



Федеральное государственное бюджетное образовательное учреждение  
высшего образования  
«Магнитогорский государственный технический университет им. Г.И. Носова»

**Е.В. Суворова**  
**Ю.А. Савинова**

**BUILDING ENGINEERING**  
**PART 2**

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в качестве практикума*

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**Рецензенты:**

кандидат филологических наук,  
доцент кафедры русского языка и литературы  
МАОУ «Академический лицей» города Магнитогорска  
**О.И. Соловьева**

кандидат филологических наук,  
доцент кафедры романо-германской филологии и перевода,  
ФГБОУ ВО «Магнитогорский государственный технический  
университет им. Г.И. Носова»  
**Т.В. Емец**

**Суворова Е.В., Савинова Ю.А.**

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Практикум составлен в соответствии с типовой программой дисциплин «Иностранный язык» и «Иностранный язык в профессиональной деятельности». Содержит 6 разделов: Unit 1 «Asbestos», Unit 2 «Air-conditioning», Unit 3 «Architecture: its forms and functions», Unit 4 «From the history of architecture», Unit 5 «The empire State Building», Unit 6 «The Architecture of Christopher Wren». Каждый из разделов включает фонетические и лексико-грамматические упражнения, нацеленные на развитие грамматических навыков и расширение словарного запаса, базовый текст, строительной или архитектурной направленности, после текстовые упражнения.

Практикум предназначен для подготовки бакалавров, специалистов и магистрантов очной и заочной форм обучения по направлениям «Строительство» (08.03.01), «Архитектура» (07.03.01), изучающих предметы «Иностранный язык» и «Иностранный язык в профессиональной деятельности».

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## Введение

Практикум «Building Engineering». Part 2. предназначен для подготовки бакалавров, специалистов и магистров очной и заочной форм обучения по направлениям «Строительство» (08.03.01) и «Архитектура» (07.03.01), изучающих дисциплины «Иностранный язык» и «Иностранный язык в профессиональной деятельности».

Целью практикума «Building Engineering» является обучение студентов строительной терминологии, развитие навыков общения на профессиональные темы, расширение профессионального и страноведческого кругозора.

Практикум состоит из 6 уроков. В каждый урок включены упражнения на тренировку произносительных навыков, лексико-грамматические упражнения, направленные на расширение словообразовательного запаса и упрощение понимания текста, базовый текст, строительной направленности, после текстовые упражнения, основной целью которых является формирование коммуникативного потенциала и развитие терминологического запаса, а также задания, развивающие навыки говорения. В конце урока предлагаются тексты для самостоятельной аудиторной и внеаудиторной работы.

Задания практикума позволяют стимулировать познавательную и коммуникативную активность студентов, способствуют развитию навыков систематизации и обобщения пройденного материала. «Building Engineering» может быть рекомендован для аудиторной работы со студентами строительных специальностей, а также для самостоятельной подготовки.

## UNIT 1. ASBESTOS

### PHONETIC REVIEW

1. Read the words paying attention to the pronunciation of the italicized letters.

qu[kw] square, squaw, squirrel, queen, require, quarrel, squeeze, question

gu[g]- guarantee, guard, guess, guest, guerilla, guide, guitar

2. Read the words paying attention to the rules of reading.

wh [w] – whale, wharf, wheat, when, whether, which, whiff, whip, why.

### VOCABULARY

3. Find Russian equivalents to the following international words.

Textile, substance, chrysotile, potential, economy, profession, university, regional, period, conveyor, mineral, product, proportion, characteristic, false, commercial, laboratory, industrial, military, decorative, hospitals, theatres, public, electrical

4. Translate the following words keeping in mind their prefix.

*pre* - до..., пред..., заранее...

prehistoric, precaution, preheat, prewar, preamble, prearrange, pre-revolutionary, pre-condition, pre-date, preface

5. Translate the following words keeping in mind their suffix.

*proof* - meaning стойкий, сопротивляющийся, непроницаемый

flameproof, waterproof, bulletproof, fireproof, weatherproof, hacker-proof, loss-proof, foolproof, shockproof, age-proof.

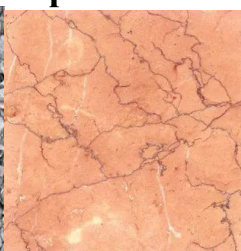
6. Work in pairs. Match the pictures with the names of the materials.



1



2



3



4



5



6



7



8

a) cement; b) asbestos; c) gravel; d) limestone; e) sand; f) clay; g) marble; h) granite.

7. List the building materials you know.

### READING

8. What do you know about asbestos?

9. Skim the text and answer why asbestos is called one of the strangest of all the naturally occurring fibers?

10. Match the words with their definitions

evidence	разнообразие
flame	век
century	пламя
substance	вещество
source	кризотил
variety	доказательство
chrysotile	источник
pure	определять
cotton	связывать, соединять
determine	чистый, без примесей
resistance	огнеупорная ткань
bind (bound, bound)	хлопок
application	сопротивление
flameproof clothing	применение
essential	носовой платок; косынка
conveyor	электрическая обмотка
industrial packings	обращение; обработка
fiber= fibre	рукав
handkerchief	существенный, важный,
sleeve	изоляция
spin (span, spun)	конвейер
treatment	промышленная упаковка
yarn	пряжа, нить
electrical winding	прясть
insulation	волокно; нить

### ASBESTOS

Asbestos has been known and used as a textile since the earliest times. The first written evidence of asbestos was recorded by Pliny in the first century A. D. It is told that one of the Emperors of Rome delighted guests by throwing a tablecloth made of asbestos into fire and then removing it unchanged from the flame. A few centuries later Marco Polo told his friends in Italy about a substance he observed in Siberia. He told that it could be woven into attractive textiles, which did not burn even in direct flame. Asbestos is one of the strangest of all the naturally occurring fibers. It is a rock, which has been subjected to unusual treatment during its formation. Asbestos is the only mineral substance used as a textile fiber in the form it is obtained from natural sources. There are many varieties of asbestos rocks but only chrysotile is widely used for textile products. Chrysotile is mined in many countries of the world.

The soft, long, white fibers of this mineral can be spun into yarn by the usual processes. Pure asbestos being very difficult to spin, a proportion of cotton fiber is usually added to help to bind the asbestos fibers together. The strangest characteristic

of asbestos fibers is their resistance to heat and burning. This property determines the ways in which they are used. Early uses for asbestos included such articles as handkerchiefs and table coverings. The Chinese used asbestos to make false sleeves, which could be cleaned by putting them in the fire. All the dirt was burned off, leaving the asbestos clean. We know commercial development of the fiber to have started in the 19th century. Asbestos was used in flameproof clothing of many kinds, for laboratory, industrial and military purposes.

Fabrics made of asbestos have good strength. Today the main applications are those in which on-inflammability is essential such as conveyor belting for hot materials, industrial packings, fireproof clothing, etc. Asbestos is sometimes used with glass fiber in making decorative fabrics for curtains used in hospitals, theatres and other buildings where the public assembles. Some grades of asbestos are used for electrical windings and insulation.

**11. Which of the statements are true? Correct the false ones.**

- 1) Asbestos is a modern material used for building purposes nowadays.  
-----  
-----
- 2) The Emperors of Rome delighted guests by throwing a tablecloth made of asbestos into fire and then removing it unchanged from the flame.  
-----  
-----
- 3) There are a lot of mineral substances used as a textile fiber in the form that is obtained from natural sources.  
-----  
-----
- 4) There are many varieties of asbestos rocks but only chrysotile is widely used for textile products.  
-----  
-----
- 5) The fibers of asbestos are soft, short and white.  
-----  
-----
- 6) The Chinese use asbestos to make false sleeves, which they wash in a washing machine.  
-----  
-----

**12. Find the following words and word combination in the text.**

огнеупорная одежда, занавес для театра, открытое пламя, сопротивление жару и горению, невоспламеняемость

**13. Translate into English**

- 1) Материалы, изготовленные из асбеста, имеют высокую прочность.  
-----  
-----
- 2) Хризотил широко используется в текстильной промышленности.  
-----  
-----
- 3) Асбест - огнестойкий материал.  
-----  
-----

4) Волокна асбеста мягкие, короткие и имеют белый цвет.

---

5) Существует большое разнообразие асбестовых пород (rocks).

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## GRAMMAR REVIEW

**Participle II** соответствует русской форме страдательного причастия: напечатанная, заданная, купленная. **Participle II** используется для описания законченного действия. Другими словами, можно сказать, что это результат, выраженный признаком или состоянием.

**Participle II** образуется с помощью суффикса **ed**, если глагол стандартный, и 3-й формы глагола, если глагол нестандартный (3 колонка таблицы неправильных глаголов).

A **published** book

A **written** letter

Как и любой член предложения, причастие в английском языке выполняет определенные **функции**. **Participle II** может быть обстоятельством, определением или частью сказуемого.

1. **Как определение Participle II** употребляется перед существительным. На русский переводится причастием прошедшего времени и описывает совершенное над предметом действие. Или эта часть речи может стоять после существительного и сопровождаться пояснительными словами:

*It was a untidily written letter.* – Это было неаккуратно написанное письмо.  
*A parcel sent from Paris will be in London in some days.* – Посылка, отправленная сегодня из Парижа, будет в Лондоне через несколько дней.

**Примечание:** Предлог *by* помогает обозначить лицо или предмет, который совершил действие, выраженное **Participle II**.

*A parcel sent from Paris by my brother will be in London in some days.* — Посылка, отправленная братом сегодня из Парижа, будет в Лондоне через несколько дней.

2. **Как обстоятельство** может характеризовать время, условия выражения действия, уступки или сравнение действий. Для выражения времени часто используются *when* и *while*, условия — *until*, *if*, уступки — *though*, *although*. Союзы используются не во всех предложениях, поэтому чтобы определить функцию, необходимо понимать смысл фразы.

*When called she refused to come.* – Когда ее позвали, она отказалась прийти (время).

*He will speak for hours until interrupted.* – Он будет говорить вечно, пока его не перебьют (условие).

«*I have to go home*», *he repeated as if hypnotized*» – «Я должен идти домой», он повторял, как загипнотизированный (сравнение).

### 3. Как именная часть сказуемого:

*She looked worried.* – Она выглядела обеспокоенной.  
*Though crushed, she wasn't broken.* – Она не показывала этого, хотя и была подавлена (уступки).

### 14. Analyze the following sentences with the Participle II and translate them into Russian

- 1) The materials used to make silicate bricks are white sand and slaked lime.  
-----
- 2) Timber is unaffected by chemically polluted atmosphere.  
-----
- 3) Broken stone when properly graded may be used as the fine aggregate for concrete work.  
-----
- 4) Steel tubes are economical and very satisfactory, if used to convey suitable waters.  
-----
- 5) The equipment provided included a modern installation for air conditioning.  
-----
- 6) The concrete when finally placed must be dense.  
-----
- 7) The proportion of cement is varied according to the strength required.  
-----
- 8) Such motors can only harden when exposed to the atmosphere.  
-----
- 9) Concrete is weak when used for tensile stresses.  
-----
- 10) A reduction in the amount of the cement used will slightly reduce the cost of concrete.  
-----

### 15. Translate the following sentences with the Participle II from Russian into English.

- 1) Первые письменные свидетельства использования асбеста были сделаны Плинием в первом веке нашей эры.  
-----
- 2) Римский император бросал в огонь ткань, сделанную из асбеста, и она не горела.  
-----
- 3) Используемый в текстильной промышленности, асбест служит хорошим огнестойким материалом для лабораторных и военных целей.

