

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РОССИЙСКОЙ ФЕДЕРАЦИИ  
федеральное государственное бюджетное образовательное учреждение  
высшего образования  
«УЛЬЯНОВСКИЙ ГОСУДАРСТВЕННЫЙ ТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ»

**Ю. В. Жукова, Н. Ю. Рогова**

# **English in Mechanical Engineering**

Учебное пособие

Ульяновск  
УлГТУ  
2017

УДК 420 (075)  
ББК 81.2-923 я7  
Ж 86

Рецензенты: кафедра общего и германского языкознания Ульяновского государственного университета;  
доцент кафедры английского языка Ульяновского государственного педагогического университета им. И. Н. Ульянова,  
кандидат филологических наук Ю. А. Лобина

*Утверждено редакционно-издательским советом университета  
в качестве учебного пособия*

**Жукова, Юлия Владимировна**

Ж 86 English in Mechanical Engineering : учебное пособие / Ю. В. Жукова, Н. Ю. Рогова. – Ульяновск : УлГТУ, 2017. – 176 с.  
ISBN 978-5-9795-1670-7

Учебное пособие предназначено для студентов машиностроительного факультета технических вузов, изучающих дисциплину «Английский язык».

Учебное пособие предназначено для формирования умений и навыков чтения и перевода технической литературы и увеличению словарного запаса у студентов.

Пособие состоит из трех разделов. Первый раздел включает в себя тексты для аудиторного и внеаудиторного чтения по специальности. Во втором разделе представлен набор грамматических упражнений. Третий раздел содержит словарь-минимум.

**УДК 420 (076)  
ББК 81.2-923 я7**

Учебное электронное издание  
ЖУКОВА Юлия Владимировна, РОГОВА Наталья Юрьевна  
**English in Mechanical Engineering**

Учебное пособие  
Редактор Ю. С. Лесняк  
ЭИ № 927. Объем данных 0,8 Мб.  
ЛР № 020640 от 22.10.97.

Печатное издание  
Подписано в печать 01.06.2017. Формат 60×84/16.  
Усл. печ. л. 10,23. Тираж 100 экз. Заказ №529.  
Ульяновский государственный технический университет  
432027, Ульяновск, Сев. Венец, 32.  
ИПК «Венец» УлГТУ, 432027, Ульяновск, Сев. Венец, 32.  
Тел.: (8422) 778-113  
E-mail: venec@ulstu.ru  
venec.ulstu.ru

ISBN 978-5-9795-1670-7

© Жукова Ю. В., Рогова Т. В., 2017  
© Оформление. УлГТУ, 2017

## ОГЛАВЛЕНИЕ

<b>ВВЕДЕНИЕ</b> .....	<b>4</b>
-----------------------	----------

### **РАЗДЕЛ 1: ЧТЕНИЕ И ПЕРЕВОД НАУЧНО-ТЕХНИЧЕСКОЙ ЛИТЕРАТУРЫ**

1.1. Тексты для аудиторного чтения .....	5
1.2. Тексты для внеаудиторного чтения .....	51

### **РАЗДЕЛ 2: ГРАММАТИЧЕСКИЕ УПРАЖНЕНИЯ**

2.1. Глагол to be, порядок слов в английском предложении, вопросительные предложения, времена группы Simple .....	85
2.2. Времена группы Continuous .....	89
2.3. Времена группы Perfect .....	93
2.4. Действительный и страдательный залоги .....	97
2.5. Степени сравнения прилагательных и наречий, слова заместители (one/that), употребление such/so .....	101
2.6. Модальные глаголы can, may, must, should, need .....	104
2.7. Согласование времен .....	108
2.8. Причастие I, Причастие II .....	113
2.9. Герундий .....	117
2.10. Условные предложения .....	121

<b>РАЗДЕЛ 3: СЛОВАРЬ-МИНИМУМ</b> .....	<b>127</b>
--	------------

<b>БИБЛИОГРАФИЧЕСКИЙ СПИСОК</b> .....	<b>135</b>
---------------------------------------	------------

#### **Приложение 1**

Основные правила грамматики английского языка .....	136
---	-----

#### **Приложение 2**

Англоязычные научно-технические ресурсы сети Интернет .....	174
---	-----

## **ВВЕДЕНИЕ**

Учебное пособие предназначено для развития навыков чтения и перевода англоязычной научно-технической литературы и увеличения словарного запаса, а также формированию грамматических навыков, так как наряду со словарным и звуковым составом грамматика представляет собой материальную основу речи и является одним из важнейших компонентов речевых умений говорения, аудирования, чтения, письма.

Пособие состоит из трех разделов. В первом разделе пособия представлены тексты для аудиторного и внеаудиторного чтения по специальности, а именно, научно-технические тексты по специальности. Второй раздел включает набор грамматических упражнений для активизации грамматических структур. Третий раздел содержит словарь-минимум с целью облегчить процесс перевода научных текстов по специальности и может быть использован как справочник при самостоятельной работе. Кроме того, в пособии имеется два приложения. Приложение 1 содержит основные правила грамматики английского языка. В Приложении 2 представлены англоязычные научно-технические ресурсы сети Интернет.

**РАЗДЕЛ 1:**  
**ЧТЕНИЕ И ПЕРЕВОД**  
**НАУЧНО-ТЕХНИЧЕСКОЙ ЛИТЕРАТУРЫ**

*1.1. Тексты для аудиторного чтения*

**Text 1: What is Mechanical Engineering?**

Mechanical engineering is a diverse subject that derives its breadth from the need to design and manufacture everything from small individual parts and devices (e.g., microscale sensors and inkjet printer nozzles) to large systems (e.g., spacecraft and machine tools). The role of a mechanical engineer is to take a product from an idea to the marketplace. In order to accomplish this broad range of skills are needed. The mechanical engineer needs to acquire particular skills and knowledge. He/she needs to understand the forces and the thermal environment that a product, its parts or its subsystems will encounter; to design them for functionality, aesthetics, and the ability to withstand the forces and the thermal environment they will be subjected to; and to determine the best way to manufacture them and ensure they will operate without failure. Perhaps the one skill that is the mechanical engineer's exclusive domain is the ability to analyze and design objects and systems with motion.

Since these skills are required for virtually everything that is made, mechanical engineering is perhaps the broadest and most diverse of engineering disciplines. Mechanical engineers play a central role in such industries as automotive (from the car chassis to its every subsystem – engine, transmission, sensors); aerospace (airplanes, aircraft engines, control systems for airplanes and spacecraft); biotechnology (implants, prosthetic devices, fluidic systems for pharmaceutical industries); computers and electronics (disk drives, printers, cooling systems, semiconductor tools); microelectromechanical systems or MEMS (sensors, actuators, micropower generation); energy conversion (gas turbines, wind

turbines, solar energy, fuel cells); environmental control (HVAC, air-conditioning, refrigeration, compressors); automation (robots, data and image acquisition, recognition, control); manufacturing (machining, machine tools, prototyping, microfabrication).

### **Задания к тексту**

#### **I. Найдите в тексте ответы на следующие вопросы:**

1. What is Mechanical Engineering?
2. What is the role of mechanical engineer?
3. Name the skills which are needed for any mechanical engineer.
4. Where do mechanical engineers play a central role?
5. Why is mechanical engineering the broadest and most diverse of engineering disciplines?
6. What is the role of mechanical engineers in manufacturing?

#### **II. Соедините части предложений по смыслу.**

1. The mechanical engineer needs to acquire	a. automotive, biotechnology, computers and electronics, microelectromechanical systems, energy conversion and others.
2. Since these skills are required for virtually everything that is made, mechanical engineering is	b. is the ability to analyze and design objects and systems with motion.
3. Mechanical engineers play a central role in such industries as	c. particular skills and knowledge.
4. Mechanical engineers needs to understand	d. is perhaps the broadest and most diverse of engineering disciplines.
5. Automation means	e. the forces and the thermal environment that a product, its parts, or its subsystems will encounter.
6. One skill that is the mechanical engineer's exclusive domain	f. robots, data and image acquisition, recognition, control.

**III. Подберите русские эквиваленты к следующим словам и словосочетаниям:**

machine tool, manufacture, thermal environment, mechanical engineering, functionality, be subjected to, microscale sensors, skills, ability, diverse, a energy conversion, semiconductor, virtually, to operate without failure, automotive industry

---

*навыки, крошечные датчики, работать без сбоя, способность, практически, термальная среда, разнообразный, автомобильная промышленность, полупроводник, машиностроение, преобразование энергии, станок, быть подверженным, производить, функциональное назначение*

**IV. Переведите предложения на английский язык, обращая внимание на употребление новой лексики из Упражнения III.**

1. Машиностроение это область обрабатывающей промышленности по производству машин и оборудования.
2. На заводах и фабриках используются разнообразные станки для разных целей.
3. Полупроводники проводят электричество хуже, чем металлы.
4. Чтобы работать инженером-механиком, нужны особые навыки.
5. Это были примитивные изделия с ограниченной функциональностью.
6. Перевести эту фразу практически невозможно.
7. В прошлом году производство работало без сбоев.

## **Text 2: What is Mechanical Engineering? (Part 2)**

Mechanical engineering deals with anything that moves including the human body – a very complex machine. Mechanical engineers learn about materials, solid and fluid mechanics, thermodynamics, heat transfer, control, instrumentation, design and manufacturing to understand mechanical systems. Specialized mechanical engineering subjects include biomechanics, cartilage-tissue engineering, energy conversion, laser-assisted materials processing, combustion, MEMS, microfluidic devices, fracture mechanics, nanomechanics, mechanisms, micropower generation, tribology (friction and wear), and vibrations. The American Society of Mechanical Engineers (ASME) currently lists 36 technical divisions from advanced energy systems and aerospace engineering to solid-waste engineering and textile engineering.

The breadth of the mechanical engineering discipline allows students a variety of career options beyond some of the industries listed above. Regardless of the particular path they envision for themselves after they graduate, their education will have provided them with the creative thinking that allows them to design an exciting product or system, the analytical tools to achieve their design goals, the ability to overcome all constraints, and the teamwork needed to design, market, and produce a system. These valuable skills could also launch a career in medicine, law, consulting, management, banking, finance, and so on.

For those interested in applied scientific and mathematical aspects of the discipline graduate study in mechanical engineering can lead to a career of research and teaching.

### **Задания к тексту**

#### **I. Найдите в тексте ответы на следующие вопросы:**

1. What do mechanical engineers learn about?
2. What do specialized mechanical engineering subjects include?

3. How many technical divisions do you know?
4. What can lead to a career of research and teaching?

**II. Укажите, являются утверждения верными (true) или неверными (false).**

1. Mechanical engineering deals with anything that is at rest.
2. The American Society of Mechanical Engineers (ASME) currently lists 41 technical divisions.
3. Specialized mechanical engineering subjects include a lot of fields such as biomechanics, cartilage-tissue engineering, energy conversion, etc.
4. Nanomechanics is one of the subjects of electrical engineering.
5. Such valuable skills as the creative thinking and the teamwork could also help mechanical engineers make a career in medicine, law, consulting, management, banking, finance, and so on.
6. Mechanical engineers can learn about design and manufacturing to understand mechanical systems.

**III. Подберите русские эквиваленты к следующим словам и словосочетаниям:**

heat transfer, to deal with, textile engineering, to overcome all constraints, solid mechanics, micropower generation, fluid mechanics, creative thinking, combustion, fracture mechanics, a variety of, solid waste, breadth, launch a career

---

*механика твердого тела, микромощная генерация, сжигание, разнообразие, широта, твердые отходы, иметь дело с, механика разрушения, теплопередача, творческое мышление, снимать все ограничения, начать карьеру, текстильная промышленность, механика жидкости*

**IV. Переведите предложения на английский язык, обращая внимание на употребление новой лексики из Упражнения III.**

1. Любая профессия требует творческого подхода и мышления.
2. Твердые бытовые отходы – предметы или товары, потерявшие потребительские свойства.
3. Если студенты хотят начать карьеру, им нужно посещать дополнительные курсы, чтобы повысить уровень знаний в своей области.
4. Эти двое мужчин олицетворяют два различных типа человеческой жизни.
5. Теоретические законы механики жидкости и газов базируются на законах гидромеханики и гидродинамики.
6. Механика разрушения – наука, изучающая условия и виды разрушения твердых тел различной формы под действием внешних сил.
7. Наличие или отсутствие облаков имеет большое влияние на теплопередачу.

### **Text 3: Three Laws of Motion**

Sir Isaac Newton was one of the greatest scientists and mathematicians that ever lived. He was born in England on December 25, 1643. He was born the same year that Galileo died. He lived for 85 years.

Isaac Newton was raised by his grandmother. He attended Free Grammar School and then went on to Trinity College Cambridge. Newton worked his way through college. While at college he became interested in math, physics, and astronomy. Newton received both a bachelor's and master's degree.

While Newton was in college he was writing his ideas in a journal. Newton had new ideas about motion, which he called his three laws of motion. He also had ideas about gravity, the diffraction of light and forces. Newton's ideas were so good that Queen Anne knighted him in 1705. His accomplishments laid the foundations for modern science and revolutionized the world. Sir Isaac Newton died in 1727.

According to Newton's first law an object at rest will remain at rest unless acted on by an unbalanced force. An object in motion continues in motion with the same speed and in the same direction unless acted upon by an unbalanced force. This law is often called "the law of inertia". This means that there is a natural tendency of objects to keep on doing what they're doing. All objects resist changes in their state of motion. In the absence of an unbalanced force an object in motion will maintain this state of motion.

According to Newton's second law acceleration is produced when a force acts on a mass. The greater the mass (of the object being accelerated), the greater the amount of force needed (to accelerate the object). Everyone unconsciously knows the Second Law. Everyone knows that heavier objects require more force to move the same distance as lighter objects. For an object with a constant mass  $m$ , the second law states that the force  $F$  is the product of an object's mass and its acceleration  $a$ :  
 $F = m * a$ .

This is an example of how Newton's Second Law works: Mike's car which weighs 1,000 kg is out of gas. Mike is trying to push the car to a gas station and he makes the car go 0.05 m/s/s. Using Newton's Second Law you can compute how much force Mike is applying to the car. Answer = 50 newtons.

According to Newton's third law for every action there is an equal and opposite reaction. This means that for every force there is a reaction force that is equal in size, but opposite in direction. That is to say that whenever an object pushes another object it gets pushed back in the opposite direction equally hard.

Let's study how a rocket works to understand Newton's Third Law. The rocket's action is to push down on the ground with the force of its powerful engines, and the reaction is that the ground pushes the rocket upwards with an equal force.

### Задания к тексту

#### I. Найдите в тексте ответы на следующие вопросы:

1. Who is Sir Isaac Newton?
2. What areas did Newton work?
3. What does Newton's first law state?
4. Why is Newton's first law called "the law of inertia"?
5. Which Newton's law states that acceleration is produced when a force acts on a mass?
6. What does the Newton's third law state?

#### II. Соедините части предложений по смыслу.

1. Sir Isaac Newton was	a. gravity, the diffraction of light, and forces.
2. Newton had new ideas about	b. the greater the amount of force needed (to accelerate the object).
3. Newton received both	c. one of the greatest scientists and mathematicians that ever lived.

4. According to Newton's first law	d. a bachelors and masters degree.
5. He also had ideas about	e. for every action there is an equal and opposite reaction.
6. According to Newton's third law	f. motion, which he called his three laws of motion.
7. According to Newton's second law acceleration is produced when a force acts on a mass. The greater the mass	g. an object at rest will remain at rest unless acted on by an unbalanced force.

**III. Подберите русские эквиваленты к следующим словам и словосочетаниям:**

be interested in, unbalanced force, a master's degree, to revolutionize the world, upwards, diffraction of light, speed, direction, a bachelor's degree, powerful engine, in motion, acceleration, gravity, equal, at rest, amount of force, lay the foundations

---

*дифракция света, заложить основы, направление, сила тяжести, степень бакалавра, ускорение, неуравновешенная сила, количество силы, в движении, вверх, равный, степень магистра, скорость, интересоваться, мощный двигатель, кардинально изменить мир, в состоянии покоя*

**IV. Переведите предложения на английский язык, обращая внимание на употребление новой лексики из Упражнения III.**

1. Многие современные изобретения кардинально изменили мир.
2. Великий ученый Исаак Ньютон заложил основы классической физики.
3. Ньютон интересовался такими науками, как: физика, математика и астрономия.
4. Дифракция света была открыта Ф. Гримальди в конце XVII века.
5. Тело находится в состоянии покоя, если оно не подвергается воздействию других тел.
6. Треугольники с равными основаниями и равными высотами равновелики.
7. По окончании университета он получил степени бакалавра и магистра в области машиностроения.

#### **Text 4: History of Robots: Early legends**

The history of robots has its origins in the ancient world. The modern concept began to be developed with the onset of the Industrial Revolution which allowed for the use of complex mechanics and the subsequent introduction of electricity. This made it possible to power machines with small compact motors. In the early 20th century the notion of a humanoid machine was developed. Today, it is now possible to envisage human sized robots with the capacity for near human thoughts and movement.

The first uses of modern robots were in factories as industrial robots – simple fixed machines capable of manufacturing tasks which allowed production without the need for human assistance. Digitally controlled industrial robots and robots making use of artificial intelligence have been built since the 1960s. Concept of artificial servants and companions date at least as far back as the ancient legends of Cadmus who sowed dragon teeth that turned into soldiers and the myth of Pygmalion whose statue of Galatea came to life. Many ancient mythologies included artificial people, such as the talking mechanical handmaidens built by the Greek god Hephaestus (Vulcan to the Romans) out of gold, the clay golems of Jewish legend and clay giants of Norse legend. Chinese legend relates that in the 10th century BC, Yan Shi made an automaton resembling a human in an account from the *Lie Zi* text.

In Greek mythology, Hephaestus created utilitarian three-legged tables that could move about under their own power and a bronze man, Talos, that defended Crete. Talos was eventually destroyed by Media who cast a lightning bolt at his single vein of lead. To take the Golden Fleece Jason was also required to tame two fire breathing bulls with bronze hooves; and like Cadmus he sowed the teeth of a dragon into soldiers.

The Indian *Lokapannatti* (11th/12th century) tells the story of King Ajatashatru of Magadha who gathered the Buddha's relics and hid them in an underground stupa. The Buddha's relics were protected by mechanical

robots (bhuta vahana yanta) from the kingdom of Roma visaya until they were disarmed by King Ashoka.

In the Egyptian legend of Rocail, the younger brother of Seth created a palace and a sepulcher containing autonomous statues that lived out the lives of men so realistically they were mistaken for having souls.

In Christian legend, several of the men associated with the introduction of Arabic learning (and through it, the reintroduction of Aristotle and Hero's works) to medieval Europe devised brazen heads that could answer questions posed to them. Albertus Magnus was supposed to have constructed an entire android that could perform some domestic tasks but it was destroyed by Albert's student Thomas Aquinas for disturbing his thought. The most famous legend concerned a bronze head devised by Roger Bacon which was destroyed or scrapped after he missed its moment of operation.

Automata were popular in the imaginary worlds of medieval literature. For instance, the Middle Dutch tale *Roman van Walewein* ("The Romance of Walewein" early 13th century) described mechanical birds and angels producing sound by means of systems of pipes.

### **Задания к тексту**

#### **I. Найдите в тексте ответы на следующие вопросы:**

1. When did the history of robots start?
2. What did many ancient mythologies include?
3. When were the first uses of modern robots?
4. Who created utilitarian three-legged tables in Greek mythology?
5. Who protected the Buddha's relics?
6. What could an entire android created by Albertus Magnus perform?
7. What is your opinion on early legends of robots?

**II. Укажите, являются утверждения верными (true) или неверными (false).**

1. The history of robots has its origins on the ancient world.
2. In the early 19th century, the notion of a humanoid machine was developed.
3. The first uses of modern robots were in factories as industrial robots.
4. Simple fixed machines were capable of manufacturing tasks which allowed production without the need for human assistance.
5. Many ancient mythologies included artificial animals.
6. A bronze man Talos that defended Crete was eventually destroyed by Media who cast a lightning bolt at his single vein of lead.
7. In Christian legend the most famous legend concerned a bronze head devised by Roger Bacon which was destroyed or scrapped after he missed its moment of operation.

**III. Подберите русские эквиваленты к следующим словам и словосочетаниям:**

humanoid machine, artificial intelligence, origin, human assistance, Industrial Revolution, lightning bolt, to construct, ancient world, digitally controlled industrial robots, human sized robots, talking mechanical handmaidens, to perform domestic tasks, modern concept, autonomous robot, manufacturing tasks

---

*промышленная революция, конструировать, роботы размером с человека, искусственный интеллект, говорящие механические служанки, помощь человека, заниматься домашними делами, автономный робот, древний мир, человекообразная машина, происхождение, современное понятие, вспышка молнии, промышленные роботы с цифровым управлением, задачи производства*

**IV. Переведите предложения на английский язык, обращая внимание на употребление новой лексики из Упражнения III.**

1. Промышленная революция, которая началась 200 лет назад в Европе, сегодня распространяется по всему миру.
2. Одним из достижений современной робототехники является создание роботы размером с человека.
3. Человечество начало создавать роботы еще в древнем мире.
4. Происхождение слова «робот» малоизвестно.
5. Человекообразная машина может выполнять домашние дела.
6. Промышленные роботы с цифровым управлением очень полезны на производстве.
7. Чтобы сконструировать робота, нужно иметь базовые знания в области робототехники.

## **Text 5: Design a Robot**

Advanced manufacturing is the use of technology to improve products and processes. Professionals involved in advanced manufacturing processes and systems must be able to identify problems, create solutions, think critically, effectively communicate as part of a team, and apply new technologies and skills.

Robotics is branch of technology that deals with the design, construction, operation, and application of robots. Robotics plays an important role in science, technology, engineering, and mathematics because it encourages hands-on learning and the integration of science, engineering, and creative thinking. Robots are working for us every day in countless ways. Robots can address a broad range of national needs that include advanced manufacturing. In advanced manufacturing robots work with, beside and sometimes instead of people to improve processes, create efficiencies, and perform specific skills.

The first generation of industrial robots were installed in a permanent position and carried out simple tasks and routines. Later generations of robots were programmed to carry out specific actions over and over again; others were more flexible having to identify objects before performing a task.

Today's robots work with or beside people to extend or augment human capabilities. Along with increasing productivity in the manufacturing sector today's robots assist with dangerous missions, help scientists accelerate discoveries, and improve our safety and well-being.

Some robots are referred to as vibrobots. With a vibrobot the vibration of the motor makes the robot wobble across the table. This type of robot uses vibrating motors to move and is the type of robot students will build in this lesson. To understand and explain how their robot moves students will explore energy and energy transfer. Energy is changing from one form to another. Light energy from the sun changes to heat energy in the rocks, soil, and water on Earth's surface.

People make use of energy transformations in nearly every application of modern life, including transportation, industry, and in their use of household appliances and devices. Vehicle engines change chemical energy in gasoline to kinetic energy. In many power plants chemical energy in coal or other fossil fuels changes to heat energy as it is burned to heat water and produce steam. Heat energy in the boiling water changes to kinetic energy of the pressurized steam which spins turbines associated with generators that change kinetic energy to electrical energy. This electrical energy is then used to power everything from industrial machines to household appliances. For example, electric ovens change electrical energy to heat energy and light bulbs change electrical energy to light energy. Battery-powered devices change chemical energy in batteries to electrical energy and then to other forms of energy.

### **Задания к тексту**

#### **I. Найдите в тексте ответы на следующие вопросы:**

1. What steps do manufacturers take to design and build a product?
2. What role does robotics have in manufacturing?
3. How have robotics changed?
4. How products are manufactured?
5. How is energy transferred between objects or systems?
6. What are the applications of energy transformations in modern life?

#### **II. Нарисуйте то, что приходит в голову, когда вы слышите слово «робот». Обсудите свои рисунки, ответив на вопросы.**

1. How do you feel about your design?
2. Did you solve a problem?
3. What parts of your design do you like? Dislike? Why?
4. How did your design perform a task for a human?
5. Did your design meet the criteria of the request from Manufacturing Arts Studio?
6. What would you do differently next time?

**III. Подберите русские эквиваленты к следующим словам и словосочетаниям:**

to create solutions, to move, to play an important role, in countless ways, to extend or augment human capabilities, light energy, household appliances and devices, kinetic energy, a vehicle engine, fossil fuels, to wobble, the pressurized steam, battery-powered devices, to spin turbines, our safety and well-being

---

*двигаться, качаться из стороны в сторону (раскачиваться), световая энергия, кинетическая энергия, наша безопасность и благополучие, разработать решения, бытовые приборы и устройства, вращать турбины, расширить и увеличить возможности человека, устройства с питанием от батареи (аккумулятора), бесчисленными способами, играть важную роль, органическое топливо, автомобильный двигатель, пар находящийся под давлением*

**IV. Переведите предложения на английский язык, обращая внимание на употребление новой лексики из Упражнения III.**

1. Ты знаешь, из каких основных частей состоит автомобильный двигатель? 2. Инженеры потратили много времени, чтобы найти (разработать) решения проблемы дизельных двигателей. 3. Световая энергия – это единственная форма энергии, которую мы действительно (непосредственно) можем увидеть. 4. Может ли использоваться солнечная энергия для того, чтобы вращать турбины? 5. Новые технологии необходимы для того, чтобы расширить и увеличить возможности человека. 6. Существуют три основные формы органического топлива – это уголь, нефть и природный газ. 7. Квалифицированные работники играют важную роль в машиностроительной промышленности.

## **Text 6: The History of Computer Development**

The rapidly advancing field of electronics led to construction of the first general-purpose electronic computer in 1946 at the University of Pennsylvania. It was Electronic Numerical Integrator and Computer or ENIAC, the device contained 18,000 vacuum tubes and had a speed of several hundred multiplications per minute. Its program was wired into the processor and had to be manually altered.

Later transistors appeared. The use of the transistor in computers began in the late 1950s. It marked the advent of smaller, faster elements than it was possible to create with the use of vacuum-tube machines. Because transistors use less power and have a much longer life computers alone were improved a lot. They were called second-generation computers. Components became smaller and the system became less expensive to build. Modern digital computers are all conceptually similar, regardless of size and shape. Nevertheless, they can be divided into several categories on the basis of cost and performance.

The first one is the personal computer or microcomputer, a relatively low-cost machine, usually of desk-top size. Sometimes they are called laptops. They are small enough to fit in a briefcase. The second is the workstation, a microcomputer with enhanced graphics and communications capabilities that make it especially useful for office work. The largest and fastest of these are called supercomputers.

A digital computer is not actually a single machine in the sense that most people think of computers. Instead it is a system composed of five distinct elements: a central processing unit, input devices, memory storage devices, output devices and a communications network, called a “bus” that links all the elements of the system and connects the system itself to the external world.

Talking about a central processing unit or the heart of computer it is necessary to add that there were several generations of microprocessors. The first generation was represented by processing unit Intel 8086. The second generation central processing unit was represented by

processing unit Intel 80286, used in IBM PC AT 286. In the end of 80s such computer costs about 25-30 000 rubles in the former USSR. The third generation is represented by Intel 80386 used in IBM PC AT 386. The microprocessors of the fourth generation were used in computers IBM PC AT 486. There are also central processing units of the fifth generation used in Intel Pentium 60 and Intel Pentium 66, central processing units of the sixth generation used in computers Intel Pentium 75, 90, 100 and 133.

Computer speeds are measured in gigahertz today. Recently an optical central processing unit has been invented which is capable of executing trillions discrete operations per second or it is as fast as the speed of light. So we are at the threshold of new computer era when artificial intelligence could be invented. There are no questions with «if», the only question is «when». And time will show us either computers become our best friends or our evil enemies as it is shown in some movies.

### **Задания к тексту**

#### **I. Найдите в тексте ответы на следующие вопросы:**

1. When was the first general-purpose electronic computer constructed?
2. When did the use of transistor in computers begin?
3. Are all modern digital computers conceptually similar?
4. What is a laptop?
5. What is a server computer?
6. What is supercomputer?
7. How many elements can be distinguished in a computer?

#### **II. Соедините части предложений по смыслу.**

1. Modern digital computers are	a. construction of the first general-purpose electronic computer in 1946 at the University of Pennsylvania.
2. A digital computer is a system composed of five distinct elements:	b. and had a speed of several hundred multiplications per minute.
3. The rapidly advancing field of electronics led to	c. several categories on the basis of cost and performance.
4. Computer speeds are measured in	d. all conceptually similar, regardless of size and shape.

5. ENIAC is the device contained 18,000 vacuum tubes	e. a central processing unit, input devices, memory storage devices, output devices and a communications network.
6. Computers can be divided into	f. gigahertz today

**III. Подберите русские эквиваленты к следующим словам и словосочетаниям:**

to improve, memory storage device, expensive, central processing unit, manually, performance, microprocessor, general-purpose electronic computer, input devices, regardless of, Numerical Integrator and Calculator, second-generation computers, low-cost machine, output devices, vacuum tube, communications network

*устройства ввода, независимо от, производительность, запоминающее устройство, электронный цифровой интегратор и калькулятор, центральный процессор, недорогой станок, сеть связи, улучшать, микропроцессор, устройства вывода, вручную, электровакуумный прибор, компьютеры второго поколения, дорогой, компьютер общего назначения*

**IV. Переведите предложения на английский язык, обращая внимание на употребление новой лексики из Упражнения III.**

1. Аппаратное обеспечение компьютера включает в себя центральный процессор, который является сердцем и мозгом компьютера.
2. Компьютер общего назначения – компьютер, способный решить любую задачу, которая может быть выражена в виде программы.
3. Устройства вывода – это устройства, которые переводят информацию с машинного языка в формы, доступные для человеческого восприятия.
4. К устройствам ввода относится клавиатура для ввода числовой и текстовой информации.
5. Компьютеры второго поколения имели до 32 Кбайт оперативной памяти.
6. Запоминающее устройство – устройство, предназначенное для записи и хранения данных.
7. Одним из пяти отдельных компонентов любого компьютера являются сети связи.

## **Text 7: A Motor Vehicle**

A motor vehicle is a self-propelled road vehicle and off-road vehicle, commonly wheeled, that does not operate on rails, such as trains or trams and used for commercial purposes on the highways in the transportation of passengers, or passengers and property.

The vehicle propulsion is provided by an engine or motor, usually by an internal combustion engine, or an electric motor, or some combination of the two, such as hybrid electric vehicles and plug-in hybrids. For legal purposes motor vehicles are often identified within a number of vehicle classes including cars, buses, motorcycles, off-road vehicles, light trucks and regular trucks. These classifications vary according to the legal codes of each country. ISO 3833:1977 is the standard for road vehicles types, terms and definitions. Generally to avoid requiring handicapped persons from having to possess an operator's license to use one, or requiring tags and insurance, powered wheelchairs will be specifically excluded by law from being considered motor vehicles.

As of 2010 there were more than one billion motor vehicles in use in the world excluding off-road vehicles and heavy construction equipment. Global vehicle ownership per capita in 2010 was 148 vehicles in operation per 1000 people. The United States has the largest fleet of motor vehicles in the world with 239.8 million in 2010. Vehicle ownership per capita in the US is also the highest in the world with 769 vehicles in operation per 1000 people. The People's Republic of China has the second largest fleet in the world with slightly more than 78 million vehicles and since 2009 became the world's largest new car market. In 2011 a total of 80 million cars and commercial vehicles were built, led by China, with 18.4 million motor vehicles manufactured.

### **Задания к тексту**

#### **I. Найдите в тексте ответы на следующие вопросы:**

1. What is a motor vehicle?
2. What is the difference between motor vehicles and trains or trams?

3. What provides the vehicle propulsion?
4. What is global vehicle ownership per capita?
5. What is a commercial purpose of motor vehicle use?

