

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РОССИЙСКОЙ ФЕДЕРАЦИИ
УНИВЕРСИТЕТ ИТМО

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АНГЛИЙСКИЙ ЯЗЫК
ENGINEERING SCIENCES

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Учебное пособие содержит тексты, словарь-минимум, лексические упражнения и упражнения на понимание прочитанного. Цель пособия – научить магистрантов и бакалавров читать и переводить научно-популярную и техническую литературу широкого профиля, а также сформировать умения и навыки аудирования и говорения в сфере профессиональной коммуникации.

Предназначено для бакалавров и магистрантов всех направлений очной и заочной форм обучения.

Рецензенты: кафедра иностранных языков Санкт-Петербургского государственного университета аэрокосмического приборостроения (зав. кафедрой кандидат филол. наук, доц. М.А. Чиханова); доктор филол. наук, проф. Т.Г. Галушко (Российский государственный педагогический университет им. А.И. Герцена)

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Университет ИТМО – ведущий вуз России в области информационных и фотонных технологий, один из немногих российских вузов, получивших в 2009 году статус национального исследовательского университета. С 2013 года Университет ИТМО – участник программы повышения конкурентоспособности российских университетов среди ведущих мировых научно-образовательных центров, известной как проект «5 – 100». Цель Университета ИТМО – становление исследовательского университета мирового уровня, предпринимательского по типу, ориентированного на интернационализацию всех направлений деятельности.

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ВВЕДЕНИЕ

Цели и задачи курса

Настоящее учебное пособие предназначено для обучения английскому языку в академических и специальных целях в техническом вузе. Пособие рассчитано на 90 аудиторных часов и 80 часов самостоятельной работы.

Задача курса – научить студентов читать научно-популярную и техническую литературу с общим пониманием смысла прочитанного, а также закрепить и развить навыки аудирования и говорения в сфере профессиональной коммуникации.

Учебное пособие построено на базе оригинальных научно-популярных и технических текстов, лексическая и грамматическая наполняемость которых позволяет подготовить студентов к чтению оригинальной литературы по направлению (профилю) на последующих этапах обучения.

По окончании данного курса обучаемый должен:

- активно усвоить 2000 учебных лексических единиц общенаучного и технического характера;
- овладеть нормативной грамматикой письменной речи;
- уметь читать общенаучную и техническую литературу широкого профиля;
- общаться в рамках тематики пособия, т. е. понимать речь в ее естественном темпе и говорить с достаточной степенью корректности (отсутствие коммуникативных ошибок).

Структура учебного пособия

Пособие состоит из 18 уроков, каждый из которых содержит текст, словарный минимум и два типа упражнений: лексические и семантические. В разделе лексических упражнений особое место уделяется изучению интернациональной лексики, которая, как известно, составляет до 30 % научно-популярных и технических текстов. Кроме того, приводятся упражнения на словообразование (аффиксация, конверсия, словосложение), синонимию, антонимию, омонимию, фразовые глаголы, свободные и устойчивые

словосочетания. Упражнения к тексту позволяют определить степень понимания и усвоения студентами прочитанного и способствуют развитию навыков говорения и аудирования, а также формируют навыки аннотирования общенаучного и технического текста.

В конце пособия имеется словарь, повторяющий словарь-минимум к каждому уроку в алфавитном порядке.

В 6 приложениях приводятся:

- краткие сведения о фонетике и основных правилах чтения;
- правила правописания окончаний: -(e)s, -ed, -ing;
- основная система словообразования;
- краткие сведения о синонимии, антонимии и омонимии английского языка;
- правила построения вопросительных предложений;
- краткие сведения, образцы написания и оформления делового письма, конверта, служебной записки и биографии (CV или resume).

При работе с данным учебным пособием рекомендуется пользоваться следующими словарями:

- Мюллер В.К. Большой англо-русский словарь: в новой редакции. – М.: Цитадел-Трейд; Рипол классик, 2005.
- Современный англо-русский политехнический словарь / Сост. В.В. Бутник. – М.: Вече, 1999.
- Электронный словарь АBBYY Lingvo 12.

Unit 1

to be, to have, there + be

Vocabulary

attractive force – сила притяжения
block (n.) – блок, «кубик», «кирпичик»
bond (n.) – связь
calcium (n.) – кальций
carbon (n.) – углерод
certain (adj.) – определенный
charge (n.) – заряд
charge (v.) – заряжать
charged (PII) – заряженный
compound (n.) – соединение
different (adj.) – различный, отличный (от)
depend on (v.) – зависеть от
for example – например
hold (held, held) (v.) – держать, удерживать
hydrogen (n.) – водород
liquid (adj.) – жидкий
liquid (n.) – жидкость
matter (n.) – вещество
mercury (n.) – ртуть
mixture (n.) – смесь
nitrogen (n.) – азот
occur (v.) – происходить
oxygen (n.) – кислород
particular (adj.) – особенный
pressure (n.) – давление
sodium (n.) – натрий
solid (adj.) – твердый
solid (n.) – твердое тело
state (n.) – состояние
substance (n.) – вещество
take up (v.) – занимать
the same – такой же, одинаковый
vapour (n.) – пар

various (adj.) – разный
volume (n.) – объем

I. Read and translate the text.

Nature's Building Blocks

Matter is anything that has mass (the amount of material in an object) and takes up space. For example, this book has a certain amount of material – its mass – and occupies a certain volume.

Matter includes the solids, liquids, and gases around us and within us. Matter is in two chemical forms: elements (the building blocks of matter that make up every material substance) and compounds (two or more different elements held together in fixed proportions by attractive forces, we call them chemical bonds). Various elements, compounds, or both form mixtures.

There are 110 known chemical elements. 92 of them occur naturally, and the other 18 scientists synthesized in laboratories. Each has properties that make it unique, just as each of the 26 letters in the English alphabet is different from the others. For simplicity chemists represent each element by a one-or two-letter symbol: hydrogen (H), carbon (C), oxygen (O), nitrogen (N), sodium (Na), calcium (Ca), mercury (Hg), etc.

In elements there are three types of building blocks: atoms (the smallest unit of matter that is unique for a particular element), ions (electrically charged atoms or combination of atoms), and molecules (combinations of atoms of the same or different elements, held together by chemical bonds).

As you know, there are three physical states of matter: solid, liquid, and gas. Water, for example, exists as ice, liquid water, and water vapour. It depends on its temperature and pressure.

II. Read the following international words and give their Russian equivalents.

Nature, mass, matter, material, object, gas, element, block, proportion, form, laboratory, alphabet, molecule, atom, ion, temperature.

III. Fill in the gaps with the following prepositions: up, by(x2), for(x2), of(x3), in. Translate the sentences into Russian.

1. ... simplicity chemists represent each element ... a one-or-two-letter symbol.
2. Molecules are combination ... atoms ... the same or different elements, held together ... chemical bonds.
3. Water, ... example, exists ... three physical states.
4. Elements are the building blocks ... matter that make ... every material substance.

IV. Complete each sentence with a word from the box:

ions, liquids, mixtures, properties, elements.

Translate the sentences into Russian.

1. Various elements, compounds, or both form ...
2. Matter includes the solids, ..., and gases.
3. There are 110 known chemical
4. Each element has ... that make it unique.
5. ... are electrically charged atoms or their combination.

V. Put the words in the correct order to make a statement. Ask your partner to translate it.

1. there / atoms / in / three / elements / in / types / ions / blocks / molecules / building / of / and / are.
2. mass / is / anything / matter / that / has.
3. 26 / the / in / there / English / are / alphabet / letters.

VI. Answer the following questions to the text.

1. What is matter?
2. How many chemical forms of matter do you know?
3. How do chemists represent elements?
4. How many types of building blocks are there in an element?
5. Which three physical states of matter do you know?

VII. Rearrange the following sentences to make the summary of the text.

1. Matter exists in two forms: elements and compounds.
2. Three physical states of matter are solid, liquid and gas.
3. Matter is everything around us.
4. Any element contains atoms, ions and molecules.
5. Matter is anything that has mass and takes up space.

Unit 2

some/any/no/one/each; the Present Simple Tense

Vocabulary

as a whole – в целом

become (became, become) (v.) – становиться, превращаться

call (v.) – называть

cancel (v.) – отменять, аннулировать; зд.: уравнивать

chlorine (n.) – хлор

consist of (v.) – состоять из

contain (v.) – содержать

distinguished (adj.) – отличительный

equal (adj.) – равный

feature (n.) – черта, признак

gain (v.) – получать, приобретать

lose (lost, lost) (v.) – терять

nucleus (n.) – ядро

I. Read and translate the text.

Atoms and Ions

Each different type of atom has a certain number of subatomic particles. The main building blocks of an atom are positively charged protons (p), unchanged neutrons (n), and negatively charged electrons (e).

Each atom consists of a relatively small centre, or nucleus, which contains protons and neutrons; one or more electrons orbit the nucleus.

The distinguishing feature of an atom of any given element is the number of protons in its nucleus called its atomic number. The simplest element, hydrogen (H), has only one proton in its nucleus, its atomic number is 1. Carbon (C), with six protons, has an atomic number of 6. Each atom has an equal number of positively charged protons and negatively charged electrons. Because these electrical charges cancel one another the atom as a whole has no electrical charge.

Atoms of some elements can lose or gain one or more electrons and form ions: atoms or groups of atoms with one or more positive (+) or negative (-) electrical charges. For example, an atom of sodium (Na) can

lose one of its electrons and become a sodium ion with a positive charge of one (Na^+). An atom of chlorine (Cl) can gain an electron and become a chlorine ion with a negative charge of one (Cl^-).

II. Read the following international words and give their Russian equivalents.

Type, positive, negative, proton, electron, neutron, centre, hydrogen, carbon, electrical, group chlorine.

III. Define the parts of the speech of the following words. Translate them into Russian.

Atomic, relative, electrical, positive, different, negative, chemical, organic, basic.

IV. Turn the following adjectives into adverbs. (use suffix -ly)

1. positive
2. negative
3. different
4. relative
5. electrical
6. chemical
7. natural

V. Fill in the gaps with the following propositions: of(x3), in, with(x2). Translate the sentences into Russian.

1. Ions are atoms or groups ... atoms ... one or more positive or negative electrical charges.
2. Hydrogen has only one proton ... its nucleus.
3. Each atom consists ... a nucleus and one or more electrons which orbit it.
4. Carbon, ... six protons, has an atomic number ... six.

VI. Put the words in the correct order to make a statement. Ask your partner to translate it.

1. contains / every / neutrons / nucleus / protons
2. as / has / charge / the / whole / atom / electrical / a / no
3. form / atoms / electrons / ions / can / or / gain / and / lose
4. has / proton / one / hydrogen / only

VII. Answer the following questions to the text.

1. Which building blocks does an atom consist of?
2. What does a nucleus contain?
3. What do we call an atomic number of an element?
4. What do we call ions?

VIII. Rearrange the following sentences to make the summary of the text.

1. An atomic number is the number of protons in its nucleus.
2. The main building blocks of an atom are protons, neutrons and electrons.
3. Atoms of some elements can lose or gain one or more electrons and form ions.
4. A nucleus contains protons and neutrons, and one or two electrons orbit the nucleus.

Unit 3

Существительное в функции определения

Vocabulary

combine (v.) – сочетать
chloride (n.) – хлорид
drugs (n.) – лекарственные препараты
exist (v.) – существовать
have in common – иметь общее
link (n.) – связь
link (v.) – связывать
oppositely (adv.) – противоположно
plastic(s) (n.) – пластмасса
represent (v.) – представлять, обозначать
sodium (n.) – натрий
subscript (n.) – подстрочный знак, индекс
sulfur (n.) – сера
unit (n.) – единица
use (v.) – использовать
yield (v.) – давать какой-нибудь результат

I. Read and translate the text.

Compounds

Most matter exists as compounds. Chemists use a short chemical formula to show the number of atoms (ions) of each type in a compound. The formula contains the symbols for each of the element present and uses subscript to represent the number of atoms (or ions) of each element in the compound's basic structural unit.

For example, in water, a molecular compound, each molecule consists of two hydrogen atoms chemically bonded to an oxygen atom, yielding H₂O (read as «H-two-O») molecules. Sodium chloride (or table salt), an ionic compound, is represented by NaCl because it consists of a network of oppositely charged ions (Na⁺ and Cl⁻) held together by the force of attraction between opposite electric charges.

Table sugar, vitamins, plastics, and many other important materials have one thing in common. They are organic compounds containing carbon atoms combined with each other and atoms of one or more other elements such as hydrogen, oxygen, nitrogen, sulfur, etc. Organic compounds can be either natural or synthetic (such as plastics and many drugs made by humans).

Larger and more complex organic compounds, called polymers, consist of a number of basic structural or molecular units (monomers) linked together by chemical bonds, somewhat like cars are linked together in a train. We call other compounds inorganic compounds.

II. Read the following international words and give their Russian equivalents.

Formula, symbol, present, basic, structural, salt, vitamin, plastic, (in)organic, synthetic, complex, monomer, human.

III. Define the parts of the speech of the following words. Translate them into Russian.

Attraction, pressure, chemist, feature, proportion, temperature, combination, mixture.

IV. Make the collocations matching an adjective on the left with a noun on the right. Ask your partner to make sentences with them.

Adjective

1. organic
2. electric
3. chemical
4. synthetic
5. simple

Noun

- a. formula
- b. element
- c. material
- d. charge
- e. compound

V. Fill in the gaps with the following propositions: of(x3), in, for(x2).

Translate the sentences into Russian.

1. The formula contains the symbols ... each ... the element.
2. They have one thing ... common.
3. Polymers consist ... a number ... monomers.
4. ... example, the symbols NaCl represent sodium chloride or table salt.

VI. Put the words in the correct order to make a statement. Ask your partner to translate it.

1. ionic / sodium / an / compound / is / chloride
2. can / natural / organic / and / be / synthetic / compounds
3. complex / organic / are / compounds / more / polymers
4. each / in / two / one / consists of / molecule / hydrogen / atoms / oxygen / water / and

VII. Answer the following questions to the text.

1. What does a chemical formula contain?
2. What do sugar and plastic have in common?
3. What do polymers consist of?

VIII. Rearrange the following sentences to make the summary of the text.

1. A molecule of water consists of two hydrogen atoms chemically bonded to an oxygen atom.
2. More complex organic compounds are called polymers.
3. Organic substances contain carbon atoms and atoms of some other element.
4. A chemical formula shows the number of atoms of each element in a compound.
5. Polymers consist of a number of monomers linked together by chemical bonds.

Unit 4
it, one, that;
comparisons

Vocabulary

available (adj.) – имеющийся в наличии, годный
average (adj.) – средний
because of – из-за
boil (v.) – кипеть
burn (burnt, burnt) (v.) – гореть, сжигать
capacity (n.) – способность, емкость
coal (n.) – уголь
cold (adj.) – холодный
concept (n.) – понятие
content (n.) – содержание
dam (n.) – плотина, дамба
define (v.) – определять
distance (n.) – расстояние
drop (v.) – ронять, бросать, падать
either...or – или...или, либо...либо
elusive (adj.) – неуловимый, незаметный
engine (n.) – двигатель, мотор
exclude (v.) – исключать
experience (v.) – испытывать, чувствовать
fall (fell, fallen) (v.) – падать
flow (flew, flown) (v.) – течь
gasoline (n.) – горючее
heat (n.) – тепло, теплота
heat (v.) – нагревать
high (adj.) – высокий
hot (adj.) – горячий, жаркий
light (n.) – свет
low (adj.) – низкий
measure (n.) – мера
motion (n.) – движение
move (v.) – двигать, передвигать
movement (n.) – движение

nuclei (n., pl.) – ядра
nucleus (n., sing.) – ядро
occupy (v.) – занимать
painful (adj.) – болезненный
perform (v.) – выполнять
pick up (v.) – собирать
propel (v.) – приводить в движение
refer to (v.) – относить, ссылаться
sample (n.) – образец, пример
scientist (n.) – ученый
speed (n.) – скорость
steam (n.) – водяной пар
store (v.) – сохранять, накапливать
stove (n.) – печь, плита
stream (n.) – поток
touch (v.) – трогать, прикасаться
transfer (v.) – передавать
velocity (n.) – скорость

I. Read and translate the text.

Forms of Energy

Energy is an elusive concept. One cannot pick it up or touch it because it neither has mass nor occupies space. We do not define energy in terms of what it is, we define energy in terms of what it does or can do. Energy is the capacity to do work and transfer heat. One can perform work when an object is moved over some distance. You do work when you move matter, such as your arm or this book. Work, or matter movement, also is necessary to boil liquid water and change it into the faster moving water molecules in steam. Energy is also the heat that flows automatically from a hot object to a cold one when they come in contact. Touch a hot stove and you experience this energy flow in a painful way.