-----  
-----  
4) Асбест используется для электрической обмотки и изоляции.  
-----

## **SPEAKING**

**16. Discuss the strengths and weaknesses of asbestos in building technologies.**

**17. Make a short summary of the text (5-6 sentences).**

## **EXTRA TEXTS FOR HOME READING**

### **Text 1**

#### **Building materials**

Some of the most important building materials are timber, brick stone, concrete, metal, plastics and glass.

Timber is provided by different kinds of trees. Timbers used for building purposes are divided into two groups called softwoods and hardwoods. Timber is at present not so much used in building construction, as in railway engineering, mining and in the chemical industry where it provides a number of valuable materials.

However, timber is still employed as a building material in the form of boards. For the interior of buildings plywood and veneer serve a number of purposes.

Bricks are made of clay by molding and baking in kilns. At present there exist different varieties of bricks for various purposes: ordinary bricks, lightweight bricks, hollow or porous bricks, multi-colour bricks for decorative purposes, fire bricks etc. Bricks are laid in place with the help of mortar.

Natural stone is used for foundations and for the construction of dams. The main varieties of building stone are basalt, granite, marble, sandstone and limestone.

Concrete is perhaps the most widely spread building material used nowadays. Concrete is an artificial stone made by thoroughly mixing cement, sand and gravel or broken stone together with sufficient water to produce a mixture of the proper consistency. It has many valuable properties. It sets under water, can be poured into moulds so as to have almost any desirable form, and together with steel in reinforced concrete it has very high strength, and also resists fire. Pre-stressed concrete is most widely used at present while prefabricated blocks are employed on vast scale for skeleton structures. For insulation mineral wool or cinder wool is often resorted to. Aluminum, principally in the form of various alloys, is highly valued for its durability and especially for its light weight, while brass is frequently used for decorative purposes in facing.

Steel finds its use in corrugated sheets for roofing, girders, frames etc. Various shapes are employed in construction.

Plastics are artificial materials used in construction work for a vast number of purposes. The main primary raw materials for the manufacture of plastics are synthetic resins. Plastics have the following advantages: they are lighter in weight than metals, they are not subjected to corrosion, they are good electrical insulators, they are not inflammable, they can take any colour and pattern while they likewise

possess a high resistance to chemical action. They have good workability and can be machined with greater ease than metals.

## **Text 2**

### **From the history of reinforced and pre-stressed concrete**

As early as 1830 the first idea of reinforced concrete was mentioned in a publication which suggested that a lattice of iron rods should be embedded in concrete to form a roof. Patents were taken out for all sorts of systems in all countries. The development of reinforced concrete really got under way in the 1850s and 1860s. Lambort, a French contractor, built a concrete boat for the Paris International Exhibition in 1855, with two in. sides reinforced with a skeleton of iron rods. W. Wilkinson, who patented a method of constructing a concrete floor in 1854, is considered by many to be the inventor of reinforced concrete.

But many people say that a Frenchman, J. Monier, who took out a patent in 1867 for the construction of plant tubs, tanks etc., made of concrete reinforced with a mesh of rods or wires, should be credited with the invention. Centrally Monier did a great deal to develop the use of reinforced concrete and his name came to be so closely linked with reinforced concrete so that reinforced concrete was known as the Monier system. Wilkinson, however, certainly appears to have been the first. His patent covered for concrete floor slabs reinforced with a network of flat iron rods placed on edge. One of his main claims was the good fire resistance of the floor. He appears to have understood the principles of reinforced concrete for he stated that the reinforcement was to be placed in the concrete to take the tension.

A number of buildings were erected, using Wilkinson's system. He also described method for the construction of pipes, reservoirs and walls of concrete reinforced with metal sheets, bars and chains.

Freyssinet is known for his work in pre-stressed concrete for which he had his first ideas before World War I. With the improved materials and the new knowledge available, Freyssinet realized the advantage to be obtained from pre-stressing and he used his system in pre-stressed works.

From now on structures became bigger, better and more exciting, and concrete steadily strengthened its position as a building material. Reinforced concrete was recognized as the best material for all types of structures. The post war era has given the biggest boost to concrete, both reinforced and pre-stressed. After the war steel was short in Europe and many architects had to use either reinforced or pre-stressed concrete in their structures in order to economize steel.

Architects were perhaps a little surprised to discover that in many cases reinforced concrete structures, apart from using the minimum of steel, were also cheaper than other forms of construction, and could be erected as quickly. They also discovered that they had more freedom for planning than they had ever before, and a larger number of different solutions to each structural problem were available. Beams could be eliminated, floor spans could be increased, shells available for roofing large areas. Another big factor which encouraged the use of concrete was the introduction of fire regulations which recognized the superiority of concrete over other structural materials in its fire resistance properties.

## UNIT 2. AIR-CONDITIONING

### PHONETIC REVIEW

1. Read the words paying attention to the pronunciation of the italicized letters.

kn[n] **kn**owledge, **kn**ight, knee, **kn**ew, **kn**ife, **kn**ack, **kn**ow

ph[f]- **ph**one, **ph**oto, **ph**enomenon, **ph**antom, **ph**ase, **ph**onetics

ch [tʃ] – **ch**ess, **ch**op, **ch**amber, **ch**arm, **ch**arity, **ch**oose

th [θ] – **th**ink, **th**ought, **th**eater, **th**under, **th**ermometer, **th**eme;

[ð] – **th**is, **th**at, **th**ose, **th**e, **th**ere, **oth**er, **oth**er, **th**ough, **alth**ough

2. Read the words paying attention to the rules of reading.

same, sample, car, care, meter, met, her, here, notes, nock, nor, more, cute, cut, curtain, cure, my, myth, tyre, nice, nick, fir, fire

### VOCABULARY

3. Find the opposite meanings of the words using the necessary suffix or prefix. Translate the words into Russian.

helpful, legal, known, fruitless, regular, uncommon, independent, accessible, useful, successful, doubtful, careful

4. Find synonyms to the following words.

main, to produce, frequently, apparatus, in this respect, to cause, ought to

5. Find Russian equivalents to the following international words.

a section, to filter, comfort, filtration, circulation, atmosphere, electrostatic, an airplane, a submarine, an apparatus

### READING

6. Skim the text and answer the following questions:

1) What are the advantages and disadvantages of air-conditioning?

2) What services does air-conditioning provide?

3) Is there any difference between air-conditioning in winter and in summer periods?

7. Read the text and match the words with their definitions.

an amount of мансарда; чердак;

attic быть способным

be capable of количество чего-л.

desire проток, канал

duct влажность

to exceed превышать, превосходить

humidity желание

velocity	скорость
moisture	душный
purity	жить, обитать
stuffy	влажность
inhabit	чистота
precipitator	осаждатель, ускоритель
motion	движение
outlet	выпускное или выходное отверстие
to waste	бесполезная трата

### **Air-conditioning**

Air-conditioning is the bringing of air in a building to a desired temperature, purity, and humidity throughout the year to maintain healthy and comfortable atmosphere. Air-conditioning may be divided into two main sections: one for the processing of materials in industry; the other for human comfort. It has been found that there is an optimum condition of temperature and humidity at which the processing of different materials may be carried out with the minimum of wastage and the maximum of goods of specification quality. The system is therefore designed to produce air of predetermined temperature and moisture content and to keep it so despite all external influences. Such air is filtered free of foreign material.

Conditioning air for human comfort may also be divided into two main sections — winter and summer. Frequently, the systems installed in office buildings provide control during both seasons. Complete air-conditioning provides the following services: first, filtration of the air both in winter and summer to remove dust and, second, circulation of the air at low velocity and with proper diffusion to prevent draughts and maintain a uniform temperature and humidity at all parts of the inhabited space; third, introduction of enough fresh air from the outside atmosphere; fourth, heating of the air in winter; fifth, cooling of the air in summer below the outside atmosphere; sixth, humidifying the air in winter to a relative humidity of at least 20-25 per cent; seventh, dehumidifying the air in summer to a relative humidity not exceeding 55 per cent.

The basic pieces of equipment are the filters, preheat coils, humidifiers, reheat coils, additional cooling coils, fans and controls. The control of air purity can be achieved in various degrees. As a minimum control, some sort of filtering must be

done near the entrance of the air-conditioning system. Possibly the most efficient filtering device is the electrostatic precipitator.

Air conditioning for human comfort is employed in both large and small installations, such as theaters, office buildings, department stores, residences, airplanes, railways, cars and submarines. People are comfortable when they are neither too cold, nor too warm and when the air about them is neither too dry, nor too damp and is not stuffy or dusty. To bring about these desirable conditions the heating or air-conditioning apparatus must be capable of maintaining the following conditions inside the house, whatever the conditions outside may be.

To avoid stuffiness, the air should be given a certain amount of motion. Under winter conditions this must be sufficient to distribute the heat uniformly throughout the rooms. It must not be too cold at the floor, not too hot at the ceiling. A stove causes the hot air around it to rise up toward the ceiling and cooler air to flow toward the stove. A radiator acts in this respect like a stove. Warm-air registers bring heated air into a room with a certain motion or velocity which imparts movement to the air already in the room. An outlet for this air should be provided in order to have good ventilation. In summer time, much greater air motion is needed, enough to change the air in a room completely from three to ten times per hour. Sometimes a fan is placed in the attic to blow the warm air out and to cause the cooler night air to flow through open windows. When this is done, air in the house can be expected to be changed completely every two or three minutes. When air is brought into a house from outside, heated in a furnace and distributed through all the rooms, it ought to be cleaned by passing it through "filters" before it enters the furnace.

**8. Answer the following questions to the text**

- 1) What main sections can air-conditioning be divided into?
- 2) What is air-conditioning system designed for?
- 3) Does air-conditioning in winter differ from the one in summer?
- 4) What per cent of relative air humidity should be reached in winter?
- 5) What per cent of relative air humidity shouldn't be exceeded in summer?
- 6) What are the basic pieces of equipment?
- 7) What's the most efficient filtering device?
- 8) Where is air conditioning employed for? Why?
- 9) Why should the air be given a certain amount of motion?

**9. Translate the following sentences from Russian into English.**

1. Тепло должно распределяться равномерно по всей комнате.

-----

2. Летом влажность выше, чем зимой.

-----

3. Кондиционирование воздуха может осуществляться и в больших, и в маленьких помещениях.

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4. Кондиционер – важный элемент комнатного пространства.

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5. Современные кондиционеры работают бесшумно.

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## GRAMMAR REVIEW

Образование **Participle I** отражает длительность процесса, подчеркивая одновременность действия со сказуемым. **Participle I** образуется от глагола при помощи **ing**:

**Особенности написания:**

— краткая гласная: run – running;

— заканчивается на «е», а перед ней стоит согласная: take – taking, но: see — seeing; — to die, to lie, to tie (умирать, лежать, связывать) меняют “ie” на “y”: die – dying, lie – lying, tie – tying.

— заканчивается на l: travelling

**Временные формы:**

Participle I Active: **working** — одновременные действия в настоящем

Present Participle I Passive: being working — одновременные действия в настоящем + указывает воздействие на подлежащее.