**II. Укажите, являются утверждения верными (true) или неверными (false).**

1. A motor vehicle is a self-propelled road vehicle.
2. A motor vehicle is used for different purposes, for example, for commercial purposes on the highways in the transportation of passengers, or passengers and property.
3. The vehicle propulsion is provided by a steam engine or motor, usually by an internal combustion engine.
4. For legal purposes motor vehicles are often identified within a number of vehicle classes including cars, buses, motorcycles, off-road vehicles, etc.
5. As of 2000 there were more than one billion motor vehicles in use in the world excluding off-road vehicles and heavy construction equipment.
6. The People's Republic of China has the third largest fleet in the world, with slightly more than 78 million vehicles.

**III. Подберите русские эквиваленты к следующим словам и словосочетаниям:**

propulsion, off-road vehicle, light truck, fleet, to be identified, per capita, license, motor vehicle, plug-in hybrid, construction equipment, property, internal combustion engine, insurance, self-propelled, in operation, transportation, total

---

*двигатель внутреннего сгорания, самоходный, сетевой гибрид, страхование, внедорожное транспортное средство, идентифицировать, автомобиль, автотранспортный парк, общий, приведение в движение, перевозка, в действии, грузовой автомобиль малой грузоподъемности, строительное оборудование, водительские права, на душу населения, имущество*

**IV. Переведите предложения на английский язык, обращая внимание на употребление новой лексики из Упражнения III.**

1. Двигатель внутреннего сгорания – тепловой двигатель, в котором топливо сгорает непосредственно в рабочей камере двигателя.
2. Грузовые автомобили малой грузоподъемности (до 0,75 т) используются для перевозки грузов мелкими партиями на небольшие расстояния.
3. Автотранспортный парк Международного аэропорта Шереметьево пополнился пятью новыми автобусами всемирно известной фирмы Неоплан.
4. Доход на душу населения это показатель экономического благосостояния страны, измеряющий среднестатистический доход, получаемый отдельно взятым лицом в стране за год.
5. Транспортное средство можно привести в движение с помощью двигателя внутреннего сгорания или электрического мотора.
6. Компания обеспечит перевозку пассажиров от аэропорта до гостиницы.
7. В следующем году компания займется созданием нового строительного оборудования.

## **Text 8: Early history of the automobile**

The early history of the automobile can be divided into a number of eras based on the prevalent means of propulsion. Later periods were defined by trends in exterior styling, size and utility preferences.

In 1807 François Isaac de Rivaz designed the first car powered by an internal combustion engine fuelled by hydrogen.

In 1864 Siegfried Marcus built the first gasoline powered combustion engine which he placed on a pushcart building four progressively sophisticated combustion-engine cars over a 10-to-15-year span that influenced later cars. Marcus created the two-cycle combustion engine. The car's second incarnation in 1880 introduced a four-cycle, gasoline-powered engine, an ingenious carburetor design and magneto ignition. He created an additional two models further refining his design with steering, a clutch and brakes.

The four-stroke petrol (gasoline) internal combustion engine that still constitutes the most prevalent form of modern automotive propulsion was patented by Nikolaus Otto. The similar four-stroke diesel engine was invented by Rudolf Diesel. The hydrogen fuel cell, one of the technologies hailed as a replacement for gasoline as an energy source for cars, was discovered in principle by Christian Friedrich Schönbein in 1838. The battery electric car owes its beginnings to Ányos Jedlik, one of the inventors of the electric motor, and Gaston Planté who invented the lead-acid battery in 1859.

In 1886 Karl Benz developed petrol or gasoline powered automobile. This is also considered to be the first "production" vehicle as Benz made several other identical copies. The automobile was powered by a single cylinder two stroke engine.

At the turn of the 20th century electrically powered automobiles were a popular method of automobile propulsion, but their common use did not last long, and they diminished to a niche market until the turn of the 20th century.

## Задания к тексту

### I. Найдите в тексте ответы на следующие вопросы:

1. What is a motor vehicle?
2. What is the difference between motor vehicles and trains or trams?
3. What provides the vehicle propulsion?
4. What is global vehicle ownership per capita?
5. What is a commercial purpose of motor vehicle use?
6. What do these dates mean in the early history of the automobile?

1864	1807	1859	1880	1886	1838
------	------	------	------	------	------

### II. Заполните пропуски в предложениях, используя следующие слова:

two-cycle	invented	can be divided	four-stroke	gasoline	
designed	patented	hydrogen	battery	means	engine

1. In 1807 François Isaac de Rivaz \_\_\_\_ the first car powered by an internal combustion engine fuelled by \_\_\_\_ .
2. The similar four-stroke diesel \_\_\_\_ was \_\_\_\_ by Rudolf Diesel.
3. The early history of the automobile \_\_\_\_ into a number of eras, based on the prevalent \_\_\_\_ of propulsion.
4. In 1886, Karl Benz developed petrol or \_\_\_\_ powered automobile.
5. The \_\_\_\_ electric car owes its beginnings to Ányos Jedlik.
6. Marcus created the \_\_\_\_ combustion engine.
7. The \_\_\_\_ petrol (gasoline) internal combustion engine that still constitutes the most prevalent form of modern automotive propulsion was \_\_\_\_ by Nikolaus Otto.

**III. Подберите русские эквиваленты к следующим словам и словосочетаниям:**

the prevalent means, define, a pushcart, sophisticated, incarnation, an ingenious carburetor design and magneto ignition, steering, a clutch, brakes, the technologies hailed as a replacement, the lead-acid battery, single, to diminish, a niche market, additional

---

*сегмент рынка, дополнительный, сложный, единственный, гениальный проект карбюратора и магнето зажигания, определять, рулевое управление, тормоза, технологии, оцениваемые как замена, уменьшать, сцепление, преобладающие средства, ручная тележка, свинцово-кислотная аккумуляторная батарея, воплощение*

**IV. Переведите предложения на английский язык, обращая внимание на употребление новой лексики из Упражнения III.**

1. Эта компания собирает автомобили класса люкс для небольшого, но значительного сегмента рынка. 2. Рулевое управление – это то, что помогает транспорту двигаться в определенных направлениях. 3. Сцепление является важным элементом трансмиссии автомобиля с механической коробкой передач. 4. Инженеры установили различные дополнительные, новые устройства в автомобиле. 5. Ручная тележка – это совсем несложный механизм. 6. Свинцово-кислотная аккумуляторная батарея была изобретена в 1859 году французским физиком Гастоном Планте. 7. Экологичные автомобили (eco-friendly vehicles) – это воплощение эры новых технологий.

## Text 9: Electric automobiles

In 1828 Ányos Jedlik, a Hungarian who invented an early type of electric motor, created a tiny model car powered by his new motor. In 1834 Vermont blacksmith Thomas Davenport, the inventor of the first American DC electrical motor, installed his motor in a small model car which he operated on a short circular electrified track. In 1835 Professor Sibrandus Stratingh of Groningen, the Netherlands and his assistant Christopher Becker created a small-scale electrical car, powered by non-rechargeable primary cells. In 1838 Scotsman Robert Davidson built an electric locomotive that attained a speed of 4 miles per hour (6 km/h). In England a patent was granted in 1840 for the use of rail tracks as conductors of electric current, and similar American patents were issued to Lilley and Colten in 1847. Between 1832 and 1839 (the exact year is uncertain) Robert Anderson of Scotland invented the first crude electric carriage powered by non-rechargeable primary cells.

The *Flocken Elektrowagen* of 1888 by German inventor Andreas Flocken is regarded as the first real electric car of the world.

Electric cars enjoyed popularity between the late 19th century and early 20th century when electricity was among the preferred methods for automobile propulsion providing a level of comfort and ease of operation that could not be achieved by the gasoline cars of the time. Advances in internal combustion technology, especially the electric starter, soon rendered this advantage moot; the greater range of gasoline cars, quicker refueling times, and growing petroleum infrastructure, along with the mass production of gasoline vehicles by companies such as the Ford Motor Company, which reduced prices of gasoline cars to less than half that of equivalent electric cars, led to a decline in the use of electric propulsion, effectively removing it from important markets such as the United States by the 1930s. However, in recent years increased concerns over the environmental impact of gasoline cars, higher gasoline prices,

improvements in battery technology, and the prospect of peak oil have brought about renewed interest in electric cars which are perceived to be more environmentally friendly and cheaper to maintain and run despite high initial costs after a failed reappearance in the late-1990s.

### Задания к тексту

#### I. Найдите в тексте ответы на следующие вопросы:

1. Who invented an early type of electric motor?
2. Who is Vermont blacksmith Thomas Davenport?
3. What do you know about Professor Sibrandus Stratingh of Groningen and his assistant Christopher Becker?
4. What did Scotsman Robert Davidson build?
5. How was the first crude electric carriage powered?
6. When was the first real electric car of the world invented?
7. When and why did electric cars enjoy popularity?

#### II. Соедините части предложений по смыслу.

1. In 1828	a. Scotsman Robert Davidson built an electric locomotive that attained a speed of 4 miles per hour (6 km/h).
2. In 1835	b. Robert Anderson of Scotland invented the first crude electric carriage powered by non-rechargeable primary cells.
3. In 1838	c. Ányos Jedlik, a Hungarian who invented an early type of electric motor, created a tiny model car powered by his new motor.
4. In 1834	d. Professor Sibrandus Stratingh of Groningen and his assistant Christopher Becker created a small-scale electrical car, powered by non-rechargeable primary cells.

5. Between 1832 and 1839	e. German inventor Andreas Flocken developed the Flocken Elektrowagen and is regarded as the first real electric car of the world.
6. In 1888	f. Vermont blacksmith Thomas Davenport, the inventor of the first American DC electrical motor, installed his motor in a small model car.

**III. Подберите русские эквиваленты к следующим словам и словосочетаниям:**

circular electrified track, small-scale, electric locomotive, conductor, petroleum infrastructure, ease of operation, non-rechargeable primary cell, electric current, a tiny model, electric current, rail tracks, to regard as, to enjoy popularity, to reduce, electric starter, mass production, internal combustion technology

---

*рельсовый путь, проводник, небольшой, пользоваться популярностью, круговой электрифицированный путь, электровоз, рассматривать в качестве, электрический ток, технология внутреннего сгорания, неперезаряжаемый первичный элемент, массовое производство, крошечная модель, нефтяная инфраструктура, удобство управления, снизить, электростартер*

**IV. Переведите предложения на английский язык, обращая внимание на употребление новой лексики из Упражнения III.**

1. Электровоз – это локомотив, который приводится в движение с помощью электричества. 2. Различные ученые и инженеры вносят вклад в разработку технологию (двигателей) внутреннего сгорания. 3. Электрический ток – это поток электрических зарядов. 4. Массовое производство широко использовалось Генри Фордом. 5. Электростартер обычно используется в бензиновых и небольших дизельных двигателях. 6. Эти крошечные модели деталей пользуются популярностью. 7. Сейчас этот завод снижает (сокращает) производство шин.

## **Text 10: Internal combustion engines**

Early attempts at making and using internal combustion engines were hampered by the lack of suitable fuels, particularly liquids, therefore the earliest engines used gas mixtures.

Early experimenters used gases. In 1806 Swiss engineer François Isaac de Rivaz built an engine powered by internal combustion of a hydrogen and oxygen mixture. In 1826 Englishman Samuel Brown tested his hydrogen-fuelled internal combustion engine by using it to propel a vehicle up Shooter's Hill in south-east London. Belgian-born Etienne Lenoir's Hippomobile with a hydrogen-gas-fuelled one-cylinder internal combustion engine made a test drive from Paris to Joinville-le-Pont in 1860, covering some nine kilometres in about three hours. A later version was propelled by coal gas. A Delamare-Deboutteville vehicle was patented and trialled in 1884.

About 1870 in Vienna, Austria (then the Austro-Hungarian Empire) inventor Siegfried Marcus put a liquid-fuelled internal combustion engine on a simple handcart which made him the first man to propel a vehicle by means of gasoline. Today this car is known as "the first Marcus car". In 1883, Marcus secured a German patent for a low-voltage ignition system of the magneto type; this was his only automotive patent. This design was used for all further engines, and the four-seat "second Marcus car" of 1888/89. This ignition in conjunction with the "rotating-brush carburetor" made the second car's design very innovative. His second car is on display at the Technical Museum in Vienna. During his lifetime he was honored as the originator of the motorcar but his place in history was all but erased by the Nazis during World War II. Because Marcus was of Jewish descent the Nazi propaganda office ordered his work to be destroyed his name expunged from future textbooks, and his public memorials removed giving credit instead to Karl Benz.

It is generally acknowledged that the first really practical automobiles with petrol/gasoline-powered internal combustion engines were completed almost simultaneously by several German inventors working independently: Karl Benz built his first automobile in 1885 in Mannheim. Benz was granted a patent for his automobile on 29 January 1886, and began the first production of automobiles in 1888 after Bertha Benz; his wife had proved with the first long-distance trip in August 1888 from Mannheim to Pforzheim and back that the horseless coach was absolutely suitable for daily use. Since 2008 a Bertha Benz Memorial Route commemorates this event.

Soon after Gottlieb Daimler and Wilhelm Maybach in Stuttgart in 1889 designed a vehicle from scratch to be an automobile rather than a horse-drawn carriage fitted with an engine. They also are usually credited with invention of the first motorcycle in 1886, but Italy's Enrico Bernardi of the University of Padua in 1882 patented a 0.024 horsepower (17.9 W) 122 cc (7.4 cu in) one-cylinder petrol motor, fitting it into his son's tricycle, making it at least a candidate for the first automobile and first motorcycle; Bernardi enlarged the tricycle in 1892 to carry two adults.

One of the first four-wheeled petrol-driven automobiles in Britain was built in Birmingham in 1895 by Frederick William Lanchester who also patented the disc brake and the first electric starter was installed on an Arnold, an adaptation of the Benz Velo, built in Kent between 1895 and 1898.

George F. Foss of Sherbrooke, Quebec built a single-cylinder gasoline car in 1896 which he drove for 4 years ignoring city officials' warnings of arrest for his "mad antics".

In all the turmoil many early pioneers are nearly forgotten. In 1891 John William Lambert built a three-wheeler in Ohio City, Ohio, which was destroyed in a fire the same year while Henry Nadig constructed a four-wheeler in Allentown, Pennsylvania. It is likely they were not the only ones.

## Задания к тексту

### I. Найдите в тексте ответы на следующие вопросы:

1. Why did the earliest engines use gas mixtures?
2. What gases did Swiss engineer François Isaac de Rivaz use to power his engine?
3. When did Englishman Samuel Brown test his hydrogen-fuelled internal combustion engine?
4. What did Siegfried Marcus do in 1870?
5. Why is “second Marcus car” innovative?
6. Who is Karl Benz and what is his contribution to the development of automobiles?
7. Where were the first four-wheeled petrol-driven automobiles built?

### II. Заполните пропуски в тексте, используя следующие слова:

<b>was born</b>	<b>driver</b>	<b>limited</b>	<b>education</b>	<b>diligent</b>
<b>passed</b>	<b>graduated</b>	<b>degree</b>	<b>a vehicle</b>	

Carl Benz \_\_\_\_\_ in 1844 in Karlsruhe, Baden, Germany, a son of an engine \_\_\_\_\_. Despite the \_\_\_\_\_ means of his family, his mother insisted upon providing him with a good technical \_\_\_\_\_. Being a \_\_\_\_\_ student, Benz \_\_\_\_\_ the entrance exam to study mechanical engineering at the Karlsruhe Institute of Technology (KIT), formerly known as the Polytechnic College. At the tender age of fifteen he came under the instruction of Ferdinand Redtenbacher and \_\_\_\_\_ on July 9, 1864, with a \_\_\_\_\_ in mechanical engineering. During his years at the university he had already started to envision concepts for ... that would eventually become the horseless carriage.

**III. Подберите русские эквиваленты к следующим словам и словосочетаниям:**

to make attempts, hydrogen, be trialed, long-distance, in conjunction with, to propel, by means of, horseless, liquid, simultaneously, low-voltage, oxygen, ignition system, to grant a patent, gasoline, independently, internal combustion engine

---

*кислород, бензин, двигать вперед, жидкость, система зажигания, подвергаться тестированию, двигатель внутреннего сгорания, независимо, вместе, делать попытки, с помощью, дальний, водород, низковольтный, выдавать патент, одновременно, безлошадный*

**IV. Переведите предложения на английский язык, обращая внимание на употребление новой лексики из Упражнения III.**

1. В настоящее время двигатель внутреннего сгорания является основным видом автомобильного двигателя. 2. Кислород это химический элемент, газ, входящий в состав воздуха, необходимый для дыхания и горения. 3. Водород это химический элемент, самый легкий газ, в соединении с кислородом образующий воду. 4. Система зажигания предназначена для воспламенения топливно-воздушной смеси бензинового двигателя. 5. Кипятите 20 минут, пока жидкость не выкипит наполовину. 6. Компьютер может выполнять тысячи операций одновременно.

## **Text 11: Automobiles**

Bicycle mechanics J. Frank and Charles E. Duryea of Springfield, Massachusetts, had designed the first successful American gasoline automobile in 1893, then won the first American automobile race in 1895 and went on to make the first sale of an American-made gasoline car the next year. Thirty American manufacturers produced 2,500 motor vehicles in 1899 and some 485 companies entered the business in the next decade. In 1908 Henry Ford introduced the Model T and William C. Durant founded General Motors.

The new firms operated in an unprecedented seller's market for an expensive consumer goods item. With its vast land area and a hinterland of scattered and isolated settlements the United States had a far greater need for automotive transportation than the nations of Europe. Great demand was ensured, too, by a significantly higher per capita income and more equitable income distribution than in European countries.

Given the American manufacturing tradition it was also inevitable that cars would be produced in larger volume at lower prices than in Europe. The absence of tariff barriers between the states encouraged sales over a wide geographic area. Cheap raw materials and a chronic shortage of skilled labor early encouraged the mechanization of industrial processes in the United States. This in turn required the standardization of products and resulted in the volume production of such commodities as firearms, sewing machines, bicycles, and many other items. In 1913 the United States produced some 485,000 of the world total of 606,124 motor vehicles.

The Ford Motor Company greatly outpaced its competitors in reconciling state-of-the-art design with moderate price. Cycle and Automobile Trade Journal called the four-cylinder, fifteen-horsepower, \$600 Ford Model N (1906-1907) "the very first instance of a low-cost motorcar driven by a gas engine having cylinders enough to give the shaft a turning impulse in each shaft turn which is well built and offered in large numbers." Deluged with orders Ford installed improved production

equipment and after 1906 was able to make deliveries of a hundred cars a day.

Encouraged by the success of the Model N, Henry Ford was determined to build an even better “car for the great multitude.” The four-cylinder, twenty-horsepower Model T, first offered in October 1908, sold for \$825. Its two-speed planetary transmission made it easy to drive, and features such as its detachable cylinder head made it easy to repair. Its high chassis was designed to clear the bumps in rural roads. Vanadium steel made the Model T a lighter and tougher car, and new methods of casting parts (especially block casting of the engine) helped keep the price down.

### **Задания к тексту**

#### **I. Найдите в тексте ответы на следующие вопросы:**

1. Who designed the first successful American gasoline automobile in 1893?
2. How many American manufacturers produced 2,500 motor vehicles in 1899?
3. What did Henry Ford introduce in 1908?
4. When was General Motors founded?
5. Why did the United States have a far greater need for automotive transportation than the nations of Europe?
6. What encouraged the mechanization of industrial processes in the United States?

#### **II. Укажите, являются утверждения верными (true) или неверными (false).**

1. In 1908 Henry Ford introduced the Model T and William C. Durant founded General Motors.
2. J. Frank and Charles E. Duryea of Springfield had designed the first successful American gasoline automobile in 1892, then won the first American automobile race in 1896.
3. In 1913 the United States produced some 485,000 of the world total of 606,124 trams.

4. Cheap raw materials and a chronic shortage of skilled labor early encouraged the mechanization of industrial processes in the United States.
5. Encouraged by the success of the Model N, Karl Benz was determined to build an even better “car for the great multitude”.
6. The absence of tariff barriers between the states encouraged sales over a wide geographic area.

**III. Подберите русские эквиваленты к следующим словам и словосочетаниям:**

to design, inevitable, income, be determined, raw materials, mechanization of industrial processes, to demand, transmission, to repair, Vanadium steel, to enter the business, rural roads, sewing machines, feature, consumer goods, multitude, detachable cylinder head

---

*передача, требовать, сельские дороги, открывать бизнес, неизбежный, Ванадиева сталь, сырье, съемная головка цилиндра, доход, особенность, механизация производственных процессов, разрабатывать, множество, быть назначенным, швейная машина, ремонтировать, потребительские товары*

**IV. Переведите предложения на английский язык, обращая внимание на употребление новой лексики из Упражнения III.**

1. Введение в сталь даже небольших количеств ванадия значительно улучшает ее качество, улучшаются ее механические свойства.
2. Ванадиевая сталь применяется при изготовлении автомобильных и авиационных моторов.
3. Механизация производственных процессов это замена ручного труда машинами, что повышает производительность труда и степень безопасности.
4. Основными сырьем для получения ванадия являются минералы ванадинит и карнотит.
5. Головка блока цилиндров вместе с цилиндрами образуют полость, в которой осуществляются все тепловые процессы рабочего цикла двигателя.
6. После войны не хватало продуктов и потребительских товаров.
7. Механизация и автоматизация технологических процессов – основное и наиболее прогрессивное направление современного технического прогресса.

## **Text 12: A Green Vehicle**

A green vehicle, or clean vehicle, or eco-friendly vehicle or environmentally-friendly vehicle is a road motor vehicle that produces less harmful impacts to the environment than comparable conventional internal combustion engine vehicles running on gasoline or diesel, or one that uses certain alternative fuels. Presently, in some countries the term is used for any vehicle complying or surpassing the more stringent European emission standards (such as Euro6), or California's zero emissions vehicle standards (such as Zero-Emissions Vehicle (ZEV), Ultra-Low-Emission Vehicle (ULEV), Super Ultra-Low Emissions Vehicle (SULEV), Partial Zero Emissions Vehicle (PZEV), or the low-carbon fuel standards enacted in several countries.

Green vehicles can be powered by alternative fuels and advanced vehicle technologies and include hybrid electric vehicles, plug-in hybrid electric vehicles, battery electric vehicles, compressed-air vehicles, hydrogen and fuel-cell vehicles, neat ethanol vehicles, flexible-fuel vehicles, natural gas vehicles, clean diesel vehicles, and some sources also include vehicles using blends of biodiesel and ethanol fuel or gasohol. In November 2016, with an EPA-rated fuel economy of 136 miles per gallon gasoline equivalent (mpg-e) (1.7 L/100 km), the 2017 Hyundai Ioniq Electric became the most efficient EPA-certified vehicle considering all fuels and of all years, surpassing the 2014-2016 model year all-electric BMW i3.

Several authors also include conventional motor vehicles with high fuel economy, as they consider that increasing fuel economy is the most cost-effective way to improve energy efficiency and reduce carbon emissions in the transport sector in the short run. As part of their contribution to sustainable transport, these vehicles reduce air pollution

and greenhouse gas emissions, and contribute to energy independence by reducing oil imports.

An environmental analysis extends beyond just the operating efficiency and emissions. A life-cycle assessment involves production and post-use considerations. A cradle-to-cradle design is more important than a focus on a single factor such as energy efficiency.

Cars with similar production of energy costs can obtain, during the life of the car (operational phase), large reductions in energy costs through several measures:

1. The most significant is by using alternative propulsion:
  - An efficient engine that reduces the vehicle's consumption of petroleum (i.e. petroleum electric hybrid vehicle), or that uses renewable energy sources throughout its working life.
  - Using biofuels instead of petroleum fuels.
2. Proper maintenance of a vehicle such as engine tune-ups, oil changes, and maintaining proper tire pressure can also help.
3. Removing unnecessary items from a vehicle reduces weight and improves fuel economy as well.

### **Задания к тексту**

#### **I. Найдите в тексте ответы на следующие вопросы:**

1. What does environmentally-friendly vehicle mean?
2. What are the most important California's zero emissions vehicle standards?
3. How can green vehicles be powered?
4. What do green vehicles include?
5. What is the most cost-effective way to improve energy efficiency while using conventional motor vehicles?
6. What measures should be taken to get large reductions in energy costs?

**II. Подберите синонимы или антонимы к следующим словам:**

similar, unnecessary, significant, similar, production, important, to extend, high, to increase, to improve, energy, pollution, independence, import, consumption, large, natural, to produce, less, harmful, impact, internal.

**III. Подберите русские эквиваленты к следующим словам и словосочетаниям:**

ultra-low-emission vehicle, fuel economy, environmentally-friendly vehicle, pollution, impact, consumption, to produce, comparable, to increase, super ultra-low emissions vehicle, to improve, independence, alternative fuel, energy efficiency, zero-emissions vehicle, flexible, partial zero emissions vehicle, pressure, harmful, contribution

---

*альтернативное топливо, вклад, автомобиль с частично нулевыми выбросами вредных веществ, потребление, энергетический кпд, увеличивать, автомобиль с максимально низким выбросом вредных веществ, влияние, экономия топлива, независимость, вредный, транспортное средство с нулевым содержанием вредных выбросов, сопоставимый, производить, экологичный автомобиль, загрязнение, автомобиль с низким уровнем выхлопа, улучшать, гибкий, давление*

**IV. Переведите предложения на английский язык, обращая внимание на употребление новой лексики из Упражнения III.**

1. Производство автомобилей с каждым годом увеличивается.
2. Инженеры пытаются уменьшить выброс машинами вредных веществ в атмосферу.
3. Ученые уже давно разрабатывают альтернативные виды топлива.
4. На данный момент практически все автомобильные компании совершенствуют двигатели своих автомобилей для уменьшения вредных выбросов.
5. Электромобиль это транспортное средство с нулевым выбросом вредных веществ.
6. В настоящее время вкладываются больше средства в разработку автомобилей на альтернативных видах топлива.
7. Автомобиль, работающий на водороде – экологичный автомобиль, так как его выхлоп это обычная вода.

### **Text 13: Benefits of green vehicle use**

**Environmental** – Vehicle emissions contribute to the increasing concentration of gases linked to climate change. In order of significance the principal greenhouse gases associated with road transport are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O). Road transport is the third largest source of greenhouse gases emitted in the UK, and accounts for over 20% of total emissions and 33% in the United States. The total greenhouse gas emissions from transport over 85% are due to CO<sub>2</sub> emissions from road vehicles. The transport sector is the fastest growing source of greenhouse gases.

**Health** – Vehicle pollutants have been linked to human ill health including the incidence of respiratory and cardiopulmonary disease and lung cancer. A 1998 report estimated that up to 24,000 people die prematurely each year in the UK as a direct result of air pollution. According to the World Health Organization, up to 13,000 deaths per year among children (aged 0–4 years) across Europe are directly attributable to outdoor pollution. The organization estimates that if pollution levels were returned to within EU limits, more than 5,000 of these lives could be saved each year.

**Monetary** – Hybrid taxi fleet operators in New York have also reported that reduced fuel consumption saves them thousands of dollars per year.

**Criticism** – A study suggested that the extra energy cost of manufacture, shipping, disposal, and the short lives of some of these types of vehicle (particularly gas-electric hybrid vehicles) outweighs any energy savings made by their using less petroleum during their useful lifespan. This type of argument is the long smokestack argument. Critics of the report note that the study prorated all of Toyota's hybrid research-and-development costs across the relatively small number of Priuses on the road, rather than using the incremental cost of building a vehicle.

Norwegian Consumer Ombudsman official Bente Øverli stated that “Cars cannot do anything good for the environment except less damage than others”. Based on this opinion, Norwegian law severely restricts the use of “greenwashing” to market automobiles, strongly prohibiting advertising a vehicle as being environmentally friendly, with large fines issued to violators.

A study that looked at other factors other than energy consumption and carbon emissions has suggested that there is no such thing as an environmentally friendly car.

The use of vehicles with increased fuel efficiency is usually considered positive in the short term but criticism of any hydrocarbon-based personal transport remains. The Jevons paradox suggests that energy efficiency programs are often counter-productive, even increasing energy consumption in the long run. Many environmental researchers believe that sustainable transport may require a move away from hydrocarbon fuels and from our present automobile and highway paradigm.

### **Задания к тексту**

#### **I. Найдите в тексте ответы на следующие вопросы:**

1. What do vehicle emissions contribute to?
2. What are the principal greenhouse gases associated with road transport?
3. What place does road transport take as a source of greenhouse gases emitted in the UK?
4. What sector is the fastest growing source of greenhouse gases?
5. What are benefits of green vehicle use?
6. What are disadvantages of green vehicle use?
7. Why does Norwegian law severely restrict the use of “greenwashing” to market automobiles?

**II. Укажите, являются утверждения верными (true) или неверными (false).**

1. Vehicle emissions contribute to the reducing concentration of gases linked to climate change.
2. In order of significance the principal greenhouse gases associated with road transport are nitrous oxide (N<sub>2</sub>O), carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>).
3. Road transport is the second largest source of greenhouse gases emitted in the UK, and accounts for over 30% of total emissions.
4. Vehicle pollutants have been linked to human ill health.
5. Hybrid taxi fleet operators in New York have also reported that reduced fuel consumption saves them thousands of dollars per year.
6. Many environmental researchers do not believe that sustainable transport may require a move away from hydrocarbon fuels and from our present automobile and highway paradigm.
7. The extra energy cost of manufacture, shipping, disposal, and the short lives of some of these types of vehicle (particularly gas-electric hybrid vehicles) outweighs any energy savings.

**III. Подберите русские эквиваленты к следующим словам и словосочетаниям:**

climate change, energy consumption, greenhouse gases, hydrocarbon fuels, pollutants, the World Health Organization, smokestack argument, nitrous oxide, relatively, principal, health, in order, to restrict, due to, monetary, carbon dioxide, to outweigh, lifespan, research-and-development costs, significance, attributable, energy saving

---

*здоровье, значимость, основной, энергосбережение, устаревший довод, углеводородное топливо, относительно, из-за, затраты на проведение научных исследований и разработок, изменение климата,*

*свойственный, углекислый газ, парниковые газы, ограничивать, Всемирная Организация Здравоохранения, оксид азота, расход энергии, срок службы, по порядку, загрязняющее вещество, денежный, перевешивать (быть более важным)*

#### **IV. Переведите предложения на английский язык, обращая внимание на употребление новой лексики из Упражнения III.**

1. Главный источник углекислого газа в воздухе это транспорт.
2. Концентрация оксида азота в атмосфере земли является высокой.
3. Здоровье людей зависит от состояния окружающей среды.
4. Всемирная организация здравоохранения – специальное учреждение Организации Объединенных Наций, основная функция которого лежит в решении международных проблем здравоохранения населения Земли.
5. Основными парниковыми газами являются: углекислый газ (CO<sub>2</sub>), метан (CH<sub>4</sub>), закись азота (N<sub>2</sub>O), тропосферный озон (O<sub>3</sub>) и водяной пар (H<sub>2</sub>O).
6. Изменения климата вызваны переменами в земной атмосфере, процессами, происходящими в других частях Земли, таких как океаны, а также деятельностью человека.
7. Весь прогрессивный мир давно обеспокоен проблемами энергосбережения, так как запасы топлива на Земле не бесконечны.

## **Text 14: Mass Production**

Mass production is the manufacture of large quantities of standardized products, frequently utilizing assembly line technology. Mass production refers to the process of creating large numbers of similar products efficiently. Mass production is typically characterized by some type of mechanization, as with an assembly line, to achieve high volume, the detailed organization of materials flow, careful control of quality standards and division of labor.

Henry Ford designed his first moving assembly line in 1913, and revolutionized the manufacturing processes of his Ford Model T.

This assembly line, at the first Ford plant in Highland Park, Michigan, became the benchmark for mass production methods around the world.

It was Henry's intention to produce the largest number of cars, to the simplest design, for the lowest possible cost. When car ownership was confined to the privileged few, Henry Ford's aim was to "put the world on wheels" and produce an affordable vehicle for the general public.

In the early days, Ford built cars the same way as everybody else – one at a time. The car sat on the ground throughout the building as mechanics and their support teams sourced parts and returned to the car to assemble it from the chassis upwards. To speed the process up, cars were then assembled on benches which were moved from one team of workers to the next. But this was not fast, as Ford still needed skilled labour teams to assemble the 'hand-built' car. So production levels were still low and the price of the car was higher to cover the costs of mechanics.

