 1) be tolerant of suicide | a) |
| 2) intermittent debates and activism | b) |
| 3) the availability of anesthesia | c) |
| 4) be the driving force behind | d) |
| 5) the driving force behind be | e) |
| 6) to give informed consent | f) |
| 7) “mercy killings” | g) |
| 8) severely disabled children | h) |
| 9) agonizing moral dilemmas | i) |
| 10) issues of life and death | j) |

**3. Find and learn English equivalents for the following words and expressions**

|  |  |
| --- | --- |
| 1) Сохранить любой ценой | a) |
| 2) Принять закон | b) |
| 3) Выписать смертельное лекарство | c) |
| 4) Обширные политические споры | d) |
| 5) Выступать в защиту | e) |
| 6) согласие/воля человека | f) |
| 7) оправданный/позволительный | g) |
| 8) испытывать сильную боль и страдания | h) |
| 9) в основе этих аргументов | i) |
| 10) ценность человеческой жизни | j) |

**Over to you**

**1. Work in groups and take the roles of people for or against euthanasia. Try and find answers to the questions**

1. What are the various methods used to euthanize the terminally ill?
2. Does euthanasia always ensure a painless, dignified death?
3. Doesn’t modern medicine keep people alive who would have died in the past?
4. When will the euthanasia controversy be settled?
5. Prepare a presentation on the topic being discussed.

**VIVISECTION**

**Vocabulary**

**1. Match the words with their definitions and write the transcription of the words in column 2. Translate the words in column 1 into Russian:**

|  |  |  |
| --- | --- | --- |
| 1. vivisection (n.) |  | 1. any unwanted therapeutic effect caused by a drug |
| 1. benefit (v.) |  | 1. to work out |
| 1. cure (n.) |  | 1. causing pain or suffering |
| 1. chemotherapy (n.) |  | 1. a colorless viscous liquid alkaloid extracted from certain plants, such as henbane, used in preventing travel sickness and as anticholinergic, sedative and truth serum |
| 1. rely on (v.) |  | 1. analgesic drug or agent |
| 1. support (v.) |  | 1. the act or practice of performing experiments o living animals involving cutting into or dissecting the body |
| 1. devise (v.) |  | 1. the weakly acidic extremely poisonous aqueous solution of hydrogen cyanide |
| 1. cruel (adj.) |  | 1. treatment of disease, esp cancer, by means of chemical agents |
| 1. painkiller (n.) |  | 1. to give aid, approval, or courage to |
| 1. side effect (n.) |  | 1. to put trust (in); be sure (of) |
| 1. scopolamine (n.) |  | 1. any course of medical therapy, esp one proved effective in combating a disease |
| 1. prussic acid (n.) |  | 1. to do or receive good; profit |

**Before you read**

**You are going to read an interview with Professor Anna Wright from Queen Margaret Hospital and Peter Savage of the Free the Animals Movement giving their opinion on vivisection. Before you read express your opinion on the following:**

1. Research which involves live animals should be banned. How far do you agree with this view?

2. What is wrong with the experimenting on animals?

3. If animal experimentation is of such questionable value, why does it persist?

**4. Skim the text to check your ideas.**

**Reading B**

THE DEBATE ON VIVISECTION

**Anna Wright.**  Now I must state categorically that for advances in medicine we count on being able to carry out experiments on animals. Without them, there would be no progress. We are unable to observe human beings in scientifically controlled conditions, so, unfortunately, we have to rely on animals. Medicine's made enormous advances based on the results of vivisection. For example, our knowledge of the nervous system is largely due to vivisection. It has allowed us to find cures for many illnesses. Diphtheria, smallpox and TB used to be killers in the old days but not any more. If you were bitten by a dog with rabies, you had very little chance of surviving. Now there is an antidote. Cancer recovery rates have greatly improved thanks to the work done on animals. And I'm afraid drugs have to be tested on animals prior to their release on the market to check for side effects.