Perfect Participle I Active: having worked – предшествует действию сказуемого

Perfect Participle I Passive: having been worked — предшествует действию сказуемого и указывает, что подлежащее подвергалось воздействию.

**Функции:**

В предложении причастие настоящего времени может выполнять следующие функции:

1. Как **определение** употребляется перед существительным или же после него.

A **reading** girl – читающая девушка

2. Если Participle I употребляется в функции **обстоятельства**, то переводится на русский с окончанием «а», «я» или «в» (спрашивая, приехав, держа). Может выражать обстоятельство времени, причины, образа действия и сравнения.

When **reading** a book, he made notes. – Читая книгу, он делал заметки.

**Having finished** the work he could relax for a while. – Сделав работу, он смог немного передохнуть.

3. Как **часть сказуемого**.

The answer of the student is **disappointing**. Ответ студента разочаровывает.

**10. Analyze the following sentences with the Participle I and translate them into Russian.**

1) Possibly, the most efficient filtering device is the electrostatic precipitator.

---

2) Being too expensive the project couldn't be approved.

---

3) If you want to create a multimedia presentation and then play it back on any available computer equipped with a CD-ROM drive, CD-R is the tool you have been looking for.

---

---

4) One can apply all these new building methods while constructing high-size residential houses.

-----

-----

5) When designing a building due attention should be given to structural and economic considerations.

-----

6) The design of a building should be done by careful considering all the problems involved.

-----

7) When working with these building materials one can invent new ways of using them.

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**11. Translate the following sentences with the Participle I from English into Russian.**

1) Повышая или понижая температуру воздуха до желательного уровня, мы создаем комфортные условия для работы.

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2) Устанавливая системы кондиционирования воздуха, необходимо учитывать размер помещения.

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3) Работающий вентилятор может быть источником опасности.

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4) Проходящий сквозь фильтры воздух очищается и нагревается (become clean and warm).

-----

**SPEAKING**

**12. Make a short summary of the text (5-6 sentences).**

**13. Describe a house of your dream. What technical devices should it have?**

**EXTRA TEXTS FOR HOME READING**

**Text 1**

**Measuring Temperature**

On the Centigrade scale the boiling point of water is fixed at 100 (one hundred degrees), its freezing point is at 0 (zero). The equivalent points on the Fahrenheit scale are at 212 and 32. When it is necessary to convert temperature reading from the Fahrenheit scale to the Centigrade, we subtract 32 and multiply by 5/9. Sometimes scientists use the Absolute Scale in which the temperature is measured in degrees by Centigrade from the point at which molecular motion ceases. Absolute zero is -273.1 C. For adequate heating when it is cooled outside the heating plant, including the necessary ducts, registers, piping, radiators, etc., must be able to keep all the rooms at 70° Fahrenheit, even if it is 20 or 30 degrees below zero outside.

Notes on the text:

- 1) boiling point—точка кипения;
- 2) freezing point—точка замерзания;
- 3) Fahrenheit scale — шкала, предложенная немецким физиком Фаренгейтом.

## Text 2

### Air – conditioning

There is some confusion as to what air conditioning really is. By some it is understood to mean merely heating or cooling combined with ventilation; by others it is held to cover only that process by which air is subjected to several treatments to maintain healthy and comfortable conditions to work or sleep in.

The public understands air-conditioning, however, as cooling, filtering, dehumidifying, and circulating air for human comfort, and it is this aspect of the subject that is of the great interest. Office buildings, banks, large theaters and stores are usually air-conditioned by a central station system in the basement and serving all the rooms by means of air ducts. In smaller stores, theaters, hotels, and residences the direct expansion type of system is commonly used. By this method the refrigerant is expanded in a finned tube evaporator and the air blown over it comes in contact with the cold surfaces of the fins and pipes. The cooled dehumidified air is then blown by a fan to the space to be air-conditioned. Most systems have filters to remove dust. The air-conditioning system also contains a small compressor and condenser for liquefying gas as rapidly as it expands in the evaporator unit. The conversion of the refrigerant from a liquid to a gaseous state requires heat, and this is secured from the atmosphere through the finned walls of the evaporator. Thus, the air is cooled and the gas is heated.

Direct expansion systems are cheaper to construct and install than central station systems. They are usually designed so that no long duct-work is required. Units capable of air-conditioning one room or several rooms are now available. Some of them are portable, requiring only an electric connection to a light socket to place them in operation. Many of them provide for the introduction of fresh air into the air-conditioned space, having a short duct to a window ventilator for this purpose.

As direct expansion systems are usually placed in the room or rooms which are air-conditioned it is necessary that they employ a refrigerant which is harmless in character. One of the most modern air-conditioned buildings in Britain is Broadcasting house. In order to maintain constant atmospheric conditions inside the studios, it's necessary to absorb the moisture and heat generated by the people present, and also the heat released by the lights. The heat and water liberated in the studios are removed by the supply of conditioned air. All the studios are supplied with conditioned air from four air-conditioning plants; each comprises a supply fan, spray chambers, pump, heater batteries, automatic controls and extract fan. Each plant draws its supply of fresh air from the roof through a brick shaft, and also takes a small proportion of return air from the extract fan. Each plant is driven by three electric motors controlled from one panel. A master control panel is provided so that

the engineer-in-charge can operate each plant at a distance. This panel carries start and stop buttons, indicator lights for each plant, and distance thermometers.

In addition to the four plants serving the studios, there are two similar sets of equipment supplying air to the machine rooms in the basement and certain rooms within the central tower.

In many of the most modern factories where working conditions have to be closely controlled windowless buildings are used. An example is a works for manufacturing fluorescent electric lamps, where dust-free air is particularly important because dust particles sticking to the inside part of the glass tubes before coating produce irregularities that affect operation of the finished lamp.

Air-conditioning in mines is a new development with a most promising future. Air-conditioning plants are being installed in most of the world's largest mines. It improves working conditions greatly.

Air-conditioning is rapidly being adopted for railway coaches, in ships' passenger and cargo spaces and automobiles.

Air-conditioning on board ship is not new, and all modern liners are equipped with plants of very high efficiency. Such plants cover both summer and winter air-conditioning.

One of the most interesting developments is the application of air-conditioning to automobiles. Car heaters have been employed for some time, but new equipment has been designed to maintain saloon-body interiors at a comfortable temperature, summer and winter, and free from draughts.

## UNIT 3. ARCHITECTURE: ITS FORMS AND FUNCTIONS

### PHONETIC REVIEW

#### 1. Read the words paying attention to the rules of reading.

Light, fight, might, straight, caught, daughter, haughty, neigh, sleight, eight, freight; rough, enough, laugh, nigh, Hugh, knight, height, weight, weigh, taught, thought, bought, fought, ought; special, mission, passion, session, nation, action, caution, tradition, mention, collection, dictation, option, demonstration, special, Asia, Russia, Russian, politician, musician, glacial, especial, explosion, corrosion, illusion, collision, vision, confusion; lecture, future, furniture, nature, culture, century; pressure, sure, exposure, measure, treasure, pleasure; when, why, which, white, where, what; who, whom, whose; wrong, write, writer, writ, wring, knight, know, knew, knit, gnat, gnash, monarch, echo, school, chemistry, mechanics, architect, machine, moustache, niche, limb, lamb, bomb, autumn, hymn, guard, guest, guild.

#### 2. Read the tongue-twisters paying attention to the rules of reading.

1) The black cat sat on a mat and ate a fat rat.

2) Betty Botta bought some butter. But she said this butter's bitter. But a bit of better butter will make my batter (жидкое тесто) better.

3) She sells seashells on the seashore, the shells that she sells are seashells, I am sure.

4) A big black bug bit a big black bear.

A big Black bear bit a big black bug.

### VOCABULARY

#### 3. Find Russian equivalents to the following international words.

planning, structure, principle, social, economic, from, aesthetical, architectural, system, theory, nation, activity, ignore, paradox, civilization, to illustrate, automatically, constant, final, to decorate, to produce, element, reason, unique, type, to integrate.

#### 4. Translate the following words keeping in mind their prefix. Prefix "re" means a repeated action.

reform, recover, reconsider, reinstall, re-use, recalculate, redo, reproduce, reconstruct

#### 5. Translate the following words keeping in mind their suffix "er", that means a tool or a person, performing an action.

generator, cooler, accumulator, accelerator, distributor, consumer, producer, absorber, operator, calculator

#### 6. Translate the words of Latin origin having plural endings.

1) analysis – analyses, basis – bases, crisis – crises, ellipsis – ellipses, emphasis – emphases, synthesis – syntheses, thesis – theses, appendixes, index – indexes;

2) alumnus – alumni, apparatus – apparatuses, nucleus – nuclei, nucleuses, radius – radiuses, stimulus – stimuli, terminus – termini, terminuses;

3) automation – automatons, automata, criterion – criteria, phenomenon – phenomena, polyhedron – polyhedrons;

- 4) addendum – addenda, curriculum – curriculums, curricula, datum – data, equilibrium – equilibriums, equilibria, maximum – maximums, maxima, medium – media, spectrum – spectra, spectrums, stratum – strata, stratums, vacuum – vacuums, vacua;
- 5) formula – formulae, dogma – dogmata, enigma - enigmas, enigmata;
- 6) apex – apexes, apices, appendix – appendixes, appendices, index – indexes, indices, matrix – matrixes, matrices, vertex – vertexes.

## READING

7. **Skim the text and give it a title.**
8. **Read the text and match the headings below to paragraphs 1,2,3,4,5,6,7.**

- A – Triple nature of architecture,  
 B – Ancient manuscripts,  
 C – Interaction of imagination and experience,  
 D – Sophisticated art,  
 E – Unique paradox,  
 F – Three basic factors

1. Architecture is the art or science of planning, building and structures. Without consideration of structural principles, materials, social and economic requirements a building cannot take form. But without aesthetical quality inherent in its form a building cannot be considered as a work of architecture as well. From the very beginning of construction in human history lots of architectural skills, systems and theories have been evolved for the construction of the buildings, which have housed nations and generations of people in any kind of their activity.

2. Writings on architecture are almost as old as writing itself. Books on the theory of architecture, on the art of buildings, and on the aesthetical view of buildings exist in great number. The oldest book, which sets forth the principles, upon which buildings should be designed and which aim is to guide the architect, is the work of Markus Vitruvius Pollio written in the first century B. C.

3. Architecture is an art. Nowadays its expression should be creative and consequently new. The heritage of the past cannot be ignored, but it must be expressed in modern terms. There exists an evident paradox in the coexistence of change and survival in every period of human civilization. This paradox of change and repetition is clearly illustrated in any architectural style.

4. Architecture is also the style or manner of building in a particular country or period of history. There are widely known examples of Gothic architecture all around the globe. During many centuries mankind admires the architecture of ancient Greece or Roman Empire as well.

5. Nearly two thousand years ago the Roman architect Vitruvius listed three basic factors in architecture. They are convenience, strength and beauty. These three factors have been present and are always interrelated in the best constructions till the 21st century. No true architect could think of any of them without almost automatically considering the other two as well. Thus, architectural design entails not

only the necessity to study various solutions for convenience, structure, and appearance as three separate processes.