What was needed was automation. Henry and his engineers invented machines to make large quantities of the parts needed for the vehicle and devised methods of assembling the parts as fast as they were made. They were ready for the breakthrough.

To achieve Henry Ford's goal of mass consumption through mass production, productivity needed to increase. At the Detroit factory in Michigan, workers were placed at appointed stations and the chassis was hauled along between them using strong rope. The chassis stopped at each station, where parts were fitted, until it was finally completed.

He continued experimenting until every practice was refined, and his mass production vision became a reality.

Another initiative was to use interchangeable parts that could be put together easily by unskilled workers. The experiments continued with gravity slides and conveyors. Naturally, even the placement of men and tools was meticulously researched to ensure the production line ran as efficiently as possible.

Each department, in the manufacturing process was broken down into its constituent parts. These sub-assembly lines were set up in each area until, as Henry was heard to remark, "everything in the plant moved".

As a result, production speeds increased – sometimes they were up to four times faster.

The ultimate step was the creation of the moving final assembly line. Starting with a bare chassis, it moved along the line and through each workstation until a complete car was driven off under its own power. An essential part of this process was that all feeder lines along the route were synchronized to supply the right parts, at the right time.

### **Задания к тексту**

#### **I. Найдите в тексте ответы на следующие вопросы:**

1. What is mass production?
2. What did Henry Ford designed in 1913?
3. Where was the first Ford plant located?
4. How did Ford build cars in the early days?

5. What should be increased to achieve Henry Ford's goal of mass consumption through mass production?
6. What was the ultimate step in making mass production vision a reality?

**II. Укажите, являются утверждения верными (true) или неверными (false).**

1. Mass production refers to the process of creating large numbers of similar products efficiently.
2. Henry Ford designed his first moving assembly line in 1914, and revolutionized the manufacturing processes of his Ford Model F.
3. This assembly line, at the first Ford plant in Highland Park, Michigan, became the benchmark for mass production methods in Europe.
4. Henry and his engineers invented machines to make large quantities of the parts needed for the vehicle and devised methods of assembling the parts as fast as they were made.
5. To achieve Henry Ford's goal of mass consumption through mass production, amount of cars needed to increase.
6. Another initiative was to use interchangeable parts that could be put together easily by unskilled workers.
7. As a result of mass production, production speeds reduced – sometimes they were up to four times slower.

**III. Подберите русские эквиваленты к следующим словам и словосочетаниям:**

mass production, assembly line technology, interchangeable parts, bare chassis, skilled labour team, affordable vehicle, large quantity, at the right time, division of labor, automation, ultimate step, general public, to cover the costs, benchmark, breakthrough

---

*разделение труда, доступное транспортное средство, общественность, команда квалифицированных рабочих, завершающий шаг, стандарт, массовое производство, прорыв (переворот), большое*

*количество, «голое» шасси, покрывать стоимость, в нужное время, технология сборочного конвейера, взаимозаменяемые детали, автоматизация*

**VI. Переведите предложения на английский язык, обращая внимание на употребление новой лексики из Упражнения III.**

1. «Манчестер Юнайтед» все еще остается для нас стандартом, с которым мы постоянно себя сравниваем. 2. Сборочная линия Генри Форда является стандартом методов массового производства по всему миру. 3. Его величайшим нововведением было использование взаимозаменяемых деталей. 4. Команда квалифицированных рабочих выполняет сборку большого количества автомобилей быстро и качественно. 5. Существующее разделение труда между простыми рабочими и управляющим персоналом скоро изменится. 6. Вход в парки этого города свободный для всех людей (общественности). 7. Переворот в области транспортных перевозок был достигнут крупной международной компанией.

## *1.2. Тексты для внеаудиторного чтения*

### **Text 1: History of Cars**

Cars are amazing. And one of the most amazing things about them is that no one invented them – no single person. There was no scribbling on the back of an envelope, no lightning flash of inspiration, and no-one ran down the street crying “Eureka”. All the different parts – the engine, the wheels, the gears, and all the fiddly bits like the windscreen wipers – somehow came together, very gradually, over a period of about five and a half thousand years. How did it happen? Let’s take a closer look!

It all began with the horse or the camel. Or perhaps even the dog. No one really knows which animal prehistoric humans picked on first. People tended to stay put, living more locally than they do now. If they needed to move things about, they had to float them down rivers or drag them by sledge. All that started to change when humans realized the animals around them had raw power they could tap and tame. These "beasts of burden" were the first engines.

By about 5000 BC there were sledges and there were animal “engines” – so the obvious thing to do was hitch them together. The Native Americans were masters at this. They invented the travois: a strong A-shaped wooden frame sometimes covered with animal skin that a horse could drag behind it like a cart without wheels. First used thousands of years ago, the travois was still scraping along well into the 19th century.

The next big step was to add wheels and turn sledges into carts. The wheel, which first appeared around 3500 BC, was one of the last great inventions of prehistoric times. No-one knows exactly how wheels were invented. A group of prehistoric people may have been rolling a heavy load along on tree trunks one day when they suddenly realized they could chop the logs like salami and make the slices into wheels. However it was

invented, the wheel was a massive advance: it meant people and animals could pull heavier loads further and faster.

Huge and heavy, the first solid wheels were difficult to carve and more square than round. When someone had the bright idea of building lighter, rounder wheels from separate wooden spokes, lumbering carts became swift, sleek chariots. The ancient Egyptians, Greeks, and Romans all used chariots to expand their empires. They were a bit like horse-drawn tanks.

Earlier civilizations made small steps by trial and error. The ancient Greeks (the first real scientists) took giant leaps. Greek philosophers (thinkers) realized that a wheel mounted on an axle can magnify a pushing or pulling force. So people now understood the science of wheels for the first time. The Greeks also gave us gears: pairs of wheels with teeth around the edge that locks and turn together to increase power or speed.

Carts and chariots were a big advance on legs – but they were useless for going cross country. That’s why ancient Middle Eastern people and Mediterraneans who lived in open grassy areas and deserts developed chariots faster than Europeans and Asians stuck among the forests and scrub. The Romans were the first to realize that a car is only as good as the road it travels on. So they linked up their empire with a huge highway network. Roman roads were cutting-edge technology. They had a soft base underneath to drain away water and a harder top made from a patchwork of tight-fitting rocks.

The Greeks gave us gears, the Romans gave us roads – but when it came to engines, the world was still stuck with horsepower. And things stayed that way for hundreds of years through a time known as the Dark Ages, the early part of the Middle Ages, when science and knowledge advanced little in the western world.

Things finally started getting interesting again toward the end of the Middle Ages. In 1335, Dutchman Guido von Vigevano drew sketches of a

“Windwagen”. It had the three key parts of a modern car: an engine (spinning windmill sails), a set of wheels, and gears to transfer power between them. During the Renaissance (the explosion of culture and science that began in the 15th century), Italian inventor Leonardo da Vinci (1452–1519) scribbled some designs for a clockwork car. Like a giant watch, it was supposed to be powered by springs that would drive the wheels through a system of interlocking gears. Even though there was little mileage in either of these ideas, the self-powered car was slowly coming together and the days of the horse seemed numbered.

The next major development came in 1712 when “the very ingenious Mr Thomas Newcomen” (as his friends called him) built a massive machine for pumping rainwater out of coal mines. It was based around a huge 2-m (7-ft) high metal cylinder with a piston inside that could move up and down like the plunger in a bicycle pump.

Every so often, steam from a boiler (a sort of gigantic coal-fired kettle) squirted into the space in the cylinder underneath the piston. Then cold water was squirted in to make the steam condense, creating a partial vacuum directly under the piston. Since the air pressure in the space above the piston was now greater than that in the space beneath it, the piston moved down. When the vacuum was released, the piston rose back up again. The rising and falling piston operated a pump that slowly sucked the water from the mine.

Machines like this were originally called fire engines – they were, after all, powered by burning coal – though they soon became known as steam engines when people realized that controlling steam was the key to making them work more efficiently. One of those people was a Scotsman named James Watt (1736–1819). In 1764, Watt redesigned Newcomen’s engine so it was both a fraction the size and more powerful. While Newcomen’s piston had simply tipped a beam up and down, Watt’s turned wheels and gears. Large Watt engines soon found their way into factories,

where they became the powerhouse of the Industrial Revolution and people did away with horses for operating pumps and other machines. Coal seemed to be the fuel of the future.

Steam engines were still too big and heavy to use in vehicles, but that didn't stop people trying. In 1769, Frenchman Nicholas Joseph Cugnot (1725–1804) used steam-engine technology to make a lumbering, three-wheeled tractor for pulling heavy army cannons. Many people consider this the world's first car, but it was incredibly primitive by today's standards. With a top speed of just 5 km/h (3mph), you would have thought it posed little danger. But the “*fardier à vapeur*” (steam wagon) was heavy and hard to steer and, just two years later, the first ever car had the first ever car crash when Cugnot rammed it through a brick wall. He was given a speeding ticket and thrown in jail.

Steam engines were soon finding their way into other heavy vehicles. In the early 1800s, Cornishman Richard Trevithick (1771–1833) started building steam carriages with wobbly 3-m (10-ft) diameter wheels. Around this time, Trevithick's American counterpart Oliver Evans (1755–1819) built an ambitious steam-powered river digger called the *Oruktor Amphibolos* that could drive on either land or water. Belching fire and smoke like a dragon, it caused a sensation as it chugged down the Philadelphia streets in 1804.

Both Trevithick and Evans ultimately switched their attention to making steam trains, but another Cornish inventor, Goldsworthy Gurney (1793–1875), was convinced the idea of steam road vehicles still had legs. He designed an early steam carriage that would gallop along on rickety pins, just like a horse. When Gurney realized wheels could do the job much better, he built impressive steam buses and ran a service between London and Bath. Ultimately he was driven out of business by horse-powered stage coaches, which were faster and cheaper. John Scott Russell (1808–1882) also had to close a promising steam-coach business when one

of his buses exploded on 29 July 1834, killing four passengers. It was the world's first fatal car accident. Horses everywhere breathed a huge sigh of relief: they'd be around for many years yet. Or so they thought until a clever bunch of scientists showed up.

## **Text 2: Ingenious Engineers**

A car is like a cart with a built-in horse – a horse-less carriage that doesn't eat grass, wear shoes, or leave a steaming pile of muck wherever it goes. The engineers who set out to make the first cars had a big problem on their hands: how to squeeze the power of a galloping horse into a small, reliable engine.

This tricky problem taxed the best minds of the day. The experiments with steam had been the first attempt to solve it, but though coal-powered steam engines were excellent for pulling trains, they weren't so good in cars. Apart from the clunking great engine itself, you had to carry a mini-mountain of coal and a tank full of water. Some ingenious Europeans were starting searching for better fuels and more compact engines. They were a mixture of "thinkers" and "doers".

### **Christiaan Huygens**

The engineers were inspired by brilliant Dutch scientist Christiaan Huygens (1629–1695), who had the laser-like mind of Isaac Newton and the inventing ability of Leonardo da Vinci. He made many astronomical discoveries, invented the mathematics of probability, made the first pendulum clock, invented a musical keyboard, and discovered that light travels like a wave. In the late 17th century, Huygens had an idea for an engine that made power by exploding gunpowder in a tube. Unfortunately, he was way ahead of his time: engineering wasn't yet good enough for him actually to build this machine. If it had been, the world might have had cars almost 200 years earlier.

### **Sadi Carnot**

Next up was a French army engineer called Nicolas Leonard Sadi Carnot (1796–1832), who wrote the original book of car science, *Reflections on the Motive Power of Fire*, in 1824. It was the first proper explanation of how engines worked, why they made power, and how you could make them even more effective. Carnot’s ideas are now considered brilliant, but they were published over 100 years after the first steam engines had already been built. What was use was science when it came a century after the inventions it tried to explain?

### **Joseph Étienne Lenoir**

Huygens’ idea to capture the power of a small explosion was what the “doers” seized on. A French-Belgian engineer called Joseph Étienne Lenoir (1822–1900) was tinkering with electricity in the 1850s when he took the next step. In those days, street lamps were naked flames fed by gas pipes. Lenoir wondered what would happen if he could ignite some of this street-lamp gas in a metal tin using an electric spark. His “spark plug” (as we now call it) would make the gas explode with a thump of power that could push a piston. If he could repeat this process again and again, he could drive a machine. The "gas engines" Lenoir built made as much power as 1.5 horses and were soon being built by the dozen. In 1863, Lenoir fixed one of them to a three-wheeled cart and built a very crude car. It made an 18-km (9-mile) journey in 11 hours—four times longer than it would have taken to walk.

### **Nikolaus August Otto**

Lenoir died a miserable pauper because his engines, though revolutionary, were soon obsolete. Gas was a cleaner fuel than coal, but it wasn’t practical –there was even a risk it would explode and kill people. Gasoline (a liquid fuel) proved to be a better bet, as German Nikolaus Otto (1832–1891) discovered. Otto was no scientific thinker – far from it: he was a traveling grocery salesman who taught himself engineering. During

the 1860s, he tinkered with various engine designs and, in 1876, finally came up with a really efficient gasoline engine, which worked by methodically repeating the same four steps (or “strokes”) over and over again. Virtually every car engine has worked the same way ever since.

### **Karl and Bertha Benz**

German engineer Karl Benz (1844–1929) studied Otto’s work and determined to do better. After building a simpler gasoline engine of his own, he fixed it to a three-wheeled carriage and made the world’s first practical gas-powered car in 1885. No-one took much notice – until Benz’s feisty wife Bertha and their two young sons “borrowed” the car one day without asking and set off for a 100-km (65-mile) journey to see grandma. They bought fuel at drug stores (chemist’s shops), because gas stations had yet to be invented, and the boys had to get out every so often to push the car up hills. Bertha even had to stop a couple of times to make repairs with her hair pin and garter belt. News of this intrepid early test-drive caught the public’s imagination; Benz couldn’t have dreamed up a better publicity stunt if he’d tried. He took his wife’s advice and added gears for uphill driving. Soon he was developing successful four-wheel cars and, by the start of the 20th century, was the world’s leading car maker.

### **Gottlieb Daimler and Wilhelm Maybach**

Benz soon found himself up against Gottlieb Daimler (1834–1900) and Wilhelm Maybach (1846–1929), who worked for Nikolaus Otto, until Otto and Daimler fell out. Setting up their own firm, Daimler and Maybach experimented with a giant gasoline engine nicknamed the Grandfather Clock (because it was tall and upright). After shrinking it down to size, they bolted it to a wooden bicycle and made the world’s first motorbike. By 1889, they were building cars. Ten years later, the Daimler company named a car “Mercedes” in honor of Mercedes Jelinek, the daughter of one of their customers and dealers, Emil Jelinek (1853–1918). The Daimler and Benz companies were rivals until the 1920s, when they

merged to make Daimler-Benz and began selling cars under the name Mercedes-Benz.

### **Rudolf Diesel**

Rudolf Diesel (1858–1913) was both a thinker and a doer. Confined to hospital after an accident, he spent months poring over books and papers by people like Carnot and Otto. He soon came to the conclusion that he could build a far better engine than the puny gasoline machines Benz and Daimler had designed and knocked up a prototype, an enormous 3-m (10-ft) high machine, in the early 1890s. This first diesel engine made twice as much power as a similar steam engine and, even more remarkably, could run on practically any fuel at all—even oil made from peanuts and vegetables. Diesel, in other words, was a pioneer of biofuels long before people had a name for them.

Diesel was convinced of his genius and certain his engine would change the world, but he never lived to see the success he'd earned. In September 1913, while traveling from Germany to England on the mail ship SS Dresden, he fell overboard and drowned. Some people think he was murdered by German or French secret agents to stop him selling the secrets of his engines to the English in the run up to World War I, which broke out the following year.

### **Charles Goodyear**

While inventors like Diesel were developing engines in a careful scientific way, a hapless American called Charles Goodyear (1800–1860) found the secret of making car tires completely by accident. After learning about rubber, he convinced himself he could make his fortune by turning it into useful objects like waterproof shoes. All attempts ended in disaster and his life became a catalog of misery and misfortune. His shoes melted in the summer heat, six of his 12 children died in infancy, and his family had to live in grinding poverty eating fish from the river. But Goodyear

was determined. When debts landed him in jail, he simply asked his wife to bring him a rolling pin and some rubber and he carried on inventing in his cell. He finally made his big breakthrough when he accidentally dropped a piece of rubber on a hot stove. It cooked and shriveled into a hard black mass that Goodyear immediately spotted as the thing he'd wanted all along. This is how he developed the tough black rubber we use in tires today by a cooking process now known as vulcanization.

### **Text 3: The rise of Henry Ford**

Ford was no scientist, but he'd been repairing watches and tinkering with machines since he was a boy. Never afraid of rolling up his sleeves, he loved machinery and understood it instinctively. His first car was little more than a four-wheel motorbike that he called the Quadricycle. When he took it on the streets of Detroit in 1896, horses bolted in all directions.

Ford must have been delighted: he had no time for horses. Aged 14, he'd been thrown from the saddle of a colt, caught his foot in the stirrups, and dragged home along the ground. A few years later, he'd been seriously injured when his bolting horse and cart tried to smash through a fence. Now was the time to settle those scores.

Ford loved machines and hated horses, so he hatched a simple plan: he'd make the simplest possible "horseless carriage" and he'd make it in such enormous quantities, in only one color, that he could sell it cheaply to a huge number of people. It took him 12 years to get things right. In fact, he made eight different models (named A, B, C, F, N, R, S, and K) before he finally came up with a winner, the Model T, launched in 1908 – a car everyone could afford. Around 15 million Model T Fords were eventually sold and a delighted (and very rich) Henry Ford scribbled in his notebook: "The horse is DONE".

## **How the horse was “done”**

“I felt perfectly certain that horses, considering all the bother of attending them and the expense of feeding, did not earn their keep” – Henry Ford, *My Life and Work*, 1922.

## **From horse to car in six steps and about 5000 years**

1. Wild horse: The horse’s stomach is its fuel tank and it “burns” food to make power. “Four-leg drive” makes this the perfect, all-terrain vehicle, with a top speed of ~90 km/h (60 mph).

2. Horse and cart (~2500 BCE): Dragging a cart with heavy, solid wheels slows the horse down to a measly 6 km/h (4 mph) – brisk human walking speed. The wheels mean the cart can carry huge loads over long distances. It’s just a shame there are no roads.

3. Roman chariot (100BCE-476CE): With four horses and two slick, spoked wheels, a racing chariot has more horsepower, less weight, and less friction to slow it down. It can reach speeds of 60 km/h (40 mph) But it can’t carry much shopping.

4. Phaeton (~1800-1900): The phaeton (a sporty, four-wheel carriage) sacrifices a bit of speed for comfort: it has suspension under the wheels to smooth the ride. The “dashboard” protects the passengers from stones and muck the horses kick back as they dash along. It has a top speed of 16 km/h (10 mph)

5. Ford’s Quadricycle (1896): Ford’s first car is not so much a “horseless carriage” as a horse crossed with a carriage: it has its own gasoline engine and fuel tank and four bicycle wheels instead of four legs. Its top speed of 32 km/h (20 mph) is only a third of a horse’s.

6. Model T Ford (1908): Ford’s Model-T combines speed, practicality, and simplicity. Its 20-horsepower gasoline engine can race to speeds of 72 km/h (45 mph) – still slower than a galloping horse. The only thing it can’t do is jump fences.

## **The Assembly Line**

Normally things get more expensive over time – but Ford’s pint-sized miracle car, the Model T, dropped in price from \$850 when it was launched in 1908 to just \$260 in 1925. The secret was mass-production: making the car from simple, easy-to-fit parts in huge quantities. Other car makers used small groups of mechanics to build entire cars very slowly. By 1913, Ford was building cars at his new Highland Park factory in a completely different way using a moving “assembly line”. Model Ts were gradually assembled on a conveyor that inched past a series of workers. Each mechanic was trained to do only one job and worked briefly on each car as it passed by. Then the vehicle moved on, someone else did another bit, and the whole car magically came together. The first year Ford used his assembly line, production of the Model T leaped from 82,000 to 189,000. By 1923, Ford’s giant River Rouge factory was making 2 million cars a year.

## **River Rouge**

Ford’s most ambitious project was his sprawling River Rouge car plant in Dearborn, Michigan. Production of Model T parts switched here in 1919, though the car was still put together at Highland Park. With dozens of enormous buildings spread across a vast area, River Rouge was more like a city for making cars than a traditional assembly plant.

The idea was to make cars more cheaply than ever before by taking in the most basic raw materials at one end and churning out millions of finished vehicles at the other. Giant barges ferried coal to the Rouge from Ford’s own mines down the river. Elsewhere on the site, there was a steelworks, a glassworks, a cement works, a body-making plant, a sawmill and a rubber-making plant. River Rouge even had its own hospital, police force, and a steam-electric power station big enough to light a city. All this meant it could produce one car every 49 seconds.

## **River Rouge Facts**

- 93 separate buildings.
- 81,000 people employed.
- 120 miles of assembly line conveyors.
- 100 miles of private railroad track and 16 trains.
- Total size: 2000 acres (an area the size of 1000 British soccer pitches or 1500 American football fields).
- 15,767,708 square feet of factory floors and 3500 mops used each month to keep them clean.
- Total cost: \$268,991,592.07—equivalent to about £1.5 billion today!

## **Text 4: The Fall of Henry Ford**

Henry Ford was a big success and a people's hero: no-one did more to put cars within reach of ordinary people. But he made big mistakes too, probably because he was a mess of contradictions.

**Stuck in the past?** Ford looked to the future – he grew soybeans to make plastic parts for cars and experimented with biofuels years before almost anyone else. He famously wrote “History is more or less bunk”. But, as he grew older, he set up his own museum, packed it full of nostalgic exhibits, and spent increasing amounts of time there daydreaming of a lost era. He even had visitors driven round on horses and carts.

**Nostalgic?** His assembly-line methods were widely copied and quickly transformed the United States from a clean and green farm-based nation into a dirty, smoky factory-based one. Yet the more industrialized things became, the more Ford yearned for the rural world he was helping to destroy.

**Stubborn?** The Model-T Ford was a huge success, but Ford refused to update it: “There is a tendency to keep monkeying with styles and to

spoil a good thing by changing it”. But other car makers began introducing a new model every year and the Ford Motor Company lost its lead. In 1927, Ford grudgingly abandoned the Model-T and closed down his factories for six months while they converted to making new models.

**Arrogant?** Ford had strong opinions and never shrank from expressing them. He ran for the US senate, but lost, and even seriously thought of standing for President. Though a brilliant mechanic, he had no qualifications to speak about world affairs.

**Racist?** Ford bought a newspaper and got into big trouble writing offensive articles about Jewish people. But he was one of the first industrialists to employ black people and treat them fairly.

**Pacifist?** When World War I broke out, this committed pacifist hired a huge ocean liner and sailed it round the world trying to make peace – earning nothing but ridicule. But during World War II, he turned his factory over to making thousands of bombers.

### **Spent Force**

Ford built his company up from nothing and was determined to keep control. Despite making his son Edsel president in 1919, Ford still made all the big decisions. He belittled Edsel and cruelly undermined his authority. Once, when Edsel ordered new coal ovens for the steel plant at River Rouge, Ford waited till they’d been built before ordering them to be demolished. Though Ford humiliated Edsel, he was devastated when his son died from cancer in 1943, aged only 49. The sparkle vanished from his eyes and he hurtled towards senility. He briefly became president of the Ford Motor Company once more, but couldn’t remember what he was supposed to be doing or why. By now, Ford was unquestionably the world’s greatest industrialist: he’d made a personal fortune of over \$1 billion. But he was deteriorating into what his doctor described as “a pleasant vegetable” and died after a massive stroke in 1947, aged 83.

## **Text 5: Car planet**

Chariots thrived in the ancient Mediterranean and Middle-East. Steam-power was a product of 18th-century Britain. In the 19th century, French and German engineers built the first gasoline cars. At the start of the 20th century Henry Ford, an American, made simple cars people could afford. Ever since then, the miracle of the motor car has spread around the world and changed the face of our planet.

### **People's wagon: 1940s: Germany**

German dictator Adolf Hitler (1889–1945) gave Henry Ford a medal for making cars affordable. Inspired by the Model-T Ford, Hitler asked German auto-maker Dr Ferdinand Porsche to develop a simple people's car or "Volks Wagen" called the KDF (Kraft durch Freude or Strength through Joy). Renamed the Beetle, it sold over 20 million worldwide and was one of the most popular cars of the 20th century.

### **Status symbols: 1950s–1960s: America**

Ford wanted to keep cars simple to keep them cheap. But his "any color so long as it's black" message fell out of favor: people wanted comfort and style. In the 1930s, cars became sleek, glamorous, and "streamlined"; inside, they boasted luxuries like automatic gears and window defrosters. The end of World War II brought cars inspired by planes. Swaggering "gas guzzlers" were given tail fins like jet fighters – and burned almost as much fuel.

### **Paving the way: 1930s–1950s: Europe and America**

Many countries launched huge road building schemes in the mid-20th century. Hitler helped to pioneer Germany's high-speed Autobahns in the 1930s, while his Italian pal Benito Mussolini (1883–1945) greatly expanded the Italian network of autostrade. Britain didn't start building motorways until the 1950s, when America also reorganized its major roads into a simple numbered network called the Interstate Highway System.

### **Cuban Classics: 1950s: Cuba**

Cuba has been cut-off from the United States since the Cuban revolution of 1959; so many Cubans still drive round in classic cars from the late 1950s. It's hard to buy new cars or spares for old ones.

### **Trabi trials (1950s–1980s): East Germany**

Before the fall of the Berlin Wall in 1989, eastern Europeans zipped around in 3 million ugly little cars called Trabants (or “Trabis”). They were cheap and cheerful – even cool in some ways, with recycled plastic body parts that lasted nearly 30 years. But their engines chugged like mowers and smoke belched from their exhausts. When communism collapsed, people drove their Trabants to the scrap heap at top speed. Only to find the plastic bits couldn't be recycled.

### **Big Sheik Out: 1970s: Middle East**

In 1973, oil-rich states in the Middle East began to restrict exports – turning off the tap that supplied the world with oil. There were sharp hikes in fuel prices and queues of cars snaking from gas stations were a familiar sight.

### **Sugar cars: 1970s: Brazil**

When the 1973 oil crisis hit home, the Brazilian government launched a major project to run the country's cars on ethanol made from sugar beet. Almost 30,000 filling stations in Brazil now sell ethanol, which supplies a fifth of the country's fuel.

### **First robot carmaker: 1961: Ewing, New Jersey, USA**

Henry Ford pioneered automation, but General Motors took it a quantum leap further in 1961. That's when the first-ever car-making robot started building car bodies at the GM plant in Ewing New Jersey.

### **Big in Japan: 1970s–1980s: Japan**

American and European car firms dominated car production till the 1970s. Then Japanese upstarts such as Nissan, Honda, Mazda, and Toyota began to undercut them by exporting cheaply made cars to the West.

For a time, countries like the United States and Britain fought off these imports. So the Japanese went further and began exporting their factories instead. Honda became the first Japanese maker to open plants in the United States and Canada in the early 1980s.

### **Compete or cooperate? California, USA: 2000s**

Car makers used to compete; now they cooperate. In the world of “globalization”, big companies and their brands operate beyond national borders. New cars are expensive to design so makers in different countries work together to reduce costs. A Renault made in France might use exactly the same chassis, engine, or bodywork as a Nissan made in Japan. Another example of globalization is when a car plant in one country builds vehicles for more than one maker. Toyota and General Motors jointly run a plant like this in Fremont, California making parts for Toyotas, Pontiacs, and Chevrolets.

### **Car-making memories: UK: 2000s**

Britain’s car industry once employed over a million people and was the world’s second-biggest producer after the United States. Today, the only big car plants left in Britain are run by Japanese firms and the once great names of British motoring – Jaguar, Rolls Royce, Bentley, and Aston Martin – are foreign-owned too.

### **Dream cars: China: 2000**

The Chinese are bicycle crazy: there are twice as many cycles in China as people in the United States. But all that could soon change. Car makers are eagerly turning their eyes to China, the world’s fastest-growing car market, where sales are growing at 80 per cent a year. The country’s biggest car maker, Shanghai Automotive, has already formed powerful alliances with big western firms including Fiat, General Motors, and Volkswagen.

## **Self-driving cars: California: 2000**

Who knows if we'll even be driving cars in the future? Companies like Google are now busily developing cars with onboard sensors that can navigate their way around the world while the people inside sit back and enjoy the view. Part robot, part computer, part old-fashioned automobile, these hybrid machines are likely to prove far safer and much more environmentally friendly than cars driven by careless, fallible humans.

## **Text 6: Gears**

Have you ever tried pedaling a bicycle up a really steep hill? It's pretty much impossible unless you use the right gear to increase your climbing force. Once you're back on the straight, it's a different story. Flick to a different gear and you can go incredibly fast: you can magically make your wheels turn round much faster than you're pedaling. Gears are helpful in machines of all kinds, not just cars and cycles. They're a simple way to generate more speed or power or send the power of a machine off in another direction. In science, we say gears are simple machines.

Gears are used for transmitting power from one part of a machine to another. In a bicycle, for example, its gears (with the help of a chain) take power from the pedals to the back wheel. Similarly, in a car, gears transmit power from the crankshaft (the rotating axle that takes power from the engine) to the driveshaft running under the car that ultimately powers the wheels.

You can have any number of gears connected together and they can be in different shapes and sizes. Each time you pass power from one gear wheel to another, you can do one of three things:

**Increase speed:** If you connect two gears together and the first one has more teeth than the second one (generally that means it's a bigger-sized wheel), the second one has to turn round much faster to keep up. So this arrangement means the second wheel turns faster than the first one

but with less force. Looking at our diagram on the right (top), turning the red wheel (with 24 teeth) would make the blue wheel (with 12 teeth) go twice as fast but with half as much force.

**Increase force:** If the second wheel in a pair of gears has more teeth than the first one (that is, if it's a larger wheel), it turns slower than the first one but with more force. (Turn the blue wheel and the red wheel goes slower but has more force.)

**Change direction:** When two gears mesh together, the second one always turns in the opposite direction. So if the first one turns clockwise, the second one must turn counterclockwise. You can also use specially shaped gears to make the power of a machine turn through an angle. In a car, for example, the differential (a gearbox in the middle of the rear axle of a rear-wheel drive car) uses a cone-shaped bevel gear to turn the driveshaft's power through 90 degrees and turn the back wheels.

Gears sound like magic, but they're simply science in action! Look at the diagram on the right and you'll see exactly how they work. The pair of gear wheels (top) works in exactly the same way as an ordinary pair of wheels the same size that are touching (middle); the only difference is that the gears have teeth cut around the edge to stop them slipping. But a wheel is really just a lever, so a pair of wheels that touch is like a pair of levers that touch

Let's think about cars. A car has a whole box full of gears – the gearbox –sitting between the crankshaft and the driveshaft. But what do they actually do?

A car engine makes power in a fairly violent way by harnessing the energy locked in gasoline. It works efficiently only when the pistons in the cylinders are pumping up and down at high speeds about 10-20 times a second. Even when the car is simply idling by the roadside, the pistons still need to push up and down roughly 1000 times a minute or the engine will cut out. In other words, the engine has a minimum speed at which it works best of about 1000 rpm. But that creates an immediate problem because if

the engine were connected directly to the wheels, they'd have a minimum speed of 1000rpm as well which corresponds to roughly 120km/h or 75mph. Put it another way, if you switched on the ignition in a car like this, your wheels would instantly turn at 75mph! Suppose you put your foot down until the rev counter reached 7000 rpm. Now the wheels should be turning round about seven times faster and you'd be going at 840 km/h or about 525 mph.