Energy comes in many forms: light, heat, electricity, chemical energy stored in the chemical bonds in coal, sugar, and other materials; moving matter such as water, wind, and nuclear one.

Scientists classify energy as either kinetic or potential. Kinetic energy is the one that matter has because of its mass and its speed or

velocity. It is energy in action or motion. Wind (a moving mass of air), flowing streams, falling rocks, heat flowing from a body at a high temperature to one at a lower temperature, electricity (flowing electrons) – all have kinetic energy.

Potential energy is stored energy that is potentially available for use. A rock held in your hand, still water behind a dam, and the nuclei of atoms all have potential energy because of their position or the position of their parts. When one drops a rock, its potential energy changes into kinetic one. When you burn gasoline in a car engine, the potential energy stored in the chemical bonds of its molecules changes into heat, light, and mechanical (kinetic) energy that propels the car.

Heat refers to the total kinetic energy of all the moving atoms, ions, or molecules within a given substance, excluding the overall motion of the whole object. Temperature is a measure of the average speed of motion of the atoms, ions, or molecules in a sample of matter at a given moment. A substance can have a high heat content (much mass and many moving atoms, ions, or molecules) but a low temperature (low average molecular speed). For example, the total heat content of a lake is enormous, but its average temperature is low. Another substance can have a low heat content and a high temperature; a cup of hot coffee, for example, has a much lower heat content than a lake but its temperature is much higher.

II. Read the following international words and give their Russian equivalents.

Energy, elusive, to occupy, term, to define, to transfer, distance, automatically, contact, chemical, nuclear, potential, kinetic, action, position, mechanical, substance, measure, moment, total, coffee.

III. Complete each sentence by making a noun from the word in brackets. Ask your partner to translate them.

1. Work, or matter (to move), is necessary to change the state of matter.
2. Kinetic energy is energy in (to act).
3. Energy is the (capable) to do work.
4. One performs work when moves an object over some (distant).

IV. Match synonyms.

- | | |
|-------------|-------------|
| 1. do | a. velocity |
| 2. movement | b. matter |

3. speed
4. total
5. substance

- c. motion
- d. perform
- e. whole

V. Fill in the gaps with the following prepositions: to(x2), into, of(x2), in, within, from. Ask your partner to translate them.

1. Kinetic energy is the one that matter has because ... its mass and speed.
2. Work is necessary to change water ... steam.
3. Heat refers ... the total kinetic energy ... all the moving atoms ... a given substance.
4. Energy is the heat that flows ... a hot object ... a cold one when they come ... contact.

VI. Mark the statements as true (T) or false (F). Correct the false statements, using the following phrases:

In my opinion ...

I think ...

As far as I know ...

1. Temperature is a measure of the average speed of motion of the atoms or molecules in substance at a given moment.
2. When you drop a rock, its kinetic energy changes into potential one.
3. Energy has either mass or space.
4. One defines energy in terms of what it is.
5. Energy is the capacity to do work and transfer heat.

VII. Answer the following questions to the text.

1. How can we define a) energy b) kinetic energy c) potential energy?
2. What forms of energy do you know?
3. What happens if you touch a hot object?
4. Can the potential energy change into kinetic one? Give examples.
5. What is the difference between the temperature and heat content?

VIII. Rearrange the following sentences to make the summary of the text.

1. Energy can be classified as kinetic and potential.
2. Energy is the capacity to do work and transfer heat.
3. Potential energy is the stored one.
4. Energy exists in many forms: light, heat, electricity, etc.

5. Temperature is a measure of the speed of all these particles at a given moment.
6. Heat is the total kinetic energy of all moving particles within a given substance.
7. A body has kinetic energy because of its mass and velocity.

Unit 5

The Present Simple Tense

Vocabulary

add (v.) – прибавлять, складывать, подводить
alter (v.) – менять, изменять
arrow (n.) – стрелка
cause (v.) – быть причиной, вызывать, заставлять
change (n.) – изменение
change (v.) – менять, изменять
chemicals (n.) – химические продукт, химикаты
completely (adv.) – полностью, целиком
composition (n.) – состав
cut (cut, cut) (v.) – резать
equation (n.) – уравнение
foil (n.) – фольга
give (gave, given) off (v.) – отдавать, отводить
happen (v.) – происходить, случаться
initial (adj.) – начальный, первоначальный
instead (adv.) – вместо, взамен
involve (v.) – вовлекать, включать
melt (v.) – таять, плавиться
pattern (n.) – модель
reactant (n.) – реагент
release (v.) – высвободить
require (v.) – требовать
spatial (adj.) – пространственный

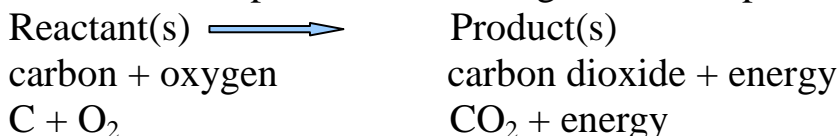
I. Read and translate the text.

Physical and Chemical Changes

A physical change involves no change in chemical composition. Cutting a piece of aluminium foil into small pieces is one example; changing a substance from one physical state to another is a second example. When solid water (ice) melts or liquid water boils, none of the H₂O molecules change; instead, the molecules form different spatial

(physical) patterns. In a chemical change or chemical reaction, the chemical compositions of the elements or compounds alter.

Chemists use short chemical equations to represent what happens in a chemical reaction. A chemical equation shows the chemical formulae for the reactants (initial chemicals) and the products (chemicals produced) with an arrow between them. For example, when coal burns completely, the solid carbon (C) which it contains combines with oxygen gas (O₂) from the atmosphere to form the gaseous compound carbon dioxide (CO₂):



This reaction gives off energy and makes coal a useful fuel. The reaction also shows how the burning of coal adds carbon dioxide gas to the atmosphere.

Physical and chemical changes illustrate the connections between matter and energy. Any physical or chemical change either requires or gives off energy. For example, it takes energy to convert liquid water to steam. However, when the steam contacts a cooler object (such as your skin), it releases energy and returns the water to its liquid state – which is why steam can cause severe burns.

II. Read the following international words and give their Russian equivalents.

Composition, aluminium, second, to alter, to organize, reaction, composition, product, to contain, atmosphere, to illustrate, to convert, to contact.

III. Fill in the table.

Verb	Noun	Adjective
differ		
	reaction	
connect		
	change	
		illustrative

IV. Match synonyms.

- | | |
|-------------|---------------|
| 1. give off | a. pattern |
| 2. change | b. combine |
| 3. connect | c. release |
| 4. show | d. alter |
| 5. example | e. illustrate |

V. Underline the odd word in each group. Explain the choice.

- | | | | |
|---------------|---------------|--------------|-------------|
| a. solid | b. gas | c. atom | d. liquid |
| a. ice | b. steam | c. water | d. carbon |
| a. substance | b. material | c. compound | d. matter |
| a. to contact | b. to convert | c. to change | d. to alter |

VI. Mark the statements as true (T) or false (F). Correct the false statements.

1. A physical change involves many changes in chemical composition.
2. Any physical or chemical change neither requires nor gives off energy.
3. When the steam contacts a cooler object, it releases energy.
4. Physical and chemical changes illustrate the connections between matter and energy.

VII. Answer the following questions to the text.

1. Does a physical change involve a change in chemical composition?
Give examples.
2. What do we call a chemical reaction?
3. What happens during the chemical reaction?
4. What does a chemical reaction show?
5. What happens in converting liquid water to steam?

VIII. Rearrange the following sentences to make the summary of the text.

1. Any physical or chemical change either requires or gives off energy.
2. The chemical formulae of the reactants and the products with an arrow between them are called chemical equation.
3. A chemical change or reaction alters the chemical compositions of the elements.
4. A physical change does not change chemical composition.
5. Physical and chemical changes illustrate the connections between matter and energy.

Unit 6

Tenses in the Active Voice

Vocabulary

although – хотя
amount (n.) – количество
billion (num.) – миллиард
bury (v.) – хоронить, зарывать в землю, прятать
carry (v.) – переносить
conservation (n.) – сохранение
consume (v.) – потреблять
create (v.) – создавать
destroy (v.) – уничтожать
discard (v.) – выбрасывать
dust (n.) – пыль
earth (n.) – земля
emit (v.) – испускать, выделять
environment (n.) – окружающая среда
essentially (adv.) – существенно, по существу, чрезвычайно
evolve for (v.) – эволюционировать, превращаться в, развивать(ся)
gain (n.) – прибыль, прирост
hence – следовательно
key chemicals – ключевые химические продукты
law (n.) – закон
loss (n.) – потеря
mean (v.) – значить, означать
measurement (n.) – измерение
minute (adj.) – мелкий, мельчайший
occasional (adj.) – случайный
process (v.) – обрабатывать, перерабатывать
receive (v.) – получать
resource (n.) – ресурс, источник
soil (n.) – почва
term (n.) – термин
throw (threw, thrown) (v.) – бросать

I. Read and translate the text.

The Law of Conservation of Matter

Earth loses some gaseous molecules to space, and it gains small amounts of matter from space, mostly in the form of occasional meteorites and cosmic dust. These losses and gains of matter are minute compared with Earth's total mass. Hence, in terms of matter, Earth is essentially a closed system although in terms of energy it is an open system. It is receiving energy from the sun and emitting heat back into space. Over billions of years natural processes have evolved for continuously cycling key chemicals between living things and their nonliving environment (soil, air, and water).

People commonly talk about consuming or using up material resources, but in truth we do not consume matter — we only use some of Earth's resources for a while. We take materials from Earth, carry them to another part of the globe, and process them into products that we use and then discard, burn, bury, reuse or recycle. In so doing we may change various elements and compounds from one physical or chemical form to another, but we cannot create or destroy any of the atoms. All we can do is to rearrange them into different spatial patterns (physical changes) or different combinations (chemical changes). We know this fact, based on many thousands of measurements, as the law of conservation of matter. It means that there is no «away» in «to throw away». Everything that we think we have thrown away is still with us in one form or another.

II. Read the following international words and give their Russian equivalents.

Meteorite, cosmic, system, to evolve, cycle, air, resource, globe, to process, combination, to (re)arrange.

III. Match antonyms

- | | |
|------------|--------------|
| 1. gain | a. minute |
| 2. create | b. emit |
| 3. living | c. destroy |
| 4. great | d. lose |
| 5. receive | e. nonliving |

IV. Change the meaning of the following verbs adding the prefix «re».

1. to use
2. to cycle
3. to arrange
4. to store
5. to form

V. Fill in the gaps with the following prepositions: from(x2), about, into(x2), in(x2), for, to, of(x2). Ask your partner to translate them.

1. People commonly talk ... consuming material resources, but ... truth we do not consume matter — we only use it ... a while.
2. We take materials ... Earth, carry them ... another part ... the globe, and process them ... products.
3. ... terms ... matter, Earth is a closed system.
4. Earth receives energy ... the sun and emits heat back ... space.

VI. Answer the following questions to the text.

1. In what forms does Earth gain matter from space?
2. What is Earth in terms of matter and in terms of energy?
3. How do we utilise products which we receive from Earth?
4. How can we define the Law of Conservation of Matter? What does it mean?

VII. Rearrange the following sentences to make the summary of the text.

1. We take materials from Earth and process them into products that we use and then discard, destroy or recycle.
2. Earth loses some molecules to space and gains small amounts of matter from space.
3. We rearrange them into different patterns or different combinations.
4. These losses and gains of matter are very small.
5. We know this fact as the law of conservation of matter.
6. In so doing we cannot create or destroy any of the atoms.
7. Earth is a closed system in terms of matter and an open system in terms of energy.

Unit 7 Modals; the Passive Voice

Vocabulary

creation (n.) – создание, формирование
decrease (n.) – уменьшение, сокращение
destruction (n.) – разрушение, уничтожение
detect (v.) – обнаруживать
disorderly (adj.) – беспорядочный, неорганизованный
disperse (v.) – рассеивать
drive (drove, driven) (v.) – ездить, ехать
equal (v.) – быть равным, равняться
exhaust (n.) – выхлопная труба
fill (v.) – наполнять, заполнять
govern (v.) – управлять, руководить, определять
input (n.) – вход
main (adj.) – основной, главный
neither...nor – ни...ни; ни тот, ни другой
observe (v.) – наблюдать
output (n.) – выход
perform (v.) – выполнять
quality (n.) – качество
quantity (n.) – количество
random (adj.) – беспорядочный, хаотичный
relatively (adv.) – относительно
scientific (adj.) – научный
spontaneously (adv.) – спонтанно, самопроизвольно
state (v.) – заявлять, констатировать, гласить
tank (n.) – бак, резервуар
violation (n.) – нарушение

I. Read and translate the text.

The Two Main Laws of Energy

Scientists have observed that energy is changed from one form to another in millions of physical and chemical changes, but they have never

been able to detect either the creation or destruction of any energy. The results of these experiments have been summarized in the law of conservation of energy, also known as the first law of thermodynamics. In all physical and chemical changes, energy is neither created nor destroyed, but it may be converted from one form to another.

This scientific law is one of the basic rules governing what we can and cannot do. It tells us that when one form of energy is converted to another one in any physical or chemical change, energy input always equals energy output. No matter how hard we try or how clever we are, we cannot get more energy out of a system than we put into it.

Because the first law of energy states that energy can be neither created nor destroyed, it is tempting to think that there will always be enough energy. Yet, if we fill a car's tank with gasoline and drive around, something has been lost. If it is not energy, what is it? The answer is energy quality, the amount of available energy that can perform useful work. The chemical energy concentrated in gasoline is high-quality energy that can perform useful work (moving a car) when the gasoline is burnt. But in the process, most of the high-quality energy in gasoline is changed into less concentrated heat energy (in the engine and exhaust) that has little ability to do useful work.

Countless experiments have shown that when energy is changed from one form to another, a decrease in energy quality always occurs. The results of these experiments have been summarized in what is called the second law of energy, or the second law of thermodynamics. When energy is changed from one form to another, some of the useful energy is always degraded to lower-quality, more dispersed, less useful energy. This degraded energy usually takes the form of heat given off at a relatively low temperature to the surroundings, where it is dispersed by the random motion of air or water molecules and becomes even more disorderly and less useful. Another way to state the second law of energy is that heat always flows spontaneously from hot (high-quality energy) to cold (low-quality energy). The more energy we use, the more low-grade energy (heat) we add to the environment. No one has ever found a violation of this fundamental scientific law.

II. Read the following international words and give their Russian equivalents.

To observe, million, to detect, to create, to destruct, result, experiment, to concentrate, fundamental.

III. Match antonyms.

- | | |
|----------------|-------------|
| 1. high | a. creation |
| 2. input | b. low |
| 3. cold | c. quantity |
| 4. destruction | d. hot |
| 5. more | e. output |
| 6. quality | f. less |

IV. Fill in the table.

Verb	Noun	Adjective	Adverb
create			
	destruction		
		conservative	
			usefully
relate			

V. Complete each sentence by making an adjective from the word in brackets. Ask your partner to translate it.

1. This (science) law is one of the (base) rules.
2. (To count) experiments were performed to prove this law.
3. Heat is a (spontaneously) flow from hot to cold.
4. When energy is changed from one form to another, some of the (use) energy is degraded to (low) quality one.