6. Architectural design also includes the necessity to keep in mind the constant interaction of these factors. It's impossible for an architect first plan a building from the point of view of convenience, and then make the design of a strong construction around his plan to shelter it. Then, as a final touch, try to adjust and decorate the whole to make it pretty. Any design evolving from such kind of work will produce only a confused, incoherent, and unsatisfactory building. When speaking about any truly great building we cannot but say that every element in it has a triple implication or significance.

7. This triple nature of architectural design is one of the reasons why architecture is a difficult art. It needs some unique type of imagination as well as long years of training and experience to make a designer capable of getting requite in the light of these three factors—use, construction, and aesthetic effect—simultaneously. The designer must have a good knowledge of both the engineering and building materials. This knowledge will enable him to create economically strong and practical construction. The designer, in addition, must possess the creative imagination, which will enable him to integrate the plan and the construction into the harmonious whole. The architect's feeling of satisfaction in achieving such integration is one of his/her (their) greatest rewards.

## 9. Match the words with their definitions.

triple	эстетический
sophisticated	также
ancient	развиваться
interaction	сосуществование
unique	очевидный
aesthetical	тройной
inherent	человечество
as well	сложный, изощренный
to evolve	древний
consequently	взаимодействовать
evident	уникальный
coexistence	взаимодействие
mankind	присущий, неотъемлемый
to interrelate	следовательно
to entail	решение
solution	вызывать
convenience	значение
appearance	награда
to keep in mind	применение
implication	помнить
significance	удобство

simultaneously	вознаграждение
to enable	наследство
harmonious	непоследовательный, несвязный
reward	внешний вид
incoherent	гармоничный
heritage	позволять
requite	одновременно

### 10. Answer the questions to the text.

- 1) What is architecture?
- 2) What is the oldest architectural guidance and who is its author?
- 3) What paradox does an architectural style illustrate?
- 4) What nations were the first teachers of the world in architecture?
- 5) What are the three basic factors in architecture?
- 6) How do the basic building factors interrelate?
- 7) What makes an architect capable of designing good buildings?
- 8) What important features should a good architect have?

### GRAMMAR REVIEW

Герундий (Gerund) — это неличная форма глагола, которая выражает название действия и сочетает в себе признаки глагола и существительного. Соответственно, на русский язык герундий обычно переводится существительным или глаголом (чаще неопределенной формой глагола). Формы, подобной английскому герундию, в русском языке нет.

My hobby is **reading**. — Мое любимое занятие - чтение.

#### Образование герундия

Герундий, как и причастие настоящего времени, образуется путем прибавления к основе глагола в неопределенной форме окончания **-ing**:

to read — reading.

Так как формы, аналогичной герундию, в русском языке нет, то переводить герундий можно по-разному. Обратите внимание на данные ниже предложения и их перевод на русский язык.

Thank you for **coming**. — Спасибо, что пришли.

#### Формы герундия

Герундий имеет простую (Simple) и перфектную (Perfect) формы, а также может употребляться в активном и пассивном залоге.

Indefinite (Simple) **writing being written**

Perfect **having written\having been written**

#### Герундий. Употребление

Поскольку герундий обладает свойствами существительного и глагола, то он может употребляться в роли любого члена предложения (кроме простого сказуемого).

#### 1) Подлежащее

В роли подлежащего герундий употребляется без предлога, на русский язык чаще всего переводится либо существительным, либо инфинитивом.

**Smoking** is harmful.

## 2) Герундий как часть составного сказуемого

Как часть составного именного сказуемого герундий следует за глаголом-связкой to be (am, is, are, was, were и т. д.).

My hobby is **reading**. — Мое хобби – чтение.

3) В роли прямого дополнения (без предлога). После некоторых глаголов в роли прямого дополнения используется только герундий. Это глаголы **admit** (признавать), **advise** (советовать), **avoid** (избегать), **burst out** (разразиться), **delay** (задерживать), **deny** (отрицать), **dislike** (не нравиться), **enjoy** (получать удовольствие), **escape** (вырваться, избавиться), **finish** (закончить), **forgive** (прощать), **give up** (отказываться, бросать), **keep on** (продолжать), **mention** (упоминать), **mind** (возражать — только в вопросах и отрицаниях), **miss** (скучать), **put off** (отложить), **postpone** (откладывать), **recommend** (рекомендовать), **suggest** (предлагать), **understand** (понимать).

I don't mind **coming** early. — Я не возражаю против того, чтобы прийти пораньше.

## 4) Герундий в роли определения

В роли определения герундий обычно стоит после определяемого слова (существительного) с различными предлогами: чаще с of, реже с for, at, about, to, in.

I don't like his manner of **speaking**. — Мне не нравится его манера (какая?) говорить.

## 5) Герундий в роли обстоятельства

В роли обстоятельства перед герундием всегда используются предлоги, например, такие как in, on, before, after, without, by, about, at, to, of, for, through, besides, instead of .

On **coming** home, we usually wash our hands.

## 11. Translate the sentences paying attention to the Gerund.

1) Instead of using traditional materials architects began to explore ways of creating buildings by using the latest technology.

-----

2) Preserving historic buildings grew common.

-----

3) The designer called for replacing the pointed medieval vaults with lighter domicile vaults.

-----

4) One of the main points of interest in reassessing a building some years after completion is to see how it has been maintained by owners.

-----

5) The designer took into account the desire to produce space by keeping the walls to a minimum thickness.

-----  
6) The problem was solved without incorporating a beam in the west wall of the foundry.  
-----

7) A well designed environment can't be achieved by adopting one well defined style.  
-----

**12. Translate the sentences paying attention to the Gerund.**

1) Архитектура это искусство или наука проектирования зданий.  
-----

2) Архитектор использовал принципы теоретической механики при проектировании своих зданий.  
-----

3) Вместо использования дерева, камня и традиционных строительных технологий, архитекторы стали искать способы создания зданий с помощью стали, стекла и бетона.  
-----  
-----

4) Небоскребы стали решением проблемы размещения растущего городского населения.  
-----

5) Проектирование осуществляется с использованием нескольких архитектурных стилей.  
-----

6) Люди не могут добираться на верхние этажи здания без использования системы лифтов.  
-----

7) Существует движение против строительства небоскребов.  
-----

**SPEAKING**

**13. Make up a short summary of the text (5-6 sentences).**

**14. Write about architecture of future. What will it look like?**

**EXTRA TEXTS FOR HOME READING**

**Text 1**

**Architecture**

Architecture is the art or science of designing and constructing buildings with durable materials following certain canons, so as to produce structures that are suited to their purpose, and that are visually stimulating and aesthetically pleasing. The English poet sir Henry Wootton stated that "Well building hath three conditions: Commodity, Firmness and Delight".

Historically, architecture has followed a succession of recognizable styles that may, for example, be identified as Gothic, Baroque or Neo-Classical; or it has a homogenous style associated with a particular culture, such as Greek, Roman or Egyptian.

Architectural style, be it a country house, factory, hotel, airport or religious building, reflects the values as well as the needs of the society that produces it. However, it is governed not only by taste and aesthetic convention but also by a range of interrelated practical considerations; these are principally technology and available materials, an awareness of loads and stresses that certain parts of the building must bear, and the precept that the structure must fulfill the purpose for which it was built.

Advances in the science of analyzing structural behavior resulted from the demand in the 19th century for great civil engineering structures: dams, bridges and tunnels. It is now possible to enclose space with suspension structures, the skins of which are held in place by air pressure. Sophisticated analysis is necessary in the case of very tall structures, because stresses that could be exerted by the effect of wind or earthquakes require more important considerations than the effect of gravity.

Architecture must also take into account the internal functional equipment of modern buildings. In recent decades, elaborate escalator and lift systems, the control of temperature and humidity, air conditioning, artificial lighting, sanitation, fire precautions, and the distribution of electricity and other services have been developed. This has added to the cost of construction and has increased expectations of comfort and convenience.

Certain broad principles have always been discernible in the purposes for which buildings are constructed. The noblest works of architecture – temples, churches, mosques – celebrate the mysteries of religion and provide assembly places where gods can be propitiated or where the faithful can receive religious instruction and participate in symbolic rituals. Another important purpose has been to provide physical security: many of the world's permanent structures were built for reasons of defense.

Related to the defense is a desire to create buildings that reflect civic pride and serve as status symbols. Palaces for kings and emperors unmistakably proclaimed their power and wealth. People of privilege have always been prominent patrons of designers, artists and artisans, and their projects often represent the best works of a given period. Today large corporations, governments, and universities play the role of patron in a less personal way.

The proliferation of types of buildings today reflects the complexity of modern life. Modern western architecture is overwhelmingly concerned with the creation of mass housing, large office buildings, shopping centers, and supermarkets, schools and universities, hospitals and airports, hotels, and holiday resorts. Individual buildings are not seen in isolation, however. The attention of their clients is increasingly focused on the interaction between new and existing, and town planning takes into account the impact that new buildings have on particular urban neighborhoods.

## **Text 2**

### **Architecture reaching for the sky**

A building reflects the scientific and technological achievements of the age as well as the ideas and aspirations of the designer and client.

The use of an architectural style cannot be said to start or finish on a specific date. Neither it is possible to say exactly what characterizes a particular movement. But the origins of what is now generally known as modern architecture can be traced back to the social and technological changes of the 18<sup>th</sup> and 19<sup>th</sup> centuries.

Instead of using timber, stone and traditional building techniques, architects began to explore ways of creating buildings by using the latest technology and materials such as steel, glass and concrete strengthened by steel bars, known as reinforced concrete. Technological advances also helped to bring about the decline of rural industries and an increase in urban population as people moved to the towns to work in new factories. Such rapid and uncontrolled growth helped to turn part of cities into slums.

By the 1920s architects throughout Europe were reacting against the conditions created by industrialization. A new style of architecture emerged to reflect more idealistic notions for the future. It was made possible by new materials and construction techniques and was known as Modernism.

By the 1930s many buildings emerging from this movement were designed in the International Style. This was largely characterized by the bold use of new materials and simple geometric forms, often with white walls supported by pillars. These were stripped of unnecessary decoration that would distract from their primary purpose - to be used or lived in.

Walter Gropius, Charles Jeanneret (better known as Le Corbusier) and Ludwig Mies van de Rohe were among the most influential of the many architects who contributed to the development of Modernism in the first half of the century. But the economic depression of the 1930s and the Second World War (1939-1945) prevented their ideas from being widely realized until the economic conditions improved and war-torn cities had to be rebuilt. By the 1950s, the International Style had developed into a universal approach to building, which standardized the appearance of new buildings in cities across the world.

Unfortunately, this Modernist interest in geometric simplicity and function became exploited for profit. The rediscovery of quick-and-easy-to-handle reinforced concrete and an improved ability to prefabricate building sections meant that builders could meet the budgets of commissioning authorities and handle a renewed demand for development quickly and cheaply. But this led to many badly designed buildings, which discredited the original aims of Modernism.

Influenced by le Corbusier's ideas on town planning, every large British city built multi-stored housing estates in the 1960s. Mass-produced, low-cost high-resistance seemed to offer a solution to the problem of housing a growing inner city population. But far from meeting human needs the new estates often proved to be wind swept deserts lacking essential social facilities and service. Many of these buildings were poorly designed and constructed have since been demolished.