It sounds wildly exciting, but there's a snag. It takes a massive amount of force to get a car moving from a standstill and an engine that tries to go at top speed, right from the word go, won't generate enough force to do it. That's why cars need gearboxes. To begin with, a car needs a huge amount of force and very little speed to get it moving, so the driver uses a low gear. In effect, the gearbox is reducing the speed of the engine greatly but increasing its force in the same proportion to get the car moving. Once the car's going, the driver switches to a higher gear. More of the engine's power switches to making speed and the car goes faster.

Changing gears is about using the engine's power in different ways to match changing driving conditions. The driver uses the gearshift to make the engine generate more force or more speed depending on whether hill-climbing power, acceleration from a standstill, or pure speed is needed.

### **Text 7: Four different ways to use gears**

There are four simple gear machines with an old construction set to illustrate a few of the ways in which we can use gears to do different jobs:

#### **Gears for speed**

In the simple gearbox we have got (from right to left) a large gear wheel with 40 teeth, a medium wheel with 20 teeth, and a small wheel with 10 teeth. When we turn the large wheel round once, the medium wheel has to turn twice to keep up. Similarly, when the medium wheel turns once, the small wheel has to turn twice to keep up. So, when we turn the large gear

wheel on the right, the small wheel on the left turns four times faster but with one quarter as much turning force. This gearbox is designed for increasing speed.

### **Gears for force**

If we power the same gearbox in the opposite direction by turning the small wheel, we will make the large wheel spin a quarter as fast but with four times as much force. That's useful if we need to make a heavy truck go up a hill, for example.

### **Worm gears**

Here we are using an electric motor and a long screw-like gear to drive a large gear wheel. This arrangement is called a worm gear. It reduces the speed of the motor to make the large wheel turn with more force, but it's also useful for changing the direction of rotation in gear-driven machinery.

### **Rack and pinion gears**

You've probably seen one of these in cliff- and hill-climbing rack railroads, but they're also used in car steering systems, weighing scales, and many other kinds of machines as well. In a rack and pinion gear, a slowly spinning gear wheel (the pinion) meshes with a flat ridged bar (the rack). If the rack is fixed in place, the gear wheel is forced to move along it (as in a railroad). If the gear is fixed, the pinion shifts instead. That's what happens in car steering: you turn the steering wheel (connected to a pinion) and it makes a rack shift from side to side to swivel the car's front wheels to the left or the right. In simple weighing scales, when you load a weight on the pan at the top, it pushes a rack straight downward, causing a pinion to rotate. The pinion is attached to a pointer that rotates as well, showing the weight on the dial.

You might think gears are brilliantly helpful, but there's a catch. If a gear gives you more force, it must give you less speed at the same time. If it gives you more speed, it has to give you less force. That's why,

when you're going up hill in a low gear, you have to pedal much faster to go the same distance. When you're going along the straight, gears give you more speed but they reduce the force you're producing with the pedals in the same proportion.

Whenever you gain something from a gear you must lose something else at the same time to make up for it. If that weren't the case, you could use gears to create energy and make what scientists call a perpetual motion machine and that's absolutely forbidden by a law of physics called the conservation of energy. Formally stated, it says that you can't create or destroy energy, only convert it from one form into another. To put it more informally, as my old physics teacher used to say: "There's no gain without pain"!

### **Text 8: 6 Simple Machines: Making Work Easier**

Throughout history, humans have developed a number of devices to make work easier. The most notable of these are known as the "six simple machines": the wheel and axle, the lever, the inclined plane, the pulley, the screw and the wedge, although the latter three are actually just extensions or combinations of the first three.

Because work is defined as force acting on an object in the direction of motion, a machine makes work easier to perform by accomplishing one or more of the following functions:

- transferring a force from one place to another,
- changing the direction of a force,
- increasing the magnitude of a force, or
- increasing the distance or speed of a force.

Many machines combine more than one of these devices to make work easier. For instance, we might attach a long handle to a shaft to make a windlass, or use a block and tackle to pull a load up a ramp. While these

machines may seem simple, they continue to provide us with the means to do many things that we could never do without them.

**Wheel and axle** – The wheel is considered to be one of the most significant inventions in the history of the world. Before the invention of the wheel in 3500 B.C., humans were severely limited in how much stuff we could transport over land, and how far. Wheeled carts facilitated agriculture and commerce by enabling the transportation of goods to and from markets, as well as easing the burdens of people traveling great distances.

The wheel greatly reduces the friction encountered when an object is moved over a surface. “If you put your file cabinet on a small cart with wheels, you can greatly reduce the force you need to apply to move the cabinet with constant speed,” according to the University of Tennessee.

In his book “Ancient Science: Prehistory-A.D. 500” (Gareth Stevens, 2010), Charlie Samuels writes, “In parts of the world, heavy objects such as rocks and boats were moved using log rollers. As the object moved forward, rollers were taken from behind and replaced in front.” This was the first step in the development of the wheel.

The great innovation, though, was in mounting a wheel on an axle. The wheel could be attached to an axle that was supported by a bearing, or it could be made to turn freely about the axle. This led to the development of carts, wagons and chariots. According to Samuels, archaeologists use the development of a wheel that rotates on an axle as an indicator of a relatively advanced civilization. The earliest evidence of wheels on axles is from about 3200 B.C. by the Sumerians. The Chinese independently invented the wheel in 2800 B.C. In addition to reducing friction, a wheel and axle can also serve as a force multiplier. If a wheel is attached to an axle, and a force is used to turn the wheel, the rotational force, or torque, on the axle is much greater than the force applied to the rim of the wheel. Alternatively, a long handle can be attached to the axle to achieve a similar effect.

The other five machines all help humans increase and/or redirect the force applied to an object. In their book “Moving Big Things” (It’s about time, 2009), Janet L. Kolodner and her co-authors write, “Machines provide mechanical advantage to assist in moving objects. Mechanical advantage is the trade-off between force and distance.” In the following discussion of the simple machines that increase the force applied to their input, we will neglect the force of friction, because in most of these cases, the frictional force is very small compared to the input and output forces involved.

When a force is applied over a distance, it produces work. Mathematically, this is expressed as  $W = F \times D$ . For example, to lift an object, we must do work to overcome the force due to gravity and move the object upward. To lift an object that is twice as heavy, it takes twice as much work to lift it the same distance. It also takes twice as much work to lift the same object twice as far. As indicated by the math, the main benefit of machines is that they allow us to do the same amount of work by applying a smaller amount of force over a greater distance.

**Lever** – “Give me a lever and a place to stand, and I’ll move the world.” This boastful claim is attributed to the third-century Greek philosopher, mathematician and inventor Archimedes. While it may be a bit of an exaggeration, it does express the power of leverage, which, at least figuratively, moves the world.

The genius of Archimedes was to realize that in order to accomplish the same amount of work, one could make a trade-off between force and distance using a lever. His Law of the Lever states “Magnitudes are in equilibrium at distances reciprocally proportional to their weights,” according to “Archimedes in the 21st Century,” a virtual book by Chris Rorres at New York University.

The lever consists of a long beam and a fulcrum, or pivot. The mechanical advantage of the lever depends on the ratio of the lengths of the beam on either side of the fulcrum.

For example, say we want to lift a 100-lb. (45 kilograms) weight 2 feet (61 centimeters) off the ground. We can exert 100 lbs. of force on the weight in the upward direction for a distance of 2 feet, and we have done 200 lb.-feet (271 Newton-meters) of work. However, if we were to use a 30-foot (9 m) lever with one end under the weight and a 1-foot (30.5 cm) fulcrum placed under the beam 10 feet (3 m) from the weight, we would only have to push down on the other end with 50 lbs. (23 kg) of force to lift the weight. However, we would have to push the end of the lever down 4 feet (1.2 m) in order to lift the weight 2 feet. We have made a trade-off in which we doubled the distance we had to move the lever, but we decreased the needed force by half in order to do the same amount of work.

**Inclined plane** – The inclined plane is simply a flat surface raised at an angle, like a ramp. According to Bob Williams, a professor in the Department of Mechanical Engineering at the Russ College of Engineering and Technology at Ohio University, an inclined plane is a way of lifting a load that would be too heavy to lift straight up. The angle (the steepness of the inclined plane) determines how much effort is needed to raise the weight. The steeper the ramp, the more effort is required. That means that if we lift our 100-lb. weight 2 feet by rolling it up a 4-foot ramp, we reduce the needed force by half while doubling the distance it must be moved. If we were to use an 8-foot (2.4 m) ramp, we could reduce the needed force to only 25 lbs. (11.3 kg).

**Pulley** – If we want to lift that same 100-lb. weight with a rope, we could attach a pulley to a beam above the weight. This would let us pull down instead of up on the rope, but it still requires 100 lbs. of force. However, if we were to use two pulleys – one attached to the overhead beam, and the other attached to the weight – and we were to attach one end of the rope to the beam, run it through the pulley on the weight and then

through the pulley on the beam, we would only have to pull on the rope with 50 lbs. of force to lift the weight, although we would have to pull the rope 4 feet to lift the weight 2 feet. Again, we have traded increased distance for decreased force.

If we want to use even less force over an even greater distance, we can use a block and tackle. According to course materials from the University of South Carolina, “A block and tackle is a combination of pulleys which reduces the amount of force required to lift something. The trade-off is that a longer length of rope is required for a block and tackle to move something the same distance.”

**Screw** – “A screw is essentially a long incline plane wrapped around a shaft, so its mechanical advantage can be approached in the same way as the incline,” according to Hyper Physics, a website produced by Georgia State University. Many devices use screws to exert a force that is much greater than the force used to turn the screw. These devices include bench vices and lug nuts on automobile wheels. They gain a mechanical advantage not only from the screw itself but also, in many cases, from the leverage of a long handle used to turn the screw.

**Wedge** – A longer, thinner wedge gives more mechanical advantage than a shorter, wider wedge, but a wedge does something else: The main function of a wedge is to change the direction of the input force. For example, if we want to split a log, we can drive a wedge downward into the end of the log with great force using a sledgehammer, and the wedge will redirect this force outward, causing the wood to split. Another example is a doorstop, where the force used to push it under the edge of the door is transferred downward, resulting in frictional force that resists sliding across the floor.

## **Text 9: Highly automated systems**

Automation, system of manufacture, designed to extend the capacity of machines to perform certain tasks formerly done by humans, and to control sequences of operations without human intervention. The term automation has also been used to describe non-manufacturing systems in which programmed or automatic devices can operate independently or nearly independently of human control. In the fields of communications, aviation, and astronautics, for example, such devices as automatic telephone switching equipment, automatic pilots, and automated guidance and control systems are used to perform various operations much faster or better than could be accomplished by humans. Human operators are not needed on the assembly line or manufacturing floor because the system is able to handle both the mechanical work and the scheduling of manufacturing tasks. The development of fully automated manufacturing systems dates to the later half of the 20th century, and this manufacturing technique is used in facilities of varying scale all over the world. Historically, manufacturing was done entirely by hand. This required large amounts of labor, driving up the cost of the final product, and also exposed workers to considerable danger. During the Industrial Revolution, mechanized manufacturing was introduced. In mechanized manufacturing, workers operate equipment that does the labor, instead of laboring directly. This reduced costs, improved consistency, and contributed to developments in workplace safety. Automated manufacturing was the next step in the process of refining and modernizing manufacturing methods.

Automated manufacturing arose out of the intimate relationship of such economic forces and technical innovations as the division of labor, power transfer and the mechanization of the factory, and the development of transfer machines and feedback systems. The division of labor (that is, the reduction of a manufacturing or service process into its smallest independent steps) developed in the latter half of the 18th century and was

first discussed by the British economist Adam Smith. In manufacturing, the division of labor results in increased production and a reduction in the level of skills required of workers. Mechanization was the next step necessary in the development of automation. The simplification of work made possible by the division of labor also made it possible to design and build machines that duplicated the motions of the worker. As the technology of power transfer evolved, these specialized machines were motorized and their production efficiency was improved. The development of power technology also gave rise to the factory system of production, because all workers and machines had to be located near the power source. In the 1920s the automobile industry combined these concepts into an integrated system of production. The goal of this assembly-line system was to make automobiles available to people who previously could not afford them. This method of production was adopted by most automobile manufacturers and rapidly became known as Detroit automation.

Automated equipment can fabricate, assemble, and package products. Some systems even package products for shipment complete with invoices and mailing labels, sending the products directly off the line and into trucks for shipment. The degree of automation depends on the product and the budget of the company, as automated manufacturing is expensive to implement even though it saves costs in the long term. Consulting firms can assist companies with ordering, installing, and customizing automated systems for manufacturing applications. From a safety perspective automated manufacturing is a significant improvement. If people are only on the assembly line when it is shut down to work on equipment, the risks of workplace injury decrease dramatically. Managing automated systems also requires more training and skill and translates into higher pay for workers involved in the maintenance and management of the system. Automated manufacturing also eliminates jobs, however. Industrial robots, originally designed only to perform simple tasks in environments

dangerous to human workers are now widely used to transfer, manipulate and position both light and heavy work pieces performing all the functions of a transfer machine. Cameras connected to sophisticated software can be used to monitor product quality, the speed of the assembly line, and so forth. Humans are involved primarily in maintenance of the equipment and programming of the control systems.

### **Text 10: Inventors and inventions (part 1)**

Have you ever dreamed of becoming a great inventor of having a fantastically clever idea that changes society for the better and makes you rich in the process? The history of technology is, in many ways, a story of great inventors and their brilliant inventions. Think of Thomas Edison and the light bulb, Henry Ford and the mass-produced car, or, more recently, Tim Berners-Lee and the World Wide Web. Inventing isn't just about coming up with a great idea; that's the easy part! There's also the matter of turning an idea into a product that sells enough to recoup the cost of putting it on the market. And there's the ever-present problem of stopping other people from copying and profiting from your ideas. Inventing is a difficult and often exhausting life; many inventors have died penniless and disappointed after struggling for decades with ideas they couldn't make work. Today, many lone inventors find they can no longer compete and most inventions are now developed by giant, powerful corporations. So, are inventors in danger of going extinct? Or will society always have a place for brave new ideas and stunning new inventions? Let's take a closer look and find out.

**What is invention?** That sounds like a trivial question, but it's worth pausing a moment to consider what "invention" really means. In one of my dictionaries, it says an inventor is someone who comes up with an idea for the first time. In another, an inventor is described as a person of "unique

intuition or genius” who devises an original product, process, or machine. Dictionary definitions like these are badly out of date and probably always have been. Since at least the time of Thomas Edison (the mid-to-late 19th century), invention has been as much about manufacturing and marketing inventions successfully as about having great ideas in the first place.

Some of the most famous inventors in history turn out, on closer inspection, not to have originated ideas but to have developed existing ones and made them stunningly successful. Edison himself didn’t invent electric light, but he did develop the first commercially successful, long-lasting electric light bulb. (By creating a huge market for this product, he created a similarly huge demand for electricity, which he was busily generating in the world’s first power plants.) In much the same way, Italian inventor Guglielmo Marconi can’t really be described as the inventor of radio. Other people, including German Heinrich Hertz and Englishman Oliver Lodge, had already successfully demonstrated the science behind it and sent the first radio messages. What Marconi did was to turn radio into a much more practical technology and sell it to the world through bold and daring demonstrations. These days, we’d call him an entrepreneur – a self-starting businessperson who has the drive and determination to turn a great idea into a stunning commercial success.

It’s important not to underestimate the commercial side of inventing. It takes a lot of money to develop an invention, manufacture it, market it successfully, and protect it with patents. In our gadget-packed homes and workplaces, modern inventions seldom do completely original jobs. More often, they have to compete with and replace some existing gadget or invention to which we’ve already become attached and accustomed. When James Dyson launched his bagless cyclone vacuum cleaner, the problem he faced was convincing people that it was better than the old-fashioned vacuums they had already. Why should they spend a fortune buying a new machine when the one they had already was perfectly satisfactory?

Successful inventions have to dislodge existing ones, both from our minds (which often find it hard to imagine new ways of doing things) and from their hold on the marketplace (which they may have dominated for years or decades). That's another reason why inventing is so difficult and expensive—and another reason why it's increasingly the province of giant corporations with plenty of time and money to spend.

**Scientific breakthroughs** – Some inventions appear because of scientific breakthroughs. DNA fingerprinting (the process by which detectives take human samples at crime scenes and use them to identify criminals) is one good example. It only became possible after the mid-20th century when scientists understood what DNA was and how it worked: the scientific discovery made possible the new forensic technology. The same is true of many other inventions. Marconi's technological development of radio followed on directly from the scientific work done by Lodge, Hertz, James Clerk Maxwell, Michael Faraday, and numerous other scientists who fathomed out the mysteries of electricity and magnetism during the 19th century. Generally, scientists are more interested in advancing human knowledge than in commercializing their discoveries; it takes a determined entrepreneur like Marconi or Edison to recognize the wider, social value of an idea – and turn theoretical science into practical technology.

**Trial and error** – But it would be very wrong to suggest that inventions (practical technologies) always follow on from scientific discoveries (often abstract, impractical theories). Many of the world's greatest inventors lacked any scientific training and perfected their ideas through trial and error. The scientific reasons why their inventions succeeded or failed were only discovered long afterward. Engines (which are machines that burn fuel to release heat energy that can make something move) are a good example of this. The first engines, powered by steam, were developed entirely by trial and error in the 18th century by such

people as Thomas Newcomen and James Watt. The scientific theory of how these engines worked, and how they could be improved, was only figured out about a century later by Frenchman Nicolas Sadi Carnot. Thomas Edison, one of the most prolific inventors of all time, famously told the world that "Genius is one percent inspiration and 99 percent perspiration"; he had little or no scientific training and owed much of his success to persistence and determination (when he came to develop his electric light, he tested no fewer than 6000 different materials to find the perfect filament).

### **Text 11: Inventors and inventions (part 2)**

Some inventions are never really invented at all they have no single inventor. You can comb your way through thousands of years of history, from the abacus to the iPhone, and find not a single person who could indisputably be credited as the sole inventor of the computer. That's because computers are inventions that have evolved over time. People have needed to calculate things for as long as they've traded with one another, but the way we've done this has constantly changed. Mechanical calculators based on levers and gears gave way to electronic calculators in the early decades of the 20th century. As newer, smaller electronic components were developed, computers became smaller too. Now, many of us own cellphones that double-up as pocket computers, but there's no single person we can thank for it. Cars evolved in much the same way. You could thank Henry Ford for making them popular and affordable, Karl Benz for putting gasoline engines on carts to make motorized carriages, or Nikolaus Otto for inventing modern engines in the first place—but the idea of vehicles running on wheels is thousands of years old and its original inventor (or inventors) has long since disappeared in time.

**Accidental inventions** – Some inventions happen through pure luck. When Swiss inventor George De Mestral was walking through the countryside, he noticed how burrs from plants stuck to his clothes and were hard to pull away. That gave him the idea for the brilliant two-part clothing fastener that he called VELCRO®. Another inventor who got lucky was Percy Spencer. He was experimenting with a device called a magnetron, which turns electricity into microwave radiation for radar detectors (used for direction-finding in ships and planes), when he noticed that a chocolate bar in his pocket had started to melt. He realized the microwave radiation was generating heat that was cooking (and melting) the food and that gave him the idea for the microwave oven. Teflon®, the super-slippery nonstick coating, was also discovered by accident when Roy Plunkett accidentally made some strange white goo in a chemical laboratory. Its amazing nonstick properties were only discovered and put to use later. All these inventions, and numerous others, were chance discoveries produced by accidents or mistakes.

**Advantageous inventions** – From IBM and Sony to Goodyear and AT&T, many of the world’s biggest, best-known corporations have been built on the back of a single great invention. IBM, for example, grew out of an earlier company selling intricate mechanical census-counting machines developed by Herman Hollerith; Sony made its name selling cheap, high-quality radios made with tiny transistors; Goodyear owes its name (and its chief product) to Charles Goodyear, a hapless inventor who finally developed durable, modern, “Vulcanized” rubber after a lifetime of trial and error; AT&T can trace its roots back to the telephone patented by Alexander Graham Bell in 1876. But a modern company can’t survive and thrive on one great idea alone. That’s why so many companies have huge research and development laboratories where inspired scientists and engineers are constantly trying to come up with better ideas than the ones on which their original success was founded. As marketing genius

Theodore Levitt pointed out in the 1960s, visionary companies need the courage to try to put themselves out of business by coming up with new products that make their existing ones obsolete; companies that rest on their laurels will be put out of business by their inventive competitors. This kind of corporate invention – companies trying to out-invent themselves and one another – is very much the way the world works now.

**The world of corporate invention** – There are probably more people trying to invent things now than at any time in history, but relatively few of them are lone geniuses struggling away in home workshops and garages. There will always be room for lucky individuals who have great ideas and get rich by turning them into world-beating products. But the odds are stacked increasingly against them. It's unlikely you'll get anywhere tinkering away in your garage trying to invent a personal computer that will change the world, the way Steve Wozniak and Steve Jobs did back in the mid-1970s when they put together the first Apple Computer. To do that, you'd have to set yourself up in competition with Apple Computer (which became the world's richest company in 2011), staffed with legions of brilliantly creative scientists, engineers, and designers, and with billions of dollars to spend on research and development. Really prolific inventors might file a few dozen patent applications during their lifetime, if they're lucky; but the world's most inventive company, IBM, files several thousand patents every single year. Companies like IBM have to keep on inventing to keep themselves in business: inventions are the fuel that keeps them going.

Think of inventions in the 19th century and you'll come across lone inventors like Charles Goodyear, Thomas Edison, Alexander Graham Bell, George Eastman (of Kodak) and many more like them. But think of inventing in the 20th and 21st century and you'll come across inventive corporations instead such companies as DuPont (the chemical company that gave us nylon, Teflon®, Kevlar®, Nomex®, and many more amazing

synthetic materials), Bell Labs (where transistors, solar cells, lasers, CD players, digital cellphones, commercial fax machines, and CCD light sensors were developed), and 3M (pioneers of Scotchgard textile protector and Post-It® Notes, to name only two of their best-known products). It was Thomas Edison who transformed the world of inventing, from lone inventors to inventive corporations, when he established the world's first ever invention "factory" at Menlo Park, New Jersey, in 1876.

These days corporations dominate our world and they dominate the world of inventing in exactly the same way. If it's your dream to become a great inventor, go for it and good luck to you but be prepared to take on some very stiff, very well-funded, corporate competition. If you succeed, congratulations: maybe you'll prove to be the founder of the next Apple, AT&T, or IBM.

**РАЗДЕЛ 2:**  
**ГРАММАТИЧЕСКИЕ УПРАЖНЕНИЯ**

*2.1. Глагол to be, порядок слов в английском предложении, вопросительные предложения, времена группы Simple*

**1. Заполните пропуски глаголом *to be* в подходящей форме настоящего времени.**

A: Hi, Olga. How (1) \_\_\_\_\_ you?

B: Hello, Peter. I (2) \_\_\_\_\_ fine and how (3) \_\_\_\_\_ you doing?

A: I (4) \_\_\_\_\_ great.

B: How (5) \_\_\_\_\_ your cousin? Where (6) \_\_\_\_\_ she at the moment?

A: She (7) \_\_\_\_\_ in Cambridge. She (8) \_\_\_\_\_ learning English and German there.

B: Really? That (9) \_\_\_\_\_ wonderful! How about your parents?

A: They (10) \_\_\_\_\_ all right as well. They (11) \_\_\_\_\_ in Spain now.

B: (12) \_\_\_\_\_ you busy tonight?

A: Not really, why?

B: We (13) \_\_\_\_\_ having a party. Would you like to come?

A: I'd love to.

B: Then come to our place at 7:00 p.m.

**2. Используйте глагол *to be* в правильной форме прошедшего времени.**

1. The fantasy books \_\_\_\_\_ (to be) not boring. 2. Anna's apple cake \_\_\_\_\_ (to be) so delicious. 3. The lorries and cars \_\_\_\_\_ (to be) too dirty. 4. My relatives \_\_\_\_\_ (to be tired) after their trip. 5. The TV set \_\_\_\_\_ (to be turned off). 6. Paul \_\_\_\_\_ (to be) not ashamed. 7. We \_\_\_\_\_ (to be) not occupied. 8. The weather \_\_\_\_\_ (to be) cool.

**3. Используйте форму глагола *to be* в будущем времени.**

1. The letter \_\_\_\_ (to be delivered). 2. It \_\_\_\_ (to be) foggy. 3. I \_\_\_\_ (not, to be) at home. 4. We \_\_\_\_ (not, to be) ready. 5. My uncle \_\_\_\_ (to be) a mechanical engineer. 6. He \_\_\_\_ (to be) a student of machine building faculty. 7. This scientific work \_\_\_\_ (to be) a masterpiece.

**4. Выберите правильную форму глагола *to be*.**

1. A sportsman \_\_\_\_ (was / were / be) satisfied by his achievements. 2. Her hair \_\_\_\_ (is / am / are) long and thick. 3. She \_\_\_\_ (is / am / are) never late for her studies. 4. The film \_\_\_\_ (was / were / be) second-to-none. 5. The main gate \_\_\_\_ (was / were / be) closed. 6. The traffic \_\_\_\_ (was / were / be) heavy last Wednesday. 7. Kate and Sam \_\_\_\_ (am / is / are) happily married. 8. My shoes \_\_\_\_ (am / is / are) too tight. 9. She \_\_\_\_ (will be / will is / will are) in Warsaw on Saturday. 10. We \_\_\_\_ (am / is / are) engineers.

**5. Отметьте предложения, в которых нарушен порядок слов, и перестройте их в соответствии с правилами:**

*Example: Tom walks every morning to work. – Tom walks to work every morning.*

1. Jim doesn't like very much baseball.
2. Ann drives every day her car to work.
3. I do my homework at 6 o'clock every day.
4. The weather is fine today.
5. You watch all the time television.
6. We went last night to the movies.
7. I go to the shop with my mom.
8. She gave a book me yesterday.
9. I like playing with my brother.
10. Maria speaks very well English.

**6. Расположите слова в правильном порядке.**

1. Lucy / the USA / when / came to / she / didn't understand / much English
2. windows/ must / we / a floor/ clean / and
3. there / many / with / are / universities / highly-qualified specialists
4. when / a child / was / I / reading / fairy-tales / like
5. chocolate / used to / I / eat / now / I / but / like / don't
6. TV / tonight /on / interesting/ is / there/ nothing
7. was / the telephone /when / invented?
8. why / in / a car / usage / general / is / now

**7. Укажите, какой тип вопроса представлен.**

1. Do you study English at the university?
2. What do you prefer: going to the cinema or watching TV at home?
3. Did you go abroad last month?
4. How many people are there in the lecture hall?
5. Does she like tea or coffee in the morning?
6. What will she do next?
7. Who invented mass production?
8. Don't you know where Sam is?
9. They bought a new house, didn't they?
10. Who is he?

**8. Задайте общие вопросы и сделайте предложения отрицательными.**

1. He speaks English, German and French fluently.
2. We invented a new device which revolutionized our world.
3. Many different languages are spoken in the Philippines.
4. Scientists will solve many important problems and make significant decisions.

**9. Задайте все типы вопросов к данным предложениям.**

1. John wants to become a mechanical engineer. 2. Mechanical engineering is a highly-developed field. 3. Thomas Edison invented a lighting bulb. 4. They will make many calculations. 5. Scientists obtained valuable data on gene engineering.

**10. Составьте 5 видов вопросов по темам:**

1. About myself. 2. About my future profession. 3. My hobby. 4. My university. 5. My friend. 6. My town. 7. My country.

**11. Напишите форму 3-го лица ед. числа следующих глаголов.**

**Составьте предложения с парой глаголов.**

*Example: do – does --> The students of this group do research every term. He often does research on Chemistry.*

go, read, collect, hate, play, study, wash, watch, teach

**12. Раскройте скобки, поставив глагол в *Present, Past, Future Simple*.**

1. The Empire Hotel is very expensive. It \_\_\_\_ (to cost) too much money to stay there. 2. Swan \_\_\_\_ (to buy) new clothes yesterday. 3. My life \_\_\_\_ (to be) very exciting and interesting. I meet a lot of people every day and travel a lot. 4. It \_\_\_\_ (to rain) when we \_\_\_\_ (go) out. 5. Her parents \_\_\_\_ (to live) in the village in a three-storeyed house with a large garden around it. 6. Liza is exhausted. She \_\_\_\_ (to want) to go on holiday now. 7. Sue lives life to the full a lot. Today she is in London. Tomorrow she \_\_\_\_ (to be) in Rome. Next week she \_\_\_\_ (to go) in Greece. 8. Let's leave this bread in the garden. The birds \_\_\_\_ (to eat). 9. I \_\_\_\_ (to start) work at 8 o'clock and \_\_\_\_ (to finish) at 5.

## 2.2. Времена группы *Continuous*

### 1. Переведите предложения на русский язык, обращая внимание на употребление *Present Continuous*.

1. Let's go out and play tennis now. It isn't raining anymore. 2. Are you enjoying parties like this one? 3. Helen wants to live and work in Germany, that's why she is taking German courses. 4. Please, don't disturb me. I am trying to finish my test. 5. What's going on over there? 6. The international company I work for is doing well this year. 7. My friends are constructing their own step-by-step transmitter. 8. Is your French improving? 9. You can turn off the radio. I am not listening to it. 10. We are doing our homework now. It is so difficult.

### 2. Раскройте скобки, поставив глагол в правильную форму *Present Continuous*.

1. Mary phoned me last night to share her impressions on being in France. She \_\_\_\_ (have) a great time there. 2. Alex has just started evening classes. He \_\_\_\_ (study) Chinese. 3. Olga and Peter have had an argument. They \_\_\_\_ (discuss) a problem now. 4. Let's go out now. It \_\_\_\_ (rain) anymore. 5. Sue \_\_\_\_ (work) today. He's taken the day off. 6. Everybody \_\_\_\_ (look) for Sally. Do you know where she is? 7. Can I speak to Bob face to face? I'm sorry, he is very busy, he \_\_\_\_ (carry out) his research now. 8. What is going on over there? Why is it so noisy? She \_\_\_\_ (practise) new dance steps.

### 3. Составьте предложения, обращая внимание на порядок слов вопросительного предложения.

1. now / John / the Internet / is / surfing?
2. painting/ at the moment / the / girls / are?
3. the / singing / girl / right now / is?
4. the / catching / mice / cats / are?
5. are / you / what / doing?

6. reading / are / you / what?
7. tonight / where / you / going / are?
8. playing / we / time /basketball/ what / are?
9. crying /girl / why /is / this?
10. lunch / are / they / for / coming / when?

**4. Сделайте данные предложения отрицательными.**

1. We are listening to the teacher very attentively.
2. I am making notes.
3. The teacher is explaining English Grammar.
4. It is raining cats and dogs.
6. He is doing his homework.
6. He is driving very fast.
7. Sally is helping her mother about the house.
8. I am working very hard (много).
9. Ron's brother is coming to the business meeting.
10. You are dancing very well.

**5. Переведите предложения на русский язык, обращая внимание на употребление *Past Continuous*.**

1. This time last year I was moving to France.
2. We noticed Mary, but she wasn't looking at us.
3. What were you doing at 8 o'clock yesterday?
4. John came home while we were watching TV.
5. It was snowing hard when I got up.
6. I saw you in the park on Thursday. You were walking and eating an ice-cream.
7. Her grandmother were planting flowers while she was working in the garden.

**6. Раскройте скобки, поставив глаголы в форму *Past Continuous*.**

1. While I \_\_\_\_\_ (to write down) a grammar rule, my friends \_\_\_\_\_ (to do) new exercises.
2. When we entered, the children \_\_\_\_\_ (to read) their books.
3. The girls \_\_\_\_\_ (to feed) the birds in the garden while the boys \_\_\_\_\_ (to make) a bird-house.
4. Some of the children \_\_\_\_\_ (to ski) while other children \_\_\_\_\_ (to play) snowballs. Everybody \_\_\_\_\_ (to have) a lot of fun.

5. When we came the family \_\_\_\_\_ (to get) everything ready for Christmas. Sam and Julia \_\_\_\_\_ (to decorate) the Christmas tree.
6. We met her at the bus stop. She \_\_\_\_\_ (to listen) to music while she \_\_\_\_\_ (to wait) for the bus.