VI. Mark the statements as true (T) or false (F). Correct the false statements, using the following phrases:

To my mind ...

I don't think that's right ...

I don't agree / I disagree ...

1. The first law of energy states that energy can be either created or destroyed.
2. When energy is changed from one form to another, an increase in energy quality always occurs.
3. When one form of energy is converted to another one, energy input always equals energy output.

4. The more energy we use, the less low-grade energy we add to the environment.

VII. Answer the following questions to the text.

1. What happens to energy during physical and chemical changes?
2. What is the correlation between energy input and energy output during its conversion?
3. What do we mean when we speak about energy quality?
4. Why cannot we use the energy in gasoline endlessly?
5. How can we define the first law of thermodynamics?
6. What is the meaning of the second law of energy?

VIII. Rearrange the following sentences to make the summary of the text.

1. This process is called the second law of energy, when heat always flows from hot to cold.
2. When one form of energy is converted to another one, energy input always equals energy output.
3. Scientists have never been able to detect either the creation or destruction of any energy.
4. However, some of the useful energy is always degraded to less useful one.
5. This degraded energy usually takes the form of heat given off to the surroundings, where it is dispersed.
6. The first law of thermodynamics states that energy is neither created nor destroyed, but it may be converted from one form to another.

Unit 8
The Passive Voice;
многозначность to be, to have, to do

Vocabulary

accept (v.) – принимать
assumption (n.) – предположение, допущение
attempt (n.) – попытка
certain (adj.) – определенный
conduct (v.) – проводить
connect (v.) – связывать
data (n., pl.) – данные, факты
description (n.) – описание
discover (v.) – открывать, обнаруживать
disprove (v.) – опровергать
eliminate (v.) – устранять, исключать, ликвидировать
exception (n.) – исключение
explain (v.) – объяснять
goal (n.) – цель
important (adj.) – важный
influence (v.) – влиять
investigate (v.) – изучать, исследовать
knowledge (n.) – знания
lead (led, led) (v.) – вести
order (n.) – порядок
predict (v.) – предсказывать
prediction (n.) – предсказание
previously (adv.) – ранее
science (n.) – наука
search (n.) – поиск
support (v.) – поддерживать
tie (v.) – связывать

I. Read and translate the text.

What is Science?

Science is an attempt to discover order in nature and then use that knowledge to make predictions about what should happen in nature. Science is based on the assumption that there is discoverable order in nature. In this search for order, scientists try to understand, predict, and influence nature by answering two basic questions: (1) What happens in nature? and (2) how do things happen this way?

What do scientists do?

The first thing scientists have to do is to ask question or identify a problem which is to be investigated. Then scientists working on this problem collect scientific data, or facts, by making observations and measurements.

The primary goal of science is not facts, but a new idea, principle, or model that connects and explains certain facts and leads to useful predictions about what should happen in nature. Scientists try to come up with a variety of possible explanations or scientific hypotheses of what they observe in nature. Then experiments are conducted to test each hypothesis. However, although experiments can eliminate (disprove) various hypotheses, they can never prove that any hypothesis is the best or the only explanation. All scientists can say is that an explanation is the most useful one so far. If many experiments by different scientists support a particular hypothesis, it becomes a scientific theory – a well-tested and widely accepted idea, principle, or model that ties together and explains many facts that previously were unrelated.

Another end result of science is a scientific law – a description of what we find happening in nature over and over in the same way, without known exceptions.

The scientific process requires not only logical reasoning, but also imagination, creativity, and intuition. According to physicist Albert Einstein, «There is no completely logical way to a new scientific idea». Intuition, imagination, and creativity are as important in science as they are in poetry, art, music, and other great adventures of the human spirit that awaken us to the wonder, mystery, and beauty of life.

II. Read the following international words and give their Russian equivalents.

To identify, problem, to collect, fact, principle, model, hypothesis(es), theory, test, intuition, creativity.

III. Match synonyms.

- | | |
|--------------|-------------|
| 1. happen | a. object |
| 2. eliminate | b. connect |
| 3. data | c. occur |
| 4. tie | d. disprove |
| 5. thing | e. facts |

IV. Fill in the gaps with the following prepositions, translate the sentences into Russian of(x3), in(x3), with, without, up, to.

1. A scientific law is a description ... what is happening in nature ... the same way ... known exceptions.
2. There is no completely logical way ... a new scientific idea.
3. Science is an attempt to discover order ... nature.
4. Scientists try to come ... a variety ... possible explanations ... what they observe ... nature.

V. Make nouns from the following verbs using suffixes.

Verb

Noun

to predict
to discover
to assume
to observe
to describe
to require
to explain
to measure
to conduct

VI. Underline the odd word in each group. Explain the choice.

1. poetry, music, painting, science
2. facts, nature, ideas, data
3. to require, to discover, to observe, to investigate
4. test, theory, experiment, trial

VII. Complete each sentence with words from the box:

experiments, hypothesis, law, intuition, theory

1. If many tests support a particular ..., it becomes a
2. ... are conducted to test hypotheses.
3. The end result of science is a scientific
4. The scientific process requires imagination and

VIII. Answer the following questions to the text.

1. What is science based on?
2. Why do scientists carry out experiments?
3. What does a scientific process result in?
4. What is a scientific theory?
5. What is a scientific hypothesis?
6. When does a hypothesis become a scientific theory?

IX. Rearrange the following sentences to make the summary of the text.

1. Another end result of science is a scientific law.
2. Then scientists collect scientific data by making observations and measurements.
3. Science is an attempt to discover order in nature and then predict what should happen.
4. The primary goal of science is a new idea that explains certain facts and leads to useful predictions.
5. The first thing scientists have to do is to identify a problem which is to be investigated.
6. If many experiments by different scientists support a particular hypothesis, it becomes a scientific theory.

Unit 9

Subordinate Clauses

Vocabulary

application (n.) – применение
apply (v.) – применять, употреблять
arise (arose, arisen) (v.) – возникать
case (n.) – случай
challenge (v.) – ставить под вопрос, оспаривать
chance (n.) – шанс
concern (v.) – касаться, относиться, затрагивать
core (n.) – центр, сердцевина, основа
crop (n.) – сельскохозяйственная культура
crossbreed (crossbred, crossbred) (v.) – скрещивать
develop (v.) – развивать, разрабатывать
differ (v.) – различать(ся)
distribute (v.) – распределять, распространять
efficiency (n.) – эффективность, результативность, продуктивность, действенность, умение
error (n.) – ошибка, погрешность
get along (v.) – справиться
improve (v.) – улучшать
inkling (n.) – намек, слабое представление о чем-либо
intend (v.) – предназначать
internal (adj.) – внутренний
invent (v.) – изобретать
keep (kept, kept) (v.) – хранить
livestock (n.) – домашний скот
modify (v.) – видоизменять, корректировать
plant (n.) – растение; завод; установка
share (v.) – делить, разделять
strain (n.) – штамм
survival (n.) – выживание
tangible (adj.) – вещественный, материальный
trial (n.) – испытание, проба
verify (v.) – проверять

I. Read and translate the text.

What is Technology?

Technology is the creation of new products and processes which are intended to improve our efficiency, our chances for survival, our comfort level, and our quality of life. The goal of science is to develop widely accepted knowledge or ideas, which are intangible; by contrast, technology is concerned primarily with the development of tangible things.

In many cases, technology develops from known scientific laws and theories. Scientists invented the laser, for example, when they apply knowledge about the internal structure of atoms. Applications of theories in nuclear physics led to nuclear bombs and nuclear power plants.

However many technologies arise by trial and error, before anyone understands the underlying scientific principles. Photography was invented by people who had no inkling of its chemistry, and farmers crossbred new strains of crops and livestock long before biologists understood the principles of genetics. In fact, much of science is an attempt to understand and explain why various technologies work.

Although some forms of technology use scientific knowledge, nearly all sciences need technology. Scientists use machines and instruments to collect and analyze data, to perform experiments, and make complex computation. Scientists cannot get along without such things as paper, pencils, test tubes, computers, books, and telephones — all products of technologies. Although at their cores science and technology share similar processes (both are essentially trial and error), they usually differ in the way the ideas and information they produce are shared.

Many of the results of scientific research are published and distributed freely to be tested, challenged, verified, or modified. In contrast, many technological discoveries are kept secret until the new process or product is patented.

II. Read the following international words and give their Russian equivalents.

Efficiency, comfort, contrast, laser, bomb, photography, biologist, genetics, machine, instrument, analyze, telephone, product, to publish, secret, to patent.

III. Make verbs from the following nouns using conversion. Ask your partner to make sentences with them.

Noun	Verb
change	
form	
heat	
drop	
burn	
store	
light	
measure	
charge	
orbit	
use	
decrease	
increase	
process	
patent	

IV. Fill in the gaps with the following prepositions in(x2), by(x2), around, with, without, of, from.

1. Many technologies arise ... trial and error.
2. ... fact, science is an attempt to understand and explain the world ... us.
3. ... contrast, technology is concerned ... the development ... tangible things.
4. ... many cases, technology develops ... scientific law and theories.
5. Scientists cannot get along ... such thing as books, pens, and computers.

V. Fill in the table.

Verb	Noun	Adjective	Adverb
produce			
	information		
			collectively
		free	

VI. Mark the statements as true (T) or false (F). Correct the false statements.

1. As a rule, many technological discoveries are distributed freely.
2. Technology is the creation of new products and processes.
3. Science is concerned primarily with the development of tangible things.
4. Scientists can get along without products of technology.

VII. Answer the following questions to the text.

1. What is technology concerned with?
2. What does technology develop from?
3. How are science and technology related?
4. How do science and technology differ?

VIII. Rearrange the following sentences to make the summary of the text.

1. Many technologies arise by trial and error.
2. Technology is the creation of new products and processes.
3. Many technological discoveries are kept secret until the new process or product is patented.
4. The goal of technology is the development of tangible things.
5. Nearly all sciences need technology.
6. In many cases, technology develops from known scientific laws and theories.

Unit 10

Subordinate Clauses

Vocabulary

advance (v.) – продвигать
applied sciences – прикладные науки
body (n.) – тело
branch (n.) – отрасль, раздел, ветвь
by means of – посредством, с помощью
carry on (v.) – продолжать
carry out (v.) – проводить, выполнять
compress (v.) – сжимать
denote (v.) – обозначать
density (n.) – плотность
devote (v.) – посвящать
establish (v.) – устанавливать, учреждать, основывать
freeze (froze, frozen) (v.) – замораживать, замерзнуть
fume (n.) – дым, испарения
hole (n.) – отверстие, дыра
include (v.) – включать в себя
installation (n.) – установка
oil (n.) – нефть
property (n.) – свойство
provide (v.) – обеспечивать, снабжать
pure sciences – фундаментальные науки
purpose (n.) – цель
research (n.) – исследование
skilful (adj.) – опытный, умелый
spirit lamp – спиртовая лампа, спиртовка
suction fan – приточный вентилятор
test-tube (n.) – пробирка
viscosity (n.) – вязкость

I. Read and translate the text.

What are Laboratories?

Any laboratory is a place where scientists must carry out experimental study in any branch of science. The purpose of it is to advance knowledge or to apply scientific principles in testing, analyses and special application of natural laws. The word 'laboratory' denotes any room or building where scientists are to make investigations.

Among the laboratories of the world we may note the laboratory of the Royal Institution of Britain established in 1800 and devoted to the applied sciences. The laboratory soon became seat of activity where such great scientists as M. Faraday and J. Tyndall might conduct research in pure sciences.

Nowadays laboratories have to be introduced into educational institutions to teach scientific and technical knowledge by means of experiments. New laboratories will have to provide for more departments for research in pure sciences and for application of science to industrial purposes where skilful industrial workers, engineers and scientists will be able to carry on their important work.

In a chemical laboratory one can see different gases, including oxygen and hydrogen kept in heavy tanks under high pressure and laboratory tables with one or two holes in them connected to the suction fan for carrying off fumes and gases. Besides in a chemical laboratory there are many bottles with reagents, test-tubes, spirit lamps, filter paper and necessary chemicals. In such laboratories students study density, viscosity, vapour pressure and other properties of materials. They also carry out scientific experiments including the study of chemical and physical processes.

In other laboratories one can see different types of installations, such as for boiling, cooling and condensing water, for freezing different materials, etc. The materials used in such laboratories are coal, oil, gas, compressed air and other working bodies.

II. Read the following international words and give their Russian equivalents.

Study, activity, institution, department, industrial, engineer, tank, to illuminate, (re)agent, lamp, filter, to compress.

III. Make antonyms by using negative prefixes.

Changed, living, organic, cover, related, order, known, connect, logical, important.

IV. Pay attention to the following phrasal verbs. Make the sentences of your own.

to carry – нести, носить

to carry out – выполнять, осуществлять

to carry on – продолжать заниматься (чем-либо)

to carry off – уносить, удалять

V. Complete the collocation by matching a verb on the left with a phrase on the right. Make the sentences of your own.

- | | |
|-----------------|--------------------------|
| 1. to keep | a. scientific principles |
| 2. to conduct | b. investigations |
| 3. to apply | c. under high pressure |
| 4. to carry off | d. fumes |
| 5. to carry out | e. research |

VI. Match synonyms.

- | | |
|---------------|-----------------|
| 1. to apply | a. to carry out |
| 2. study | b. to define |
| 3. purpose | c. to use |
| 4. to conduct | d. resarch |
| 5. to denote | e. goal |

VII. Answer the following questions to the text.

1. What do scientists do in the laboratories?
2. What does the word 'laboratory' mean?
3. What can we find in a chemical laboratory?
4. What equipment is usually used in laboratories?
5. What kind of materials can we use working in the laboratory?

VIII. Rearrange the following sentences to make the summary of the text.

1. Besides in a chemical laboratory there are many bottles with reagents, test-tubes and necessary chemicals.

2. Today laboratories have to be introduced into educational institutions to teach scientific and technical knowledge by means of experiments.
3. In other laboratories one can see different types of installations and materials used for experiments.
4. In a chemical laboratory one can see different gases kept in heavy tanks.
5. A laboratory is a place where scientists carry out experiments.

Unit 11 Participle I, II

Vocabulary

achievement (n.) – достижение
acid (adj.) – кислотный
activity (n.) – деятельность
ancient (adj.) – древний
appear (v.) – появляться
blanket (n.) – защитный слой
breathe (v.) – дышать
by-products (n.) – побочные продукты
concern (n.) – забота, беспокойство
conquer (v.) – покорять, завоевывать
consider (v.) – рассматривать, считать
consumer (n.) – потребитель
danger (n.) – опасность
direction (n.) – направление
discharge (n.) – выброс
fossil fuel – ископаемое топливо
generation (n.) – поколение
grain (n.) – зерновые культуры
growth (n.) – рост
harmful (adj.) – вредный
increase (v.) – увеличивать
increasingly (adv.) – все больше и больше, в большей степени
interference (n.) – вмешательство
numerous (adj.) – многочисленный
pollute (v.) – загрязнять
produce (v.) – производить
protection (n.) – защита
rapid (adj.) – быстрый
rare (adj.) – редкий
reason (n.) – причина
save (v.) – спасать
seem (v.) – казаться
serve (v.) – служить

set (set, set) up (v.) – устанавливать, создавать
species (n.) – порода (породы), вид(ы)
thick (adj.) – толстый
trap (v.) – улавливать, захватывать
upset (v.) – нарушать
vast (adj.) – обширный
vegetables (n.) – овощные культуры

I. Read and translate the text.

Ecological Problems

Since ancient times nature served humans, being the source of their life. For thousands of years people lived in harmony with environment and it seemed to them that natural riches were unlimited, but with the development of civilization human interference in nature began to increase.

Even in the 19th century when the word «ecology» was born people continued to use nature as consumers, considering man to be «lord and king» of nature and not the child.

In the 20th century with the rapid growth of science and technology human achievements in conquering nature became so great that economic activities began to produce an increasingly negative effect on the biosphere.