By the 1970s a new respect for the place of buildings within the existing towns arose. Preserving historic buildings or keeping only their facades grew common. Architects also began to make more use of building styles and materials that were traditional to the area. The architectural style usually referred to as High Tech was also emerging. It celebrated scientific and engineering achievements by openly parading the sophisticated techniques used in construction. Such buildings are commonly made of metal and glass; examples are Stansted airport and the Loyd's building in London.

Disillusionment at the failure of many of the poor imitations of Modernist architecture led to interest in various styles and ideas from the past and present. By the 1980s the coexistence of different styles of architecture in the same building became known as Post Modern. Other architects looked back to the classical tradition. The trend in the architecture now favors smaller scale building design that reflects a growing public awareness of environmental issues such as energy efficiency. Like the Modernists, people today recognize that a new designed environment improves the quality of life but is not necessarily achieved by adopting one well defined style of architecture.

The 20<sup>th</sup> century architecture will mainly be remembered for its tall building. They have been made possible by the development of light steel frames and safe passenger lifts. They originated in the US over a century ago to help meet the demand for more economical use of land. As construction techniques improved, the skyscraper became a reality.

## UNIT 4. FROM THE HISTORY OF ARCHITECTURE

### PHONETIC REVIEW

#### 1. Read the words paying attention to the pronunciation of the italicized letters.

igh [ai] - light, fight, might, straight, caught, daughter, haughty, neigh, sleight, eight, freight, knight, height;

eigh [ei] - weight, weigh

gh [f] - rough, enough, laugh;

augh [ɔ] - taught, thought, bought, fought, ought;

sion, tion [ʃn] mission, passion, session, nation, action, caution, tradition, mention, collection, dictation, option, demonstration;

sian [ʃn] Russian, politician, musician;

sion [zn] explosion, corrosion, illusion, collision, vision, confusion;

ture [tʃə] lecture, future, furniture, nature, culture, century;

sure [ʃə] pressure, sure,

sure [zə] exposure, measure, treasure, pleasure;

ch [k] monarch, echo, school, chemistry, mechanics, architect;

ch [ʃ] machine, moustache, niche;

mb [m] limb, lamb, bomb, autumn, hymn, guard, guest, guild.

**2. Read the tongue-twisters paying attention to the rules of reading.**

- 1) Thirty-three thousand people think that Thursday is their thirtieth birthday.
- 2) What noise annoys an oyster most? A noisy noise annoys an oyster most.
- 3) Ripe white wheat reapers reap ripe white wheat right.
- 4) Blake's black bike's back brake bracket block broke.
- 5) Each Easter Eddie eats eighty Easter eggs.
- 6) She slits the sheet she sits on.
- 7) A rough-coated, dough-faced, thoughtful ploughman strode through the streets of Scarborough; after falling into a slough, he coughed and hiccupped.
- 8) A twister of twists once twisted a twist and the twist that he twisted was a three twisted twist now in twisting this twist, if a twist should untwist, would the twist that untwisted untwist the twists.

**VOCABULARY**

**3. Transform the following verbs into adjectives using suffixes able, ible and, if necessary, the prefix un.**

Eat, move, break, read, cure, respond, expand, extend, divide, exhaust, avoid, forget, change, recognize, think, believe, achieve, bear, forgive.

**4. Find Russian equivalents to the following international words**

geographical, geological, climatic, social, historical, museum, detail, style, analysis, structural, visualize, contact, evolution, progress, religion, decorative.

**5. Pay your attention to the words that are called "false friends of an interpreter".**

a word	a false translation	a correct translation
accurate	аккуратный	точный, правильный
actually	актуально	на самом деле
benzene	бензин	бензол
complexion	комплексия	цвет лица
data	дата	данные
intelligence	интеллигенция	интеллект, ум
magazine	магазин	журнал

personal	персонал	личный
prospect	проспект	вид, обзор, панорама
resin	резина	смола

## READING

6. Skim the text and enumerate architectural styles you have read about?

7. What are the main differences between them?

### From the history of architecture

The history of architecture aims at displaying clearly the characteristic features of the architecture of each country by describing buildings of each period and the geographical, geological, climatic, social and historical conditions which have contributed to the formation of a particular style. The best way to learn about architecture is to study actual buildings and museums which provide excellent opportunities for examining details of a style. The analysis of the characteristic features which resulted from solving certain structural problems enables to visualize clearly the main factors which brought about changes in each style.

Architecture is the art with which we all are in daily contact for it shelters us, gives us “home”. Finally, architecture is the mother of the arts of sculpture, painting, and the allied decorative crafts.

Architecture, with all its varying phases and complex developments, must have had a simple origin in the primitive efforts of mankind to provide protection against inclement weather, wild beasts and human enemies in rock, caves, huts and tents. Here, then, in caves, huts and tents we find the three primitive types of human dwellings, the three germs of later architectural developments.

The history of architecture is a record of continuous evolution. A glance among the past ages reveals architecture as a history of social condition progress and religion and events which are landmarks in the history of mankind; for as architecture is in all periods connected with national life, the genius of a nation is unmistakably stamped on its architectural monuments.

Architectural styles, by the test of evolution, fall naturally into several groups: styles, which beginning in Egypt and Assyria reached their highest development in Europe, styles of Indian, Chinese, Japanese and Ancient American architecture.

**Egyptian architecture.** The natural products, such as clay, brick and stone, largely determine the basic features of the architecture of the country. Stone, including sandstone, limestone and alabaster, as well as syenite, granite or porphyry was the material chiefly employed, not only for constructive or decorative works, but also for vases and even for personal ornaments, as the country was poor in metal and there was little building timber.

The gigantic scale which distinguishes Egyptian architecture was made possible not only by the materials, but also by the methods of quarrying, transporting and raising huge blocks of stone into position.

The architecture of Egypt is characterized by massive walls, close-spaced columns carrying stone lintels which, in their turn, support the flat roof.

The Pyramids, which are amongst the oldest monuments were religious in origin and reveal not only the religious faith but also the social and industrial conditions in those far-off days; for such massive buildings would have not been possible without a despotic government and the forced labor of a vast population of slaves and captives.

**The architecture of Western Asia** also reflects national characteristics. Here, again, the colossal nature of building undertakings point to the social conditions that prevailed.

**European architecture** up to this period may be divided into three main types, differentiated by important constructive principles.

- 1) The Greek style, combining column and beam.
- 2) The Roman or composite style combining column and semi-circular arch and vault.
- 3) The gothic style is that, in which the pointed arch prevailed.

**Greek architecture.** The chief mineral wealth of Greece was in her marble – the most beautiful and monumental of all building materials. The Greeks attached so much importance to the quality of fine-grained marble for producing exact outlines and smooth surfaces, that they even coated coarse-grained limestone with a layer of marble “stucco” in order to secure this effect, which is the great characteristic of their architecture. The architecture of Greece reflects each stage of Greek history with remarkable accuracy and her architecture has influenced all styles down to our own day.

**Roman architecture.** In addition to marble the Romans could quarry terracotta, stone, and brick, all of which were used even for important buildings. In the neighborhood of Rome there was travertine, a hard limestone, a volcanic substance of which the hills of Rome were composed, besides excellent sand and gravel. The main building material, however, which led to great structure innovations, was concrete formed of pozzolana, which has a peculiar property when mixed with water. It was exceedingly hard and cohesive concrete. Not only domes and vaults but also walls were frequently formed of concrete, and they were faced with brick, stone, alabaster, porphyry and other marbles. The architecture of Rome is largely influenced by the Etruscan arch so that a complex type resulted from blending the Greek column and entablature as decorative facings to piers with semicircular arches but they still used columns constructively. By the use of the newly invented concrete and by the employment of the arch, vault and dome the architecture of Rome became the foundation of the European architecture.

**Gothic architecture.** The establishment of Christianity as the state religion resulted in the construction in Rome of over thirty churches. It gave an impetus to the marvelous architectural development of the Medieval period which were in their turn developed from Romanesque architecture and to which the name of Gothic has since

been given. Gothic architecture of the thirteenth century is mainly distinguished from Romanesque architecture by the introduction of the pointed arch and by embellishment of stones held together with thick mortar joints.

**8. Match the words with their definitions.**

aim, to aim at	путь, способ
to contribute to	возможность
way	цель, нацелиться на
to provide with	суровая погода
opportunity	способствовать, содействовать
to solve a problem	укрытие, укрывать
shelter	решать проблему
inclement weather	снабжать, обеспечивать чем-либо
germ	взгляд
evolution	эволюция
glance	веха
to reveal	штамп, ставить штамп на
landmark	росток
to stamp	выявлять, обнаруживать
to determine	добывать карьерным способом
syenite	масштаб, размах
to quarry	определять, решать
scale	сиенит

**9. Answer the questions to the text.**

- 1) What's the aim of the history of architecture?
- 2) What features are taken into consideration when describing the formation of an architectural style?
- 3) What's the best way to learn about architecture?
- 4) What arts originated from architecture?
- 5) What are primitive types of human dwellings?
- 6) What groups can we divide architectural styles into?
- 7) What determined the basic features of the architecture of a country?
- 8) What can architecture of Egypt be characterized by?
- 9) Does the architecture of Western Asia reflect the natural products used in that part of the world?
- 10) Can you divide European architecture into 4 main types? What are they?
- 11) Is limestone the great characteristic of Greek architecture?
- 12) Are the hills of Rome composed of sand and gravel?
- 13) What is pozzolana?
- 14) Where is travertine found?
- 15) What influenced Roman architecture?
- 16) What made an impetus to the architectural development of the medieval period in Gothic architecture?

## GRAMMAR REVIEW

### Инфинитив в английском языке. Infinitive

В английском языке инфинитив (Infinitive) — это неличная форма глагола, которая обозначает действие, но при этом не указывает на время, лицо и число. В русском языке английский инфинитив соответствует неопределенной форме глагола, которая отвечает на вопросы «что делать? что сделать?». Формальным признаком инфинитива является частица to, которая может опускаться.

I have **to write** a letter. - Я должен написать письмо.

I can **speak** two foreign languages. – Я говорю на двух иностранных языках.

### Формы инфинитива

Aspect	Active Voice (Активный залог)	Passive Voice (Пассивный залог)
Indefinite (Simple)	to write	to be written
Continuous	to be writing	-----
Perfect	to have written	to have been written
Perfect Continuous	to have been writing	-----

- 1) I am glad **to work** with you. Я рад работать с вами.
- 2) I am glad **to be helped** by you. Я рад, что вы мне помогаете.
- 3) I am glad **to be working** with you now. Я рад, что работаю с вами.
- 4) I am glad to have helped you. – Я рад, что помог вам.
- 5) I am glad to have been helped by you. – Я рад, что вы мне помогли.
- 6) I am glad to have been working with you all this time. - Я рад, что работаю с вами все это время.

### 10. Translate the sentences paying attention to the Infinitive.

- 1) A railway was built at the construction site to move materials quickly.
- 2) To save money, time and man-power the builders created various innovations.
- 3) Did it take you forever to get to your floor because the lift had to stop at every floor to let someone on or off?
- 4) To help the problem, the architects created seven banks of lifts, with each servicing a portion of the floors.
- 5) He is looking for a place to build the house.
- 6) There are designs which provide for service centers to be connected with the dwelling houses by roofed passages.
- 7) No time was to be wasted.
- 8) The principle design concept was to provide sales space.

### 11. Translate the sentences paying attention to the Infinitive.

- 1) Чтобы обеспечить полную защиту от перегрева, крыша имеет особое покрытие.