**7. Прочитайте текст, переведите. Найдите глаголы в форме *Past Continuous*. Ответьте на вопрос: *What happened outside?***

At 8 o'clock biathlon started on TV, so my father was still watching it at 8.30. Mum was sitting in the bedroom. She was quietly reading her favorite magazine "Vogue". Helen was trying on her Mum's clothes in her room. John's cousins were constructing something in their room while listening to music. It was very loud so they didn't hear the crash. At 8.30 the cats were lying in front of the fireplace and they were sleeping. John went out with his friend to play football. So at 8.30 he was still there.

**8. Допишите предложения по содержанию текста предыдущего упражнения, используя глаголы в *Past Continuous*.**

1. When John was outside Dad \_\_\_\_\_ .
2. When Mum heard the crash she \_\_\_\_\_ .
3. The cousins didn't hear the noise because they \_\_\_\_\_ .
4. The cats \_\_\_\_\_ when the noise woke them up.
5. At 8.30 John \_\_\_\_\_ .

**9. Переведите предложения на русский язык, обращая внимание на употребление *Future Continuous*.**

1. I will be doing my English test tomorrow at 11 a.m.
2. This time next week I will be taking an exam on physics.
3. I will be sunbathing, eating delicious ice-cream and swimming in the sea tomorrow at this time.
4. I am sure that she will be communicating with her friends tomorrow at this time.
5. You will be cleaning your room while I will be cooking.
6. The government will be stating a law about the environment protection tomorrow in the morning.

## 10. Раскройте скобки, поставив глаголы в форму

### *Future Continuous.*

1. This time next month I \_\_\_\_\_ in an international company in London. (work)
2. This time at weekends Lily \_\_\_\_\_ on a beach in Italy. (sunbathe)
3. Be quiet – I \_\_\_\_\_ an entrance test. (write)
4. He \_\_\_\_\_ to Moscow tomorrow at this time. (fly)
5. Students \_\_\_\_\_ notes while he \_\_\_\_\_ the test. (make/ finish)
6. I \_\_\_\_\_ in the library at 5pm tomorrow. (work).
7. This time next year we \_\_\_\_\_ the Pacific Ocean. (cross)
8. I \_\_\_\_\_ the dinner table while my mother \_\_\_\_\_ a meal. (lay / cook)
9. You'll recognize Helen. She \_\_\_\_\_ blue jeans and a red pullover. (wear)
10. From 8 till 12 I \_\_\_\_\_ courses. (take)

## 11. Составьте вопросы в *Future Continuous*. Дайте ответ, используя словосочетания в скобках.

*Example: What will John be doing? (to move to London) – John will be moving to London.*

1. What Mary be doing? (to do a research)
2. What Michael be doing? (to design a new car model)
3. What Nick's father be doing? (to work in the garden)
4. What Alex be doing at the University? (to study languages)
5. What Bob's mother be doing? (to cook a delicious meal)
6. What the singer be doing at the concert? (to sing his new songs)
7. What the teacher be doing? (to explain a new grammar rule)
8. What the scientist be doing next week? (to make the scientific breakthrough)

### 2.3. Времена группы *Perfect*

#### 1. Переведите предложения на русский язык, обращая внимание на употребление *Present Perfect*.

1. They have been married for fifteen years and are still very friendly.
2. She has lived in this city all her life.
3. I've known her for all my life and consider her to be very reliable and responsible.
4. Where's Sam? – He's gone abroad.
5. Paul is fond of travelling and now is away on holiday.
- Oh, where has he gone?
6. How long has she gone in for sports?
7. How long have you carried out this experiment?
8. Have you ever been to the USA? – No, I haven't been there yet.

#### 2. Напишите три формы следующих глаголов:

be, tell, invent, swim, discover, think, draw, spend, begin, become, control, give, take, lose, make, do, go, intent, know, lead, visit, see, cut, follow, drive, catch.

#### 3. Раскройте скобки, поставив глаголы в форму *Present Perfect*.

1. How long \_\_\_\_ you \_\_\_\_ (to learn) English?
2. We \_\_\_\_ (to buy) a new computer.
3. I \_\_\_\_ (to know) each other since January.
4. It's Ann's birthday tomorrow and Kate \_\_\_\_ (to buy) her a wonderful present.
5. Can I take this magazine? \_\_\_\_ you \_\_\_\_ (to read) it yet?
6. They \_\_\_\_ (not to write) their report yet.
7. I \_\_\_\_ just \_\_\_\_ (to do) my homework.
8. I \_\_\_\_ (to hear) a lot about this famous scientist.
9. I \_\_\_\_ never \_\_\_\_ (to be) to foreign countries.
10. I don't believe that he \_\_\_\_ never \_\_\_\_ (to see) the pictures of this distinguished artist.

#### 4. Заполните пропуски, используйте один из приведенных ниже глаголов в *Present Perfect*. Переведите предложения.

*break, buy, decide, finish, forget, go, go, invite, lose, see not/see, take, tell not/tell.*

1. I \_\_\_\_ my notes. I don't know where they are.
2. I \_\_\_\_ two books of my favorite writer. Do you want to read them?
3. Where is Bob? – I don't

know. He's not here. He \_\_\_\_\_ out. 4. I'm looking for Paula for all morning. \_\_\_\_\_ you \_\_\_\_\_ her? 5. Look! I don't believe that. Somebody \_\_\_\_\_ her construction of a bridge. 6. Is Ann informed that you are going there without her? Yes, I \_\_\_\_\_ her. 7. I can't find my textbook. Somebody \_\_\_\_\_ it. 8. Where are my glasses? – I don't know. I \_\_\_\_\_ them. 9. I haven't seen Sarah for two days. Where \_\_\_\_\_ she \_\_\_\_\_? 10. I am sure that I know that woman and even have seen her once, but I \_\_\_\_\_ her name. 11. Sue is having a party tonight. She \_\_\_\_\_ a lot of her relatives and close friends. 12. What are you going to do? \_\_\_\_\_ you \_\_\_\_\_? 13. Does Sam know about the meeting tomorrow? – I don't think so. I \_\_\_\_\_ him. 14. I \_\_\_\_\_ with this report. Do you want me to show it to you?

**5. Раскройте скобки, поставив глаголы в форму *Past Perfect*.**

1. When they arrived home, Sam \_\_\_\_\_ already \_\_\_\_\_ (to cook) dinner.  
2. When we got home last night, we found that we \_\_\_\_\_ (to forget) to turn off the lights.  
3. Helen didn't want to join us and go to the cinema because she \_\_\_\_\_ already \_\_\_\_\_ (to see) the movie.  
4. At first I thought I \_\_\_\_\_ (to find) the proper solution, but I soon realized that I \_\_\_\_\_ (to make) a big mistake.  
5. The girl sitting next to me on the plane was very nervous. He \_\_\_\_\_ (to flow) before.  
6. I wasn't sure who she was. I \_\_\_\_\_ (to see) her before, but I couldn't remember where.  
7. I wasn't thirsty. I \_\_\_\_\_ just \_\_\_\_\_ (to drink) three cups of tea.

**6. Составьте вопросительные и отрицательные предложения.**

1. I had read this interesting book with great pleasure.  
2. The laboratory assistant had prepared the experiment by 9 p.m.  
3. Kate had finished her test when we came.  
4. They had made a lot of mistakes in their calculations.  
5. By the beginning of the lecture he had brought all the necessary diagrams.

**7. Определите, какое действие произошло раньше.**

**Объедините два предложения в одно, не меняя части местами.**

**Используйте *before*.**

*Example: I wrote a letter. Then I met my friend. – I had written a letter before I met my friend.*

1. The rain stopped. The weather was warm and sunny. I went for a walk.
2. I did my homework. My father came home.
3. We met in the park. We went to the cinema.
4. They packed their things. Then they went to the station.
5. I finished my article. I switched on the TV set.
6. He arrived home. His relatives left.
7. We came to the theatre. The play began.
8. I read the book. I saw the play.
9. They lived here for a long time. They moved to another place.
10. We played basketball. We went to our friend's place.

**8. Раскройте скобки, поставив глаголы в форму *Future Perfect*.**

1. Fred \_\_\_\_ (to recover) by August and should be much healthier and fitter. 2. By Friday John \_\_\_\_ (to read) these novels by Pushkin. 3. By the beginning of his holiday Paul \_\_\_\_ (to spend) all his money. 4. Kate thinks the film \_\_\_\_ (to start) by the time she gets to the cinema. 5. This work is so time-consuming, that I \_\_\_\_ (not/complete) it in a day's time. 6. Next year is Sam and Ann's 15th wedding anniversary. They \_\_\_\_ (to be) happily married for fifteen years.

7. He \_\_\_\_ (to translate) book into many languages by next year. 8. I \_\_\_\_ (to cook) dinner by the time guests come. 9. I \_\_\_\_ (to do) my English homework before Jill comes home. 10. I \_\_\_\_ (to live) in Moscow for five and a half years by next September. 11. Before Lucy arrives, I \_\_\_\_ (to prepare) for my test. 12. John \_\_\_\_ (to translate) this difficult English text by 8 p.m. this afternoon. 13. The train \_\_\_\_ (to leave) by the time we get to the station. 14. Sam \_\_\_\_ (not/learn) his lesson by tomorrow. 15. They \_\_\_\_ (to finish) the report by the end of the week.

**9. Ответьте на вопросы, используя *Future Perfect* и слова в скобках.**

*Example: Will Kate be occupied at 6pm? (to write an article) – Oh, no, Kate will have written her article by that time.*

1. Will you be at your relatives on Monday? (to be at home)
2. Will the scientific team be discussing the project at 3 o'clock? (to make a decision)
3. Will the students be carrying out their experiments at 11 am? (to finish)
4. Will Jill's nephew still be a pupil next year? (to finish school)
5. Will two metallurgists be producing a super plastic metal in 2 weeks? (to invent)
6. Will they be designing a new car model on Tuesday? (to demonstrate)
7. Will inventors be working at a new transmitter in 2 months at this time? (to practice it)
8. Will they be looking for new ways of using solar power in 10 years? (to find industrial application)

**10. Составьте предложения во времени *Future Perfect*, обращая внимание на правильный порядок слов.**

1. have / I / you / seen / will / at the library / you / by the time / go to lectures.
2. a new job / Sally / have / by next month / will / found.
3. get home / Kate's / cleaned / by the time / parents / she / will / the house / have.
4. to communicate / Steve / he / learned / will / have / well / Chinese / before / enough / flies to Beijing?
5. finishes / have / that course / twenty / taken / Julia's father / by the time / he / will / online tests.
6. human labour / will / robots / have / by the year 2030 / replaced.
7. by June / successfully / all / I / passed / my exams / will / enough / have.
8. laboratory / to / by 8 o'clock / have / come / will / I.

## *2.4. Действительный и страдательный залоги*

### **1. Определите залог. Переведите предложения.**

1. Students ask the lecturer many questions. The lecturer is asked many questions. 2. Thomas Edison invented a lighting bulb. A lighting bulb was invented by Thomas Edison. 3. Scientists carry out many unusual experiments. Many unusual experiments are carried out by scientists. 4. Pushkin wrote a lot of famous novels. A lot of famous novels were written by Pushkin. 5. Popov invented the radio in 1895. The radio was invented by Popov in 1895. 6. They will introduce a new system of education next year. A new system of education will be introduced next year. 7. We must finish our work as soon as possible. Our work must be finished as soon as possible. 8. They are doing research now. Research is being done now. 9. We will have finished our work by the evening. Our work will have been finished by the evening. 10. You can do this exercise. This exercise can be done by you.

### **2. Переведите предложения, обращая внимание на употребление страдательного залога.**

1. My grandfather was a machine builder. Many cars were repaired by him. 2. It is a big international company. Two thousand people are employed by it. 3. A lot of money was spent to carry out this project. 4. Is this flat cleaned every day? 5. I'm not invited to parties very often because I don't like noisy companies. 6. How is this word translated? 7. New methods were developed. 8. Much attention must be paid to improvement of standards. 9. A country must be provided with highly-qualified specialists. 10. Electricity is widely used. 11. This document will be checked later. 12. An experiment was conducted successfully.

**3. Напишите нужную форму глагола to *make* в страдательном залоге.**

1. The calculations \_\_\_\_ at the moment.
2. The calculations \_\_\_\_ by 3 o'clock tomorrow.
3. The calculations \_\_\_\_ by the time the deadline was over.
4. The calculations \_\_\_\_ every day.
5. The calculations \_\_\_\_ by the time the telephone rang.
6. The calculations \_\_\_\_ yet.
7. The calculations \_\_\_\_ three weeks later.
8. The calculations \_\_\_\_ while I was getting ready for exams.
9. The calculations \_\_\_\_ already \_\_\_\_.
10. The calculations \_\_\_\_ when scientists entered the room.

**4. Раскройте скобки, поставив глаголы в нужном времени действительного или страдательного залога.**

Ulyanovsk State Technical University \_\_\_\_ (to abbreviate) as UISTU. It is a major higher education and research institution in Ulyanovsk. It \_\_\_\_ (to found) in 1957 as Ulyanovsk Polytech University. UISTU \_\_\_\_ (to locate) in the Volga River region. Ulyanovsk State Technical University (UISTU) is one of the leading science centers of the Volga region. Many specialists in various areas, including economy, humanities, technical sciences \_\_\_\_ (to train) there. The University \_\_\_\_ well (to know) in Russia for its research-and-development activities. Many scientific experiments and developments \_\_\_\_ (to carry out) there at the moment. By 2020 it \_\_\_\_ (to become) one of the leading scientific centers in Russia. It is necessary to say that graduates of UISTU \_\_\_\_ (to employ) by a large variety of companies. A great number of books, magazines, e-books, video materials and other resources \_\_\_\_ (can/ find) in UISTU. One of the biggest concert halls \_\_\_\_ (to visit) by many students every year. Many cultural and scientific events \_\_\_\_ (to take place) there.

**5. Преобразуйте предложения из действительного залога в страдательный.**

1. They are now building new research institutes to develop a scientific basis. 2. Will they publish her new book of poems next year? 3. They will have completed the work on this project by winter. 4. The teacher has just corrected students' translations. 5. They cut the electricity off because this family hadn't paid bills. 6. They will open a fitness centre next month. 7. Our direction discusses important matters every Wednesday. 8. The government stated a law last week. 9. They were solving many important problems on machine building development. 10. We are using less hot water.

**6. Преобразуйте предложения из действительного залога в страдательный, обращая внимание на место предлога.**

**Переведите предложения, обращая внимание на перевод глаголов с предлогами:**

*Example: We often speak about her. – She is often spoken about. О ней часто говорят.*

1. We will take care of our grandmother. 2. They often refer to his scientific discovery. 3. When I was going home my friend was following me. 4. They had insisted on this experiment. 5. The scientists listened to him with great attention. 6. She will send for the documents next week. 7. Today people are speaking about this poet much. 8. Parents have looked for the child everywhere. 9. Teachers paid attention to the work of this student. 10. His friends always wait for him.

**7. Заполните пропуски предлогами *with* или *by*.**

1. This delicious cake was cooked \_\_\_\_\_ my Mum.
2. This scientific paper was written \_\_\_\_\_ unknown author many years ago.
3. Extra training was provided \_\_\_\_\_ the company.

4. Paul was woken up \_\_\_\_\_ the drone of a motor.
5. The window was broken \_\_\_\_\_ a boy \_\_\_\_\_ a stone by accident.
6. An essay is being written \_\_\_\_\_ Kate right now.
7. Ann's bedroom wall was covered \_\_\_\_\_ posters of her favorite rock band.
8. My computer may be repaired \_\_\_\_\_ my brother this week.
9. His work table was covered \_\_\_\_\_ dust.
10. The new house was surrounded \_\_\_\_\_ flowerbeds.

**8. Раскройте скобки, употребив правильную форму глагола в страдательном залоге.**

1. The town can \_\_\_\_\_ (to see) from afar. – Город можно увидеть издалека.
2. Cheese \_\_\_\_\_ (to make) from milk. – Сыр изготавливается из молока.
3. Your parents \_\_\_\_\_ (to invite) to a meeting. – Твои родители будут приглашены на собрание.
4. This car \_\_\_\_\_ (to buy) two years ago. – Эта машина была куплена 2 года назад.
5. The swimming pool \_\_\_\_\_ (to open) next month. – Бассейн будет открыт в следующем месяце.
6. The Pyramids \_\_\_\_\_ (to build) in Egypt. – Пирамиды были построены в Египте.
7. Where is your computer? – It \_\_\_\_\_ (to repair) at the moment. – Где твой компьютер? – В данный момент его ремонтируют.
8. The books already \_\_\_\_\_ (to read). – Книги уже прочитаны.
9. The roads \_\_\_\_\_ (to cover) with the snow because of heavy snowfall. – Дороги покрыты снегом.
10. All exercises \_\_\_\_\_ (to do) by the evening. – Все задания были выполнены к вечеру.

**2.5. Степени сравнения прилагательных и наречий, слова заместители (one/that), употребление such/so**

**1. Напишите степени сравнения (сравнительную и превосходную степени сравнения).**

old, strong, happy, modern, important, good, large, serious, pretty, crowded, young, slow, beautiful, bad, far, prospective, big, wonderful

**2. Переведите предложения на русский язык.**

1. You can find further information on our web-site. 2. This is the oldest cathedral in Europe. 3. This book is more interesting than that. 4. Don't take the bus. It's easier to take a taxi. 5. The weather wasn't very good yesterday, but it's better today. 6. Japan is big, but China is bigger. 7. Is it more expensive to go by car or by train? 8. My neighbor is the most extraordinary man. 9. My hair is the same colour as yours. 10. Summer is the most favorite season of mine.

**3. Раскройте скобки, употребив сравнительную или превосходную степени сравнения.**

1. This is the \_\_\_\_ dictionary in the bookshop. (expensive)
2. This bus is too small. We need to get a \_\_\_\_ one. (big)
3. This year's exam was \_\_\_\_ than last year's (difficult)
4. It was the \_\_\_\_ music I've ever heard. (beautiful)
5. The weather today \_\_\_\_ than it was yesterday. (warm)
6. Your mobile phone is \_\_\_\_ than mine. (modern)
7. Australia is the earth's \_\_\_\_ continent. (old)
8. My cousin was always \_\_\_\_ than me. (pretty)
9. What's the \_\_\_\_ mountain in your country? (high)
10. This is the \_\_\_\_ TV set they have got. (large)

**4. Определите, являются ли предложения грамматически правильными (*correct*) или неправильными (*wrong*).**

**Исправьте неправильный вариант.**

1. Let's not talk about this routine work. Let's talk about something interestinger. 2. Because of the new duties I have littler time today than I had last year. 3. His daughter becomes prettier every day. 4. Weather forecasters say that next summer will be hoter. 5. Living in big cities doesn't make us healthyer. 6. Of the two pets, this one is smarter. 7. It is more dangerous to drive a car than a bicycle. 8. These dresses are too small. I need a larger size. 9. Happiness is more important than money. 10. You are stronger than I thought.

**5. Перепишите предложение, заменив повторяющееся существительное словом-заместителем *one* или *ones*.**

**Переведите предложения.**

*Example: I am going to buy a pie. Would you like a pie? – Would you like one?*

1. Our house is the house with the blue roof. 2. Should I buy plastic chairs or wooden chairs? 3. German is a difficult language. – There aren't easy languages. 4. That violin is better than this violin. 5. Who is your favourite actor? – The actor that starred in "James Bond". 6. I bought a chocolate cocktail last time. Today I want to buy a vanilla cocktail. 7. Which house do you like? – I like the house with huge windows. 8. Where did you put my copy book? – Do you mean the copy book with blue flowers on it? 9. These vegetables are cheaper than those vegetables. 10. I haven't got a dictionary. I must buy a dictionary.

**6. Перепишите предложение, заменив повторяющееся существительное словом-заместителем *that* или *those*.**

**Переведите предложения.**

*Example: The weight of two cars is more than the weight of one car. – The weight of two cars is more than that of one car.*

1. There are many interesting articles in these scientific magazine, read articles on your specialty. 2. These pictures are as nice as the pictures you painted last month. 3. The dress you are wearing today suits you more than the dress you wore last week. 4. The diameter of the Moon is 50 times less than the diameter of the Earth. 5. The new technologies that are being developed must be connected with traditional technologies. 6. The fruits in our store are more expensive than the fruits in the market. 7. He put the photo of his children beside the photo of his wife. 8. Education in Cambridge is different in many ways from education in other universities.

**7. Переведите предложения на русский язык, обращая внимание на *so/such*.**

1. This child is so cheerful. 2. This book is so boring. 3. He is such a good scientist. 4. His friend is such a distinguished scientist. 5. We are so busy. 6. They have got such obedient children. 7. His hair cut is so beautiful. 8. He is such a reliable person, that I have nothing to add. 9. They are such close friends. 10. Why do you play such a boring game? 11. He is such a strong sportsman. 12. We went by such a fantastic car. 13. He made such an important discovery. 14. We were told such an interesting story yesterday. 15. This box is so light.

**8. Заполните пропуски, используя *so/such*.**

1. It was \_\_\_\_ windy weather that we had to stay at home. 2. There was \_\_\_\_ a long queue that I decided not to wait. 3. You should read this book – it's \_\_\_\_ interesting and informative. 4. She spoke \_\_\_\_ clearly that I understood everything. 5. She's \_\_\_\_ a good girl that I'm sure you'll be happy with her. 6. That man is driving \_\_\_\_ slowly that I'm going to overtake. 7. It's \_\_\_\_ difficult to decide what to do. 8. He worked \_\_\_\_ hard that he had nervous breakdown. 9. That decision was \_\_\_\_ a terrible mistake.

## 2.6. Модальные глаголы *can, may, must, should, need*

### 1. Замените модальные глаголы соответствующими эквивалентами.

1. We can see new electrical devices everywhere. 2. She can speak English well. 3. You may take this dictionary till tomorrow. 4. We must learn new English words every week. 5. I live not far from my work. I can go by bus or I can walk. 6. You may call her. 7. We can take this book in the library. 8. She can't do this work in time. 9. He must go abroad for a few days. 10. Students must take exams in January.

### 2. Употребите *can / can't / could / couldn't* и глаголы по смыслу в следующих предложениях:

*come eat hear run sleep wait*

1. I'm afraid I \_\_\_\_\_ to your party next week. 2. When my father was 15, he \_\_\_\_\_ 100 meters in 11 seconds. 3. You look tired. Yes, I \_\_\_\_\_ last night. 4. I was feeling sick yesterday. I \_\_\_\_\_ anything. 5. Can you speak a little louder? I \_\_\_\_\_ you very well. 6. Are you in a hurry? No, I've got plenty of time. I \_\_\_\_\_ .

### 3. Переведите на английский язык, употребляя модальные глаголы *can (could), be able to*.

1. Она не может долго ждать. У нее поезд в 5 вечера. 2. Ты сможешь отправить ему электронную почту сегодня вечером? 3. Я думаю, она сможет решить эту задачу. 4. Ты можешь поторопиться? Ты можешь опоздать на поезд. 5. Неужели он перевел всю книгу? 6. Не может быть, что они изобрели новое устройство. 7. Где мои книги? – Не знаю. Мама могла положить их в шкаф. 8. Твоя бабушка умела танцевать, когда была молодой? 9. Не может быть, что он занял первое место. 10. Неужели он сейчас сдает экзамен?

**4. Заполните пропуски модальными глаголами *can, may* или *must*.**

1. He \_\_\_\_ not speak English fluently yet.
2. I have many things to do, I \_\_\_\_ go.
3. They \_\_\_\_ not go to the cinema today because they are busy.
4. I have a terrible headache. – I think you \_\_\_\_ see a doctor.
5. What \_\_\_\_ you see on this map?
6. \_\_\_\_ I come in?
7. What time \_\_\_\_ you come to school?
8. He \_\_\_\_ play football, tennis and other games but he \_\_\_\_ not play chess.
9. \_\_\_\_ I ask you several questions on your report? – You certainly \_\_\_\_ .
10. You \_\_\_\_ stay in town the whole summer or you \_\_\_\_ go to the seaside with us if you want.
11. \_\_\_\_ I take your dictionary? – I am afraid not. I need it.
12. Schoolchildren \_\_\_\_ not wear a uniform now.

**5. Используйте *must* или *can't*. Переведите предложения.**

1. I often see my friend walking along this street. She \_\_\_\_ live near here.
2. That cafe \_\_\_\_ be very good. Many people go there very often.
3. You \_\_\_\_ be very happy with your friendly family.
4. I'm sure I gave you the letter. You \_\_\_\_ have it. Have you looked in your bag?
5. Tom and Julia always travel a lot, so they \_\_\_\_ be short of money.
6. You've been working all day. You \_\_\_\_ be tired.
7. Congratulations on making new discovery. You \_\_\_\_ be very pleased.
8. That restaurant \_\_\_\_ be very good. It's always empty.

**6. Перефразируйте следующие предложения, употребляя модальные глаголы *must, may, can't*.**

*Example: I don't believe that he forgot to call her. – He can't have forgotten to call her.*

1. I am confident you are tired: you have been making calculations for hours.
2. That building seems to be a library.
3. I am sure it is a difficult

task. 4. I don't believe you have lost your passport: probably you have left it at home. 5. Perhaps the girl was surprised. 6. Probably you left your textbook in classroom. 7. I don't believe they will not implement such a brilliant idea. 8. You look pale. Probably you are tired. 9. I don't believe that this boy is a reliable friend. 10. She is certain to be waiting for you at home.

**7. Завершите предложения, используя *have to / has to / had to*.**

1. John starts work at 5 a.m. (get up / at four)
2. There was a lot of noise from the street. (we / close/ the window)
3. Paul can't stay for the whole meeting. (he / leave/early)
4. I don't have much time. (I /hurry)
5. How is Sam enjoying his new job? \_\_\_\_\_ a lot? (he /travel)
6. The bus was late again. How long \_\_\_\_\_ ? (you/wait)
7. I do everything by myself. (make progress)
8. He made a lot of mistakes in his test. (he / study / harder)

**8. Выберите правильный вариант. Переведите предложения.**

1. We waste time. We *must / mustn't* hurry.
2. You *must / needn't* take good care of it and you *mustn't / don't need* to lose it.
3. I have to talk to Kate. I *must / mustn't remember* to call her.
4. I have to talk to Peter. I *mustn't / needn't* forget to call him.
5. There's plenty of time for you to make up your mind. You *mustn't / don't need* to decide now.
6. We *needn't / mustn't* wash these apples. They've already been washed.
7. We've got plenty of time. We *mustn't / don't need* to hurry. This is a valuable book.

9. Допишите предложения, используя *should* или *shouldn't* и подходящую по смыслу фразу: *go away for a few days, go to bed so late, look for another job, put some pictures on the walls, take a photo, use her car so much.*

Your salary is very low. You ...

Jack always finds it hard to get up. He ...

What a beautiful view! You ...

Sue drives everywhere. She never walks. She ...

She works hard. She ...

Nick's room isn't interesting. They ...

## ***2.7. Согласование времен***

### **1. Переведите на русский язык, обращая внимание на согласование времен.**

1. She asked me how old I was. 2. He wanted to know what I did in my spare time. 3. They asked me how long I had been working for this company. 4. She asked me why I had made such a decision. 5. He wanted to know whether I could speak any foreign languages. 6. Mary said that her parents were very well. 7. She asked if I had got a driving license. 8. She said she was going to learn to drive. 9. Nick said that he had given up this idea to go abroad. 10. He said that he wanted to go away for a holiday but (he) didn't know where to go. 11. She said that she was going away for a few days and would phone me when she got back. 12. Tom said that he was feeling better. 13. I told her that I didn't have any money.

### **2. Поставьте главное предложение в прошедшее время и сделайте соответствующие изменения в придаточном предложении согласно правилам согласования времен.**

1. Bob says that he is sure Mary and Ann will be excellent inventors.
2. He says that they have made huge progress in English language learning.
3. She says that Sam told her a lot of interesting things about his travelling abroad.
4. Lucy says that she is going to visit her friends next Sunday.
5. He says that they have not seen each other for ages.
6. He says that they met five years ago.
7. He says that he will take them to the theatre on Sunday.
8. A boy says that he is very hungry and wants to eat something now.
9. He says that his niece doesn't go to school yet as she is too small.
10. She says that she speaks French well enough.

### 3. Раскройте скобки, выбирая требуемое время глагола.

1. I think I saw him yesterday. He said that he \_\_\_\_\_ (*have seen / had seen / saw*) him the day before.
2. The kids are playing football. Mother said that the kids \_\_\_\_\_ (*played / were playing / had been plying*) football.
3. We had dated for two years before we got married. He knew that they \_\_\_\_\_ (*were dated / had dated / have dated*) together for two years.
4. All my friends are so happy now. He said that all his friends \_\_\_\_\_ (*were / are*) so happy then.
5. I could not finish the project on time. I am sorry. Mike said that he \_\_\_\_\_ (*could not / did not can, had not could*) finish the project on time.
6. My daughter does not like poetry. He said that his daughter \_\_\_\_\_ (*not liked/ hadn't liked/ didn't like*) poetry.
7. The weather is so nice today. They said that the weather \_\_\_\_\_ (*was/ were / is*) very nice (*this day/ that day*).
8. I don't want to stay here any longer. The boy exclaimed that he \_\_\_\_\_ (*did not want/ hadn't wanted/ hasn't wanted*) to stay \_\_\_\_\_ (*there/ here*) any longer.
9. We have never seen such things before. They said that they \_\_\_\_\_ (*have never seen/ did never see/ had never seen*) such things before.

### 4. Преобразуйте предложения в косвенную речь.

1. "I am very pleased. I passed all my exams successfully", a student said.
2. "I will never complete this work if you don't help me", Ann told her friend.
3. "This solution is not good but the others are much better", he said.
4. "I've heard about this invention before", she said.
5. "I was working hard the whole day yesterday", Bob said.
6. "I can meet you after lectures", he said.
7. "He has been reading a lot about celebrities", his friend said.
8. "I spent my holidays in the village last year", she said.
9. "We visited this city two years ago", he said.
10. "I have to tell them the truth", she said.

### **5. Преобразуйте вопросы в косвенную речь.**

1. He asked that student: Are you making notes? 2. She asked me: Did you see him at the party? 3. He asked me: Have you passed your exams? 4. My friend asked: Does your sister like skating? 5. Mother asked her daughter: Have you cleaned your room? 6. He wanted to know: Will she come here tomorrow? 7. They asked me: Have you ever been to the USA? 8. He asked her: Did you go to the university? 9. He wondered: Were you playing football yesterday evening? 10. My father asked me: Can you pass me this journal? 11. My mother said to me: Why didn't you help your sister? 12. His friend asked: How long does it take you to get to the university? 13. Bob said to me: How long have you been waiting for your friend? 14. She asked: Who is singing in the next room? 15. I asked my friend: When did you return my dictionary? 16. They asked: What time will the train arrive?

### **6. Повелительные предложения в косвенной речи.**

1. "Stop making so much noise," the teacher said. The teacher told \_\_\_\_\_.
2. "Be more tolerant," she said to him. She told him \_\_\_\_\_.
3. "Clean your room," her father said to her. Her father told her \_\_\_\_\_.
4. "Hurry up! We are late," she said to us. She told us \_\_\_\_\_.
5. "Give me your advice," he told her. He asked her \_\_\_\_\_.
6. "Don't be angry," he advised us. He advised us \_\_\_\_\_.
7. "Don't worry about me," Kate said. Kate told \_\_\_\_\_.
8. "Don't trust her," she said to him. She told him \_\_\_\_\_.
9. "Don't go there alone," he said to me. He told me \_\_\_\_\_.
10. "Don't watch this film. It is so boring," she said. She told \_\_\_\_\_.