Large cities with thousands of smoky industrial enterprises appear all over the world today. The by-products of their activity pollute the air we breathe, the water we drink, the land we grow grain and vegetables. Every year world industry pollutes the atmosphere with about 1,000 million tonnes of dust and other harmful substances. The discharge of dust and gas into the atmosphere returns to the Earth in the form of acid rain. Vast forests are cut and burn in fire. Their disappearance upsets the oxygen balance. As a result many rare species of animals, birds, fish and plants disappear forever, a number of rivers and lakes dry up.

Environmental protection is a universal concern. That is why serious measures to create a system of ecological security should be taken.

Some progress has been already made in this direction. Numerous countries – member of UNO¹ – have set up environmental protection

¹ UNO – United Nations Organization

agencies. A lot of conferences have been held by them to discuss questions of ecologically poor regions.

But these are only the initial steps and they must be carried forward to protect nature, to save life on the planet not only for the sake of the present but also for the future generations.

During the long history of our planet, the climate has often changed for natural reasons. This is because the energy that we get from the sun changes regularly. The planet was warmer during the time of the dinosaurs, and during the ice age it was four degrees lower than today. However, nowadays the climate is changing faster than ever before. This rapid change, known as global warming, is caused by the current high levels of carbon dioxide (CO₂) in the atmosphere.

There has been CO₂ in the atmosphere for millions of years. Animals produce CO₂ when they breathe, and plants use it to make energy and oxygen. The CO₂ that is not used by plants forms a blanket in the atmosphere. In a positive way, this blanket traps the sun's energy and keeps the planet warm. However, CO₂ is also produced when we burn oil, coal and gas — fossil fuels. Because of this, the amount of CO₂ in the atmosphere is now higher than at any time in the last 600,000 years. The CO₂ blanket is getting thicker and thicker, and this means the planet is getting hotter and hotter. This is causing the rapid climate change and it is a danger to life on the planet.

II. Read the following international words and give their Russian equivalents.

Ancient, to serve, human, harmony, (un)limited, civilization, interference, effect, biosphere, tonne, balance, plant, future, climate, regularly.

III. Define the part of the speech of the following words and put them into the appropriate column of the table.

Environment, natural, unlimited, interference, continued, economic, negative, protection, regularly, warmer, changing, harmful, substance, development, increasingly, industrial, ecologically.

Noun	Adjective	Verb	Adverb
------	-----------	------	--------

IV. Translate the following words paying attention to their prefixes:
Inorganic, rearrange, discover, unrelated, subatomic, unchanged, subscript, nonliving, disorder, unlimited, remove, disappearance.

V. Fill the gaps with the following prepositions: of (x5), in (x3), on, with, to, into, for, by. Ask your partner to translate them.

1. ... the development ... civilization human interference ... nature began to increase.
2. We must protect nature to save life ... the planet ... the sake ... the present and future generations.
3. The discharge ... dust and gas ... the atmosphere returns ... the Earth ... the form ... acid rains.
4. Global warming is caused ... the current high levels ... carbon dioxide ... the atmosphere.

VI. Match the antonyms. Make with them the sentences of your own. Ask your partner to translate them.

- | | |
|------------|------------|
| 1 positive | a high |
| 2 poor | b warm |
| 3 cold | c rich |
| 4 fast | d negative |
| 5 low | f slow |

VII. Put the words in the correct order to make a question. Ask your partner to answer it.

1. universal / why / protection / a / environmental / is / concern?
2. do / carbon dioxide / when / animals / produce?
3. trap / the CO₂ blanket / does / what?

VIII. Answer the following questions to the text.

1. What are the main factors affecting the polluting of the environment?
2. Why is it important to protect the environment?
3. What are the reasons of the climate change on our planet?
4. What causes the global warming?
5. What upsets the oxygen balance?

IX. Define the main idea of the text.

1. Many countries have environmental protection agencies.
2. Dinosaurs died because of climate change.

3. Our planet is at risk and serious measures should be taken to achieve environmental security.
4. The CO₂ blanket keeps the planet warm.

Unit 12

Participle I, II; the Gerund

Vocabulary

character (n.) – знак, символ
decision (n.) – решение
design (v.) – конструировать, разрабатывать
device (n.) – прибор, устройство
digital (adj.) – цифровой
due to – благодаря, вследствие, в результате
enhance (v.) – увеличивать, усиливать, расширять
equipment (n.) – оборудование
exchange (n.) – обмен
hardware (n.) – аппаратные средства, оборудование, «железо»
intelligence (n.) – интеллект
lap (n.) – колени
manner (n.) – способ
manufacture (n.) – производство
numerical (adj.) – числовой
palm (n.) – ладонь
procedure (n.) – процедура, порядок действий, набор команд
raw material – сырье
receive (v.) – получать
recreation (n.) – отдых
refine (v.) – очищать
respond (v.) – реагировать, отзываться
satellite (n.) – спутник
software (n.) – программное обеспечение

I. Read and translate the text.

What is a Computer?

Computer is an electronic device that can receive a programme (a set of instructions) and then carry out this programme by calculating numerical information.

The modern world of high technology is possible mainly due to the development of the computer. Computers have opened up a new era in manufacture by means of automation, and they have enhanced modern communication systems.

A computer system is a combination of five elements: hardware, software, people, procedure and data / information. Hardware is a device made up of a combination of mechanical, magnetic, electronic, and electrical components. It has no intelligence by itself. Hardware comes in many configurations, depending what the computer system is designed to do. It can fill several floors of a large office building or can fit on your lap or palm.

When completing a job a computer requires more than just the actual equipment we see and touch. It requires software – programmes for directing the operation of a computer. Without having software instruction, the hardware does not know what to do.

People, however, are the most important component of the computer system: they create the computer software instructions and respond to the procedures that those instructions present.

The basic job of the computer is the processing of information. Computers accept information in the form of instruction called a programme and characters called data to perform mathematical and logical operations, and then give the results. The data is raw material while information is organized, processed, refined and useful for decision making. Computer is used to convert data into information. It is also used to store information in the digital form.

When one computer system is set up to communicate with another one, connectivity becomes the sixth system element. In other words the manner in which the various individual systems are connected – for example, by phone lines, microwave transmission, or satellite – is an element of the total computer system.

Millions of people around the world use the Internet to search for information including such areas as science, technology, business, politics, and recreation. People communicate through electronic mail (e-mail), discussion groups, chat channels, and other means of informational exchange.

II. Read the following international words and give their Russian equivalents.

Electronic, programme, instruction, information, to calculate, to manufacture, combination, procedure, component, intelligence, configuration, to design, office, actual, mathematical, logical, to convert, individual, transmission, politics, discussion.

III. Try to translate the words given in the columns below. Make with them the sentences of your own.

Noun	Verb
act	to act
cause	to cause
change	to change
charge	to charge
flow	to flow
force	to force
form	to form
place	to place
rise	to rise
start	to start
study	to study
transfer	to transfer
work	to work

IV. Add the negative prefix and translate each word into Russian:

1. dis- to charge, to continue, order, to place, advantage, satisfaction.
2. in- attentive, capable, complete, dependent, formal.
3. il- (перед l) logical, legal, literate.
4. ir- (перед r) regular, relevant, reversible.
5. im-(перед m, b, p) mobile, miscible, perfect, probable, balance.
6. mis- to take, to understand, to do, to name.
7. non- living, effective, metal, nuclear, sense.
8. un- known, natural, certain, fortunately, common, equal, even, like.

V. Underline the odd word in each group. Explain the choice.

- | | | | |
|---------------|--------------|----------------|---------------|
| a. software | b. warehouse | c. information | d. hardware |
| a. machine | b. device | c. element | d. equipment |
| a. to get | b. to obtain | c. to process | d. to receive |
| a. phone line | b. satellite | c. air-mail | d. e-mail |

VI. Complete each sentence with a word from the box:

information, hardware, processing, enhanced, raw material, intelligence

1. The main job of the computer is the ... of information.
2. Computers have ... modern communication systems.
3. ... can fit on your lap or palm.
4. The data are ... which computers convert into
5. Hardware has no ... by itself.

VII. Answer the following questions to the text.

1. What do we call a computer programme?
2. What do we call data?
3. How many elements does a computer include? What are they?
4. What is the main task of a computer?
5. What can we regard as the sixth element of the computer system?
6. How do people use the Internet?

VIII. Read the text again. Decide if the following information is true, false or there is no such information in the text.

1. Computer hardware was developed earlier than software.
2. Robots are the most important component of a computer system.
3. The data processing is the basic job of computers.
4. The Internet is widely used for recreation.

Unit 13

Participle I, II; the NAPC; the Gerund

Vocabulary

adjustment (n.) – регулировка, приспособление, пригонка
adopt (v.) – принимать
average (adj.) – средний
calibrate (v.) – калибровать, градуировать
centigrade (adj.) – стоградусный
define (v.) – определять
degree (n.) – градус; степень
determine (v.) – определять
difference (n.) – различие
employ (v.) – применять, использовать
equilibrium (n.) – равновесие
express (v.) – выражать
latter (adj.) – последний (из упомянутых)
magnitude (n.) – величина
measure (v.) – измерять
notion (n.) – идея, понятие, представление
otherwise (adv.) – иначе, в противном случае
pure (adj.) – чистый
relate (v.) – относиться, иметь отношение, быть связанным
respectively (adv.) – соответственно
revise (v.) – проверять, пересматривать, перерабатывать
scale (n.) – шкала; масштаб
select (v.) – выбирать
single (adj.) – один, единственный, одиночный
triple (adj.) – тройной
underlie (v.) – лежать в основе
unique (adj.) – уникальный, исключительный, единственный
value (n.) – значение
variety (n.) – разнообразие

I. Read and translate the text.

Temperature

Temperature is a physical property of a system that underlies the common notions of hot and cold; something that is hotter generally has the higher temperature.

Temperature is one of the principal parameters of thermodynamics. On the microscopic scale, temperature is defined as the average energy of microscopic motion of a single particle in the system per degree of freedom. On the macroscopic scale, temperature is the unique physical property determining the direction of heat flow between two objects placed in thermal contact. No heat flow occurring, the two objects have the same temperature; otherwise heat flows from the hotter object to the colder object.

Temperature is measured with thermometers that may be calibrated to a variety of temperature scales.

There are three main temperature scales in use today, Fahrenheit, Celsius and Kelvin.

The Fahrenheit temperature scale is a scale based on 32 for the freezing point of water and 212 for the boiling point of water, the interval between the two being divided into 180 parts. The 18th century German physicist Daniel Gabriel Fahrenheit originally took as the zero of his scale the temperature of an equal ice-salt mixture and selected the values of 30 and 90 for the freezing point of water and normal body temperature, respectively; these later were revised to 32 and 96, but the final scale required an adjustment to 98.6 for the latter value.

Until the 1970s the Fahrenheit temperature scale was in general common use in English-speaking countries; the Celsius, or Centigrade, scale being employed in most other countries and for scientific purposes worldwide. Since that time, however, most English-speaking countries have officially adopted the Celsius scale. The conversion formula for a temperature that is expressed on the Celsius (C) scale to its Fahrenheit (F) representation is: $F=9/5C+32$.

The Celsius temperature scale, also called Centigrade temperature scale, is the scale based on 0 for the freezing point of water and 100 for the boiling point of water. Invented in 1742 by the Swedish astronomer Anders Celsius, it is sometimes called the Centigrade scale because of the

100-degree interval between the defined points. The following formula can be used to convert a temperature from its representation on the Fahrenheit (F) scale to the Celsius (C) value: $C=9/5(F-32)$. The Celsius scale is in general use wherever metric units have become accepted, and it is used in scientific work everywhere.

The Kelvin temperature scale is the base unit of thermodynamic temperature measurement in the International System (SI) of measurement. It is defined as $1/273.16$ of the triple point (equilibrium among the solid, liquid, and gaseous phases) of pure water. The Kelvin (symbol K without the degree sign) is also the fundamental unit of the Kelvin scale, an absolute temperature scale named after the British physicist William Thomson, Baron Kelvin. Such a scale has as its zero point absolute zero, the theoretical temperature at which the molecules of a substance have the lowest energy. Many physical laws and formulas can be expressed more simply when an absolute temperature scale is used; accordingly, the Kelvin scale has been adopted as the international standard for scientific temperature measurement. The Kelvin scale is related to the Celsius scale. The difference between the freezing and boiling points of water being 100 degrees in each, the Kelvin has the same magnitude as the degree Celsius.

II. Read the following international words and give their Russian equivalents.

Thermodynamics, micro(macro)scopic, to define, to determine, direction, thermal contact, thermometers, to calibrate, interval, mixture, to select, normal, final, phase, symbol, standard.

III. Translate the following sentences paying attention to the meaning of the underlined words.

1. Temperature is the unique physical property determining the direction of heat flow between two bodies.
2. Heat flows from the hotter object to the colder one.
3. Thermometers measure temperatures of physical bodies.
4. This system gives people a measure of protection against pollution.
5. There are three main temperature scales in use.
6. Scientists all over the world use the Kelvin scale for their temperature measurement.
7. Remove the cause of the trouble.

8. Operation of the machine causes vibration.
9. The process occurs at constant temperature.
10. Computers process data as it is received.

IV. Match synonyms. Make sentences of your own. Ask your partners to translate them.

- | | |
|-------------|--------------|
| 1. define | a. range |
| 2. select | b. name |
| 3. call | c. mean |
| 4. interval | d. determine |
| 5. average | e. choose |
| 6. adopt | f. accept |

V. Put the words in the correct order to make a question. Ask your partner to answer it.

1. are / scales / in / temperature / today / use / how many?
2. invented / scale / who / the Centigrade?
3. the Kelvin / adopted / why / as / the international standard / has / for / been / measurement / scale?

VI. Mark the statements as true (T) or false (F). Correct the false statements.

1. The Fahrenheit temperature scale is also called Centigrade scale because of the 100-degree interval between the main points.
2. Temperature is one of the principal parameters of thermodynamics.
3. No heat flow occurring, the two objects have different temperatures.
4. The Kelvin scale was named after the German physicist Daniel Gabriel, Baron Kelvin.
5. The British astronomer Anders Celsius invented his scale in 1842.

VII. Answer the following questions to the text.

1. How can we define temperature?
2. Which three temperature scales do we use today?
3. What do you know about the scientists who invented temperature scales?
4. How can we convert the temperature readings on the Fahrenheit scale to the Celsius one and vice versa?
5. Why is the Celsius scale also called the Centigrade one?

6. What is absolute zero?

7. Where is the Kelvin temperature scale used?

VIII. Make the summary of the text 'Temperature'.

Unit 14

The Infinitive; the Infinitive Constructions

Vocabulary

ailment (n.) – болезнь
appear (v.) – появляться; казаться
attract (v.) – привлекать, притягивать
be keen (v.) – желать
casual (adj.) – обычный
consist of (v.) – состоять из
convince (v.) – убеждать
decide (v.) – решать
describe (v.) – описывать
engineering (n.) – техника
enough – достаточно
film (n.) – пленка
food (n.) – пища
frighten (v.) – пугать
head (n.) – головка
in turn – в свою очередь
ingest (v.) – потреблять
inherent (adj.) – присущий, свойственный
meaning (n.) – значение
particle (n.) – частица
pin (n.) – булавка
prefix – первая составная часть сложных слов – названий единиц измерения, обозначающая уменьшение в триллион раз
precision (n.) – точность
promote (v.) – продвигать, способствовать, поддерживать
rather than – лучше, охотнее, скорее, а не
reach (v.) – достигать
recognize (v.) – признавать
reference (n.) – ссылка
repel (v.) – отражать, отталкивать
self- – само-, себя-
stick (stuck, stuck) (v.) – приклеивать
target (v.) – направлять, нацеливать

tend (v.) – стремиться, иметь тенденцию
term (n.) – термин
worry about (v.) – беспокоиться по поводу

I. Read and translate the text.

What is a nano?

We listen to our music on nanos, we style our hair with nanos, with the arrival of the Tata Nano¹ people will even be driving nanos, but what exactly is a nano?