- 
- 2) Электропроводка должна быть вставлена в перекрытие полов, чтобы решить проблему изоляции.
-

3) Конструкция, которая будет демонтирована, была спроектирована в прошлом веке.

-----

4) Строительство хорошего дома требует большого опыта и умений.

-----

5) Конструкция должна быть прочной и долговечной.

-----

**12. Translate the sentences paying attention to the underlined words.**

1) In addition all houses will have a downstairs cloakroom with a W.C. and a washbasin.

-----

2) Shortly speaking a balcony protects the children's rooms from the heat of the sun and from being viewed from outside.

-----

3) Bathrooms vary according to house type.

-----

4) At any rate the terraces vary in size depending largely on the size of the flats.

-----

5) It is silly, say, to make wooden chairs which are on the market in huge quantities.

-----

6) I love daylight. That is if I have a choice I prefer big windows and big empty spaces.

-----

7) Design is by far the most important area of the 20<sup>th</sup> century culture.

-----

8) In other words all the living areas of the house are open onto the public rear yard.

-----

9) Regardless of the east-west alignment the flats enjoy south sunlight due to the diagonal inclination of the building.

-----

10) The shower unit coupled with a chemical toilet is of plywood construction.

-----

11) Incidentally the framing and furniture, internal trim is all in aluminum alloy.

-----

## **SPEAKING**

**13. Divide into two teams. One team will discuss the main features of the Roman architecture, the other one will tell about Greek architecture.**

## **EXTRA TEXTS FOR HOME READING**

### **Text 1**

#### **Origins of Modern Architecture**

The technological scope and social context of architecture were so profoundly altered by the Industrial Revolution that traditional concepts about the appearance and purpose of buildings lost their validity. From 1840 onward, leading artists, designers, and critics sought to develop new approaches to architecture.

In England, the writer John Ruskin and the designer William Morris, founder of the Arts and Crafts Movement, held that machine – made objects were devoid of cultural significance. Inspired by the medieval past, they affirmed the importance of hand craftsmanship and persuaded leading craftsmen to become involved in the decision of ordinary artifacts and domestic surroundings.

As for technology, on the other hand, Sir Joseph Paxton's Crystal Palace, a huge temporary exhibition space built for the Great Exhibition that was held in London in 1851, marked an important advance in the development of modern architecture. It was made entirely of prefabricated units of iron and glass. The fact that it was also beautiful may have been in part accidental. One of the persistent ideas in 20<sup>th</sup> century architecture, however, is the belief of many engineers that beauty can be seen in the clear exposure of the structure of the new materials.

As iron, glass, and steel become abundant, building construction was no longer limited to masonry and timber. Two structures erected for the Paris Exposition Universelle of 1889 showed this dramatically. The Halle des Machines, by the architect C.L.F. Dutertand the engineering company Contamin, Pierron, and Charton, had a clear span of 117 m (285 ft). The Eiffel Tower, by Alexander Gustave Eiffel, soared 305 m (1,000ft) into the sky.

Technology soon began to affect the design of buildings serving more useful purposes. High-rise buildings were made possible by the erection of a steel cage to which were attached floors and walls, and rendered practical for the user by the development of passenger lifts. The basic skyscraper office building had taken form in Chicago by the 1890 and spread rapidly elsewhere. Among the exceptionally able architects involved in the development of the high-rise buildings were Louis Sullivan and other members of the Chicago School.

### **Text 2**

In planning his own home, British architect Michael Wilford mixed rural architectural traditions and contemporary trends. The result of this collage was a luxurious private residence located in the calm, quiet forests of Sussex County. The design, internally as well as externally, is executed so organically that it is difficult to comprehend where in this eclecticism there is one clear facet dividing the traditional and the new. It may seem that in the building complicatedly compatible materials and shapes neighbor each other; sandstone and dark wood, which are common for country structures, are combined with sheet metal and steel. Original temporary designs and

daring unexpected colors are in complete harmony within this provincial house. Wilford's dwelling is located directly on the border of dense woods and fields, and the architect tried to fully use the contradictions of this landscape.

In the structure, there are two facades – one is turned to the forest and is imperceptible among the tree branches; the second, the decorated solid veranda and spiral staircase, looks to the fields. One part of the rooms rests in the cool shade, another is placed in the sun, thus, depending on their moods, the house's tenants may select which atmosphere "to take a dip in". Another special feature of the landscape is the mound that fences off the forest side of the house. This did not prevent Wilford from locating the main entrance on precisely that side of the structure, despite this being rather uncommon. Because of the mound, it became possible to create the illusion of multi-levels: to lengthen the walkway leading to the entrance into the living area and then along the façade descending to the separate entrance on the ground floor, where the guest rooms and pool are located.

### **Text 3**

The word engineering means the art of designing, constructing or using engines. But this word is now applied in a more extended sense. It is applied also to the art of executing such works as the objects of civil and military architecture, in which engines or other mechanical appliances are used. Engineering is divided into many branches. The most important of them are civil, mechanical, electrical, nuclear, mining, military, marine, and sanitary engineering. While the definition "civil engineering" dates back only two centuries, the profession of civil engineer is as old as civilized life.

In order to understand clearly what civil engineering constitutes, let us consider briefly the development of different branches of engineering. Some forms of building and utilization of the materials and forces of nature have always been necessary for man. Man had to protect himself against the elements and sustain himself in the conflict with nature.

Up to about the middle of the eighteenth century there were two main branches of engineering – civil and military. The former included all those branches of the constructive art not directly connected with military operations and the construction of fortifications, while military engineering concerned itself with the application of science and the utilization of building materials in the art of war.

But later there came a remarkable series of mechanical inventions, great discoveries in electrical science and atomic energy. It led to the differentiation of mechanical, electrical, nuclear engineering etc. Architecture, which up to the eighteenth century had been considered a branch of engineering, had become a profession by itself. The term "civil engineering" has therefore two distinct meanings. In the wildest and oldest sense it includes all non-military branches of engineering as it did two centuries ago. But in its narrower, and at the present day more correct sense, civil engineering includes mechanical engineering, electrical engineering, metallurgical, and mining engineering. Here are some fields of engineering.

- 1) Housing, industrial, and agricultural construction.

- 2) Structural engineering which comprises the construction of all fixed structures with their foundations.
- 3) The construction of highways and city streets and pavements.
- 4) The construction of railroads.
- 5) The construction of harbors and canals.
- 6) Hydraulic engineering which includes the construction of dams and power plants.

The above enumeration will make clear the vast extent of field of civil engineering.

## UNIT 5. THE EMPIRE STATE BUILDING

### PHONETIC REVIEW

#### 1. Read the words paying attention to the pronunciation of the italicized letters.

Due, dew; muse, mews; tub, tube; fare, far; rede, red; duck, dutch; duke, dark; faint, feint; dot, dote; asp, wasp; has, was; that, what; watch, natch; bar, bare; car, care; her, here; heal, health; on, son; ponder, wonder; home, come; grove, glove; per, peer; fir, fire; sir, sire; mood, blood; rouse, cousin; cut, put; rush, bush; far, fare; cur, cure; ruddy, pudding; go, to, rood, good, rather, father; duty, truly; nude, rude; suit, brute; rout, route; dew, drew; later, water; go, do; rose, lose; duty, truly; nude, rude; dew, drew; stew, strew; strange, haste, steak, speak; riddle, bridle; lost, post; cloth, both; cobble, nobble; now, know; bady, puny, cabin, radish, finish, civil, polish, florin, duty, eight, weight, field; great, break, year, pear; eye, height, either, neither; deed, dead, weather, wealth; pea, peasant; please, pleasant; ear, early, earth; hear, heard; ran, range; has, haste; was, waste; will, wild; mill, mild; pran, plant; can, can't; comma, command; small, smell, slang; sale, salt; face, fast; lace, last; class, clasp; bathe, bath; father, mother, close, cloth; sole, sold; hole, hold; bull, pull, full; moon, too, book, took, shook, poor, door, floor, blood, flood; out, now, how, row, brow, low, blow, meadow; our, four; reply; friend, heart, good; say.

#### 2. Read the tongue-twisters paying attention to the rules of reading.

- 1) Whether the weather is fine  
or whether the weather is not.  
Whether the weather is cold  
or whether the weather is hot.  
We'll weather the weather  
Whatever the weather  
Whether we like it or not.
- 2) Peter Piper picked a peck of pickled peppers. A peck of pickled peppers Peter Piper picked. If Peter Piper picked a peck of pickled peppers Where's the peck of pickled peppers Peter Piper picked?
- 3) What a to-do to die today, at a minute or two to two;  
A thing distinctly hard to say, but harder still to do.  
For they'll beat a tattoo, at twenty to two

A rat-tat-tat- tat-tat-tat- tat-tat-tattoo  
And a dragon will come when he hears the drum,  
At a minute or two to two today, at a minute or two to two.

- 4) You've no need to light a night-light  
On a light night like tonight,  
For a night-light's light's a slight light,  
And tonight's a night that's light.  
When a night's light's like tonight's light,  
I wouldn't really think it's quite right  
To light night-lights with their slight lights  
On a light night like tonight.

**VOCABULARY**

- 3. Transform the following adjectives into nouns using suffix (i)ty.**  
Regular, similar, popular, stable, creative, responsible, capable, mobile, necessary
- 4. Transform the following verbs into nouns using suffix tion (sion, ion).**  
Include, continue, produce, absorb, consider, create, pollute, repeat, review, present
- 5. Translate the following sentences paying attention to the underlined words.**
- 1) A further 200 acres have been scheduled for development of a new housing estate.  
-----
- 2) Lightning in the glass-walled building is provided by fluorescent light fixtures.  
-----
- 3) The bulk of the academic buildings in the new university are laboratories, the teaching and residential areas.  
-----
- 4) Precast columns are of Z-shaped section to resist wind forces and to fit in with the grid system.  
-----
- 5) Since the columns are story-height length, the bottom chords of the edge girders must overlap the column joint.  
-----
- 6) This all-weather machine can excavate footings and trenches for drains.  
-----
- 7) A train of wagons can haul from the site some 20 tons every minute.  
-----
- 8) The rest of the debris is then pulverized by a large machine and is then compacted to the required density.  
-----
- 9) The use of cleansers diminishes the life of linoleum.  
-----

## READING

6. What are the tallest buildings in the world you know about?
7. Skim the text and answer what company was in charge of building and planning of the Empire State Building and what simple decision was found when designing it?

### Who was going to build it?

Planning the tallest building in the world was only half the battle; they still had to build the towering structure and the quicker the better. For the sooner the building was completed, the sooner it could bring an income.

As part of their bid to get the job, builders Starrett Bros and Eken told Raskob that they could get the job done in eighteen months. When asked during the interview how much equipment they had on hand, Paul Starrett replied, "Not a blanket blank thing. Not even a pick and shovel". Starrett was sure that they had plenty of equipment and what they didn't have they would rent. Yet, Starrett explained his statement: "Gentlemen, this building of yours is going to represent unusual problems. Ordinary building equipment won't be worth a damn on it. We'll buy new stuff, fitted for the job, and at the end sell it and credit you with the difference. That's what we do on every big project. It costs less than renting second hand stuff and it's more efficient". Their honesty, quality, and swiftness won them the bid.