### **7. Преобразуйте предложения в косвенную речь.**

1. "She has already graduated from the university", they said. 2. "What are you looking for over there?" she asked him. 3. "Don't play computer

games so much”, his mother said. 4. “You must try once again”, she said. 5. “Can I translate this text without a dictionary?”, he asked. 6. “I have forgotten to sign a document”, he said. 7. “Will you come to the meeting tomorrow?”, she asked him. 8. “Go to bed!” father said to his children. 9. “Do you like him?”, she asked. 10. “I am living in London now”, she said. 11. “I saw Ann in the theater in summer and she seemed fine”, he said. 12. “Ann and Sam are getting married next week”, she said. 13. “I don’t know where Bill is going on holiday”, she said. 14. “You were driving too fast”, he said. 15. “I didn’t want to disturb Ann”, he said. 16. “Don’t be afraid at me if I am late”, he said to his friends. 17. “What time will we arrive in London tomorrow?”, he asked. 18. “May I take your pen?”, he asked her. 19. “What countries have you been?”, he asked. 20. “What is the capital of China?”, he asked.

### **8. Восстановите прямую речь в предложениях.**

1. She said she had already visited this new fitness center. 2. My father told me that he was occupied and didn’t have time for going there. 3. The student confessed he had not learnt the lesson. 4. Everybody was sure that he wouldn’t come because he was ill and felt unwell. 5. My sister told me that she would give me a book to read when she finished it. 6. Mother asked me to stay at home as it was raining outside. 7. The man said he had never been to England. 8. Jill told us she would be working the whole day on Sunday. 9. The dean said that the industrial training would be in summer. 10. His father asked him to be more serious. 11. Bill said that he thought he had left his passport at home. 12. Jane said that she had been going for sports since her childhood. 13. The teacher told the students to close their books and repeat after him. 14. Sam told me he had to entertain his sisters on Saturday evening. 15. She said she was going to make a scientific report.

**9. Переведите предложения на английский язык, используя правило согласования времен.**

1. Она сказала, что будет ждать нашего приезда.
2. Он сказал, что знает, что я сдал все экзамены и уезжаю отдыхать на море.
3. Он сказал, что он только что вернулся из командировки.
4. Мы не заметили, как погода поменялась и стало тепло и солнечно.
5. Она пообещала, что напишет нам письмо через неделю.
6. Он не хотел верить, что они не пригласили его на день рождения.
7. Он не захотел признаться, что не любит ходить в театр.
8. Мы надеялись, что он уже вернулся домой.
9. Она сказала, что живет в Москве уже двадцать лет.
10. Мой брат сказал, что не согласен со мной.

## 2.8. Причастие I, Причастие II

**1. Прочитайте и переведите словосочетания и предложения, обращая внимание на употребление Причастия I и Причастия II.**

a building house – a built house, developing countries – developed countries, boiling vegetables – boiled vegetables, smiling faces, dancing people, painting children – a painted picture, the rising sun, a blooming tree, the falling snow, packed things, a broken cup, a lost key

1. There are a lot of people waiting for me today in the evening. 2. The cup broken by the boy was his sister's. 3. The watch lost in the darkness wasn't mine. 4. The weather was fine, there were people walking in the park and enjoying a lovely day. 5. There are many people in the cinema watching a new film. 6. Who is that man sitting over there and talking on the phone? 7. Which of the boys playing in the garden is your brother? 8. Notes made during the lecture will be useful the next examination period. 9. The fruit dried in summer will be eaten in winter. 10. I have received photos taken in summer. 11. Being very busy he couldn't come. 12. The large house being built in our street is a new library. 13. This firm is interested in the goods produced by our factories. 14. All books taken from the library must be returned there next week.

**2. Выберите из скобок нужную форму причастия.**

1. The girl (*sitting / sat*) on the bench is our best student. 2. Everything (*writing / written*) here is quite right. 3. The building (*surrounding / surrounded*) by trees (*bloomed / blooming*) is very beautiful. 4. Who is that boy (*talked / talking*) to his group mates? 5. The texts (*translating / translated*) by the students were easy. 6. The girl (*singing / sung*) in the room is my sister. 7. The floor (*washing / washed*) by Ann looked very clean. 8. We listened to the folk songs (*singing / sung*) by Russian singers.

9. Do you know the girl (*playing / played*) in the garden? 10. The book (*writing / written*) by this scientist is very significant. 11. Translate the new words (*writing / written*) on the blackboard. 12. We could not see the sun (*covering / covered*) by dark clouds. 13. The (*losing / lost*) key was found. 14. I met Mary and Ann (*going / gone*) along the street. 15. Read the (*translating / translated*) sentences once more.

### **3. Выберите правильный вариант. Переведите предложения.**

1. Do you know the teacher \_\_\_\_\_ in the lecture hall?  
a. delivering    b. having delivered    c. delivered
2. The device \_\_\_\_\_ by this scientist is very useful.  
a. inventing    b. invented    c. having invented
3. We could not see the house \_\_\_\_\_ by dark clouds.  
a. surrounding    b. surrounded    c. being surrounded
4. \_\_\_\_\_ her homework, Ann went for a walk.  
a. finishing    b. finished    c. having finished
5. \_\_\_\_\_ the newspaper, Sally made notes.  
a. having read    b. reading    c. read
6. The \_\_\_\_\_ book was found at last.  
a. lost    b. having lost    c. losing
7. \_\_\_\_\_ the road, I met Mary and Ann.  
a. having crossed    b. crossed    c. crossing
8. Children fell asleep quickly \_\_\_\_\_ by their journey.  
a. having been tired    b. being tired    c. tired
9. Read the \_\_\_\_\_ text once more.  
a. translating    b. translated    c. having translated
10. \_\_\_\_\_ their research, they went home.  
a. carrying out    b. carried out    c. having carried out

#### **4. Объедините два предложения в одно, используя Причастие I.**

*Example: She was sitting in a sofa. She was reading a novel. – She was sitting in a sofa reading a novel.*

1. Ann was lying on the bed. She was dreaming. 2. I came home. I was feeling exhausted. 3. The man was walking along the street. He was talking on the phone. 4. Sam felt unwell. He was playing tennis. 5. Ann fell asleep. She was listening to music. 6. The man was reading an interesting article. He was making notes. 7. The girl studied different cultures. She was exploring various cuisines. She was cooking. 8. The man looked around. He was crossing the road. 9. He was climbing up a mountain. he was taking photos. television. 10. He repaired his computer. He was following all the instructions.

#### **5. Объедините два предложения в одно, используя Причастие I (Perfect).**

1. They went abroad. They had got visa. 2. She sent him a message. She had tried phoning him many times. 3. We moved to Greece. We had done all our duties. 4. He was exhausted in the evening. He had studied all day. 5. They made a decision. They had thought things over several times. 6. They began to doubt. They had accepted the majority decision. 7. He sent an email. He had corrected all the mistakes. 8. He went for a walk. He had done his homework.

#### **6. Раскройте скобки, употребляя Причастие II.**

1. Research (to make) by him was of scientific value. 2. We are interested in the results of experiments (to carry out). 3. She didn't understand the word (to say) by her student. 4. He didn't find books (to take) from the library. 5. She doesn't like a meal (to cook yesterday). 6. This is the house (to build) many years ago. 7. The question (to bring up) during the discussion was very important. 8. The article on quantum mechanics (to publish) in this journal was written by a famous scientist. 9. You can get

the book (to recommend) by our teacher in the library. 10. When (to finish) the new invention will be widely used.

**7. Раскройте скобки, обращая внимание на употребление Причастия I и Причастия II.**

1. I have had such an \_\_\_\_ day that all I want to do is to go to bed. (to exhaust)
2. I was \_\_\_\_ to find out that Bob had left the country. (to surprise)
3. Everyone thinks Kate is an \_\_\_\_ person. (to amuse)
4. They were \_\_\_\_ to learn that their daughter was getting married. (to worry)
5. I didn't like the film because it was \_\_\_\_ (to bore).
6. What's the most \_\_\_\_ thing you've ever done? (to embarrass)
7. The children weren't \_\_\_\_ by the story that wanted to listen to another one. (to frighten)
8. Your traveling to Brazil sounds \_\_\_\_ (to fascinate).
9. Ann finds it very \_\_\_\_ to lie in the beach sunbathing. (to relax)
10. The teacher was \_\_\_\_ by her students' excellent exam results. (to impress)

**8. Переведите предложения на английский язык, обращая внимание на форму причастия.**

1. Это новые доклады студентов, присланные на проверку.
2. Общаясь с друзьями, она не заметила, что на улице стало темно.
3. Он подошел к своей смеющейся сестренке и обнял ее.
4. Изучив биографию этого ученого и его изобретения, он решил сделать доклад о нем.
5. Будучи очень занятым, он не услышал, что мама его позвала ужинать.
6. Купив все необходимые продукты, он приготовил салат.
7. Сделав все приготовления, он ждал гостей.
8. Книга, которую сейчас обсуждают – важная работа этого писателя.
9. Взяв бумагу и ручку, ребенок начал писать.
10. Читая статью в английском журнале, я выписал незнакомые слова.

## 2.9. Герундий

### 1. Проанализируйте словосочетания. Определите, чем является слово с *ing* окончанием. Переведите на русский язык:

a sleeping lion, a sleeping cat, a boiling temperature, boiling water, freezing point, freezing lake, a driving license, a driving wheel, playing cards, playing little children, laughing gas, a waiting room, waiting women, a hunting season a cooling temperature, a looking glass, visiting hours, the rising smoke, a working place, working man, the house with a swimming pool.

### 2. Найдите герундий в парах предложений. Переведите.

1. Avoiding these difficulties and problems is not so easy as it may seem. Avoiding these difficulties and problems the designers can raise the fuel efficiency.

2. Finding problems scientists make the first step to its solution. Finding problems is the first step to its solution.

3. Covering the distance between Japan and Moscow in less than two hours this superliner has a speed five times above the speed of sound. Covering the distance between Japan and Moscow on board a superliner needs about two hours.

4. Putting the discovery into practice the mechanical engineers will solve a complex technological task. Putting the discovery into practice often requires more exertions than making it.

### 3. Переведите на русский язык, обращая внимание на употребление герундия.

1. On coming to Edinburgh she had some problems in understanding spoken English.

2. Before starting on your journey don't forget to take a guidebook.

3. Observing people from various countries, their way of life and their manners is more interesting than visiting galleries, museums and palaces.

4. Don't try to visit everything in a new foreign city or town. It is the same as tasting everything on the menu in any restaurant.
5. Talking without thinking is shooting without a goal.
6. I'll never forget sailing down the Don on that wonderful summer day.
7. I am so sorry; I forgot to tell you about this fact.
8. Don't forget to remind her about the birthday party.
9. I remember seeing him in the park.
10. Did you remember to do washing up today?
11. They regret to tell him that he has failed these exams.
12. She regrets making that mistake; now she hasn't got any money.

**4. Составьте предложения, выбрав начало из первого столбца и окончание – из второго.**

1. He is interested	a) smoking.
2. We would like	b) to seeing her grand-daughter.
3. He should give up	c) being ill.
4. They really enjoy	d) laughing at them.
5. The grandmother is looking forward	e) to living in a dirty flat.
6. She is used	f) talking to drunk men.
7. The boy pretended	g) swimming in the ocean.
8. Polly is good	h) to have three cups of tea.
9. We couldn't help	i) in surfing the Internet.
10. This woman avoids	j) at riding horses.

**5. Закончите предложения, используя соответствующие формы герундия. Переведите предложения на русский язык:**

*Example: She was late. She said: "Excuse..." – She said, "Excuse my being late".*

1. He will take an English course. I approve of \_\_\_\_\_.
2. Bob was rude to his girl. Of course, he should apologize for \_\_\_\_\_.
3. It is not so hard for her to get up early. She got used to \_\_\_\_\_.

4. Kate doesn't study Italian any longer. Kate gave up \_\_\_\_\_.
5. We don't want to argue with her. We are against \_\_\_\_\_.
6. Molly left immediately and didn't say good-bye. She left without \_\_\_\_\_.
7. Michael got an excellent mark. We should congratulate him on \_\_\_\_\_.
8. Mary's mother is a shop-assistant. Mary too dreams of \_\_\_\_\_.
9. Nick wants to spend this lovely evening at home. She likes his idea of \_\_\_\_\_.
10. They devoted too much time to this difficult situation. It's useless \_\_\_\_\_.
11. The scientists wasted much time in debates. It's no good \_\_\_\_\_.
12. This engineer came so early. The workers were surprised at \_\_\_\_\_.

**6. Прочитайте предложения. Выберите один из предложенных вариантов ответа.**

1. Baroness Bertha von Suttner, a peace activist, encouraged Alfred Nobel \_\_\_\_\_ (*establish / to establish / establishing / to be established*) a prize for peace.
2. The police officers made Tom get out of the lorry and demanded \_\_\_\_\_ (*see / seeing / to see / to be seen*) his driver's license.
3. The noblemen were not allowed \_\_\_\_\_ (*have / to have / having / having had*) beards during the time of Peter the Great.
4. The manager wouldn't let \_\_\_\_\_ (*her to enter / she enters / her enter / her entering*) the country without the entry visa, would he?
5. Robert couldn't make \_\_\_\_\_ (*they believed/ them believe / them believed / them to believe*) that he had caught the huge black fish himself.
6. Leo was very close to the telephone box and Nelly noticed him \_\_\_\_\_ the number, and then she heard him \_\_\_\_\_ something to passer-by. (*to dial, to say / dialing, to say / to dial, say / dial, say*)
7. Nick was seen \_\_\_\_\_ the hall and then Jane watched him \_\_\_\_\_. (*enter, go away / be entered, to go away / enter, go away / to have entered, to be gone away*)
8. It's too late now, but he will always regret \_\_\_\_\_ (*to ask / asking / ask / to*

*be asked*) Jude to do this experiment.

9. Their friend Monica stopped \_\_\_\_ (*to buy / buying / buy / to be bought*) diary products because she is on a diet.

10. The workers were allowed \_\_\_\_ (*to continue / continuing / continue / to be continued*) discussing the plans and questions, so their partners introduced themselves and went on to speak about the project.

**7. Переведите предложения на английский язык, употребив герундий.**

1. Извини, что мы перебиваем тебя. 2. Спасибо, мама, что ты меня разбудила. 3. Мария помнит, что Андрей учился в нашей школе. 4. С нетерпением ждем встречи с этими людьми. 5. Для них странно, что она так часто опаздывает. 6. Вы не имеете ничего против, если я открою это окно? 7. Анна с нетерпением ждет, когда ее пригласят на это собрание. 8. Ему нравится плавать в море и в реке. 9. Алиса предпочитает работать по субботам. 10. Вместо того, чтобы пообедать дома, они пошли во французский ресторан. 11. Курение вредно для здоровья человека. 12. Готовить вкусные блюда – это трудное занятие. 13. Алекс любит есть пиццу каждое воскресенье. 14. Моя кузина ненавидит работать по субботам и воскресеньям. 15. Ты делаешь упражнения по английскому языку ради развлечения. 16. Я играю в хоккей, но также люблю дайвинг. 17. Читать книги о машинах очень интересно.

## 2.10. Условные предложения

**1. Выберите подходящую форму глагола в каждом предложении, обращая внимание на употребление условных предложений**

**I типа.**

1. If they \_\_\_\_ (*will leave / leave / leaves*) at 9 o'clock, they \_\_\_\_ (*will arrive / arrive / arrives*) on time.
2. If Robert \_\_\_\_ (*will get / get / gets*) a wonderful job, he \_\_\_\_ (*will buy / buy / buys*) a new red car.
3. If this man \_\_\_\_ (*won't drink / don't drink / doesn't drink*) wine, he \_\_\_\_ (*won't feel / don't feel / doesn't feel*) sleepy.
4. This child \_\_\_\_ (*will start / start / starts*) crying if his small car \_\_\_\_ (*will break / break / breaks*).
5. We \_\_\_\_ (*will go / go / goes*) to the sandy beach if the weather \_\_\_\_ (*will be / is / be*) hot and sunny tomorrow.
6. I \_\_\_\_ (*will be / am / be*) late for the rock concert if I \_\_\_\_ (*won't find / don't find / doesn't find*) a cheap taxi.
7. If Billy \_\_\_\_ (*will become / become / becomes*) Prime Minister, he \_\_\_\_ (*will raise / raise / raises*) some taxes.
8. If you \_\_\_\_ (*will be / are / is*) more careful with this test, you \_\_\_\_ (*won't make / makes / make*) a lot of mistakes.

**2. Раскройте скобки в условных предложениях I типа, поставив глаголы в правильную форму.**

1. If Paul \_\_\_\_ (come) to my place, we \_\_\_\_ (go) to play in my beautiful garden.
2. If Paul \_\_\_\_ (not come) to my place, I \_\_\_\_ (watch) a TV programme .
3. If Daniel's parents \_\_\_\_ (have) their holidays in winter, they \_\_\_\_ (go) to Finland.
4. If they \_\_\_\_ (have) their holidays in autumn, they \_\_\_\_ (stay) at home.

5. If the fog \_\_\_\_\_ (thicken), Harry \_\_\_\_\_ (put up) his tent for the night.
6. When she \_\_\_\_\_ (finish) her homework, she \_\_\_\_\_ (go) to her favourite cinema.
7. They \_\_\_\_\_ (buy) this interesting book as soon as our father \_\_\_\_\_ (give) us some money.
8. When we \_\_\_\_\_ (come) he \_\_\_\_\_ (show) us his new presents.
9. I \_\_\_\_\_ (return) you your expensive ring when you \_\_\_\_\_ (ask) me about it.
10. Sam \_\_\_\_\_ (wait) for his friend until he \_\_\_\_\_ (come) from the shopping centre.
11. My grandfather \_\_\_\_\_ (start) writing a letter before the sun \_\_\_\_\_ (rise).
12. As soon as Nelly and Dino \_\_\_\_\_ (finish) their study I \_\_\_\_\_ (present) them with a big flat.

**3. Объедините два предложения в одно по образцу, обращая внимание на употребление условных предложения I типа.**

*Example: John will come. We will play draughts. – When John comes, we will play draughts.*

1. It will snow today. We will not go for a walk in the park.
2. Don't move. Be careful. You will fall down. It will be bad.
3. The wind will change immediately. It will be snowy.
4. She will be careful. She will not break the glasses.
5. We have free time now. Go for a walk with us.
6. Victor will go hiking this summer. He will find a lot of interesting things.
7. The girls will go shopping. They will buy a present for their father and mother.
8. We will not do our homework. The Maths teacher will be so angry.
9. The boy won't come today. The team will play basketball without him.

**4. Ответьте на вопросы, используя условные предложения I типа.**

*What will you do*

1. if it snows on Saturday?
2. if your best friends don't play with you?

3. if your TV-set doesn't work this afternoon?
4. if you lose your university English book?
5. when the English lessons are over?
6. when your weekends comes?
7. when your best friend comes to visit you at noon?
8. when you finish your university homework?

**5. Замените условные предложения I типа (реальное условие) на условные предложения II типа (нереальное условие).**

*Example: If they make a fire, they will frighten away the wild wolves. (Если они разожгут костер, они спугнут диких волков.) – If they made a fire, they would frighten away the wild wolves. (Если бы они разожгли костер, они бы спугнули диких волков.)*

1. If the mother leaves the child alone, her child will hurt himself.
2. The friends will make nice photos if Polly brings her camera.
3. If it is snowy, the kids will make a big snowman.
4. I'll buy this mobile phone if I have enough money to do it.
5. If her grandmother puts on the glasses, she will see the beautiful flowers in the vase.
6. If he is too busy, they will leave him alone.
7. I will plant the potatoes and tomatoes tomorrow if it rains.
8. If Viola finds her relatives, she will live with them.

**6. Выберите подходящую форму глагола в каждом предложении, обращая внимание на употребление условных предложений II типа.**

1. A mother *would have sent* / *would send* her child to the camp if she *has* / *had* the opportunity to do it.
2. I *wouldn't* / *mustn't* be surprised if he *will turn* / *turned* out to be her brother.
3. If Marry *looked* / *would look* out at this beautiful view, *she would take* / *she took* nice photos.

4. If it *costs / cost* not so much I *bought / would buy* it.
5. She *was / would be* angry if you *lost / had lost* this photo.
6. If I *have / had* free time now I *watched / would watch* my favorite film then.
7. If I *was / were* be you I *would call / called* her.
8. His job *was / would be* more interesting if he *traveled / had traveled* a lot.

**7. Раскройте скобки в условных предложениях II типа, поставив глаголы в правильную форму.**

1. If you \_\_\_\_ (to be) more attentively, you \_\_\_\_ (not / to make) so many mistakes.
2. If you \_\_\_\_ (to go) to bed earlier, you \_\_\_\_ (not / to oversleep).
3. If we \_\_\_\_ (to have) more time, I \_\_\_\_ (to communicate) more often.
4. If you \_\_\_\_ (to find) a well-paid job, you \_\_\_\_ (earn) more money.
5. I \_\_\_\_ (to help) you if you \_\_\_\_ (to trust) me more.
6. If I \_\_\_\_ (to have) much money, I \_\_\_\_ (to go) abroad.
7. They \_\_\_\_ (to know) English better if they \_\_\_\_ (to learn) new words and grammar rules.
8. I \_\_\_\_ (not mind) going there if we \_\_\_\_ (to buy) tickets.
9. If I \_\_\_\_ (be) you, I \_\_\_\_ (not worry) about going to university.
10. His car \_\_\_\_ (be) a lot safer if he \_\_\_\_ (buy) some new tires.

**8. Найдите и исправьте ошибки в условных предложениях II типа.**

1. How she could trust him if he didn't tell her the truth.
2. I would be grateful if you will give me this dictionary.
3. I should be grateful if this text would have been translated into Russian.
4. If I know who they are, I would remember them.
5. If Bob made an offer of marriage, what should you do?
6. But if wind energy can be more efficiently stored, wind power could compete with other types of electricity generation.
7. If Kate comes first, she could have met him.
8. If you had a chance to go abroad, which country you will chose?

**9. Раскройте скобки в условных предложениях III типа, поставив глаголы в правильную форму.**

1. If they \_\_\_\_ (to give) more money to the factory, it \_\_\_\_ (not close).
2. If mankind \_\_\_\_ (to take) care of nature, there \_\_\_\_ (to be) less ecological problems.
3. If Sam \_\_\_\_ (to know) the right answer, he \_\_\_\_ (get) better marks.
4. If Kate \_\_\_\_ (to study) harder, she \_\_\_\_ (to be) one of the best students in her group.
5. If Ann \_\_\_\_ (tell) me she didn't like horror films, we \_\_\_\_ (to go) to a comedy.
6. If she \_\_\_\_ (prepare) for exams, she \_\_\_\_ (pass) them.
7. If Bob \_\_\_\_ (see) the map, he \_\_\_\_ (not/ to lose) his way.
8. If you \_\_\_\_ (to agree) to go with me to Paris, you \_\_\_\_ (to see) the Eiffel Tower too.
9. The device \_\_\_\_ (not / to break) if you \_\_\_\_ (to notice) defects earlier.
10. If Mum \_\_\_\_ (not / to open) the windows, it \_\_\_\_ (to be) stuffy in the room.

**10. Отметьте предложения, в которых допущены ошибки.**

- I. 1. What would you study when you went to the university next year?  
2. What will you study if you go to the university next year?
- II. 1. What will you want to be when you grow up? 2. What you want to be if you grow up?
- III. 1. If she had prepared for exams, she would passed them successfully.  
2. If she has prepared for exams, she would have passed them successfully.
- IV. 1. I wouldn't do that if I were you. 2. I wouldn't do that if I was you.
- V. 1. My mother will punish me if she knew. 2. My mother will punish me if she knows.

**11. Раскройте скобки и поставьте глаголы в правильную форму и определите тип условного предложения.**

1. When my brother \_\_\_\_ (to have) free time we \_\_\_\_ (to go) to the cinema together. *(Когда у моего брата бывает свободное время, мы ходим вместе в кино.)*
2. If my kids \_\_\_\_ (to play) active games in the playground they \_\_\_\_ (to have) a good appetite. *(Если мои дети играют в подвижные игры на игровой площадке, у них просыпается хороший аппетит.)*
3. If I \_\_\_\_ (to have) enough money I \_\_\_\_ (to buy) it. *(Если у меня будет достаточно денег, я куплю его.)*
4. She \_\_\_\_ (to be) angry if you \_\_\_\_ (to lose) this photo. *(Она бы разозлилась, если бы ты потерял эту фотографию.)*
5. If you \_\_\_\_ (to want) we \_\_\_\_ (can) watch this film at home. *(Если хочешь, мы можем посмотреть этот фильм дома.)*
6. If I \_\_\_\_ (to have) free time now I \_\_\_\_ (to watch) my favorite comedy. *(Если бы у меня было свободное время сейчас, я бы посмотрел любимую комедию.)*
7. If I \_\_\_\_ (to be) you I \_\_\_\_ (not / to waste) time. *(На твоём месте я бы не тратил время впустую.)*
8. If we \_\_\_\_ (to meet) him yesterday we \_\_\_\_ (to call) you. *(Если бы мы встретили его вчера, мы бы позвонили тебе.)*

### РАЗДЕЛ 3: СЛОВАРЬ-МИНИМУМ

#### A

**ability** – способность

**acceleration** – ускорение

**amount of force** – количество силы

**ancient world** – древний мир

**artificial intelligence** – искусственный интеллект

**automotive industry** – автомобильная промышленность

**autonomous robot** – автономный робот

#### B

**bachelor's degree** – степень бакалавра

**battery-powered devices** – устройства с питанием от батареи

**branch** – отрасль

**brakes** – тормоза

**breadth** – широта (ширина)

**builder** – строитель

#### C

**central processing unit** – центральный процессор

**circular electrified track** – круговой электрифицированный путь

**clutch** – сцепление

**combustion** – сжигание

**communications network** – сеть связи

**conductor** – проводник

**in conjunction with** – вместе

**to construct** – конструировать

**construction engineer** – инженер-строитель

**construction equipment** – строительное оборудование

**in countless ways** – бесчисленными способами

**to create solutions** – разработать решения

**creative thinking** – творческое мышление

## **D**

**to deal with** – иметь дело с

**to define** – определять

**design engineer** – инженер-конструктор

**diffraction of light** – дифракция света

**digitally controlled industrial robots** – промышленные роботы с цифровым управлением

**to diminish** – уменьшать

**direction** – направление

**diverse** – разнообразный

## **E**

**ease of operation** – удобство управления

**electric current** – электрический ток

**electric locomotive** – электровоз

**electric starter** – электростартер

**energy conversion** – преобразование энергии

**to enjoy popularity** – пользоваться популярностью

**enterprise** – предприятие

**equal** – равный

**expensive** – дорогой

**to extend or augment human capabilities** – расширить и увеличить возможности человека

## **F**

**factory** – фабрика

**fleet** – автотранспортный парк

**fluid mechanics** – механика жидкости

**foreman** – мастер

**fossil fuels** – органическое топливо

**fracture mechanics** – механика разрушения

**functionality** – функциональное назначение

## **G**

**gasoline** – бензин

**general-purpose electronic computer** – компьютер общего назначения

**grant a patent** – выдавать патент

**gravity** – сила тяжести

## **H**

**heat transfer** – теплопередача

**horseless** – безлошадный

**household appliances and devices** – бытовые приборы и устройства

**human assistance** – помощь человека

**human sized robots** – роботы размером с человека

**humanoid machine** – человекообразная машина

**hydrogen** – водород

## **I**

**to be identified** – идентифицировать (быть идентифицированным)

**ignition system** – система зажигания

**to improve** – улучшать

**incarnation** – воплощение

**independently** – независимо

**Industrial Revolution** – промышленная революция  
**ingenious carburetor design and magneto ignition** – гениальный проект карбюратора и магнето зажигания  
**input devices** – устройства ввода  
**insurance** – страхование  
**to be interested in** – интересоваться  
**internal combustion engine** – двигатель внутреннего сгорания  
**internal combustion technology** – технология внутреннего сгорания

## L

**to launch a career** – начать карьеру  
**to lay the foundations** – заложить основы  
**lead-acid battery** – свинцово-кислотная аккумуляторная батарея  
**license** – водительские права  
**light truck** – грузовой автомобиль малой грузоподъемности  
**lightning bolt** – вспышка молнии  
**liquid** – жидкость  
**long-distance** – дальний  
**low-cost machine** – недорогой станок  
**low-voltage** – низковольтный

## M

**machine- tool** – станок  
**to make attempts** – делать попытки  
**manually** – вручную  
**to manufacture** – производить  
**manufacturing tasks** – задачи производства  
**mass production** – массовое производство  
**master's degree** – степень магистра  
**by means of** – с помощью

**mechanic** – механик  
**mechanical engineering** – машиностроение  
**memory storage device** – запоминающее устройство  
**metallurgy** – металлургия  
**micropower generation** – микромощная генерация  
**microprocessor** – микропроцессор  
**microscale sensors** – крошечные датчики  
**mine** – шахта  
**miner** – шахтер  
**modern concept** – современное понятие  
**in motion** – в движении  
**motor vehicle** – автомобиль

## N

**niche market** – сегмент рынка  
**night shift** – ночная смена  
**non-rechargeable primary cell** – не перезаряжаемый первичный элемент  
**Numerical Integrator and Calculator** – электронный цифровой интегратор и калькулятор

## O

**off-road vehicle** – внедорожное транспортное средство  
**to operate without failure** – работать без сбоя  
**in operation** – в действии  
**origin** – происхождение  
**output devices** – устройства вывода  
**to overcome all constraints** – снимать все ограничения  
**oxygen** – кислород

## **P**

**per capita** – на душу населения

**to perform domestic tasks** – заниматься домашними делами

**performance** – производительность

**petroleum infrastructure** – нефтяная инфраструктура

**plant** – завод

**to play an important role** – играть важную роль

**plug-in hybrid** – сетевой гибрид

**power station** – электростанция

**powerful engine** – мощный двигатель

**pressurized steam** – пар, находящийся под давлением

**prevalent means** – преобладающие средства

**to propel** – двигать вперед

**property** – имущество

**propulsion** – приведение в движение

**pushcart** – ручная тележка

## **R**

**at rest** – в состоянии покоя

**rail tracks** – рельсовый путь

**to reduce** – снижать

**to regard as** – рассматривать в качестве

**regardless of** – независимо от

**to revolutionize the world** – кардинально изменить мир

## **S**

**second-generation computers** – компьютеры второго поколения

**self-propelled** – самоходный

**semiconductor** – полупроводник

**shift** – смена

**simultaneously** – одновременно  
**single** – единственный  
**site** – участок  
**skills** – навыки  
**small-scale** – небольшой  
**solid mechanics** – механика твердого тела  
**solid waste** – твердые отходы  
**sophisticated** – сложный  
**speed** – скорость  
**to spin turbines** – вращать турбины  
**steering** – рулевое управление  
**steel founder** – сталевар  
**structure** – сооружение  
**to be subjected to** – быть подверженным

## **T**

**talking mechanical handmaidens** – говорящие механические служанки  
**team** – бригада  
**technologies hailed as a replacement** – технологии, оцениваемые как замена  
**technician** – техник  
**technologist** – технолог  
**textile engineering** – текстильная промышленность  
**thermal environment** – термальная среда  
**tiny model** – крошечная модель  
**total** – общий  
**transportation** – перевозка  
**to be trialed** – подвергаться тестированию

## U

**unbalanced force** – неуравновешенная сила

**upwards** – вверх

## V

**vacuum tube** – электровакуумный прибор

**variety of** – разнообразие

**vehicle engine** – автомобильный двигатель

**virtually** – фактически

## W

**welder** – сварщик

**worker** – рабочий

**worker in the oil industry** – нефтяник

**workshop** – цех

## БИБЛИОГРАФИЧЕСКИЙ СПИСОК

1. Шляхова, В. А. Английский язык для студентов автомобилестроительных специальностей средних профессиональных учебных заведений : учеб. пособие / В. А. Шляхова. – Москва : Высшая школа, 2008. – 120 с.
2. David Bonamy, Christopher Jacques: Technical English 1A Flexi-Course Book : Students' Book and Workbook- Pearson Longman – 51 с.
3. Raymond Murphy. English Grammar in Use: a self-study reference and practice book for intermediate learners of English (The fourth edition) Cambridge University Press, 2012 – 398 с.
4. Raymond Murphy. English Grammar in Use: a self-study reference and practice book for elementary learners of English (The fourth edition) Cambridge University Press, 2015 – 319 с.
5. Infoplease : Encyclopedia, Almanac, Atlas, Biographies, Dictionary, Thesaurus [Электронный ресурс]. – Sandbox Networks, Inc., 2000 – 2015. – Режим доступа: <http://www.infoplease.com/> (дата обращения: 20.02.2017).
6. Top 10 Inventions of the 21st Century [Электронный ресурс] // Top 10 Lists: Toptenz.net. – Режим доступа: <http://www.toptenz.net/top-10-inventions-of-the-21st-century.php> (дата обращения: 22.02.2017).