Once upon a time the Greeks used the word ‘nanos’ to mean ‘a dwarf²’. This term was used in science in the 20th century and in 1960 it was recognized when the term nanometre came into use, meaning a billionth of a metre. It could be thought of as about 10 atoms long.

In 1959 the legendary physicist Richard Feynman gave a speech about the possibility of machines being used to build smaller machines which would in turn build smaller machines until you reached a near atomic scale of a machine. He asked: ‘Why can’t we write the entire 24 volumes of the Encyclopedia Britannica on the head of a pin?’

Feynman did not use the term ‘nano’, but in 1974 Norio Taniguchi used the word ‘nanotechnology’ to describe ultra-precision engineering. It is this meaning that attracts the technology marketers.

Nanotechnology is known to be used in many spheres. We know nano to be widely used in chemistry. An example might be a self-cleaning window which uses a film that has been manipulated at a nano level to be hydrophilic (attracted to water) on one side so it sticks to the glass, while being hydrophobic on the other. Nano-textiles that have inherent water-repelling properties are now available.

Nanotechnology opens up the possibility that one day most medicines will consist of particles engineered to target the ailment being treated, rather than being absorbed by many parts of the body unnecessarily. But the critics are worried that not enough is known about these engineered particles and what happens when they are ingested.

The Institute of Nanotechnology (Scotland) is particularly keen to promote understanding of the use of nanotechnology in food. It is not hard

¹ Tata Nano – самый дешевый в мире автомобиль, произведенный индийской компанией Tata

² dwarf - карлик

to see why. To the casual observer it appears that nanotechnology in everyday objects frightens people much less than the prospect of actually ingesting nanotechnology. It is going to be a long journey to convince people. But the nano seems to stay in consumer technology. At least that is, until an MP3 manufacturer decides to call their product 'pico' in reference to a trillionth.

II. Read the following international words and give their Russian equivalents.

Music, to style, legendary, encyclopedia, film, to manipulate, hydrophilic (phobic) textile, medicine, critic.

III. Make compounds from the components given below. Let your partners translate them.

- | | |
|------------|--------------|
| 1. any | a. repelling |
| 2. short | b. day |
| 3. soft | c. one |
| 4. English | d. graphy |
| 5. self | e. hand |
| 6. by | f. ware |
| 7. micro | g. product |
| 8. photo | h. cleaning |
| 9. water | i. wave |
| 10. every | j. speaking |

IV. Turn the following verbs into nouns. Make sentences with them.

1. to mean
2. to arrive
3. to use
4. to attract
5. to treat
6. to understand

V. Translate the following sentences into Russian paying attention to the underlined words.

1. What does the word 'nitrogen' mean?
2. What is the mean temperature of the substance?

3. These instruments are well suited for such measurements.
4. Oil recovery involves drilling a well and pumping out the oil that flows by gravity into the bottom of the well.
5. This fact has provided valuable information on the point.
6. Provided the reaction proceeds smoothly, the end product may increase.
7. Dark surface reflects light.
8. This object is as light as a feather.
9. Temperature can reach 40° C.
10. Fill the can with food and seal it.

VI. There is something wrong with the following sentences. Discuss with partners why they are strange, using the phrases given below.

I believe/consider/suppose...

I am convinced that...

I don't think so.

I strongly object to...

1. The ancient Greeks used the word 'nanos' to mean a giant.
2. The term nanometer means a millionth of a metre.
3. Nano-textiles have water-absorbing properties.
4. Nowadays it is not hard to convince people to use nanotechnology in food.
5. The word 'nanotechnology' came into being in 1959.

VII. Answer the following questions to the text.

1. What do the terms 'nanometre' and 'nanotechnology' mean?
2. Where is nanotechnology used?
3. Why do you think people are afraid of ingesting food produced by nanotechnology?

VIII. Define the main idea of the text.

1. Nano methods are now being used in all spheres of life and are considered to be one of the most promising technologies.
2. Richard Feynman invented nanotechnology.
3. Using nano methods in food industry will save the world from hunger.
4. Nanotechnology is used mostly in medicine.

Unit 15

The Gerund; the Infinitive; the Infinitive Constructions

Vocabulary

air-conditioning – кондиционирование воздуха
alternatively (adv.) – поочередно
ammonia (n.) – аммиак
apartment (n.) – жилое помещение, квартира
as well as – так же, как, а также
assume (v.) – принимать; допускать, предполагать
assumption (n.) – предположение
breakthrough (n.) – достижение, успех, открытие
compressor (n.) – компрессор
compressor-cooling principle – охлаждение с помощью компрессора
condense (v.) – конденсировать
coolant (n.) – хладагент, охладитель
cooling (ger.) – охлаждение
corrosive (adj.) – едкий, коррозионный
destructive (adj.) – разрушительный
evaporator (n.) – испаритель
fluorine (n.) – фтор
freezer (n.) – морозильник
freon (n.) – фреон
halogenated hydrocarbon – галогенированный углеводород
heat transfer – теплопередача
heating (ger.) – нагревание; отопление
install (v.) – устанавливать
introduction (n.) – введение
layer (n.) – слой
medium (n.) – среда
prevalent (adj.) – распространенный, общепринятый
reduce (v.) – понижать, сокращать, уменьшать
refrigerator (n.) – холодильник
same – такой же самый, одинаковый
smell (v.) – пахнуть
substantiate (v.) – доказывать, обосновывать
substitute (n.) – замена, замещение

suck (v.) – всасывать
technique (n.) – технический прием, метод
valve (n.) – клапан

I. Read and translate the text.

Energy for cooling

On a global scale it is assumed that nowadays more energy is used for cooling than for heating. This assumption might be difficult to substantiate, but it is clear that cooling is a very large and energy intensive sector in modern society. Air-conditioning systems, especially in warmer countries, are continuously installed in buildings, apartments, and cars. Refrigerators and freezers are installed in homes as well as in the business sector, restaurants, shops, and so on. The largest user of cooling techniques is likely to be the chemical industry, process industry, and sports arenas.

The most prevalent technique for cooling is using the compressor-cooling principle. A cooling medium, or coolant, is circulated in a system where it is in alternatively gas and liquid form. The medium is brought to gas form in the evaporator, when a compressor is reducing the pressure as it is sucking the vapour away through a valve into a condenser. There the medium, back to normal pressure, condenses to a liquid, and finally is recirculated to the evaporator. During the process the evaporator is cooled while the condenser is heated. The energy needed to transfer heat is the one required to run the compressor. The same principle is known to be used in heat pumps where the heat of the condenser is used to warm the space.

In the early technical developments ammonia was used as cooling medium. However it is toxic, corrosive and bad smelling. The introduction during the 1930s of a new group of cooling media, the halogenated hydrocarbons among them the freons, was a major technical breakthrough. Since the 1980s, substitutes for freons as coolants have been developed. These are mostly based on fluorine and chlorine containing hydrocarbons, but of a kind that is much less destructive to the ozone layer.

II. Read the following international words and give their Russian equivalents.

Intensive, modern, apartment, refrigerator, freezer, restaurant, arena,

compressor to circulate, alternatively, condenser, ammonia, toxic, corrosive.

III. Give the synonyms to the following words:

Apartment, to assume, breakthrough, coolant, to reduce, to substantiate, technique, kind, major.

IV. Underline the odd word in each group. Explain the choice.

- | | | | |
|---------------|-----------------|---------------|-------------------|
| a. evaporator | b. refrigerator | c. compressor | d. condenser |
| a. ozone | b. ammonia | c. fluorine | d. freon |
| a. to cool | b. to freeze | c. to heat | d. to refrigerate |
| a. gas | b. vapour | c. steam | d. liquid |

V. Match the beginning of the sentence with its logical ending. Ask your partners to translate them.

- | | |
|--------------------------------------|-------------------------------------|
| 1. The medium is brought to gas form | a. circulated in a system. |
| 2. A coolant is | b. the coolant turns to a liquid. |
| 3. Ammonia was used | c. installed in buildings and cars. |
| 4. In the condenser | d. in the evaporator. |
| 5. Air-conditioning is | e. as cooling medium. |

VI. Answer the following questions to the text.

1. What requires more energy, cooling or heating?
2. Which spheres are cooling techniques mostly used in?
3. What is the most common technique for cooling?
4. Why was ammonia replaced by other refrigerants?
5. Which coolants are used nowadays?

VII. Read the text again. Decide if the following information is true, false or there is no such information in the text.

1. During the cooling process the evaporator is heated.
2. Cooling requires more energy than heating.
3. One of the largest users of cooling techniques is space industry.
4. Ammonia is the most prevalent refrigerant nowadays.

Unit 16

The Infinitive; the Infinitive Constructions

Vocabulary

ability (n.) – способность
according to – согласно
acknowledge (v.) – признавать
agree (v.) – соглашаться
angle (n.) – угол
announce (v.) – объявлять, провозглашать
arrange (v.) – расставлять, классифицировать, систематизировать
be made up (v.) – состоять из
begin (began, begun) (v.) – начинать
bend (bent, bent) (v.) – гнуть, сгибать
cellar (n.) – подвал
complete (adj.) – полный
complicated (adj.) – сложный
describe (v.) – описывать
development (n.) – развитие
disastrous (adj.) – пагубный, гибельный
dispose of (v.) – располагать (чем-либо)
empty (adj.) – пустой
extension (n.) – распространение, расширение
faith (n.) – вера
fall (fell, fallen) (v.) – падать
find (found, found) (v.) – находить
follow (v.) – следовать
found (v.) – основывать
heavy (adj.) – тяжелый
honour (n.) – честь
huge (adj.) – огромный
impetus (n.) – стимул, импульс, толчок
inclination (n.) – склонность, предпочтение
leave (left, left) (v.) – оставлять, покидать
lightning (n.) – молния
lightning rod – громоотвод
maintain (v.) – поддерживать, сохранять

means (n.) – средство, средства
miraculous (adj.) – чудодейственный, сверхъестественный
objection (n.) – возражение
obtain (v.) – получать
ordinary (adj.) – обычный
pass (v.) – проходить
phenomenon (n.) – явление
posses (v.) – обладать
power (n.) – сила, энергия, мощность
prove (v.) – доказывать
quantum mechanics – квантовая механика
ray (n.) – луч
rejection (n.) – отказ, непринятие
research (n.) – исследование
society (n.) – общество
solve (v.) – решать
weight (n.) – вес
workshop (n.) – мастерская

I. Read and translate the text.

A Few Facts from the History of Science and Experimental Research

The word ‘science’ seems to possess miraculous power. ‘If you are told ‘science’, then agree without any objection’, this is the statement of a well-known French physicist L. Brillouin describing the role of science in the life of society today, the faith in the ability of science to provide an answer to any question and to solve the most complicated problem. Constant production of new ideas, extension of our knowledge of nature, and rejection of established ideas are thought to be part of the normal development of science.

I. Newton (1642–1727), the great English scientist, performed many experiments in his early years. According to Newton himself, his first physical experiment was carried out in 1658 when he was sixteen years old. Newton performed many experiments with light and found that white light was made up of rays of different colours and that each particular kind of coloured ray was differently bent when it fell on a glass surface at the angle. By the time he was 25, Newton had formed all his main thoughts on gravitation and the main ideas of his ‘Optics’.

B. Franklin (1706–1790) is acknowledged to be the founder of the theory of atmospheric electricity. At the time when theories explaining electricity were neither complete nor well founded he began to experiment, and proved the lightning to be an electrical phenomenon. He finally invented the lightning rod – means of protection against the disastrous effects of lightning.

T. Edison (1847–1931), well known throughout the world, began to experiment when he was ten or eleven years of age, his inclination being towards chemistry. As he had no laboratory he used for his experiments the ordinary cellar of the house. Many years had passed before he could dispose of laboratories and workshops of his own, that were to become huge research centres employing hundreds of people and maintaining contacts with world-known scientists and inventors. Realizing the importance of electric illumination, Edison developed the first power station in the world. In 1882 it started to supply Manhattan in New York with electricity.

N. Bohr (1885–1962), the great Danish physicist, went to work at Rutherford's laboratory in Manchester in 1912. Working at this laboratory he is known to create his model of the atom. His model gave the impetus to the development of quantum mechanics.

In 1869 the great Russian scientist Dmitri Mendeleev (1834–1907) announced the discovery of the Periodic Law of elements. So science received the key to the secrets of matter. All the greatest discoveries which have been made since then in the fields of chemistry and physics have been based on this law.

The elements in Mendeleev's Periodic Table follow one another in the order of their atomic weights. They are arranged in periods and groups. Mendeleev's discovery made it possible for the scientists to find 38 new chemical elements to fill the empty spaces left in the Periodic Table. At the same time they tried to find elements heavier than the last element in the Periodic Table. In 1955 the American scientist Dr. Glenn Seaborg obtained element № 101 and named it Mendelevium in honour of the creator of the Periodic Law.

II. Read the following international words and give their Russian equivalents.

Role, to provide, constant, gravitation, optics, phenomenon, protection, ordinary, mechanics, periodic.

III. Match synonyms. Make the sentences with them and ask partners to translate them.

- | | |
|---------------|-----------------|
| 1. to perform | a. to obtain |
| 2. to found | b. to invent |
| 3. to receive | c. to carry out |
| 4. to create | d. to have |
| 5. to possess | e. to establish |

IV. Fill the gaps with the right word. Translate the sentences into Russian.

a) there/their

1. They tried to express ... point of view.
2. ... is, however, another view.

b) here/hear

1. You have to sign
2. Do you ... me?

c) right/write

1. Do not ... on both sides of the paper.
2. I hope you know the difference between ... and wrong.

d) for/four

1. It will take them more than ... hours to carry out this test.
2. We have dealt with these problems ... many years.

e) by/buy

1. Hydrogen was substituted ... oxygen.
2. Now you can ... and sell shares on the Internet.

f) weather/whether

1. ... or not this reaction will take place is not known yet.
2. Unsettled ... will continue through the weekend.

V. Complete the collocation by matching a verb on the left with a noun on the right. Make sentences with them.

- | | |
|----------------|---------------|
| 1. to employ | a. contacts |
| 2. to give | b. an answer |
| 3. to solve | c. an impetus |
| 4. to maintain | d. people |
| 5. to provide | e. problems |

VI. Complete the following sentences. Ask your partners to translate them.

1. The elements in the Periodic Table are arranged...
2. N. Bohr's model of the atom gave the impetus...
3. I. Newton found that white light was made up...
4. B. Franklin invented...
5. T. Edison began...

VII. Answer the following questions to the text.

1. What did Newton discover?
2. Who invented the lightning rod?
3. What did Edison develop?
4. Who invented the model of the atom?
5. What is the main idea of Mendeleev's Periodic Table?

VIII. Look at the text and read the paragraph containing the following information.

1. The ideas of gravitation were formed in the 1660s.
2. Quantum mechanics is based on Bohr's model of the atom.
3. The lightning was proved to be an electrical phenomenon.
4. It was possible to find new chemical elements with the help of the Periodic Table.