With such an extremely tight schedule, Starrett and Eken started planning immediately. Over sixty different trades would need to be hired, supplies would need to be ordered (much of it to specifications because it was such a large job), and time needed to be minutely planned. The companies they hired had to be dependable and be able to follow through with quality work within the allotted timetable. The supplies had to be made at the plants with as little work as possible needed at the site. Time was scheduled so that each section of the building process overlapped - timing was essential. Not a minute, an hour, or a day was to be wasted.

### Demolishing glamour

The first section of the construction timetable was the demolition of the Waldorf-Astoria Hotel. When the public heard, that the hotel was to be torn down, thousands of people sent requests for mementos from the building. One man wrote asking for the Fifth Avenue side iron-railing fence. A couple requested the key for the room they had occupied on their honeymoon. Others wanted the flagpole, the stained-glass windows, the fireplace, light fixtures, bricks, etc. Hotel management held an auction for many items they thought might be wanted.

The rest of the hotel was torn down piece by piece. Though some of the materials were sold for reuse and others given away for kindling, the bulk of the debris was hauled to a dock, loaded onto barges, and then dumped fifteen miles into the Atlantic Ocean.

Even before the demolition of the Waldorf-Astoria was complete, excavation for the new building was begun. Two shifts of 300 men worked day and night to dig through the hard rock in order to make a foundation.

After deciding on and obtaining a site for the skyscraper, Raskob needed a plan. Raskob hired Shreve, Lamb and Harmon to be the architects for his new building. It is said that Raskob pulled a thick pencil out of a drawer and held it up to William Lamb and asked, "Bill, how high can you make it so that it won't fall down?"

Lamb got started planning right away. Soon, he had a plan.

The logic of the plan was very simple. A certain amount of space in the center, arranged as compactly as possible, contains the vertical circulation, mail chutes, toilets, shafts and corridors. Surrounding this is a perimeter of office space 28 feet deep. The sizes of the floors diminish as the elevators decrease in number. In essence, there is a pyramid of non-rentable space surrounded by a greater pyramid of rentable space.

The race was getting very competitive. With the thought of wanting to make the Empire State Building higher, Raskob himself came up with the solution. After examining a scale model of the proposed building, Raskob said, "It needs a hat!" Raskob decided that the "hat" would be used as a docking station for dirigibles. The new design for the Empire State Building, including the dirigible mooring mast, would make the building 1,250 tall (the Chrysler Building was completed at 1,046 feet with 85 stories).

#### **8. Match the words with their definitions.**

the towering structure	подходить для чего-либо
bid	высокая конструкция
on hand	заявка на торгах
not a blanket blank	абсолютно ничем
to be worth doing	поставки
to fit	планировать
the supplies	плавно переходить
timetable	сувенир
to schedule	флагшток
to demolish	основная часть
memento	цветное, витражное стекло
flagpole	строительный мусор
stained-glass	причальная мачта для дирижаблей
light fixtures	смена
kindling	земляные работы
the bulk	на дрова
debris	под рукой, в наличии
to haul	стоит что-либо делать
excavation	расписание
a shift	сносить, разрушать (здание)
mooring mast	электрика
to overlap	перекрывать

#### **9. Answer the following questions to the text.**

1) Why did Raskob decide to hire Paul Bros & Eken company to build the tallest building?

- 2) Why was the building schedule so tight?
- 3) What did the minutely planned work demand on the part of the building companies and the suppliers?
- 4) What was the first section of the construction timetable?
- 5) Why did the hotel management hold an auction?
- 6) How was the foundation for the building made?
- 7) What was done with the debris after the demolishing of the hotel?
- 8) Who devised the plan for the new high structure?
- 9) What was the logic of the building plan?
- 10) What solution did Raskob find to build the skyscraper?

## GRAMMAR REVIEW

**Объектный инфинитивный оборот** – это сочетание имени существительного в общем падеже или местоимения в объектном падеже с инфинитивом глагола:

I expect **the architect to build** the house in the Hi Tech style. – Я полагаю, **что** архитектор построит здание в стиле Хай Тек.

I expect **him to build** the house in the Hi Tech style. – Я полагаю, **что** он построит здание в стиле Хай Тек.

Перевод предложения с объектным инфинитивным оборотом предполагает, что его русский аналог будет состоять из главного предложения и придаточного. Часто объектный инфинитивный оборот употребляется после глаголов, выражающих

1) желание или потребность: **to want, to wish, to desire, I would like**

I would like you to review all the architectural styles in the article. Я бы хотел, чтобы в этой статье вы сделали обзор всех архитектурных стилей.

2) предположение, мнение: **to suppose, to expect, to consider, to assume, to prove, to believe, to understand, to think, etc.**

I suppose the scale model of the proposed building is amazing. Я полагаю, что масштабная модель предложенного здания восхитительна.

3) физическое восприятие и ощущение: **to watch, to see, to observe, to notice, to hear, to feel**

I feel the race to the sky only begins. Я чувствую, что гонка к небу только начинается.

4) знание, осведомленность о чем-либо: **to note, to find, to claim, to state**

We found the construction to be dangerous for living. Мы посчитали, что конструкция опасна для жилья.

5) принуждение, разрешение, запрет: **to make, to cause, to force, to allow, to permit, to order, to command, to enable**

The architect made the builders be more careful at the site. Архитектор заставил рабочих **быть** осторожнее на строительной площадке.

После этого типа глаголов объектный инфинитив не переводится развернутым придаточным предложением.

## Субъектный инфинитивный оборот

Конструкция, выраженная существительным в общем падеже или местоимением в именительном падеже с инфинитивом, переводится на русский язык придаточным предложением. Сравните сложноподчиненное предложение и предложение, имеющее субъектный инфинитивный оборот.

1                    2 → 3    →

**It is said** that they live in St. Petersburg.

2   1    →   3            →

They **are said** to live in St. Petersburg.

Сказуемое английского предложения (are said) при переводе на русский язык преобразуется в сказуемое главного предложения. They становится подлежащим русского предложения, а инфинитив to live - его сказуемым. Придаточное предложение в русском переводится союзом **что**. Субъектный инфинитивный оборот употребляется с глаголами, обозначающими утверждение, знание, физическое восприятие, просьбу, приказание, которые могут стоять в любом времени в страдательном залоге.

**To say, to know, to think, to report, to suppose, to expect, to consider, to assume, to believe, to see, to hear**

He is known to design the cathedral and some 50 parish churches as well as libraries, hospitals and royal residence in England.

Субъектный инфинитивный оборот употребляется также с непереходными глаголами, которые могут стоять в действительном залоге.

**To seem, to appear, to prove, to turn out, to happen etc.**

In the crypt of St. Paul's cathedral there appears to be a tombstone with the inscription (translated from the Latin): "Reader, if you wish to see my monument, look around you".

**10. Translate the sentences containing Complex Object and Complex Subject into Russian.**

1) The elevators seemed to take forever to get to your floor.

-----

2) Starrett had trucks dump the bricks down on a chute.

-----

3) The Empire State Building was expected to have 15 000 people in the building.

-----

4) The elevator had to stop at every floor to let the passengers get in and out.

-----

5) The structure appears to be standing on stilts.

-----

6) The history of architecture may almost be said to be the history of stone work.

-----

7) Water supply is likely to be interrupted by accidents.

-----

8) South wall panels are calculated to minimize solar energy.

-----

9) Architects expect the building columns outside the lobby to be exposed to view from the street.

-----

**11. Translate the sentences containing Complex Object and Complex Subject into English.**

1) Кристофер Рен считается выдающимся ученым и архитектором.

-----

2) Известно, что Чарльз II назначил Кристофера Рена главным архитектором Англии.

-----

3) Считается, что Кристофер Рен не использовал принципы теоретической механики при проектировании зданий.

-----

4) К. Рен считал, что орнамент в архитектуре является лишним.

-----

5) Казалось, что научная революция 17 века стала слиянием теоретических принципов механики и архитектуры.

-----

6) Архитекторы считают, что собор Святого Павла и Шелдонский Театр отражают наиболее важные архитектурные решения Кристофера Рена.

-----

7) Известно, что деревянные балки, поддерживающие потолок, являются новыми структурными элементами того времени.

-----

**SPEAKING**

**14. Make up a short summary of the text (5-6 sentences).**

**15. Make a presentation about one of the architectural miracles in the world.**

**EXTRA TEXTS FOR HOME READING**

**Text 1**

**The empire State Building**

The construction of the Empire State Building was a model of efficiency. A railway was built at the construction site to move materials quickly. Since each railway car (a car pushed by people) held 8 times more than a wheelbarrow, the materials were moved with less effort.

The builders created various innovations that saved time, money and manpower. Instead of having the 10 million bricks needed for construction dumped in the street as was usual for construction, Starrett had trucks to dump the bricks down a chute led to a hopper (a container that tapers at the bottom for controlled release of its contents) in the basement. When needed, the bricks would be released from the

hopper, thus dropped into carts which were hoisted up to the appropriate floor. This process eliminated the need to close down streets for brick storage as well as eliminated much back-breaking labor of moving the bricks from the pile to the brick layer via wheel barrows.

While the outside of the building was being constructed, electricians and plumbers began installing the internal necessities of the building. Timing for each trade to start working was finally tuned.

Have you ever stood waiting in a ten or even a six story building for an elevator that seemed to take forever? Or have you ever gotten into an elevator and it took forever to get to your floor because the elevator had to stop at every floor to let someone on or off? The Empire State Building was going to have 102 floors and expected to have 15 000 people in the building. How would people get to the top floors without waiting hours for the elevator or climbing the stairs?

To help with the problem, the architects created seven banks of elevators, with each servicing a portion of the floors. For instance, bank A serviced the third through the seventh floors while bank B serviced the seventh through the eighteenth floors. This way, if you needed to get to the 65th floor, for example, you could take an elevator from bank F and only have possible stops from the 55<sup>th</sup> floor to 67<sup>th</sup> floor, rather than the first floor to the 102<sup>nd</sup>.

Making elevators faster was another solution. The Otis Elevator Company installed 58 passenger elevators and 8 service elevators in the Empire State Building. Though these elevators could travel up to 1200 feet per minute, the building code restricted the speed to only 700 feet per minute based on older models of escalators. The builders took a chance, installed the faster (and more expensive) elevators (running them at the slower speed) and hoped that the building code will soon change. A month after the Empire State Building was completed the lift running was speeded up.

The entire Empire State Building was constructed in just one year and 45 days – an amazing feat! The Empire State Building came in on time and under the budget. Because the Great Depression significantly lowered labor costs, the cost of the building was only \$ 40 948 900 (below the \$50 million expected price tag).

The Empire State Building officially opened on May,1, 1931 to a lot of fanfare. A ribbon was cut, Mayor Jimmy Walker gave a speech and the president Herbert Hoover lit up the tower with a push of a button (symbolically pushed at a specific time in Washington, D.C.)

The Empire State Building was now the tallest building in the world and would keep that record until the completion of the World Trade Center in New York in 1972.

Ever since it was built, the Empire State Building has captured the attention of young and old alike: every year, millions of tourists flock to the Empire State Building to get a glimpse from the 86<sup>th</sup> and 102<sup>nd</sup> floor observatories; the image of the Empire State Building has appeared in hundreds of ads and movies (who can forget King Kong's climb to the top or the romantic meeting in An Affair to Remember or

Sleepless in Seattle); not to mention the countless toys, models, postcards, ash trays, thimbles, etc. that bear the image if not the shape of the towering Art Deco building.