Medical procedures like measuring blood pressure, pacemakers and heart and lung machines were used on animals prior to being tried on humans. Surgery techniques, like those to mend and eliminate bone diseases were devised out of experimentation on the animals. Animal testing not only benefits humans but also can help other animals, for example the heartworm medication that was devised from research on animals has assisted many dogs. The cat nutrition has been better comprehended through animal research and has assisted cats to live longer and healthier lives. Animal models for AIDS are very important factors that are required to understand the biology of immuno-deficiency viruses in the vivo. This allows us to raise necessary awareness about the processes of pathogenesis and its prevention by vaccination and chemotherapy. Those who support animal testing argue that the society has an obligation to take actions in ways that will minimize injury and maximize benefits. Banning or restraining the experimentation on animals would not allow society to achieve such results. It is assumed that a scientist’s goal is to devise methods to minimize pain to every extent possible but for now we have to sacrifice on animals to achieve this result. Activists against this practice portray scientists to be a society of crazy, cruel, curiosity seekers. However, when one feeds painkillers to animals, one should ask where they came from and what their purpose is. Is it to improve the quality of human life?

**Peter Savage**. I'd like to start by saying that I'm speaking on behalf of animals. On the issue of testing drugs on animals for side effects in human beings, as we know from the thalidomide case, it's very difficult to predict what the effect of a drug will be on human beings from tests done on animals. They just don't tell us the whole story. As for understanding the nervous system, I think most experts would agree that this could have been done equally well by careful observation and nothing more. Professor Wright points to the reduction in the number of deaths from diseases like diphtheria, TB and smallpox. This is utter nonsense because these diseases were in decline already and they've been on the decline primarily because of improvements in hygiene, not animal experiments. No, the whole thing is rubbish. If we look at penicillin and aspirin, two of the most famous modern drugs, these drugs were found by accident. So much for medical research! And Professor Wright's argument completely ignores the moral dimension. The point is experiments on animals should be stopped because they are cruel and inhumane. Dogs are made to smoke cigarettes and mice have shampoo and cosmetics squirted in their eyes to sec what will happen. Dogs don't smoke and rats and mice don't wash their hair. Very often these animals have suffered so much they have to be put down. Basically, we should take care of animals not take advantage of them.

The fact that the results attained from experiments on animal testing do not accurately portray their influence on humans is considered to be a one of the serious argument against the animal testing. Humans are quite different from other animals, so the consequences of animal testing may not applicable to humans. They argue that they way one species reacts to a given drug or chemical in a particular way does not necessarily entail other species will react in the same way. Parsley is considered to be a deadly poison for parrots yet we use it to flavor our food. Arsenic, a poison for humans but it is not harmful to sheep. Sheep, goats, horses and mice can also eat hemlock in large numbers while this is toxic to the humans. Lemon juice is toxic to the cats. A hedgehog can take a sufficient amount of opium can be taken by a hedgehog at one sitting but humans can’t without the obvious effect. Morphine is regarded as an anesthetic for humans but if it is administered to cats, it generates a state of frenzied excitement. Vitamin C is not something dogs, rats, hamsters and mice have to worry about taking, for their bodies generate Vitamin C. If humans inhale a small amount of prussic acid fumes it can kill them. However, toads, sheep and hedgehogs can drink it without any harm. Scopolamine can kill humans with a dose of just 5 milligrams. To dogs and cats about 100 milligrams was considered harmless. Penicillin, the first antibiotic, was experimented first on mice. Its application on guinea pigs would have entailed dangerous consequences, because penicillin controls the floral bacteria in the stomachs of guinea pigs and destroys them within a few days.

Animals have the right to live their own life peacefully; and we are not allowed to meddle with them just because we can.

*From Think First Certificate by Jon Naunton*

**Reading Comprehension**

**1. Read the article carefully and say if these statements true or false according to the information in the text.**

1) Animal testing supporters consider that without experiments on animals people are unable to observe human beings in scientifically controlled conditions.