**Основные правила грамматики английского языка**

**1. Глагол to be**

**Спряжение глагола to be в настоящем времени**

Утвердительное предложение		Отрицательное предложение		Вопросительное предложение
I	am	I	am not	Am I ...?
You	are	You	are not	Are you ... ?
He / She / It	is	He / She / It	is not	Is he / she / it ... ?
We	are	We	are not	Are we ... ?
You	are	You	are not	Are you ... ?
They	are	They	are not	Are they ... ?

**Спряжение глагола to be в прошедшем времени**

Утвердительное предложение		Отрицательное предложение		Вопросительное предложение
I	was	I	was not	Was I ...?
You	were	You	were not	Were you ... ?
He / She / It	was	He / She / It	was not	Was he / she / it ... ?
We	were	We	were not	Were we ... ?
You	were	You	were not	Were you ... ?
They	were	They	were not	Were they ... ?

**Спряжение глагола to be в будущем времени**

Утвердительное предложение		Отрицательное предложение		Вопросительное предложение
I	will be	I	will not be	Will I be ...?
You	will be	You	will not be	Will you be ... ?
He / She / It	will be	He / She / It	will not be	Will he / she / it be ... ?
We	will be	We	will not be	Will we be ... ?
You	will be	You	will not be	Will you be ... ?
They	will be	They	will not be	Will they be ... ?

## 2. Порядок слов в английском предложении

Об-ство времен и или места	Подлежащее	Сказуемое	Дополнение			Обстоятельство		
			косвенное	прямое	предложное	образа действия	места	времени
	She	wrote	her friend	a letter.				
	She	wrote		a letter	to her friend.			
	He	does		his work		with pleasure.		
At present	he	can't talk						
	We	saw		him			near the shop	today.

## 3. Вопросительные предложения

Тип вопроса	Пример
Общий	Do you study at university? – Ты учишься в университете?
Специальный	Where do you study? – Где ты учишься?
Альтернативный	Do you study at university or college? – Ты учишься в университете или колледже?
Разделительный	Do you study at university, don't you? – Ты учишься в университете, не так ли?
Вопрос к подлежащему	Who studies at university? – Кто учится в университете?

### Общий вопрос (yes/no or general question)

Это наиболее простой и распространенный из пяти типов вопросов в английском языке. Он задается ко всему предложению и подразумевает простой утвердительный или отрицательный ответ – да или нет.

Общая схема образования общего вопроса:

<b>Вспомогательный / модальный глагол</b>	<b>подлежащее</b>	<b>сказуемое</b>	<b>дополнение</b>	<b>обстоятельство</b>
Do	you	play	football	every day?
Can	you	do	it for me?	

### Специальный вопрос (Wh- or special question)

Каждый *Wh-question* начинается с вопросительного слова: *why, where, what, which, whom, whose* и т. д. Эта особенность и стала причиной появления такого названия.

Общая схема построения специального вопросительного предложения:

<b>Вопросительное слово</b>	<b>вспомогательный/ модальный глагол</b>	<b>подлежащее</b>	<b>сказуемое</b>	<b>дополнение</b>	<b>обстоятельство</b>
When	do	you	play	football?	
What	can	you	do	for me?	
Where	are	you	going?		

### Альтернативный вопрос (alternative question)

В вопросе должен быть выбор между двумя вариантами. Такой вопрос можно задать к любому члену предложения. И самое главное – здесь всегда вы встретите союз *or* (или). Формула такая же, как в общем вопросе, но надо не забыть поставить *or* там, где нужно.

*Did they finish writing the article in the morning or at night?*

*Where are you going: to the cinema or to the park?*

*When did you arrive: Sunday or Monday?*

### Разделительный вопрос (disjunctive or tag-question)

Порядок слов в таком вопросе прямой, как в обычном предложении. И только в конце такого упражнения мы встретим вопрос, который называется *tag*. В русском языке тоже есть такой вопрос, и звучит он так: «не так ли?» / «не правда ли?» / «да?». Для того чтобы образовать *tag-question*, вспомогательный глагол и подлежащее надо поставить в конец предложения.

Есть два способа образования такого вопроса в английском языке:

<b>1. Начало предложения утвердительное</b>	<b>Краткий отрицательный вопрос</b>
He reads a book,	doesn't he?
His friend is German,	isn't he?
He will be an engineer,	won't he?
<b>2. Начало предложения отрицательное</b>	<b>Краткий положительный ответ</b>
He doesn't read a book,	does he?
His friend isn't German,	is he?
He won't be an engineer,	will he?

### Вопрос к подлежащему (question to the subject)

Этот тип вопроса в английском языке задается к подлежащему и также как предыдущий, содержит вопросительное слово. Обычно это Who, Whose, Whom, What и т. д. Особенность заключается в том, что такое вопросительное предложение имеет прямой порядок слов и не нуждается во вспомогательных глаголах. Есть лишь один нюанс – в настоящем времени прибавляем окончание -s к глаголу.

Общая схема построения вопроса к подлежащему:

Вопросительное слово	сказуемое	дополнение	обстоятельство
Who	invites	guests	for the party?
Who	is making	a test?	
What	happened	to them?	

4. Времена группы Simple

SIMPLE	PRESENT (настоящее)	PAST (прошедшее)	FUTURE (будущее)
Случаи употребления	1. сообщение о факте 2. периодичность действия	1. сообщение о свершившемся факте в прошлом 2. последовательность действий в прошлом	1. сообщение о факте в будущем 2. периодичность или последовательность действий в будущем
Утвердительное предложение	<i>I</i> <i>you</i> <i>we</i> <b>V1</b> <i>they</i>  <i>He/she/it</i> <b>V1 + (e)s</b>	<b>Ved</b>  <b>V2</b>	<b>will V1</b>
Пример	<i>I</i> <i>ask</i> <i>He</i> <i>asks</i> <i>They</i> <i>write</i>	<i>I</i> <i>asked</i> <i>He</i> <i>wrote</i> <i>They</i> <i>studied</i>	<i>I</i> <i>will ask</i> <i>He</i> <i>will write</i> <i>They</i> <i>will study</i>
Отрицательное предложение	<b>do not V1 (don't)</b>  <b>does not V1 (doesn't)</b>	<b>did not V1 (didn't)</b>	<b>will not V1 (won't)</b>
Пример	<i>I</i> <i>don't ask</i> <i>He</i> <i>doesn't write</i> <i>They</i> <i>don't study</i>	<i>I</i> <i>did not ask</i> <i>He</i> <i>did not write</i> <i>They</i> <i>did not study</i>	<i>I</i> <i>will not ask</i> <i>He</i> <i>will not write</i> <i>They</i> <i>will not study</i>
Вопросительное предложение	<b>Do</b> <i>you, they</i> <b>V1?</b> <b>Does</b> <i>he, she, it</i> <b>V1?</b>	<b>Did</b> <i>you, they</i> <b>V1?</b>	<b>Will</b> <i>you, they</i> <b>V1?</b>
Пример	<i>Do</i> <i>you</i> <i>write?</i> <i>Does</i> <i>he</i> <i>ask?</i>	<i>Did</i> <i>you</i> <i>write?</i> <i>Did</i> <i>he</i> <i>ask?</i>	<i>Will</i> <i>you</i> <i>write?</i> <i>Will</i> <i>he</i> <i>study?</i>
Ключевые слова	<b>every day/ week/ month/ year</b> <b>often / seldom</b> <b>always</b> <b>usually</b> <b>sometimes</b>	<b>yesterday</b> <b>last year</b> <b>2 hours ago</b> <b>In 1999</b>	<b>tomorrow</b> <b>next year</b> <b>in 2 hours</b>

### 5. Времена группы Continuous

CONTINUOUS	PRESENT (настоящее)	PAST (прошедшее)	FUTURE (будущее)
Случаи употребления	1. Процесс, который происходит в данный момент времени	1. Процесс, который происходил в определенный момент времени в прошлом	1. Процесс, который будет происходить в определенный момент времени в будущем
Утвердительное предложение	<i>I am Ving</i> <i>He/she/it is Ving</i> <i>We are Ving</i> <i>You are Ving</i> <i>They are Ving</i>	<i>I was Ving</i> <i>He/she/it was Ving</i> <i>We were Ving</i> <i>You were Ving</i> <i>They were Ving</i>	<i>will be Ving</i>
Пример	<i>I am asking</i> <i>He is writing</i> <i>They are studying</i>	<i>I was asking</i> <i>He was writing</i> <i>They were studying</i>	<i>I will be asking</i> <i>He will be writing</i> <i>They will be studying</i>
Отрицательное предложение	<b>am not</b> <b>is not (isn't)</b> <b>are not (aren't)</b> <b>Ving</b>	<b>was not (wasn't)</b> <b>were not (weren't)</b> <b>Ving</b>	<b>will not be (won't)</b> <b>Ving</b>
Пример	<i>I am not asking</i> <i>He is not writing</i> <i>They are not studying</i>	<i>I was not asking</i> <i>He was not writing</i> <i>They were not studying</i>	<i>I won't be asking</i> <i>He won't be writing</i> <i>They won't be studying</i>
Вопросительное предложение	<b>Am I Ving?</b> <b>Are you, they Ving?</b> <b>Is he, she, it Ving?</b>	<b>Was I, he Ving?</b> <b>Were you Ving?</b>	<b>Will I, he be Ving?</b>
Пример	<i>Am I writing?</i> <i>Are you doing?</i> <i>Is he reading?</i>	<i>Was he writing?</i> <i>Were you doing?</i>	<i>Will he be writing?</i> <i>Will they be reading?</i>
Ключевые слова	<b>now</b> <b>at the moment</b> <b>Look!</b>	<b>yesterday at this time at 5 p.m.</b> <b>when smth happened</b>	<b>tomorrow at this time at 5 p.m.</b> <b>when smth happens</b>

### 6. Времена группы Perfect

PERFECT	PRESENT (настоящее)	PAST (прошедшее)	FUTURE (будущее)
Случаи употребления	1. Действие, которое завершилось в прошлом, но есть связь с настоящим	1. Действие, которое совершилось в прошлом и закончилось в прошлом к определенному моменту	1. сообщение о факте в будущем 2. периодичность или последовательность действий в будущем
Утвердительное предложение	<i>I</i> <i>You</i> <i>We</i> <b>have V3</b> <i>They</i>  <i>He/she/it</i> <b>has V3</b>	<b>had V3</b>	<b>will have V3</b>
Пример	<i>I have asked</i> <i>He has written</i> <i>They have studied</i>	<i>I had asked</i> <i>He had written</i> <i>They had studied</i>	<i>I will have asked</i> <i>He will have written</i> <i>They will have studied</i>
Отрицательное предложение	<i>I</i> <i>You</i> <i>We</i> <b>have not</b> <b>V3</b> <i>They</i>  <i>He/she/it</i> <b>has not V3</b>	<b>had not V1</b>	<b>will not have V3 (won't)</b>
Пример	<i>I haven't asked</i> <i>He hasn't written</i> <i>They haven't studied</i>	<i>I hadn't asked</i> <i>He hadn't written</i> <i>They hadn't studied</i>	<i>I won't have asked</i> <i>He won't have written</i> <i>They won't have studied</i>
Вопросительное предложение	<b>Have you V3 ?</b> <b>Has he/she/it V3?</b>	<b>Had you, they V3?</b>	<b>Will you, they have V3?</b>
Пример	<i>Have you asked?</i> <i>Has he written?</i> <i>Have they studied?</i>	<i>Had you asked?</i> <i>Had he written?</i> <i>Had they studied?</i>	<i>Will you have asked?</i> <i>Will he have written?</i> <i>Will they have studied?</i>
Ключевые слова	<b>already</b> <b>just</b> <b>yet (- / ?)</b> <b>before</b> <b>for</b> <b>since</b>	<b>by 5 p.m.</b> <b>by the time he came</b> <b>when smth happened</b>	<b>by 5 p.m.</b> <b>by the time he comes</b> <b>when smth happens</b>

## 7. Действительный и страдательный залог

Формы залога показывают, является ли подлежащее лицом (предметом), совершающим действие, или лицом (предметом), подвергающимся действию. В английском языке существует два вида залога: **действительный залог** (*active voice*) и **страдательный залог** (*passive voice*).

Залог	Действительный залог	Страдательный залог
<b>Употребление</b>	Глаголы в действительном залоге выражают действие, которое производится подлежащим.	Глаголы в страдательном залоге выражают действие, которое испытывает на себе подлежащее.
<b>Образование</b>	<p><b>Исполнитель действия</b> + <b>V1</b> (первая форма глагола) + <b>Получатель действия</b></p>	<p><b>Получатель действия</b> + <b>be</b> + <b>Participle II</b> (причастие прошедшего времени)</p>
<b>Примеры</b>	<p>The professor teaches the students. <i>Профессор преподает студентам.</i></p> <p>John washes the dishes. <i>Джон моет посуду.</i></p>	<p>The students are taught. <i>Студентам преподают.</i></p> <p>The dishes are washed. <i>Посуду моют.</i></p>

### Способы перевода страдательного залога на русский язык

Существует три способа перевода страдательного залога на русский язык:

1. При помощи глагола «быть» + краткая форма причастия

*Пример:* Were his books translated into Russian? – Были ли его книги переведены на русский язык?

2. Глаголами, оканчивающимися на -ся

*Пример:* Letters are delivered by mailmen. – Письма доставляются почтальонами.

3. Неопределенно-личным оборотом (этот способ перевода возможен в тех случаях, когда в английском предложении не упоминается исполнитель действия).

*Пример:* They were taught French last year. – Их учили французскому языку в прошлом году.

Сводная таблица спряжения глаголов в страдательном залоге

Вид Время	Simple (простое)	Continuous (длительное)	Perfect (совершенное)
Форма образования	<b>to be + Participle II (V3 или V+ed)</b>		
PRESENT (настоящее)	<i>I</i> <b><u>am V3</u></b> <i>you</i> <i>we</i> <b><u>are V3</u></b> <i>they</i>  <i>He/she/it</i> <b><u>is V3</u></b>	<i>I</i> <b><u>am being V3</u></b>  <i>We</i> <i>You</i> <b><u>are being V3</u></b> <i>They</i>  <i>He/she/it</i> <b><u>is being V3</u></b>	<i>I</i> <i>You</i> <i>We</i> <b><u>have been V3</u></b> <i>They</i>  <i>He/she/it</i> <b><u>has been V3</u></b>
Пример	<i>I am asked</i> <i>He is asked</i> <i>They are asked</i>	<i>I am being asked</i> <i>He is being asked</i> <i>They are being asked</i>	<i>I have been asked</i> <i>He has been asked</i> <i>They have been asked</i>
PAST (прошедшее)	<i>I</i> <i>He/she/it</i> <b><u>was V3</u></b>  <i>We</i> <i>You</i> <b><u>were V3</u></b> <i>They</i>	<i>I</i> <i>He/she/it</i> <b><u>was being V3</u></b>  <i>We</i> <i>You</i> <b><u>were being V3</u></b> <i>They</i>	<i>I</i> <i>You</i> <i>He/she/it</i> <b><u>had been V3</u></b> <i>We</i> <i>They</i>
Пример	<i>I was asked</i> <i>You were asked</i>	<i>I was being asked</i> <i>They were being asked</i>	<i>I had been asked</i> <i>They had been asked</i>
FUTURE (будущее)	<b><u>will be V3</u></b>	_____	<b><u>will have been asked</u></b>
Пример	<i>I will be asked</i> <i>They will be asked</i>	_____	<i>I will have been asked</i> <i>You will have been asked</i> <i>asked</i>

**Вопросительная форма** образуется путем переноса первого вспомогательного глагола на место перед подлежащим:

Пример: The suit **is pressed**. – **Is the suit pressed?** *Костюм отглажен. – Отглажен ли костюм?*

The house **has been built**. – **Has the house been built?** *Дом построен. – Дом построен?*

They **will be requested** to go there. – **Will they be requested** to go there?  
*Их попросят пойти туда. – Их попросят пойти туда?*

**Отрицательная форма** образуется путем постановки отрицательной частицы **not** после первого вспомогательного глагола:

Пример: The suit **is not pressed**. – *Костюм не отглажен.*

We **were not told** that he was ill. – *Нам не сказали, что он болен.*

The books **have not been sold** yet. – *Книги еще не распроданы.*

В страдательном залоге **не употребляются**:

1. Непереходные глаголы, так как при них нет объекта, который испытывал бы воздействие, то есть нет прямых дополнений, которые могли бы стать подлежащими при глаголе в форме *Passive*.

Переходными глаголами называются глаголы, после которых в действительном залоге следует прямое дополнение; в русском языке это дополнение, отвечающее на вопросы винительного падежа – кого? что?: *to build* (строить), *to see* (видеть), *to take* (брать), *to open* (открывать) и т. п.

Непереходными глаголами называются такие глаголы, которые не требуют после себя прямого дополнения: *to live* (жить), *to come* (приходить), *to fly* (летать), *to cry* (плакать) и др.

2. Глаголы-связки: *be* – быть, *become* – становиться/стать.

3. Некоторые переходные глаголы не могут использоваться в страдательном залоге. В большинстве случаев это глаголы состояния, такие как: *to fit* (годиться, быть впору), *to have* (иметь), *to lack* (не хватать, недоставать), *to like* (нравиться), *to resemble* (напомять, быть похожим), *to suit* (годиться, подходить) и др.

## 8. Степени сравнения прилагательных и наречий

Имя прилагательное и наречие в английском языке имеют три степени сравнения:

1. Положительная степень (*the Positive Degree*) обозначает качество предмета без сравнения. *This car is new.* – Эта машина новая.

2. Сравнительная степень (*the Comparative Degree*) это сравнение двух и более предметов. *This car is newer than that car.* – Эта машина новее, чем та машина.

3. Превосходная степень (*the Superlative Degree*) выражает наибольшую степень качества. *This is the newest car I have ever seen.* – Это самая новая машина, которую я когда-либо видел.

**Таблица 1. Образование сравнительной степени односложных прилагательных**

<b>Правило</b>		
Сравнительная степень односложных прилагательных образуется при помощи прибавления суффикса <b>-er</b> . Следует отметить, что некоторые двусложные прилагательные также образуют сравнительную степень по этому правилу.		
Положительная степень	Сравнительная степень	Пример
cheap – дешевый	cheaper – дешевле	My car is <b>cheaper</b> than yours. – Моя машина дешевле твоей.
large – большой	larger – больше	My house is <b>larger</b> than yours. – Мой дом больше твоего.
fast – быстрый	faster – быстрее	You must swim <b>faster</b> . – Тебе нужно плыть быстрее.
narrow – узкий	narrower – уже	Streets here are <b>narrower</b> than in Moscow. – Улицы здесь более узкие, чем в Москве.
easy – легкий	easier – легче	Sometimes it's <b>easier</b> to agree than to argue – Иногда легче согласиться, чем спорить.

**Таблица 2. Образование превосходной степени  
односложных прилагательных**

<b>Правило</b>		
<p>Превосходная степень односложных прилагательных образуется при помощи прибавления суффикса <b>-est</b> и <b>определенного артикля</b>. Следует отметить, что некоторые двусложные прилагательные также образуют сравнительную степень по этому правилу.</p>		
<b>Положительная степень</b>	<b>Сравнительная степень</b>	<b>Пример</b>
cheap – дешевый	<b>the cheapest</b> – самый дешевый	My car is <b>the cheapest</b> than yours. – Моя машина самая дешевая.
large – большой	<b>the largest</b> – самый большой	I need <b>the largest</b> size of shoes – Мне нужен самый большой размер туфель.
fast – быстрый	<b>the fastest</b> – самый быстрый	You were <b>the fastest</b> so you won. – Ты был самым быстрым, поэтому победил.
narrow – узкий	<b>the narrowest</b> – самый узкий	Streets here are <b>the narrowest</b> in this city. – Улицы здесь самые узкие в городе.
funny – смешной	<b>the funniest</b> – самый смешной	It was <b>the funniest</b> day in my life – Это был самый смешной день в моей жизни.

**Таблица 3. Образование сравнительной степени  
многосложных прилагательных**

<b>Правило</b>		
Сравнительная степень многосложных прилагательных образуется при помощи слова <b>more</b> .		
<b>Положительная степень</b>	<b>Сравнительная степень</b>	<b>Пример</b>
modern – современный	<b>more</b> modern – современнее, более современный	Her new flat is <b>more modern</b> than ours. – Ее новая квартира более современная, чем наша.
comfortable – удобный	<b>more</b> comfortable – более удобный, удобнее	Can you find <b>more comfortable</b> place to work? – Вы можете найти более удобное место для работы?
modest – скромный	<b>more</b> modest – более скромный, скромнее	My daughter is <b>more modest</b> than my son. – Моя дочь скромнее сына.
careful – заботливый	<b>more</b> careful – более заботливый, заботливее	John is <b>more careful</b> than Tom. – Джон более заботливый, чем Том.
expensive – дорогой	<b>more</b> expensive – более дорогой, дороже	I thought that these flowers were <b>more expensive</b> . – Я думал, что эти цветы более дорогие.

**Таблица 4. Образование превосходной степени  
многосложных прилагательных**

<b>Правило</b>		
Превосходная степень многосложных прилагательных образуется при помощи слова <b>most</b> и <b>определенного артикля</b> перед прилагательным.		
<b>Положительная степень</b>	<b>Сравнительная степень</b>	<b>Пример</b>
serious – серьезный	<b>the most serious</b> – самый серьезный	This is <b>the most serious</b> event in December – Это самое серьезное событие декабря.
interesting – интересный	<b>the most interesting</b> – самый интересный	Cosmopolitan is <b>the most</b> <b>interesting</b> magazine for women – Космопо- литэн – самый интересный журнал для девушек.
dangerous – опасный	<b>the most dangerous</b> – самый опасный	That my trip was <b>the most</b> <b>dangerous</b> in my life – То мое путешествие было самым опасным в жизни.
useful – полезный	<b>the most useful</b> – самый полезный	It was <b>the most useful</b> advice of you – Это был твой самый полезный совет.
beautiful – красивый	<b>the most beautiful</b> – самый красивый	You are <b>the most beautiful</b> woman I have ever seen – Ты самая красивая девушка из всех, что я видел.

Таблица 5. Исключения

Положительная степень	Сравнительная степень	Превосходная степень
<b>good</b> – хороший	<b>better</b> – лучше	<b>the best</b> – самый лучший
<b>bad</b> – плохой	<b>worse</b> – хуже	<b>the worst</b> – самый худший
<b>little</b> – маленький	<b>less</b> – меньше	<b>the least</b> – самый маленький, меньше всего
<b>many, much</b> – много	<b>more</b> – больше	<b>the most</b> – наибольший, больше всех
<b>far</b> – далекий	<b>farther</b> – более далекий, дальше (о расстоянии) <b>further</b> – дальше (о времени и расстоянии)	<b>the farthest</b> – (о расстоянии) <b>the furthest</b> – (о времени и расстоянии) самый далекий, дальнейший
<b>late</b> – поздний, последний	<b>later</b> – более поздний	<b>the latest</b> – (о времени) <b>the last</b> – (о порядке следования) самый последний, поздний
<b>near</b> – близкий	<b>nearer</b> – более близкий	<b>the nearest</b> – (о расстоянии) <b>the next</b> – (о порядке следования) ближайший, самый близкий)

Таблица 6. Союзы

Союз	Пример
<p><b>than</b> – чем (при сравнении двух предметов неравного качества всегда употребляется союз <i>than</i>, который следует за прилагательным или наречием в сравнительной степени)</p>	<p>My son is <u>younger</u> <b>than</b> yours. <i>Мой сын моложе вашего (= чем ваш).</i></p>
<p><b>as ... as</b> – такой же, как (при сравнении равных качеств используется парный союз <i>as... as</i>. Прилагательное или наречие стоит в положительной степени.)</p>	<p>He is <b>as</b> <u>old</u> <b>as</b> my grandfather. <i>Ему столько же лет, сколько моему деду. (= Он такой же старый, как мой дед.)</i></p>
<p><b>not so ... as</b> – не такой, как При отрицании равенства качеств двух предметов используется парный союз <i>not so... as</i>. Прилагательное или наречие стоит в положительной степени.</p>	<p>Your house is <b>not so</b> <u>big</u> <b>as</b> ours. <i>Ваш дом не такой большой, как наш.</i></p>
<p><b>the... , the ...</b> – чем, тем (употребляется с прилагательными или наречиями в сравнительной степени.)</p>	<p><b>The</b> <u>more</u> we read, <b>the</b> <u>more</u> we know. <i>Чем больше мы читаем, тем больше мы знаем.</i></p>

## 9. Слова заместители (one/that)

В английском языке имеются слова, которые употребляются в предложении для того, чтобы избежать повторения одного и того же слова, части предложения или всего предложения. Такие слова называются словами-заменителями. На русский язык слова-заменители либо вовсе не переводятся, либо переводятся ранее употребленным словом.

Слова-заменители		
Слово-заменитель	Особенности употребления	Пример
<b>ONE</b> (во мн. ч. – <b>ONES</b> )	Может заменять ранее упомянутое исчисляемое существительное	I haven't got a pen. I must buy <b>one</b> . – <i>У меня нет ручки, мне нужно ее купить.</i> I don't like these yellow flowers. Let me have some red <b>ones</b> . – <i>Мне не нравятся эти желтые цветы. Дайте мне красных.</i>
<b>THAT</b> (во мн. ч. – <b>THOSE</b> )	Может заменять ранее упомянутое существительное, за которым следует какой-либо предложный оборот	This power-station on the is much more powerful than that on the Dnieper. – <i>Эта электростанция намного мощнее, чем та, что на Днепре.</i> <i>The railways of our country are longer than those of any other country.</i> – <i>Железные дороги нашей страны длинней, чем (железные дороги) какой-либо другой страны.</i>

## 10. Употребление so / such

Таблица 1. Употребление SO

so + прилагательное	I am <b>so</b> tired. I'll better go to bed.	<i>Я так устал. Я лучше пойду спать.</i>
so + наречие	He speak English <b>so</b> well.	<i>Он так хорошо говорит на английском.</i>

**Таблица 2. Использование SUCH**

such + a/an + прилагательное + исчисляемое существительное	He gave me <b>such an interesting book.</b>	Он дал мне <b>такую</b> интересную книгу.
	She is <b>such a beautiful woman.</b>	Она <b>такая</b> красивая женщина.
such + прилагательное + неисчисляемое существительное	It was <b>such good weather yesterday!</b>	Вчера была <b>такая</b> чудесная погода!
such + прилагательное + существительное во мн.ч.	She has <b>such beautiful eyes!</b>	У нее <b>такие</b> красивые глаза!

**Таблица 3. Сравнение SO и SUCH**

<b>So</b>	<b>Such</b>
Оба слова <i>so</i> и <i>such</i> используются, чтобы усилить значение слов, перед которыми они ставятся.	
Слово <i>so</i> используется, чтобы усилить чувства, качество, количество чего-либо. Оно используется со словами, отвечающими на вопрос «какой» и «как».	Слово <i>such</i> используется, чтобы подчеркнуть описание кого-то или чего-то. После этого слова обязательно должен идти предмет или человек.
This boy is <b>so modest.</b> – <i>Этот мальчик такой скромный.</i>	Tom is <b>such a modest boy.</b> – <i>Том – такой скромный мальчик.</i>
The film is <b>so interesting.</b> – <i>Фильм такой интересный.</i>	I saw <b>such an interesting film.</b> – <i>Я посмотрел такой интересный фильм.</i>
A car was <b>so expensive.</b> – <i>Машина была такой дорогой.</i>	He bought <b>such an expensive car.</b> – <i>Он купил такую дорогую машину.</i>

## 11. Модальные глаголы

Модальные глаголы не выражают конкретных процессов (действий), а показывают лишь отношение говорящего к действию, оценку действия, т. е. возможность, необходимость, предположительность, долженствование, разрешение и т. д. Модальные глаголы являются недостаточными глаголами (*Defective Verbs*), так как они не имеют всех форм, какие есть у других глаголов.

**Таблица 1. Отличительные особенности модальных глаголов**

Особенность	Пример
<p>1. Не имеют окончания -s в 3-м лице единственного числа настоящего времени.</p>	<p><u>He</u> <b>can</b> do it. – Он может сделать это.  <u>He</u> <b>must</b> go there. – Он должен пойти туда.  <u>He</u> <b>ought to</b> help him. – Ему следовало бы помочь ему.  <b>Need</b> <u>he</u> do it? – Ему нужно это делать?</p>
<p>2. Не употребляются как отдельный член предложения, а только в сочетании с еще одним, не модальным, глаголом в форме инфинитива без частицы <i>to</i> (кроме <i>ought</i> и иногда <i>need</i>), образуя составное глагольное сказуемое.</p>	<p><b>I must go</b> there. – Я должен пойти туда. <b>You needn't do</b> it. – Вам не нужно делать этого.          Но: <b>You ought to help</b> him. – Вам следовало бы помочь ему.</p>
<p>3. Вопросительная и отрицательная формы модальных глаголов образуются без вспомогательного глагола: в вопросительных предложениях модальный глагол ставится перед подлежащим, в отрицательных – после него ставится отрицание <i>not</i>.</p>	<p><b>Can you</b> do it? <b>May I</b> take it?  <b>Must he</b> go there? <b>Ought he to</b> help him? <b>Need he</b> do it?          He <b>can not</b> do it. You <b>may not</b> take it.          He <b>ought not to</b> help him. He <b>need not</b> do it.</p>

Продолжение приложения 1  
Окончание табл. 1

Особенность	Пример
4. Не имеют формы прошедшего времени (кроме <i>can – could, may – might</i> ) и форм будущего времени, продолженного вида, перфектных форм и форм страдательного залога. В случае необходимости вместо отсутствующих форм используются эквиваленты модальных глаголов.	She <b>could</b> do it when she was three. He <b>might</b> go there.  Но: You <b>had to</b> go there. ( <i>have to – эквивалент глагола must</i> )
5. Не имеют неличных форм (инфинитива, герундия и причастия).	_____

**Таблица 2. Употребление модальных глаголов**

Модальный глагол	Характерное значение	Пример
<b>CAN</b>	- способность (физическая или умственная)	What weight <b>can</b> he carry? – <i>Какой вес он может поднять?</i>
	- просьба	<b>Could (Can)</b> I take your umbrella? – <i>Могу ли я взять твой зонтик?</i>
	- запрет	You <b>can not</b> go out now, stay with them. – <i>Ты не можешь уйти сейчас, останься с ними.</i>
	- разрешение	You <b>can</b> write him a letter, if you want. – <i>Можешь написать ему письмо, если хочешь.</i>
	- возможность	They <b>can</b> hardly lose one another in the crowd. – <i>Они едва ли смогут потерять друг друга в толпе.</i>
	- вероятность (сомнение, недоверие и др.)	He <b>can not</b> feel embarrassed, we have told him everything. – <i>Не может быть, чтобы он был смущен, мы же ему все рассказали.</i>
<b>Эквивалент</b>	<b>be able to</b> – быть в состоянии что-то сделать	I <b>can</b> do it = I <b>am able to</b> do it

Продолжение приложения 1  
Продолжение табл. 2

Модальный глагол	Характерное значение	Пример
<b>MAY</b>	- возможность объективного типа	You <b>may</b> order everything you want. – Ты можешь заказать все, что захочешь. She <b>might</b> order everything she wanted. – Она могла бы заказать, все что захотела бы.
	- просьба (более официально)	<b>May</b> we have a short talk with your boss now? – Можно нам немного побеседовать с Вашим боссом сейчас?
	- запрет (более официально)	You <b>may not</b> drink alcoholic drinks in the office. – В офисе нельзя употреблять алкоголь.
	- разрешение (более официально)	You <b>may</b> go. – Вы можете идти.
	- упрек, неодобрение	They <b>might</b> change their employer. – Они могли бы сменить их работодателя.
<b>Эквивалент</b>	<b>be allowed to</b> – разрешается	He <b>may</b> come = He <b>is allowed to</b> come
<b>MUST</b>	- необходимость в виду личного убеждения	I'm sure, that you <b>must</b> talk with your professor. – Я уверен, что ты должен побеседовать со своим профессором.
	- предположение (наибольшая уверенность)	They <b>must</b> be at the railway station now, they started two or three hours ago. – Они наверняка должны быть на вокзале сейчас, они выехали два-три часа назад.
	- необходимость совершения действия (в вопросах)	<b>Must</b> we start this project ? – А мы должны начинать этот проект?
	- категорический запрет	Hunters <b>must not</b> go here. – Охотникам запрещено ходить здесь.