Unit 17

Conditionals; should, would

Vocabulary

account for (v.) – объяснять
adjacent (adj.) – соседний, смежный
allow (v.) – позволять, разрешать
assistance (n.) – помощь
because of – из-за
bring (brought, brought) about (v.) – вызывать
capability (n.) – способность
communicate (v.) – сообщать, передавать
conduction (n.) – проводимость
conductivity (n.) – проводимость
conductor (n.) – проводник
considerable (adj.) – значительный
convection (n.) – конвекция
current (n.) – течение, ток
depend on (v.) – зависеть от
direct (adj.) – прямой
entire (adj.) – целый, единый
expand (v.) – расширяться
expansion (n.) – расширение
find (found, found) (v.) – находить
flame (n.) – пламя
fluid (n.) – текучее вещество (жидкость, газ)
gradually (adv.) – постепенно
insulator (n.) – изолятор
light-coloured (adj.) – светлый
mirror (n.) – зеркало
mode (n.) – способ
offer resistance (v.) – оказывать сопротивление
penetrate (v.) – проникать
polished (adj.) – полированный
poor (adj.) – плохой
provided – при условии
radiate (v.) – излучать

radiation (n.) – излучение
readily (adv.) – легко
reflect (v.) – отражать
replace (v.) – замещать
result from (v.) – происходить, получаться из-за чего-либо
rise (rose, risen) (v.) – подниматься
rough (adj.) – грубый
separate (v.) – разделять
similar to (adv.) – подобно
still (adj.) – спокойный
strike (struck, struck) (v.) – ударять
such as – такой как
sufficiently – достаточно
surface (n.) – поверхность
take (took, taken) place (v.) – иметь место, происходить
thermal (adj.) – тепловой
transparency (n.) – прозрачность
vibratory (adj.) – колебательный
visible (adj.) – видимый
wave (n.) – волна

I. Read and translate the text.

Three modes of heat transfer

Heat may be transferred from one body to another in three ways either by conduction, convection or radiation. Heat transfer by conduction occurs provided it is transferred from one body to another by direct contact. The heated molecules communicate their energy to other molecules adjacent to them. It should be noted that all substances have to a greater or less extent this capability of allowing heat to flow through them, but they do not conduct heat at the same rate. Some materials, such as metals, would conduct heat very readily, whereas others such as glass or wood offer considerable resistance to the conduction of heat. The relative capacity of a material to conduct heat is called its conductivity. Metals having a high conductivity are known as good conductors, whereas materials that are poor conductors are called heat insulators.

In general, solids are better conductors than liquids or gases. This is accounted for by the difference in the molecular structure. Since the molecules of a gas are widely separated, the transfer of heat by direct contact between them is difficult. Air, as a gas, would be a good insulator in completely still state, unless any air space had convection currents circulating within it. These currents increase transmission of heat.

Heat transfer by convection occurs if heat moves from one place to another by means of currents setting up within some fluid medium. These currents are known as convection ones and result from the change in density that is brought about by the expansion of heated portion of the fluid. For example, if a container with water is heated by the flame the water adjacent to the flame absorbs heat, its temperature increases and it expands. The heated portion of the water being lighter than surrounding water rises to the top and is replaced by a cooler, heavier portion of water. Gradually the heat is distributed throughout the entire mass of the water by means of the convection currents established within its mass.

Heat transfer by radiation takes place in the form of wave motion similar to light waves. The heated body radiates out into space vibratory waves of an electrodynamic nature because of the thermal vibratory motion of atoms. Whether heat waves are visible or invisible depends on the temperature of radiating body. If the body were heated to a sufficiently high temperature, these waves would be visible as light ones. If the body is at a lower temperature, the waves cannot be seen by the human eye, and then they are called infrared radiation.

It should be known that radiant heat is transmitted without the assistance of any material medium. When radiant energy waves strike a material body, they may be reflected or absorbed by it, or they may pass through it to some other beyond. For example, it was found that light-coloured, polished mirror would reflect a maximum of radiant heat, but dark, rough surface would absorb its maximum amount. The amount of radiant heat passing through a material depends on the degree of transparency. For example, most of the radiant heat passes through a clear glass or air, but does not penetrate through wood or metal. Vacuum would have been an ideal isolator (since heat transfer by conduction or convection through it is impossible), but for the radiation, which does not require the transmitting medium and can pass through a vacuum.

II. Read the following international words and give their Russian equivalents.

Convection, radiation, insulator, transmission, portion, container, vibratory, electrodynamic, assistance, to reflect, maximum, transparency.

III. Match the following phrasal verbs on the left with their definitions on the right. Make sentences with them.

- | | |
|-------------------|---|
| 1. to result from | a. to explain |
| 2. to result in | b. to do a particular piece of work, research |
| 3. to account for | c. to cause or to produce something |
| 4. to bring about | d. to continue doing something |
| 5. to consist of | e. to cause changes |
| 6. to carry out | f. to produce something, to emit |
| 7. to carry on | g. to be made of particular parts |
| 8. to give off | h. to be caused by something |

IV. Choose the best option to complete the following sentences.

1. The heated body radiates out into space vibratory waves of a(n) ...nature.
 - a) acoustical
 - b) electrodynamic
 - c) gravitational
2. The heated portion of water is...than the cold one.
 - a) lighter
 - b) heavier
 - c) darker
3. Good conductor must be made of...
 - a) wood
 - b) metal
 - c) glass
4. Heat transfer by convection occurs by means of...
 - a) a direct contact of the bodies
 - b) a wave motion
 - c) currents setting up within some fluid medium
5. Polished mirror...radiant heat.
 - a) reflects
 - b) absorbs
 - c) transmits

V. Answer the following questions to the text.

1. Which ways of heat transfer do you know?
2. When does heat transfer by conduction occur?
3. What is the main principle of heat transfer by convection?
4. How is heat transferred by radiation?
5. What is conductivity?
6. Why are solids better conductors than gases?

VI. Make the summary of the text 'Three modes of heat transfer'.

Unit 18

Grammar Review

Vocabulary

bake (v.) – печь, выпекать
cake (n.) – торт, пирог, лепешка
celebration (n.) – празднование, торжество
cleansing (n.) – очищение
corn (n.) – (амер.) кукуруза, маис
custom (n.) – обычай
hungry (adj.) – голодный
meal (n.) – еда, принятие пищи, трапеза
mealtime (n.) – время принятия пищи
noodles (n.) – лапша
nourishment (n.) – питание, пища, еда
nutrition (n.) – пища, питание
prosperity (n.) – процветание, преуспевание, благосостояние
significance (n.) – значение, смысл, важность
significant (adj.) – важный, знаменательный
signify (v.) – значить, означать
trust (n.) – доверие, вера
unity (n.) – единство, единение, сплоченность
wealth (n.) – богатство, изобилие, процветание, благосостояние

I. Discuss these questions with a partner.

1. What kind of foods do you enjoy eating? Are they local products, or from other countries?

I enjoy eating...

It comes from...

2. What foods have special meaning in your culture? When do you eat them?

Some of the foods that have a special meaning in my culture are ...

We eat ... to celebrate...

II. Read and translate the text.

Food as Communication

We usually understand when someone speaks or writes to us, and many gestures and facial expressions have meaning, too. But have you ever considered what and how we eat as a form of communication? Food serves this purpose in two fundamental ways. In many cultures, people share food at mealtime. Sharing bread or other foods is a common human tradition that can promote unity and trust. Food can also have a specific meaning, and play a prominent role in a family or culture's celebrations or traditions. The foods we eat – and when and how we eat them – are often unique to a particular culture or may even differ between rural and urban areas within one country.

In most cultures, bread represents nourishment. It is also one of the most commonly shared foods in the world. Sharing bread, whether during a special occasion or at the family dinner table, is a common symbol of companionship and togetherness. In fact, the word companion comes from the Latin roots *com-* (together) and *panis* (bread). Many cultures also celebrate birthdays and marriages with elaborately decorated cakes that are cut and shared among the guests. Early forms of cake were simply a kind of bread, so this tradition has its roots in the custom of sharing bread.

Food also plays an important role in many New Year celebrations. In the southern United States, pieces of cornbread represent blocks of gold for prosperity in the new year. In Greece, people share a special cake called *vasilipita*. A coin is baked into the cake, which signifies success in the New Year for the person who receives it. Most of the foods eaten during the Chinese New Year have symbolic significance. Sometimes this is based on their shape; for instance, long noodles symbolize long life. The symbolism can also be based on the sound of the word in Chinese: for example, people give out oranges because the word for 'orange' sounds like the word for 'wealth'.

Food can also be part of a ceremony. For example, many cultures have ceremonies to celebrate the birth of a child, and food can play a significant role. In China, when a baby is one month old, families name and welcome their child in a celebration that includes giving red-colored eggs to guests. In Afghanistan, parents feed babies butter and sugar for the first six days of life to symbolize cleansing. In a ceremony around 100 days after a child's birth, Japanese families symbolically 'feed' the baby by putting

different kinds of food to its lips, and sometimes putting a single grain of rice in its mouth. This ritual expresses their hope that the baby will never be hungry. In many cultures, round foods such as grapes, pomegranates, bread, and moon cakes are eaten at welcome celebrations to symbolize family unity.

Nutrition is essential for life, so it is not surprising that food is such an important part of different cultures around the world. The food people eat during celebrations and ceremonies can symbolize many things, but sharing food is one custom that almost all humans have in common.

III. Complete the chart with information from the text.

Food	Culture or country	Significance or meaning
1. bread	worldwide	
2.	southern U.S.	prosperity or wealth
3. vasilopita		success in the new year
4.	China	to welcome a new baby
5. butter and sugar		
6. various foods / grain of rice		to protect the baby from hunger
7. round foods	worldwide	

IV. Match the words in bold with a word or phrase with a similar meaning.

1. Giving money is a popular Chinese New Year **tradition**.
2. The new businesses brought **prosperity** to the town.
3. The group was not successful because there was no **unity** amongst its members.
4. Rice is one of the world's most important sources of **nutrition**.
5. People living in large **urban** areas often experience problems with traffic and air pollution.
6. He was a very **prominent** and well-respected member of the community.
 - a) relating to towns and cities;
 - b) custom;
 - c) wealth;
 - d) important and well-known;
 - e) food that is necessary for life and health;

f) state of cooperation, agreement or friendship between people or countries.

V. Read the text again. Match these sentences with the paragraph they best summarize.

1. Food is important in many New Year celebrations around the world.
2. Around the world, food is important in welcoming ceremonies for young children.
3. Food can bring people together.
4. Food is a way of communicating.

VI. Discuss these questions in a group.

1. Which foods are shared in your culture? Why?
In our culture we share ... because ...
2. Many of the food traditions mentioned in the text are very old. Why do you think they are still important today?
Food traditions are important because ...

VII. Write a short text describing a special dish, eaten in your culture on a special day. Answer the following questions as you plan your description.

1. What is the name of the dish?
2. What region of the country or world does the dish come from?
3. At what special celebration(s) or family event(s) is it eaten?
4. Who usually prepares the dish?
5. What are the key ingredients? Where are they grown or made?
6. How should you eat the dish?

Vocabulary

ability (n.) – способность
accept (v.) – принимать
according to – согласно
account for (v.) – объяснять
achievement (n.) – достижение
acid (adj.) – кислотный
acknowledge (v.) – признавать
activity (n.) – деятельность
add (v.) – прибавлять, складывать, подводить
adjacent (adj.) – соседний, смежный
adjustment (n.) – регулировка, приспособление, пригонка
adopt (v.) – принимать
advance (v.) – продвигать
agree (v.) – соглашаться
ailment (n.) – болезнь
air-conditioning – кондиционирование воздуха
allow (v.) – позволять, разрешать
alter (v.) – менять, изменять
alternatively (adv.) – поочередно
although – хотя
ammonia (n.) – аммиак
amount (n.) – количество
ancient (adj.) – древний
angle (n.) – угол
announce (v.) – объявлять, провозглашать
apartment (n.) – жилое помещение, квартира
appear (n.) – появляться
appear (v.) – появляться; казаться
application (n.) – применение
applied sciences – прикладные науки
apply (v.) – применять, употреблять
arise (arose, arisen) (v.) – возникать
arrange (v.) – расставлять, классифицировать, систематизировать

arrow (n.) – стрелка
as a whole – в целом
as well as – так же как, а также
assistance (n.) – помощь
assume (v.) – принимать; допускать, предполагать
assumption (n.) – предположение, допущение
attempt (n.) – попытка
attract (v.) – привлекать, притягивать
attractive force – сила притяжения
available (adj.) – имеющийся в наличии, годный
average (adj.) – средний
bake (v.) – печь, выпекать
be keen (v.) – желать
be made up (v.) – состоять из
because of – из-за
become (became, become) (v.) – становиться, превращаться
begin (began, begun) (v.) – начинать
bend (bent, bent) (v.) – гнуть, сгибать
billion (num.) – миллиард
blanket (n.) – защитный слой
block (n.) – блок, «кубик», «кирпичик»
body (n.) – тело
boil (v.) – кипеть
bond (n.) – связь
branch (n.) – отрасль, раздел, ветвь
breakthrough (n.) – достижение, успех, открытие
breathe (v.) – дышать
bring (brought, brought) about (v.) – вызывать
burn (burnt, burnt) (v.) – гореть, сжигать
bury (v.) – хоронить, зарывать в землю, прятать
by means of – посредством, с помощью
by-products (n.) – побочные продукты
cake (n.) – торт, пирог, лепешка
calcium (n.) – кальций
calibrate (v.) – калибровать, градуировать
call (v.) – называть
cancel (v.) – отменять, аннулировать
capability (n.) – способность

capacity (n.) – способность, емкость
carbon (n.) – углерод
carry (v.) – переносить
carry on (v.) – продолжать
carry out (v.) – проводить, выполнять
case (n.) – случай
casual (adj.) – обычный
cause (v.) – быть причиной, вызывать, заставлять
celebration (n.) – празднование, торжество
cellar (n.) – подвал
centigrade (adj.) – стоградусный
certain (adj.) – определенный
challenge (v.) – ставить под вопрос, оспаривать
chance (n.) – шанс
change (n.) – изменение
change (v.) – менять, изменять
character (n.) – знак, символ
charge (n.) – заряд
charge (v.) – заряжать
charged (PII) – заряженный
chemicals (n.) – химические продукт, химикаты
chloride (n.) – хлорид
chlorine (n.) – хлор
cleansing (n.) – очищение
coal (n.) – уголь
cold (adj.) – холодный
combine (v.) – сочетать
communicate (v.) – сообщать, передавать
complete (adj.) – полный
completely (adv.) – полностью, целиком
complicated (adj.) – сложный
composition (n.) – состав
compound (n.) – соединение
compress (v.) – сжимать
compressor (n.) – компрессор
compressor-cooling principle – охлаждение с помощью компрессора
concept (n.) – понятие
concern (n.) – забота, беспокойство

concern (v.) – касаться, относиться, затрагивать
condense (v.) – конденсировать
conduct (v.) – проводить
conduction (n.) – проводимость
conductivity (n.) – проводимость
conductor (n.) – проводник
connect (v.) – связывать
conquer (v.) – покорять, завоевывать
conservation (n.) – сохранение
consider (v.) – рассматривать, считать
considerable (adj.) – значительный
consist of (v.) – состоять из
consume (v.) – потреблять
consumer (n.) – потребитель
contain (v.) – содержать
content (n.) – содержание
convection (n.) – конвекция
convince (v.) – убеждать
coolant (n.) – хладагент, охладитель
cooling (ger.) – охлаждение
core (n.) – центр, сердцевина, основа
corn (n.) – (амер.) кукуруза, маис
corrosive (adj.) – едкий, коррозионный
create (v.) – создавать
creation (n.) – создание, формирование
crop (n.) – сельскохозяйственная культура
crossbreed (crossbred, crossbred) (v.) – скрещивать
current (n.) – течение, ток
custom (n.) – обычай
cut (cut, cut) (v.) – резать
dam (n.) – плотина, дамба
danger (n.) – опасность
data (n., pl.) – данные, факты
decide (v.) – решать
decision (n.) – решение
decrease (n.) – уменьшение, сокращение
define (v.) – определять
degree (n.) – градус; степень

denote (v.) – обозначать
density (n.) – плотность
depend on (v.) – зависеть от
describe (v.) – описывать
description (n.) – описание
design (v.) – конструировать, разрабатывать
destroy (v.) – уничтожать
destruction (n.) – разрушение, уничтожение
destructive (adj.) – разрушительный
detect (v.) – обнаруживать
determine (v.) – определять
develop (v.) – развивать, разрабатывать
development (n.) – развитие
device (n.) – прибор, устройство
devote (v.) – посвящать
differ (v.) – различать(ся)
difference (n.) – различие
different (adj.) – различный, отличный (от)
digital (adj.) – цифровой
direct (adj.) – прямой
direction (n.) – направление
disastrous (adj.) – пагубный, гибельный
discard (v.) – выбрасывать
discharge (n.) – выброс
discover (v.) – открывать, обнаруживать
disorderly (adj.) – беспорядочный, неорганизованный
disperse (v.) – рассеивать
dispose of (v.) – располагать (чем-либо)
disprove (v.) – опровергать
distance (n.) – расстояние
distinguished (adj.) – отличительный
distribute (v.) – распределять, распространять
drive (drove, driven) (v.) – ездить, ехать
drop (v.) – ронять, бросать, падать
drugs (n.) – лекарственные препараты
due to – благодаря, вследствие, в результате
dust (n.) – пыль
earth (n.) – земля