2) Vivisection has allowed scientists to find cures for many illnesses

3) Those who support animal testing argue that the society has no obligation to take actions in ways that will minimize injury and maximize benefits

4) Peter Savage believes we can’t predict the effects drugs will have on humans by experimenting on animals

5) According to Professor Wright, it’s important to test drugs on animals to check for possible side-effects

6) Understanding the nervous system is possible by observation

7) Diseases were declining because of better hygiene

8) Penicillin and aspirin were discovered by careful observation

**Language Development**

Look at these sentences from the article and underline the Modals:

1. *We are unable to observe human beings in scientifically controlled conditions, so, unfortunately, we have to rely on animals.*
2. *Animal testing not only benefits humans but also can help other animals.*
3. *The point is experiments on animals should be stopped because they are cruel and inhumane.*
4. *Now I must state categorically that for advances in medicine we count on being able to carry out experiments on animals.*
5. *However, when one feeds painkillers to animals, one should ask where they came from and what their purpose is.*
6. *Humans are quite different from other animals, so the consequences of animal testing may not applicable to humans.*
7. **Underline the correct modal verb in these sentences.**
8. If humans inhale a small amount of prussic acid fumes it *can /may* kill them.
9. Vitamin C is not something dogs, rats, hamsters and mice *have to/should* worry about taking, for their bodies generate Vitamin C.
10. While there has been promise to find alternatives to animal testing, the best researchers *can/may* do for now is try to reduce the number of animals being used.
11. Consumers *can/may* prevent the unnecessary animal testing by boycotting certain products that don’t necessary require animal testing.
12. All we *must/should* do now is to try to reduce the number of animals being harmed in these experiments aimed at benefiting society.

**2. Find and learn Russian equivalents for the following words and expressions**

|  |  |
| --- | --- |
| 1) cancer recovery rates | a) |
| 2) to mend and eliminate bone diseases | b) |
| 3) to raise necessary awareness | c) |
| 4) in the vivo | d) |
| 5) to sacrifice on animals | e) |
| 6) because of improvements in | f) |
| 7) accurately portray | g) |
| 8) prussic acid fumes | h) |
| 9) to meddle with | i) |
| 10) to entail dangerous consequences | j) |

**3. Find and learn English equivalents for the following words and expressions**

|  |  |
| --- | --- |
| 1) Утверждать категорически | a) |
| 2) Полагаться на… | b) |
| 3) Прежде чем/раньше | c) |
| 4) Побочные эффекты | d) |
| 5) Свести к минимуму | e) |
| 6) выступать от лица/в защиту | f) |
| 7) снижаться/понижаться | g) |
| 8) внимательное наблюдение | h) |
| 9) случайно обнаружить | i) |
| 10) заботиться о | j) |

**4. Translate the following passage from Russian into English.**

По всему миру животных используют, чтобы тестировать продукцию, начиная от шампуней до новых препаратов от рака. Каждый лекарственный препарат, используемый человеком, сначала тестируется на животных. Животные также применяются для разработки обезболивающих, чтобы облегчить страдания людей от хронических заболеваний и во время операций. В последнее время поднимаются вопросы об этике тестирования животных. В результате было реализовано несколько

постановлений чтобы оценивать и контролировать животных, используемых в целях проведения экспериментов.

Как показывает статистика, эксперименты на животных опасны и вредны, но исследования в области медицины должны продолжаться. Нам необходимо найти другие методы тестирования.

**Over to you**

1. Divide into two groups: supporters of animal testing and supporters of animal rights and get ready for the round-table discussion. The questions below should be answered by both groups

Would drugs be safe for us without being tested first on animals?

1. If we don't use animals, what will we use?

3) How will we combat AIDS without animal experimentation?

4) How will we ever cure cancer without animals?

5) Prepare a presentation on the topic being discussed.

1. *Skimming* means to get a general idea of what a text is about. Read the first paragraph (the introduction) and the last paragraph (the conclusion). Then read the first and last sentences of the other paragraphs. [↑](#footnote-ref-1)