Продолжение приложения 1  
Продолжение табл. 2

Модальный глагол	Характерное значение	Пример
Эквивалент	- <b>have to</b> (заменяет в прошедшем и будущем временах) - <b>be to</b> (используется только в Present/Past Simple)	He <b>must</b> do it = He <b>had to</b> / <b>will have to</b> do it.  He <b>must</b> do it = He <b>was to</b> / <b>is to</b> do it.
OUGHT TO	- необходимость в виду убеждения третьих лиц, отражение общепринятых истин	Everyone <b>ought to</b> pay his debts. – <i>Каждый должен заплатить свои долги.</i>
	- предположение (с оттенком уверенности)	You <b>ought to be</b> ready to start working now. – <i>Ты должен быть готов приступить к работе сейчас.</i>
	- совет	You <b>ought to</b> change this subject. – <i>Вам следует изменить этот предмет.</i>
NEED	- отсутствие необходимости (в отрицательных предложениях) - сомнение (в вопросах)	<b>Need</b> I tell them about that? – <i>Нужно ли им говорить об этом?</i>
WILL	- твердое намерение, желание в будущем	I <b>will</b> jump this stream! – <i>Я перепрыгну этот ручей.</i>
	- долженствование	You <b>will</b> take it! – <i>Ты должен взять это!</i>
WOULD	- твердое намерение, желание в прошлом	I <b>would</b> close this door! – <i>Я бы запер эту дверь.</i>

Продолжение приложения 1  
Окончание табл. 2

Модальный глагол	Характерное значение	Пример
<b>WOULD</b>	- обычное и повторяющееся действие (синоним <i>used to</i> ):	He <b>would</b> spend hours playing computer games. – <i>Он обычно проводил много времени...</i>
	- упорное нежелание выполнять какое-либо действие:	I asked him to do it but he <b>wouldn't</b> . – <i>Я его попросил сделать это, но он ни за что не хотел.</i>
	- присущее свойство, характеристика (часто встречается в техн. лит-ре):	Paper <b>would</b> burn. – <i>Бумага хорошо горит</i>
	- would + rather (better) – пожалуй	I <b>would better</b> stay here. – <i>Я бы лучше остался здесь.</i>
<b>SHALL</b>	- необходимость (приказ, обещания)	We <b>shall</b> close these discussions! – <i>Мы обещаем прекратить эти обсуждения.</i>
	- запрос на получение совета в вопросе или вопрос о том, сделать действие или нет	<b>Shall</b> we close the window? – <i>Нам нужно закрыть окно?</i>
<b>SHOULD</b>	- необходимость в виду какого-то субъективного мнения (следует), совет	I <b>should</b> end these remarks. – <i>Мне следует закончить свои комментарии.</i>
	- предположение с оттенком уверенности	You <b>should be</b> running out of milk. – <i>У тебя, наверное, заканчивается молоко.</i>
	- упрек, сожаление	The whole work <b>should not have ended</b> in failure! – <i>Вся работа не должна была закончиться провалом!</i>

## 12. Согласование времен

Таблица 1

<b>Правило</b>		
<p>Если глагол-сказуемое главного предложения стоит в одной из форм <b>прошедшего времени</b>, то и глагол-сказуемое придаточного дополнительного предложения должен стоять в одном из <b>прошедших времен</b>.</p>		
	<b>Прямая речь</b>	<b>Косвенная речь</b>
<p>1. Если глагол главного предложения в <b>настоящем или будущем времени</b>, то глагол придаточного предложения остается в том же времени, в каком он был в прямой речи</p>	<p>He says, "I <b>know</b> the answer" – <i>Он говорит: «Я знаю ответ»</i>                      He says, "I <b>saw</b> him" – <i>Он говорит: "Я видел его".</i>                      He says, "I <b>am reading</b>" – <i>Он говорит: «Я читаю»</i></p>	<p>He <u>says</u> that he <b>knows</b> the answer. – <i>Он говорит, что он знает ответ.</i>                      He <u>says</u> that he <b>saw</b> him on Monday. – <i>Он говорит, что он видел его.</i>                      He <u>says</u> that he <b>is reading</b>. – <i>Он говорит, что он читает.</i></p>
<p>2. Если глагол главного предложения стоит в одном из <b>прошедших времен</b>, то время глагола прямой речи заменяется в косвенной речи другим временем, согласно правилу согласования времен</p>	<p><b><u>Present Simple</u></b>                      He said, "I <b>know</b> it." – <i>Он говорит: «Я знаю это»</i></p> <p><b><u>Present Continuous</u></b>                      She said, "I <b>am working</b>" – <i>Она говорит: «Я работаю»</i></p> <p><b><u>Present Perfect</u></b>                      He said, "I <b>have translated</b> the text" – <i>Он сказал: «Я перевел текст»</i></p> <p><b><u>Past Simple</u></b>                      He said, "I <b>saw</b> her there" – <i>Он сказал: «Я видел ее там»</i></p>	<p><b><u>Past Simple</u></b>                      He <u>said</u> that he <b>knew</b> it. – <i>Он сказал, что он знает это.</i></p> <p><b><u>Past Continuous</u></b>                      She said that she <b>was working</b>. – <i>Она сказала, что она работает.</i></p> <p><b><u>Past Perfect</u></b>                      He said that he <b>had translated</b> the text. – <i>Он сказал, что он перевел текст.</i></p> <p><b><u>Past Perfect</u></b>                      He said that he <b>had seen</b> her there. – <i>Он сказал, что видел ее там.</i></p>

	<b>Прямая речь</b>	<b>Косвенная речь</b>
	<p><b><u>Past Continuous</u></b> She said, "I <b>was reading</b>" – <i>Она сказала: «Я читала»</i></p>	<p><b><u>Past Perfect Continuous</u></b> She said that she <b>had been reading</b>. – <i>Она сказала, что она читала.</i></p>
	<p><b><u>Past Perfect</u></b> He said, "We <b>had finished</b> our work" – <i>Он сказал: «Мы закончили свою работу»</i></p>	<p><b><u>Past Perfect</u></b> He said that they <b>had finished</b> their work. – <i>Он сказал, что они закончили свою работу.</i></p>
	<p><b><u>Future will</u></b> He said, "I <b>will go</b> there" – <i>Он сказал: «Я пойду туда»</i></p>	<p><b><u>Future in the Past would</u></b> He said that he <b>would go</b> there. – <i>Он сказал, что пойдет туда.</i></p>
<b>Модальные глаголы</b>	<p><b>can</b> <b>may</b> <b>must</b></p>	<p><b>could</b> <b>might</b> <b>had to</b></p>
<b>Указательные местоимения и наречия времени и места</b>	<p><b>this</b> (этот) <b>these</b> (эти) <b>here</b> (здесь) <b>now</b> (сейчас) <b>today</b> (сегодня) <b>yesterday</b> (вчера)</p> <p><b>tomorrow</b> (завтра)</p> <p><b>last year</b> (в прошлом году)</p> <p><b>next year</b> (в следующем году)</p>	<p><b>that</b> (тот) <b>those</b> (те) <b>there</b> (там) <b>then</b> (тогда) <b>that day</b> (в тот день) <b>the day before</b> (днем раньше) <b>the next day</b> (на следующий день) <b>the previous year</b> (в предыдущий год) <b>the following year</b> (на следующий год)</p>

	Прямая речь	Косвенная речь
<b>Косвенные вопросы</b>		
<b>1) Общий вопрос</b> присоединяется к главному предложению при помощи союзов <b>if</b> и <b>whether</b> , имеющих значение частицы <b>ли</b> .	I asked him, "Do you know the boy?" – <i>Я спросил его: «Ты знаешь мальчика?»</i> He asked me, "Will you be here tomorrow?" – <i>Он спросил меня: «Ты придешь сюда завтра?»</i>	I asked him <b>if</b> he knew the boy. – <i>Я спросил его, знает ли он мальчика.</i> He asked me <b>if</b> I would be there the next day. – <i>Он спросил меня приду ли я туда на следующий день.</i>
<b>2) Специальный вопрос</b> присоединяются к главному с помощью тех вопросительных слов (местоимений или наречий), которые были использованы в самом вопросе (who, when, where, why, which, whose)	He asked, " <b>What</b> is your name?" – <i>Он спросил: «Как тебя зовут?»</i> He asked, " <b>When</b> did you see him?" – <i>Он спросил: «Когда ты его видел?»</i>	He asked me <b>what</b> my name was. – <i>Он спросил меня, как меня зовут.</i> He asked <b>when</b> I had seen him. – <i>Он спросил, когда я его видел.</i>
<b>Косвенные просьбы</b> вводятся глаголами, выражающими просьбу: <b>to ask</b> просить, <b>to beg</b> просить, умолять, <b>to tell</b> сказать, велеть, приказать, <b>to order</b> приказывать, <b>to allow</b> разрешать и др.	He said, "Wait for me" – Он сказал: «Подожди меня». She said, "Take my book" – Она сказала: «Возьми мою книгу».	He asked me to wait for him. – Он попросил подождать его. She allowed to take her book. – Она разрешила взять ее книгу.

Продолжение приложения 1  
Окончание табл.1

	<b>Прямая речь</b>	<b>Косвенная речь</b>
<b>просьба или команда + инфинитив</b>	He said, "Stop the car" – Он сказал: «Останови машину». She said to me, "Open the window, please" – Она сказала мне: «Открой, пожалуйста, окно».	He <b>told me to stop</b> the car. – Он велел остановить машину. She <b>asked me to open</b> window. – Она попросила меня открыть окно.
<b>просьба или команда + not + инфинитив</b>	He said to me, "Don't go there" – Он сказал мне: «Не ходи туда».	He <b>told me <u>not</u> to go</b> there. – Он велел мне не ходить туда.

### 13. Причастие I, Причастие II

**Причастие** – неличная форма глагола, обладающая признаками глагола, прилагательного и наречия. В английском языке нет такой части речи, как деепричастие. Поэтому английское причастие соответствует и причастию, и деепричастию в русском языке.

В английском языке существует два причастия:

**1. Причастие I (Participle I)** – причастие настоящего времени действительного и страдательного залога. Имеет две формы:

а) **Present Participle Simple**. Соответствует русскому причастию настоящего времени и деепричастию несовершенного вида: *reading* – читающий, читая, *resting* – отдыхающий, отдыхая;

б) **Present Participle Perfect**. Соответствует русскому деепричастию совершенного вида: *having written* – написав, *having read* – прочитав.

**2. Причастие II (Participle II)** – причастие прошедшего времени страдательного залога: *opened* – открытый, *dressed* – одетый, *made* – сделанный.

Таблица 1. Причастие I (Participle I)

Время \ Залог	Активный (Active)	Страдательный (Passive)
Present	<b>asking</b> – спрашивающий. <i>спрашивая</i>	<b>being asked</b> – спрашиваемый, <i>будучи спрошен</i>
Perfect	<b>having asked</b> – спросив	<b>having been asked</b> – был <i>спрошен</i>

#### Present Participle Simple

Эта форма употребляется независимо от времени, в котором стоит сказуемое, выражая лишь **одновременность** с действием, выраженным глаголом-сказуемым.

### Продолжение приложения 1

Образуется путем прибавления окончания **-ing** к основе глагола. Отвечает на вопросы «что делающий?», «что делаая?».

ask + ing = asking	→ спрашивающий, спрашивая
walk + ing = walking	→ гуляющий, гуляя
know + ing = knowing	→ знающий, зная
smile + ing = smiling	→ улыбающийся, улыбаясь

### Функции

Причастие I в английском языке может выполнять в предложении несколько функций и быть:

**1. Определением** (как и русское причастие), которое стоит перед существительным или после него.

*Пример: The man **waiting** for you has come from Moscow. – Человек, **ожидающий** вас, приехал из Москвы.*

*I saw her **smiling** face in the window. – Я увидел ее **улыбающуюся** лицо в окне.*

*The girl **smiling** to see her friends is my sister. – Девочка, **заулыбавшаяся** при виде друзей – моя сестренка.*

*The house **being built** in this street now will be a new library. – Дом, **строящийся** сейчас на этой улице, будет новой библиотекой.*

**2. Обстоятельством (образа действия, причины, времени).** Причастие в этой функции обычно стоит в начале предложения, то есть перед подлежащим или следует за группой сказуемого. В данном случае перед причастием могут стоять союзы **when, while, if, though** и пр. Причастие (с союзом или без) переводится на русский язык или полным придаточным предложением или деепричастием.

*Пример: **Knowing** English perfectly he was able to watch foreign movies. – **Зная** английский в совершенстве, он мог смотреть иностранные фильмы.*

**Crossing** the road first look to the left. – *Переходя* дорогу, посмотрите сначала налево.

When **crossing** the road, first look to the left. – *Когда переходите (при переходе)* дорогу, посмотрите сначала налево.

### Present Participle Perfect

Эта форма употребляется для выражения действия, **предшествующего** действию, выраженному глаголом-сказуемым, и употребляется только в функции **обстоятельства**.

Образуется с помощью вспомогательного глагола **have** с прибавлением окончания **-ing** и **третьей формой глагола (V3)**.  
Отвечает на вопрос «что сделал?»

**Have + ing + V3** → **having asked** → спросив  
**having done** → сделал

*Пример: Having finished* the test he put down the results. – *Закончив тестирование, он записал результаты.*

**Having done** his homework he went for a walk. – *Сделав домашнее задание, он пошел гулять.*

### Причастие II (Participle II)

Чтобы образовать это причастие в английском языке от **правильных глаголов**, необходимо добавить окончание **-ed** к основе глагола:

*ask + ed = asked* → *спрошенный*, *train + ed = trained* → *обученный*.

У **неправильных глаголов** форма причастия II особая. Она указана в таблице неправильных глаголов и находится в третьей колонке:

*written* → *написанный*, *bought* → *купленный*.

### Продолжение приложения 1

Это причастие отражает законченный процесс, а на русский язык мы его переводим страдательным причастием совершенного или несовершенного вида. В основном в этом причастии в английском языке представлено действие, которое **предшествует** действию, выраженному глаголом-сказуемым.

**Таблица 2. Причастие II (Participle II)**

Время \ Залог	Активный (Active)	Страдательный (Passive)
Past	-----	<b>discussed</b> – <i>обсужденный</i> <b>written</b> – <i>написанный</i>

#### Функции

Причастие II в английском языке может выполнять в предложении несколько функций и быть:

**1. Определением**, которое стоит перед существительным или после него. Пример: The **discussed** problems are interesting. – *Обсуждаемые проблемы интересны.*

They spoke of the problems **discussed**. – *Они говорили об обсуждаемых проблемах.*

The problems **discussed** at the conference are interesting. – *Проблемы, обсуждаемые на конференции, интересны.*

**2. Обстоятельства** (часто с предшествующими союзами **when, if, unless**)

Пример: **Written** in pencil, the article was difficult to read. – *Написанную карандашом статью трудно было читать.*

When **asked**, he looked at us and was silent. – *Когда его спрашивали, он смотрел на нас и молчал.*

If **invited**, I'll go there. – *Если меня пригласят, я поеду туда.*

They will leave, unless **stopped**. – *Они уйдут, если их не остановит.*

## 14. Герундий

**Герундий** – это неличная форма глагола, обладающая признаками как глагола, так и существительного. Подобной формы в русском языке нет. Как и глагол, герундий имеет формы времени и залога, может определяться наречием. Как и существительное, герундий может выполнять в предложении функцию подлежащего, дополнения и определяться притяжательным или указательным местоимением. В сочетании с предлогом *of* герундий может выполнять функцию определения.

**Таблица 1. Формы герундия**

Форма	Действительный залог	Страдательный залог
<b>Indefinite</b>	asking	being asked
<b>Perfect</b>	having asked	having been asked

Формы герундия совпадают с формами причастия настоящего времени и перфектного причастия. *Indefinite Gerund* выражает действие, одновременное с действием глагола-сказуемого; *Perfect Gerund* выражает действие, которое предшествует действию, выраженному глаголом-сказуемым. На русский язык герундий переводится существительным, неопределенной формой глагола, деепричастием, глаголом в личной форме или придаточным предложением:

*Пример:* Students often have difficulties in understanding the difference between the Present Perfect and the Past Indefinite. – *Учащиеся часто испытывают трудности в понимании различия между настоящим совершенным временем (глагола) и прошедшим неопределенным (или: «в том, чтобы понять различие...»).*

Таблица 2. Функции герундия

Функция	Пример
1. Подлежащего	<b>Reading</b> gives you knowledge. – <i>Чтение приносит вам знание.</i> <b>Swimming</b> in the lake is forbidden. – <i>Купаться (купание) в озере запрещено</i>
2. Именной части сказуемого	Seeing is <b>believing</b> . – <i>Увидеть – значит поверить.</i>
3. Дополнения (прямого, предложного)	The teacher has aimed at <b>teaching</b> students to speak in correct English. – <i>Учитель поставил цель научить учащихся правильно говорить на английском языке.</i>
4. Определения	The difficulties of <b>rebuilding</b> the plant were successfully overcome. – <i>Трудности, связанные с перестройкой завода, были успешно преодолены.</i>
5. Обстоятельства	You can help him by <b>supporting</b> him. – <i>Вы можете помочь ему тем, что поддержите его.</i>

Сходство **герундия** и **причастия** настоящего времени состоит в том, что они образуются одинаково, т. е. путем прибавления к основе инфинитива суффикса *-ing*, и имеют признаки глагола. Герундий и причастие настоящего времени могут определяться наречием и употребляются в предложении в функции обстоятельств. Вне контекста бывает трудно определить, чем является неличная форма глагола, оканчивающаяся на *-ing*: причастием или герундием. Вместе с тем, герундий и причастие – это разные неличные формы глагола, отличающиеся одна от другой и по своему значению, и по функциям, выполняемым ими в предложении. Герундий имеет признаки глагола и существительного, в то время как причастие имеет признаки глагола и прилагательного.

**Таблица 3. Различия герундия и причастия**

Герундий	Причастие
<p>1. Употребляется в функции подлежащего, именной части сказуемого, дополнения: Carrying out this operation is very important. – <i>Выполнение этой операции очень важно.</i></p>	<p>1. Не употребляется в функции подлежащего, именной части сказуемого, не может быть дополнением.</p>
<p>2. В функции определения употребляется с предлогом: The method of carrying out the operation is well known. – <i>Метод выполнения операции хорошо известен.</i></p>	<p>2. В функции определения употребляется без предлога: The group carrying out the operation consisted of 20 men. – <i>Группа, выполнявшая операцию, состояла из двадцати человек.</i></p>
<p>3. В функции обстоятельства употребляется с предлогом: Before carrying out the operation one should study all the instructions. – <i>Прежде чем выполнять операцию, нужно изучить все указания.</i></p>	<p>3. В функции обстоятельства употребляется без предлога: Carrying out the operation the tanks penetrated into the enemy rear. – <i>Выполняя операцию, танки зашли в тыл противника.</i></p>

Сходство **герундия** и **отглагольного существительного** заключается в том, что отглагольное существительное образуется путем прибавления к основе инфинитива суффикса *-ing*, т. е. по форме отглагольное существительное совпадает с герундием:

to begin (начинать) – beginning (начало); to open (открывать) – opening (открытие, отверстие).

Но отглагольное существительное и герундий – это две разные части речи, имеющие разные значения и выполняющие разные функции в предложении.

Отглагольное существительное имеет все свойства существительного и на русский язык переводится чаще всего существительным, герундий же имеет только некоторые свойства существительного.

**Таблица 4. Различия герундия и отглагольного существительного**

Герундий	Отглагольное существительное
<p>1. Не может иметь артикля: I remember meeting in Moscow. – <i>Я помню, как встретил его в Москве.</i></p>	<p>1. Может иметь артикль: The meeting began at 7. – <i>Собрание началось в 7 часов.</i></p>
<p>2. Не может иметь формы множественного числа: I don't mind your opening the window. – <i>Я не возражаю, если вы откроете окно.</i></p>	<p>2. Может иметь форму множественного числа: All these shuttings and openings of the door disturb me greatly. – <i>Все эти открывания и закрывания дверей страшно мне мешают.</i></p>
<p>3. Может иметь прямое дополнение: He began doing his exercises when I left him. – <i>Когда я ушел от него, он начал выполнять упражнения.</i></p>	<p>3. Может иметь предложное дополнение: The doing of the exercises didn't take him long. – <i>Выполнение упражнений не отняло у него много времени.</i></p>
<p>4. Может определяться наречием: I don't like your speaking so loudly. – <i>Я не люблю, когда вы так громко разговариваете.</i></p>	<p>4. Может определяться прилагательным: My attention was attracted by his loud speaking. – <i>Мое внимание было привлечено его громкой речью.</i></p>
<p>5. Имеет формы времени и залога: Mother disapproved of her son's having come so late. – <i>Мать неодобрительно отнеслась к тому, что ее сын пришел так поздно.</i></p>	<p>5. Не имеет форм времени и залога.</p>

**Таблица 5. Основные глаголы, после которых всегда употребляется герундий**

to think of	<i>думать о</i>
to be proud of	<i>гордиться чем-л.</i>
to consist in	<i>заключаться в</i>
to accuse of	<i>обвинять в</i>
to approve (disapprove) of	<i>одобрять (неодобрять) что-л.</i>
to prevent from	<i>препятствовать(сделать что-л.)</i>
to count on (upon) = to depend on (upon)	<i>рассчитывать на</i>
to be tired of	<i>уставать от чего-л.</i>
to be fond of	<i>любить что-л.</i>
to succeed in	<i>удаваться</i>
to insist on (upon)	<i>настаивать на</i>
to be interested in	<i>интересоваться чем-л.</i>
to suggest	<i>предлагать</i>
to go on	<i>продолжать(-ся)</i>
to be surprised at	<i>удивляться чему-л.</i>
to hear of	<i>слышать о</i>
to be afraid of	<i>бояться чего-л.</i>
to spend in	<i>тратить (время) на что-л.</i>
to be capable (incapable) of	<i>быть способным (неспособным) на</i>
to result in	<i>приводить к чему-л.</i>
to be engaged in	<i>заниматься чем-л.</i>
to thank for	<i>благодарить за что-либо</i>
to finish	<i>заканчивать</i>
can't help	<i>не мочь не</i>
to be responsible for	<i>быть ответственным за</i>

## 15. Условные предложения

Условные предложения или придаточные предложения условия (*Conditionals*) – это сложноподчиненные предложения, состоящие из главного предложения (*Main clause*) и придаточного условия (*if-clause*), которое часто вводится союзом *if*. Условные предложения используются для описания реальных или нереальных ситуаций и бывают четырех типов.

Таблица 1

Тип		Придаточное условие ( <i>if-clause</i> )	Главное предложение ( <i>Main clause</i> )
Реальные условия	<b>Нулевой тип</b>	<i>Present Simple</i>	<i>Present Simple</i>
	описывает закономерности развития событий (основанные на опыте, здравом смысле), а не предположения.	<b>If temperature is zero,</b> <i>Если температура равна нулю,</i> <b>If you heat water,</b> <i>Если вы нагреете воду,</i>	water <b>freezes.</b> <i>вода замерзает.</i>  it <b>boils.</b> <i>она закипит.</i>
	<b>Первый тип</b>	<i>Present Simple</i>	<i>Future Simple</i>
	выражает реальные, возможные ситуации в настоящем или будущем. Вероятность, что действие произойдет, очень велика.	<b>If it rains,</b> <i>Если пойдет дождь,</i>  <b>If I see her,</b> <i>Если я увижу ее,</i>	<b>I will not go there.</b> <i>я не пойду туда.</i>  <b>I will tell her the truth.</b> <i>я скажу ей правду.</i>
Нереальные условия	<b>Второй тип</b>	<i>Past Simple</i>	<i>would/could + Infinitive</i>
	выражает действия, совершение которых в определенных ситуациях в настоящем и будущем оказывается нереальным. Вероятность, что действие произойдет, равна нулю.	<b>If I were you,</b> <i>Если бы я был тобой,</i>  <b>If I had more time,</b> <i>Если бы у меня было больше времени,</i>	<b>I would go there myself.</b> <i>я бы сам пошел туда.</i>  <b>I would come.</b> <i>я бы пришел.</i>

Тип		Придаточное условие ( <i>if-clause</i> )	Главное предложение ( <i>Main clause</i> )
Нереальные условия	Третий тип	<i>Past Perfect</i>	<i>would/could + have V3</i>
	выражает воображаемые ситуации, относящиеся к <i>прошлому</i> . Вероятность, что действие произойдет, равна нулю.	<p><b>If you had gone</b> there, <i>Если бы ты пошел туда,</i></p> <p><b>If it hadn't been</b> so hot last summer, <i>Если бы не было так жарко прошлым летом,</i></p>	<p>you <b>would have seen</b> him. <i>ты бы увиделся с ним.</i></p> <p>we <b>could have gone</b> to the South. <i>мы бы могли поехать на юг.</i></p>

**Смешанные условные предложения в английском языке** бывают двух типов, чаще всего для образования смешанных условных предложений используются условные предложения II и III типа.

**1. Смешение II и III типа условных предложений.** В этом случае придаточное предложение относится к настоящему времени, а главное предложение относится к прошлому и описывает ситуацию, которая уже произошла.

*Примеры:* **If I were smarter, I would have graduated** from Stanford. – Если бы я был сообразительнее, я бы закончил Стэнфорд.

**2. Смешение III и II типа условных предложений.** В этом случае придаточное предложение относится к прошлому времени, а главное предложение к настоящему.

*Примеры:* **If my father hadn't lost his keys, we wouldn't have to wait** until he finds them. – Если бы мой отец не потерял ключи, нам не пришлось бы ждать, пока он найдет их.

**Англоязычные научно-технические ресурсы сети Интернет**

**1. <http://www.infoniac.com>**

*InfoNIAC – Latest Inventions. The main goal of the site is to inform on various technical innovations, latest inventions and talented people around the world.*

**2. <http://www.brighthub.com>**

*Science and technology articles, education lesson plans, tech tips, computer hardware and software reviews, news and more.*

**3. <http://beforeitsnews.com>**

*Before It's News® is a community of individuals who report on what's going on around them, from all around the world.*

**4. <http://www.inventions-handbook.com>**

*Inventions help and inspiration for the first-time inventors.*

**5. <http://www.scientificamerican.com>**

*Science news, articles, and information – Scientific American.*

**6. <http://www.telegraph.co.uk/technology/>**

*The latest technology news, reviews, advice, picture galleries and video.*

**7. <http://www.independent.co.uk/life-style/gadgets-and-tech>**

*Tech – The Independent.*

**8. <http://listverse.com>**

*Listverse — the original Top 10 site — publishes lists that intrigue and educate, specializing in the bizarre or lesser-known trivia. Every day they present three or more new, unique lists.*

**9. <http://www.infoplease.com/biography/science-technology-bios.html>**

*Science and Technology: Biographies – Information about outstanding scientists, inventors and explorers.*

**10. <http://scienceworld.wolfram.com/biography/>**

*Eric Weisstein's World of Scientific Biography – A database of very brief biographies for over 1,000 figures in science.*

**11. <http://www-history.mcs.st-and.ac.uk/>**

*The MacTutor History of Mathematics archive – Comprehensive collection of biographies and history of mathematics articles.*

**12. <http://www.achievement.org/autodoc/halls/sci>**

*Academy of US Achievement: Science and Exploration – Collection of Biographies of US explorers, profiles and interviews with them.*

**13. [http://nobelprize.org/nobel\\_prizes/](http://nobelprize.org/nobel_prizes/)**

*Nobel prize.org – All related information on all Nobel Prize Laureates, biographies, autobiographies, interviews and lectures.*

**14. <http://inventors.about.com/>**

*About: Inventors – A collection of biographies of famous inventors indexed in alphabetical order.*

**15. <http://www.thefamouspeople.com/profiles/>**

*World Famous Personalities: The Famous People – Society for recognition of famous people.*

**16. <http://www.animatedengines.com/>**

*Animated illustrations that explain the inner workings of a variety of steam, Stirling, and internal combustion engines.*

**17. <http://www.science20.com/>**

*Science and technology articles classified by the field of knowledge.*

**18. <http://www.realclearscience.com>**

*Real Clear Science – Science News and Opinion.*

**19. <https://www.sciencenews.org/>**

*Daily news articles, blogs and biweekly magazine covering all areas of science.*

**20. <http://www.bbc.com/news/technology/>**

*Technology – BBC News.*

**21. <http://www.sciencedaily.com/>**

*One of the Internet's most popular science news web sites.*

**22. <http://www.abc.net.au/science/news/>**

*The Australian Broadcasting Corporation's online gateway to science.*

**23. <http://www.huffingtonpost.com/science/>**

*HuffPost Science – Science news, discoveries and breakthrough scientific research.*

**24. <http://phys.org/>**

*Phys.org is a leading web-based science, research and technology news service which covers a full range of topics. These include physics, earth science, medicine, nanotechnology, electronics, etc.*

**25. <http://www.newscientist.com/section/science-news>**

*New Scientist – Science and technology news.*

**26. <http://www.lingvo-online.ru/ru>**

*Онлайн-словарь ABBYY Lingvo-Online*

**27. <http://www.multitran.ru/c/m.exe?a=1>**

*Электронный словарь Мультитран*

**28. <http://dictionary.cambridge.org/ru>**

*Бесплатный кембриджский словарь и тезаурус по английскому языку*

**29. <http://www.short-stories.co.uk/>**

*Ресурс для тех, кто хочет забыть об адаптированных текстах и перейти на чтение в оригинале. Это сборник коротких рассказов, разбитых на 8 категорий по жанрам. На сайте есть читательский рейтинг, а также коллекция игр со словами, с помощью которых можно закреплять лексику.*

**30. <https://www.usingenglish.com>**

*Тексты с заданиями по трем уровням: Beginner, Intermediate, Advanced. Большинство из них основаны на заданиях к популярным экзаменам, таким как Cambridge ESOL, TOEFL, IELTS и т.д.*

**31. [english03.ru](http://english03.ru)**

*Самоучитель-справочник по учебнику Raymond Murphy "Essential Grammar in Use" (красный Мерфи) и видео разговорник английского языка для самых начинающих.*

**32. [learn-english-today.com](http://learn-english-today.com)**

*Краткое англоязычное пособие по грамматике.*

**33. [correctenglish.ru](http://correctenglish.ru)**

*На этом сайте представлены тесты по грамматике английского языка для начинающих и продолжающих.*

**34. [audioenglish.org](http://audioenglish.org)**

*Этот англоязычный ресурс удобен тем, что предлагает прослушивать группы слов, классифицированные по темам.*

**35. [newsinlevels.com](http://newsinlevels.com)**

*Новости на английском языке для начинающих начитаны профессиональным диктором в замедленном темпе.*

**36. [esl.fis.edu](http://esl.fis.edu)**

*По указанной ссылке вы найдете тесты по английскому языку для начинающих. С помощью этих заданий вы проверите, насколько хорошо знаете базовые слова, и сможете изучить новую лексику, догадываясь о ее значении по объяснениям.*