efficiency (n.) – эффективность, результативность, продуктивность, действенность, умение
either...or – или...или, либо...либо
eliminate (v.) – устранять, исключать, ликвидировать
elusive (adj.) – неуловимый, незаметный
emit (v.) – испускать, выделять
employ (v.) – применять, использовать
empty (adj.) – пустой
engine (n.) – двигатель, мотор
engineering (n.) – техника
enhance (v.) – увеличивать, усиливать, расширять
enough – достаточно
entire (adj.) – целый, единый
environment (n.) – окружающая среда
equal (adj.) – равный
equal (v.) – быть равным, равняться
equation (n.) – уравнение
equilibrium (n.) – равновесие
equipment (n.) – оборудование
error (n.) – ошибка, погрешность
essentially (adv.) – существенно, по существу, чрезвычайно
establish (v.) – устанавливать, учреждать, основывать
evaporator (n.) – испаритель
evolve for (v.) – эволюционировать, превращаться в, развивать(ся)
exception (n.) – исключение
exchange (n.) – обмен
exclude (v.) – исключать
exhaust (n.) – выхлопная труба
exist (v.) – существовать
expand (v.) – расширяться
expansion (n.) – расширение
experience (v.) – испытывать, чувствовать
explain (v.) – объяснять
express (v.) – выражать
extension (n.) – распространение, расширение
faith (n.) – вера
fall (fell, fallen) (v.) – падать
feature (n.) – черта, признак

fill (v.) – наполнять, заполнять
film (n.) – пленка
find (found, found) (v.) – находить
flame (n.) – пламя
flow (flew, flown) (v.) – течь
fluid (n.) – текучее вещество (жидкость, газ)
fluorine (n.) – фтор
foil (n.) – фольга
follow (v.) – следовать
food (n.) – пища
for example – например
fossil fuel – ископаемое топливо
found (v.) – основывать
freeze (froze, frozen) (v.) – замораживать, замерзать
freezer (n.) – морозильник
freon (n.) – фреон
frighten (v.) – пугать
fume (n.) – дым, испарения
gain (n.) – прибыль, прирост
gain (v.) – получать, приобретать
gasoline (n.) – горючее
generation (n.) – поколение
get along (v.) – справиться
give (gave, given) off (v.) – отдавать, отводить
goal (n.) – цель
govern (v.) – управлять, руководить, определять
gradually (adv.) – постепенно
grain (n.) – зерновые культуры
growth (n.) – рост
halogenated hydrocarbon – галогенированный углеводород
happen (v.) – происходить, случаться
hardware (n.) – аппаратные средства, оборудование, «железо»
harmful (adj.) – вредный
have in common – иметь общее
head (n.) – головка
heat (n.) – тепло, теплота
heat (v.) – нагревать
heat transfer – теплопередача

heating (ger.) – нагривание; отопление
heavy (adj.) – тяжелый
hence – следовательно
high (adj.) – высокий
hold (held, held) (v.) – держать, удерживать
hole (n.) – отверстие, дыра
honour (n.) – честь
hot (adj.) – горячий, жаркий
hungry (adj.) – голодный
huge (adj.) – огромный
hydrogen (n.) – водород
impetus (n.) – стимул, импульс, толчок
important (adj.) – важный
improve (v.) – улучшать
in turn – в свою очередь
inclination (n.) – склонность, предпочтение
include (v.) – включать в себя
increase (v.) – увеличивать
increasingly (adv.) – все больше и больше, в большей степени
influence (v.) – влиять
ingest (v.) – потреблять
inherent (adj.) – присущий, свойственный
initial (adj.) – начальный, первоначальный
inkling (n.) – намек, слабое представление о чём-либо
input (n.) – вход
install (v.) – устанавливать
installation (n.) – установка
instead (adv.) – вместо, взамен
insulator (n.) – изолятор
intelligence (n.) – интеллект
intend (v.) – предназначать
interference (n.) – вмешательство
internal (adj.) – внутренний
introduction (n.) – введение
invent (v.) – изобретать
investigate (v.) – изучать, исследовать
involve (v.) – вовлекать, включать
keep (kept, kept) (v.) – хранить

key chemicals – ключевые химические продукты
knowledge (n.) – знания
lap (n.) – колени
latter (adj.) – последний (из упомянутых)
law (n.) – закон
layer (n.) – слой
lead (led, led) (v.) – вести
leave (left, left) (v.) – оставлять, покидать
light (n.) – свет
light-coloured (adj.) – светлый
lightning (n.) – молния
lightning rod – громоотвод
link (n.) – связь
link (v.) – связывать
liquid (adj.) – жидкий
liquid (n.) – жидкость
livestock (n.) – домашний скот
lose (lost, lost) (v.) – терять
loss (n.) – потеря
low (adj.) – низкий
magnitude (n.) – величина
main (adj.) – основной, главный
maintain (v.) – поддерживать, сохранять
manner (n.) – способ
manufacture (n.) – производство
matter (n.) – вещество
meal (n.) – еда, принятие пищи, трапеза
mealtime (n.) – время принятия пищи
mean (v.) – значить, означать
meaning (n.) – значение
means (n.) – средство, средства
measure (n.) – мера
measure (v.) – измерять
measurement (n.) – измерение
medium (n.) – среда
melt (v.) – таять, плавиться
mercury (n.) – ртуть
minute (adj.) – мелкий, мельчайший

miraculous (adj.) – чудодейственный, сверхъестественный
mirror (n.) – зеркало
mixture (n.) – смесь
mode (n.) – способ
modify (v.) – видоизменять, корректировать
motion (n.) – движение
move (v.) – двигать, передвигать
movement (n.) – движение
neither...nor – ни...ни; ни тот, ни другой
nitrogen (n.) – азот
noodles (n.) – лапша
notion (n.) – идея, понятие, представление
nourishment (n.) – питание, пища, еда
nuclei (n., pl.) – ядра
nucleus (n., sing.) – ядро
numerical (adj.) – числовой
numerous (adj.) – многочисленный
nutrition (n.) – пища, питание
objection (n.) – возражение
observe (v.) – наблюдать
obtain (v.) – получать
occasional (adj.) – случайный
occupy (v.) – занимать
occur (v.) – происходить
offer resistance (v.) – оказывать сопротивление
oil (n.) – нефть
oppositely (adv.) – противоположно
order (n.) – порядок
ordinary (adj.) – обычный
otherwise (adv.) – иначе, в противном случае
output (n.) – выход
oxygen (n.) – кислород
painful (adj.) – болезненный
palm (n.) – ладонь
particle (n.) – частица
particular (adj.) – особенный
pass (v.) – проходить
pattern (n.) – модель

penetrate (v.) – проникать
perform (v.) – выполнять
phenomenon (n.) – явление
pick up (v.) – собирать
pico – первая составная часть сложных слов – названий единиц измерения, обозначающая уменьшение в триллион раз
pin (n.) – булавка
plant (n.) – растение; завод; установка
plastic(s) (n.) – пластмасса
polished (adj.) – полированный
pollute (v.) – загрязнять
poor (adj.) – плохой
posses (v.) – обладать
power (n.) – сила, энергия, мощность
precision (n.) – точность
predict (v.) – предсказывать
prediction (n.) – предсказание
pressure (n.) – давление
prevalent (adj.) – распространенный, общепринятый
previously (adv.) – ранее
procedure (n.) – процедура, порядок действий, набор команд
process (v.) – обрабатывать, перерабатывать
produce (v.) – производить
promote (v.) – продвигать, способствовать, поддерживать
propel (v.) – приводить в движение
property (n.) – свойство
prosperity (n.) – процветание, преуспевание, благосостояние
protection (n.) – защита
prove (v.) – доказывать
provide (v.) – обеспечивать, снабжать
provided – при условии
pure (adj.) – чистый
pure sciences – фундаментальные науки
purpose (n.) – цель
quality (n.) – качество
quantity (n.) – количество
quantum mechanics – квантовая механика
radiate (v.) – излучать

radiation (n.) – излучение
random (adj.) – беспорядочный, хаотичный
rapid (adj.) – быстрый
rare (adj.) – редкий
rather than – лучше, охотнее, скорее, а не
raw material – сырье
ray (n.) – луч
reach (v.) – достигать
reactant (n.) – реагент
readily (adv.) – легко
reason (n.) – причина
receive (v.) – получать
recognise (v.) – признавать
recreation (n.) – отдых
reduce (v.) – понижать, сокращать, уменьшать
refer to (v.) – относить, ссылаться
reference (n.) – ссылка
refine (v.) – очищать
reflect (v.) – отражать
refrigerator (n.) – холодильник
rejection (n.) – отказ, непринятие
relate (v.) – относиться, иметь отношение, быть связанным
relatively (adv.) – относительно
release (v.) – высвободить
repel (v.) – отражать, отталкивать
replace (v.) – замещать
represent (v.) – представлять, обозначать
require (v.) – требовать
research (n.) – исследование
research (n.) – исследование
resource (n.) – ресурс, источник
respectively (adv.) – соответственно
respond (v.) – реагировать, отзываться
result from (v.) – происходить, получаться из-за чего-либо
revise (v.) – проверять, пересматривать, перерабатывать
rise (rose, risen) (v.) – подниматься
rough (adj.) – грубый
same – такой же самый, одинаковый

sample (n.) – образец, пример
satellite (n.) – спутник
save (v.) – спасать
scale (n.) – шкала; масштаб
science (n.) – наука
scientific (adj.) – научный
scientist (n.) – ученый
search (n.) – поиск
seem (v.) – казаться
select (v.) – выбирать
self- – само-, себя-
separate (v.) – разделять
serve (v.) – служить
set (set, set) up (v.) – устанавливать, создавать
share (v.) – делить, разделять
significance (n.) – значение, смысл, важность
significant (adj.) – важный, знаменательный
signify (v.) – значить, означать
similar to (adv.) – подобно
single (adj.) – один, единственный, одиночный
skilful (adj.) – опытный, умелый
smell (v.) – пахнуть
society (n.) – общество
sodium (n.) – натрий
software (n.) – программное обеспечение
soil (n.) – почва
solid (adj.) – твердый
solid (n.) – твердое тело
solve (v.) – решать
spatial (adj.) – пространственный
species (n.) – порода (породы), вид(ы)
speed (n.) – скорость
spirit lamp – спиртовая лампа, спиртовка
spontaneously (adv.) – спонтанно, самопроизвольно
state (n.) – состояние
state (v.) – заявлять, констатировать, гласить
steam (n.) – водяной пар
stick (stuck, stuck) (v.) – приклеивать

still (adj.) – спокойный
store (v.) – сохранять, накапливать
stove (n.) – печь, плита
strain (n.) – штамм
stream (n.) – поток
strike (struck, struck) (v.) – ударять
subscript (n.) – подстрочный знак, индекс
substance (n.) – вещество
substantiate (v.) – доказывать, обосновывать
substitute (n.) – замена, замещение
such as – такой как
suck (v.) – всасывать
suction fan – приточный вентилятор
sufficiently – достаточно
sulfur (n.) – сера
support (v.) – поддерживать
surface (n.) – поверхность
survival (n.) – выживание
take (took, taken) place (v.) – иметь место, происходить
take up (v.) – занимать
tangible (adj.) – вещественный, материальный
tank (n.) – бак, резервуар
target (v.) – направлять, нацеливать
technique (n.) – технический прием, метод
tend (v.) – стремиться, иметь тенденцию
term (n.) – термин
test-tube (n.) – пробирка
the same – такой же, одинаковый
thermal (adj.) – тепловой
thick (adj.) – толстый
throw (threw, thrown) (v.) – бросать
tie (v.) – связывать
touch (v.) – трогать, прикасаться
transfer (v.) – передавать
transparency (n.) – прозрачность
trap (v.) – улавливать, захватывать
trial (n.) – испытание, проба
triple (adj.) – тройной

trust (n.) – доверие, вера
underlie (v.) – лежать в основе
unique (adj.) – уникальный, исключительный, единственный
unit (n.) – единица
unity (n.) – единство, единение, сплоченность
upset (v.) – нарушать
use (v.) – использовать
value (n.) – значение
valve (n.) – клапан
vapour (n.) – пар
variety (n.) – разнообразие
various (adj.) – разный
vast (adj.) – обширный
vegetables (n.) – овощные культуры
velocity (n.) – скорость
verify (v.) – проверять
vibratory (adj.) – колебательный
violation (n.) – нарушение
viscosity (n.) – вязкость
visible (adj.) – видимый
volume (n.) – объем
wave (n.) – волна
wealth (n.) – богатство, изобилие, процветание, благосостояние
weight (n.) – вес
workshop (n.) – мастерская
worry about (v.) – беспокоиться по поводу
yield (v.) – давать какой-нибудь результат

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APPENDIX 1

ОСНОВНЫЕ ПРАВИЛА ЧТЕНИЯ

Основные правила чтения гласных в ударном слоге

Буквы	I тип (алфавитное чтение)	II тип (краткое чтение)	III тип (+r+согл.)	IV тип (+r+гласная)
Aa	[ei] name	[æ] cat	[a:] car, card	[ɛə] care
Oo	[ou] no	[ʊ] not	[ɔ:] for, fork	more
Ee	[i:] be	[e] pet	[ə:] her	[iə] here
Uu	[ju:] cube	[ʌ] bus	fur	[juə] pure
Ii	[ai] like	[i] film	girl	[aiə] fire
Yy	my	myth	myrtle	tyre

Правила чтения некоторых согласных

Cc	[s]	Перед e, i, y	cent	['sent]	
			cinema	['sinimə]	
	[k]	В остальных случаях	cycle	['saɪkl]	
			cake	['keɪk]	
Gg	[dʒ]	Перед e, i, y	age	['eɪdʒ]	
			gin	['dʒɪn]	
			gyp	['dʒɪp]	
	[g]	В остальных случаях	go	['gou]	
			Исключения	begin	[bɪ 'ɡɪn]
				get	['ɡet]
				gift	['ɡɪft]
	give	['ɡɪv]			

			girl	['gɜ:l]
Ss	[s]	В начале слова	so	['sou]
		Перед глухой согласной	steel	['sti:l]
		В конце слова после глухой согласной	books	['buks]
	[z]	В конце слова после гласной	days	['deiz]
		В конце слова после звонкой согласной	rains	['reinz]
		Между гласными	rose	['rouz]
Xx	[ks]	После ударной гласной	six	['siks]
	[gz]	Перед ударным слогом	exam	[ig 'zæm]

Сочетания согласных

ck	[k]	clock	[klɔk]
ch	[tʃ]	chess	[tʃes]
	[k]	chemistry	['kemistri]
	[ʃ]	machine	[mə'ʃi:n]
tch	[tʃ]	match	['mætʃ]
gh	[f]	enough	[i'nʌf]
	[-]	high	['hai]
		light	['lait]
kn	[n]	know	['nou]
ph	[f]	photo	['foutəu]
	[v]	nephew	['nevju:]
sh	[ʃ]	she	[ʃi:]

th	[ð]	they	[ðei]
	[θ]	three	[θri:]
		month	[mʌnθ]
	[t]	Thames	['temz]
wr	[r]	write	[rait]

Сочетания гласных

ea	[i:]	sea	[si:]
ee		see	[si:]
oa	[ou]	boat	[bout]
ai	[ei]	rain	[rein]
ay		pay	[pei]
ey	[ei]	they	[ðei]
ei		veil	[veil]
oo	[u:]	cool	[ku:l]
	[u]	book	[buk]
ou	[au]	out	[aut]
ow		now	[nau]
oi	[ɔi]	oil	[ɔil]
ew	[ju:]	new	[nju:]
au	[ɔ]	pause	[pɔz]
aw		draw	[drɔ]
ea+d	[e]	head	[hed]

Сочетания гласных с согласными

a+ll	[ɔ]	all	[ɔ]
a+lt	[ɔ]	salt	[sɔlt]

a+lse	[ɹ]	false	[fɹls]
a+lck	[ɹ]	chalk	[tʃɹk]
a+lɪm	[ɑ:]	calm	[kɑ:m]
a+lɪf (lv)	[ɑ:]	half halves	[hɑ:f] [hɑ:vz]
a+nɛ	[ɑ:]	chance	[tʃɑ:ns]
a+nɪtʃ	[ɑ:]	ranch	[rɑ:nʃ]
a+nɪt	[ɑ:]	plant	[plɑ:nt]
a+s	[ɑ:]	glass	[glɑ:s]
a+st	[ɑ:]	last	[lɑ:st]
a+sɪk, sp	[ɑ:]	ask grasp	[ɑ:sɪk] [grɑ:sp]
a+ff, th	[ɑ:]	staff bath	[stɑ:f] [bɑ:θ]
w+ar	[ɹ]	warm	[wɹm]
w+or	[ə:]	work	[wə:k]

Сочетания согласных с гласными

cail	[fə]	official	[ə'fɪjəl]
cient		sufficient	[sə'fɪjənt]
dier	[dʒə]	soldier	['souldʒə]
dure		procedure	[prə'sɪdʒə]
gue	[g]	dialogue	['daɪəlɔg]
gui		guide	['gaɪd]
qu	[kw]	quite (well)	['kwaɪt]
que	[k]	cheque	['tʃek]
sion	[z(ə)n]	television	[teli'vɪz(ə)n]
	[ʃ(ə)n]	pension	['penʃ(ə)n]
ssion	[ʃ(ə)n]	mission	['mɪʃ(ə)n]
Исключение:		combustion	[kəm'bʌstʃ(ə)n]

sure	[ʒə]	measure	['meɜə]
	[fə]	pressure	['preʃə]
tion	[ʃ(ɹ)n]	dictation	[dik'teiʃ(ɹ)n]
tual	[tʃuəl]	actual	['æktʃuəl]
	[tjuəl]	mutual	['mju:tjuəl]
ture	[tʃə]	future	['fju:tʃə]
ture		century	['sentʃəri]
Исключение:		mature	[mə'tjuə]
		premature	[premə'tjuə]
wh + o	[h]	who	[hu:]
wh + другая гласная	[w]	what	['wɒt]
		where	[wɛə]
		white	['wait]
		why	[wai]
w + er	[ə]	answer	['a:nsə]
w + or	[wə:]	work	['wə:k]
w+a; qu+a			
+ r, l	[ɹ]	war	['wɹ]
		wall	['wɹl]
		quarter	['kwɹtə]
+ другая согласная	[ɒ]	want	[wɒnt]
		quantity	['kwɒntiti]

APPENDIX 2

Правила произношения и правописания окончаний *-(e)s, -ed, -ing*

1. Окончание *-(e)s* используется для образования множественного числа имени существительного и глагола в 3-м лице единственного числа видовременной формы the Present Simple Tense.

Произношение

Звук	Окончание основы существительного или глагола	Пример
[s]	глухой согласный звук	books, works
[z]	звонкий согласный звук гласный звук	friends, runs days, pays, goes
[iz]	шипящий или свистящий согласный звук	watches, manages

Правописание

Единственное и множественное число имени существительного

Правило правописания	Единственное число	Множественное число
<i>-s</i> для большинства существительных	bag table car	bags tables cars
<i>-es</i> для существительных, оканчивающихся на <div style="display: flex; justify-content: space-between; padding: 0 10px;"> <i>-o</i> potato potatoes </div> <div style="display: flex; justify-content: space-between; padding: 0 10px;"> <i>-s</i> class classes </div> <div style="display: flex; justify-content: space-between; padding: 0 10px;"> <i>-x</i> box boxes </div> <div style="display: flex; justify-content: space-between; padding: 0 10px;"> <i>-sh</i> bush bushes </div> <div style="display: flex; justify-content: space-between; padding: 0 10px;"> <i>-ch</i> watch watches </div>		
<i>-ies</i> согласный звук + <i>y</i> <i>-s</i> гласный звук + <i>y</i>	country day	countries days
Исключения: изменение гласного в корне существительные с мн.ч. на <i>-en</i> отсутствие изменения существительные, оканчивающиеся на <i>f/fe</i> → <i>ves</i> иноязычные слова	man woman child sheep means leaf wife analysis datum	men women children sheep means leaves wives analyses data

Правописание глагола в 3-м лице единственного числа
видовременной формы the Present Simple Tense

Правило правописания	Словарная форма глагола	3-е лицо ед. числа
-s для большинства глаголов	work drive buy	works drives buys
-es для глаголов, оканчивающихся на -o -s -x -sh -ch	do miss mix push catch	does misses mixes pushes catches
-ies согласный звук + y	cry study	cries studies

2. Окончание – *ed* используется для образования II (Past Simple) и III (Participle II) формы у правильных глаголов.

Произношение

Звук	Окончание основы глагола	Пример
[t]	глухой согласный звук	worked passed laughed
[d]	звонкий согласный звук гласный звук	opened arrived stayed
[ɪd]	согласный d/t	added posted

Правописание

Правило правописания	Словарная форма глагола	Past Simple/Participle II
- <i>ed</i> для большинства глаголов	wait	waited
- <i>d</i> для глаголов, оканчивающихся на - <i>e</i>	arrive	arrived
удвоение конечной согласной + <i>ed</i>	stop refer	stopped referred
NB при ударении на первый слог	differ	differed
- <i>ied</i> согласный + y NB	carry delay	carried delayed

3. Окончание – *ing* – четвертая форма глагола (Participle I/Gerund)

Правописание

Правило правописания	Словарная форма	Participle I/Gerund
<i>-ing</i> для большинства глаголов	wait try study	waiting trying studying
гласная – <i>e</i> опускается	write	writing
удвоение конечной согласной	run begin	running beginning
NB при ударении на первый слог	differ	differing
<i>ie</i> → <i>y</i>	lie tie	lying tying

APPENDIX 3

Типы словообразования

1. **Аффиксация** – способ словообразования путем присоединения к корню или основе словообразовательных аффиксов. Аффиксы подразделяются на **префиксы** и **суффиксы**.

Суффикс – производная морфема, следующая за корнем и образующая новое слово в другой части речи: heart, to hearten, hearty, heartless, heartly. Поэтому знание суффиксов важно для определения части речи.

Суффиксы существительных

-er, -or	seller (продавец), constructor (конструктор)
-tion (-ation)	connection (соединение), organization (организация)
-ing	building (здание), planning (планирование)
-ment	development (развитие), government (правительство)
-(t)ure	future (будущее), nature (природа)
-ance(- ence)	importance (важность), dependence (зависимость)
-ness	effectiveness (эффективность), accurateness (точность)
-ity	activity (деятельность), possibility (возможность)
-th	strength (сила), growth (рост)
-ship	friendship (дружба), relationship (взаимосвязь)
-ism	mechanism (механизм), capitalism (капитализм)
-ics	economics (экономика), physics (физика)
-ist	economist (экономист), physicist (физик)

Суффиксы прилагательных

-al	national (национальный), industrial (промышленный)
-able (-ible)	changeable (изменчивый), convertible (обратимый)
-ant (-ent)	resistant (устойчивый), different (различный)
-ive	active (деятельный), competitive (конкурирующий)

-ful	peaceful (мирный), useful (полезный)
-ic	basic (основной), historic (исторический)
-ous	famous (знаменитый), dangerous (опасный)
-less	useless (беспользнь), careless (небрежный)

Суффиксы глаголов

-en	to weaken (ослаблять), to shorten (укорачивать(ся))
-fy	to intensify (усиливать), to simplify (упрощать)
-ize	to realize (осуществлять), to stabilize (стабилизировать)

Суффиксы наречий

-ly	practically (практически), entirely (полностью)
-ward(s)	forward(s) (вперёд), backward(s) (назад)

Префикс – морфема, стоящая до корня и служащая для изменения значения слова. Наибольшую группу слов составляют отрицательные префиксы: known – unknown.

Префиксы с отрицательным значением

dis-	disability (неспособность), to disapprove (не одобрять)
in-	incapable (неспособный), incomplete (неполный)
il- (перед l)	illegal (незаконный), illiterate (неграмотный)
ir- (перед r)	irrational (нерациональный), irregular (нестандартный)
im- (перед m, p, b)	impossible (невозможный), immobile (неподвижный)

mis-	to miscalculate (ошибиться в расчёте), to misinform (дезинформировать)
non-	non-essential (несущественный), noneffective (неэффективный)
un-	unlimited (неограниченный), unknown (неизвестный)

Префиксы с разными значениями

over- (сверх)	to overestimate (переоценить), to overcome (преодолевать)
post- (после)	postwar (послевоенный), postgraduate (аспирант)
pre- (до)	prewar (довоенный), prehistoric (доисторический)
re- (вновь)	to rewrite (переписывать), to restore (восстанавливать)
under- (не, ниже, под)	to underestimate (недооценить), underdeveloped (слаборазвитый)

2. **Словосложение** – образование слов путем слияния двух или более основ (корней), которые встречаются в языке в виде свободных форм.

Типы классификации:

1) по типу соединительного элемента

a) без соединительного элемента: heartache, snowball

b) с соединительным элементом (гласная или согласная):

statesman, speedometer

c) соединительный элемент (предлог или союз): son-in-law,

forget-me-not, up-to-date

2) по части речи, к которой принадлежит сложное слово

a) сложное существительное: blackboard

b) сложное прилагательное: first-class

c) сложный глагол: to blackmail и т. д.

3. **Конверсия** – образование новых слов путем перехода в другую часть речи без какого-либо изменения слова: love – to love, offer – to

offer, work – to work. При конверсии образуются грамматические омонимы, семантически связанные с исходным словом. Иногда наблюдается изменение ударения: `increase – to in`crease или изменение произношения: use [ju:s] – to use [ju:z].

APPENDIX 4

АНГЛИЙСКАЯ ЛЕКСИКА

Синонимы, антонимы, омонимы

Синонимы – слова, принадлежащие к одной части речи и близкие или тождественные по значению. Они отличаются оттенками значения и употреблением в речи.

Слова-синонимы объединяются в синонимические ряды. Одно из этих слов является в этом ряду основным, т.к. передает наиболее общее понятие и является нейтральным по стилю.

Например:

to work – (основное значение) – работать, трудиться

to labour – трудиться, (тяжело) работать, прилагать усилия

to toil – усиленно работать, достигать (чего-либо) усиленным трудом

to drudge – выполнять тяжелую, нудную работу

mistake – (основное значение) – ошибка

slip – ошибка, промах, оговорка, описка

error – ошибка, погрешность, заблуждение

blunder – грубая ошибка

Антонимы – слова, принадлежащие к одной части речи, но имеющие противоположное значение. Выделяют:

1. Абсолютные (корневые) антонимы:

to love – to hate – любить – ненавидеть

hot – cold – холодный – горячий

peace – war – мир – война

2. Производные, образованные при помощи отрицательных префиксов или суффиксов:

known – unknown – известный – неизвестный

logical – illogical – логичный – нелогичный

useful – useless – полезный – бесполезный

Омонимы – слова, идентичные по звучанию и/или по написанию, но различные по значению. Омонимы подразделяются на:

1. Истинные омонимы, которые звучат и пишутся одинаково:
 - well (хорошо) – well (колодец, скважина)
 - can (мочь) – can (консервная банка)
 - ball (мяч) – ball (бал)
 - rose (роза) – rose (V₂ от глагола ‘to rise’)
 - light (свет, светлый, освещать) – light (легкий)
2. Омофоны – омонимы, которые пишутся по-разному, но звучат одинаково:
 - buy (покупать) – by (предлог) – bye (до свидания)
 - blue (синий) – blew (V₂ от глагола ‘to blow’)
 - for (предлог) – four (четыре) – fore (передняя часть чего-либо, передний)
 - here (здесь) – hear (слышать)
 - know (знать) – no (нет)
 - meet (встречать(ся)) – meat (мясо)
 - hour (час) – our (наш)
 - right (правый, правильный) – write (писать)
3. Омографы – омонимы, которые пишутся одинаково, а произносятся по-разному:
 - wind [wind] – ветер, [waɪnd] – пружина, петлять
 - lead [li:d] – вести, руководить, [led] – свинец
 - bow [bou] – лук, дуга, [bau] – поклон, кланяться
 - tear [tɛə] – рвать, [tiə] – слеза

APPENDIX 5

Типы вопросительных предложений

Название	Вопрос	Ответ
Общие вопросы General questions	Do you <u>work</u> ? Is she <u>reading</u> ?	Yes, I do / No, I don't . Yes, she is / No, she isn't .
Альтернативные вопросы Alternative questions	Have you <u>been</u> to London or (have you been to) Paris? Does he <u>know</u> French or English?	I have been to London. He <u>knows</u> English.
Разделительные вопросы Tag-questions	You <u>work</u> much, don't you? She can't <u>speak</u> English, can she?	Yes, I do / No, I don't . No, she can't / Yes, she can .
Специальные вопросы Special questions	Where do you <u>work</u> ? What is she <u>reading</u> ? Who knows this story?	I <u>work</u> at an institute. She is <u>reading</u> a book. He (does).

APPENDIX 6

Деловая корреспонденция

1. Структура и смысловые части делового письма

Схема делового письма

	Letterhead (including the company's name and sender's address) (Заголовок, включающий наименование компании и адрес отправителя)
	Date (Дата)
Recipient's address (the name and the address of the person to whom you are writing (addressee)) (Имя и адрес получателя)	
Salutation (Обращение)	
Subject line (Содержание письма)	
	Message (Текст)
Complimentary clause (Заключительная формула вежливости)	
Signature (Подпись)	
Writer's identification (Расшифровка подписи)	
Reference initials (Инициалы автора письма и исполнителя)	
Enclosure (Приложения)	

Образец делового письма

Interice Inc.
2358 Yates Road
Los Angeles, Ca. 00007, USA

May 24, 2015

Mr. Jack Baily
President, Rotary Club
2554 Seventh Street
Westport, Connecticut 06881-2765

Dear Jack,

Subject: Business seminar

Thank you for your invitation to lead a business seminar for high-school students for the next two months.

Unfortunately, I've already made other commitments for those dates.

I hope the enclosed book of mine (not printed yet) will help those who are going to work instead of me. Please let me know how else I might support the present seminar.

Sincerely,

Don Lyman

Lyman Oriental Imports, Inc.

DL/gt

Enclosure: book

Схема расположения частей адреса на конверте делового письма

Sender's name and address Имя отправителя и/или название организации номер дома, название улицы, город, почтовый индекс (ZIP code), страна	Марка Указание на способ доставки Recipient's name and address (Addressee) Имя получателя и/или название организации номер дома, название улицы, город, почтовый индекс (ZIP code), страна
--	--

Образец оформления конверта

Dr. I. Ivanov ITMO University, 9 Lomonosova str. St.Petersburg 191002 Russia	Stamp Express Delivery Sleigh Ltd 99 Shandwick Place Edinburgh EH2 4SD Scotland
--	--

Схема служебной записки (Мемо)

To (кому):	Date (дата):
From (от кого):	
Subject (содержание):	
Message (Текст)	
The writer's initials (Инициалы автора записки)	

Образец служебной записки

To: Barry Lehman	Date: 24 April
From: John Black	
Subject: price quotations, costs of transport and insurance	
Here is the information you required about the Red Tunnel shipping services Yokohama – Southampton: &14,000 for our cargo of word processors plus &2,000 all – risks insurance.	
Do you need more information?	
J.B.	

Образец написания биографии (Curriculum Vitae/CV) или (Resume)

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