Yet, why does the Empire State Building appeal to so many? When the Empire State Building opened on May, 1, 1931, it was the tallest building in the world – standing at 1250 feet tall. This building not only became an icon of New York City, it became a symbol of the twentieth century man's attempts to achieve the impossible.

How did this gigantic icon get build? It started with a race to the sky.

When the Eifel Tower (984 feet) was built in 1889 in Paris it, in a way, taunted American architects to build something taller. By the early twentieth century, a skyscraper race was on. By 1909 the Metropolitan Life Tower rose 700 feet (50 stories), quickly followed by the Bank of Manhattan Building in 1929 at 927 feet (71 stories).

When John Jacob Raskob (previously a vice president of General Motors) decided to join in the skyscraper race, Walter Chrysler (founder of the Chrysler Corporation) was constructing a monumental building, the height of which he was keeping secret until the building's completion. Not knowing exactly what height he had to beat, Raskob started construction on his own building.

In 1929, Raskob and his partners bought a parcel of property at 34<sup>th</sup> Street and Fifth Avenue for their new skyscraper. On this property sat the glamorous Waldorf – Astoria Hotel. Since the property on which the hotel was located had become extremely valuable, the owners of the Waldorf–Astoria Hotel decided to sell the property and build a new hotel on Park Avenue (between 49<sup>th</sup> and 50<sup>th</sup> streets). Raskob was able to purchase the site for approximately \$16 million.

## **Text 2**

### **The top ten tallest buildings**

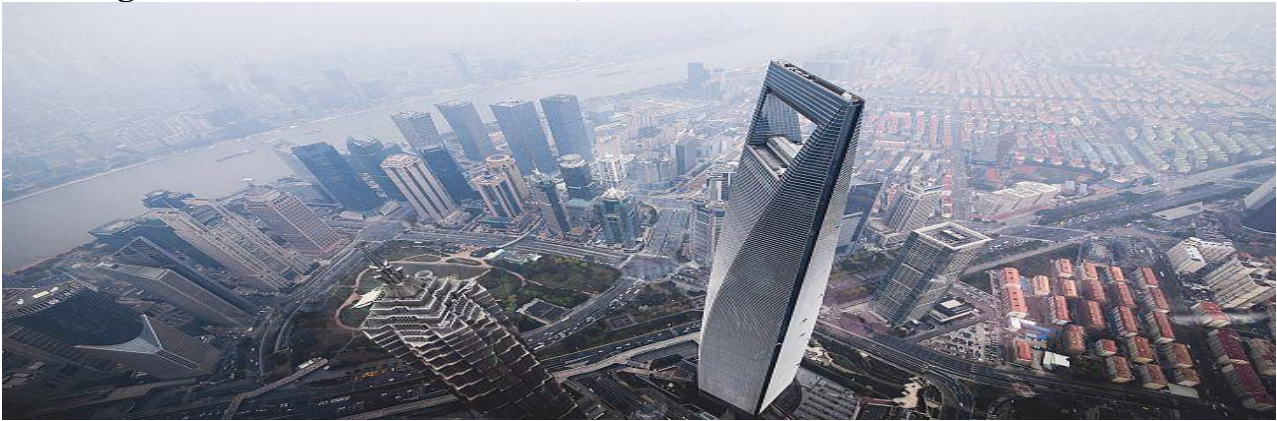
The top ten tallest buildings worldwide according to data from the Council on Tall Buildings and Urban Habitat are listed herein. The organization only measures the highest points of these buildings, regardless of non-architectural and architectural extensions. This highest point measure assists in determining air traffic obstruction. It also includes extensions that can be added, modified or removed from these buildings. The expansion of towns and cities has increased the rate of such tall buildings construction in the world due to land scarcity, and there seems to be a great deal of competition within and between cities, regions and countries alike in the construction of the tallest structures and most complex geometries for recognition. These skyscrapers' locations, building functions, and the materials used to build are also changing with time. North America used to have 75 percent of the tallest buildings 20 years ago, but this has shifted to Asia and Middle East. The cost of construction of these superstructures has also risen due to the complexity of the engineering approaches necessary to take them higher and higher.

## 10. International Commerce Centre, Hong Kong - 1588 Feet



The International Commerce Centre, located in Hong Kong, houses 108 floors. It was completed in 2010. At that time, it was the fourth tallest skyscraper in the world although its position has now changed. That's a home to the world's highest swimming pool and a bar on the 108th floor of the building. Also in the building there is an observation deck, a shopping mall, and five star restaurants.

## 9. Shanghai World Financial Centre, China - 1614 feet



The Shanghai World Financial Centre was completed in 2008, and has a height of 1,614 feet with 101 floors. It is located in Shanghai's skyscraper-laden Pudong district and acts as an international finance and trade center. It is home to hotel rooms, offices, conferences, observation decks and shopping malls. Its tower has a trapezoid aperture towards the peak and has an air controlling feature called Variable Air Volume (VAV), and it is designed with a diagonal frame to mitigate bending and compressive forces from people inside the building, the wind, and heavy equipment on the ground alike. The design of the skyscraper has been very positively received by critics.

## 8. Taipei 101, Taiwan - 1667 feet



Standing at 1667 feet tall, the 101-floored Taipei 101 is located in Taipei City. The structure is best known for having once held the position of world's tallest building after its construction in 2004, as well as for having a unique blue-green glass curtain tint. The building was designed and constructed by C. Y. Lee & Partners and KTRT Joint Venture and has the flexibility and strength to withstand earthquake tremors and typhoon winds. This structure has also been awarded by the Leadership in Energy and Environmental Design (LEED). It is an example of postmodern architecture.

### **7. CTF Finance Centre, China - 1739 feet**



Located in the city of Guangzhou in southern China, the CTF Finance Centre is a mixed-use skyscraper that is a new addition to this list. It was completed in October 2016. It is notably home to one of the fastest elevators found in the world, which reaches speeds of 44.7 miles per hour. There are 111 floors in total. A shopping mall exists in the building, with the parking spots. The building is also home to offices, although the highest sixteen floors are also home to a hotel with a total of 251 rooms, although it is not yet open.

### **6. World Trade Center, United States - 1776 feet**



Standing at 1,776 feet tall and 104 stories, World Trade Center is not only the tallest building in the city of New York City, and the United States, but also the entire Western Hemisphere. It was completed in 2014. It was built to act as a functional building commemorative to the 9/11 attacks, and was given the name of the North Tower of the original World Trade Center. The building has been noted for its renewable energy features, including the reuse of rainwater. Future plans for the World Trade Center include the construction of five high-rise office buildings, as well as the National September 11 Memorial and Museum.

#### **6. Lotte World Tower, South Korea – 1819 feet**



The Lotte World Tower, found in South Korea, is one of the newest additions to this list, as its construction finished recently in March of 2016, giving it the status of the fifth tallest building in the world. 13 years of planning went into the preparation the Lotte World Tower's construction, which began in March 2011. The building features 123 floors, six of which are underground. It is designed to withstand earthquakes with a magnitude of up to 9 on the Richter scale.

#### **4. Pang An International Finance Center, China – 1965 feet**



The Pang An International Center in Shenzhen is 1965 feet high and is one of the most recent entries on this list. Although the skyscraper is officially topped off in 2015, construction is still ongoing and is expected to be completed in 2017. The building features a conference center, hotel, and rental spaces within a high-end shopping mall. The building uses a total of 33 double decker elevators to access its 115 floors. Originally, the building design called for the inclusion of an antenna, although this plan was eventually called off cutting concerns of flight interference.

#### **12. Makkah Royal Clock Tower, Saudi Arabia – 1972 feet**



Also referred to as Abraj Al Baitis, the Makkah Royal Clock Tower is the third tallest building in the world at 1,972 feet tall. It is located in Saudi Arabian city of Mecca and is government-owned. It features a hotel with 120 floors, and was constructed by the Saudi Binladin Group, which is the largest construction firm in Saudi Arabia. Completed in the year 2012, the German architecture firm SL Rasch GmbH and the Mahmoud firm co-designed the clock tower. The clock dimensions have an area of 141 square feet, making it the largest worldwide. Besides hotel rooms, the tower features a conference center, an Islamic Museum, a prayer room that can be used by 10,000 people, a Lunar Observation Centre for watching the moon during the Holy Month, and a shopping mall with five stories. There are 21,000 green and white lights located on the top of the clock and signalize prayer times. These lights can be seen up to 19 miles away

## **2. Shanghai Tower, China – 2,073 feet**



The Shanghai Tower, with 121 floors that stand 2,073 feet tall, is the second tallest building in the world. The construction of Shanghai Tower began in 2006 and took eight years of work before its completion in March of 2014. It is home to the world's highest observation deck. The total cost of the building was \$4.2 billion. The tower is located in Shanghai's Lujiazui financial district, and even towers over the other two world-renowned skyscrapers in Shanghai: Jin Mao Tower and the Shanghai World Financial Centre. This building was designed to serve as a hotel and office by the American architectural company Gensler. It has a total of 1,100 parking spaces and 320 hotel rooms. The structure has a fascinating view of the unique Shanghai skyline.

## 1. Burj Khalifa, United Arab Emirates – 2717 feet



The Burj Khalifa, originally known as the Burj Dubai, towers above the city's already burgeoning skyline. It has 163 floors and a height of 2,717 feet tall, and is the tallest building in the world. Primarily constructed from steel and concrete, the building is the design by Owings, Skidmore and Merrill of Chicago, who were also responsible for the design of famous skyscrapers such as Willis Tower and One World Trade Center. The South Korean company Samsung C&T carried out the engineering and construction of the structure, which was completed in the year 2010. The building was a project by the United Arab Emirates' government to shift the country's economy from solely oil-based to a more tourism- and service-based nation. The building has 30,000 residences, 19 residential towers, a man-made lake which occupies 30 acres, parkland which occupies seven acres, nine hotels, and a shopping mall. This superstructure has given the United Arab Emirates international recognition, in addition to receiving praise from critics for its sleek design.

### Text 3

Just as modern art developed from the repudiation of the historical styles of the 19<sup>th</sup> century, so the canons of modern architecture lay in a conscious break with the past. In place of the stylistic traditions inherited from the Renaissance, modern architecture embraced geometric forms and reference both to the classical orders of architecture and to the arches and vaults that formed part of the vocabulary of architecture developed by the Greeks and Romans.

However, the development of modern architecture was driven not only by new aesthetic principles. The easy availability of materials such as concrete, iron, steel, and glass freed architecture from the restrictions of building in stone, wood, and masonry; moreover, a new sense of space was allied to the search for a new kind of architecture to meet the needs of life in the 20<sup>th</sup> century.

Modern architecture, prefigured by a number of efforts at various centers during the mid-to-late 19<sup>th</sup> century, was pioneered by Frank Lloyd Wright in the United States, and then established in Europe, before and after the World War. As a result of the International Exhibition of Modern Architecture held at the Museum of Modern Art, New York, 1932, the term International Style was coined to describe this new wave.

The austere purism of International Style became diffuse, and by the 1980 architectural theory and practice had ceased to follow modernist orthodoxy.

## UNIT 6. THE ARCHITECTURE OF CHRISTOPHER WREN

### PHONETIC REVIEW

#### 1. Read the words paying attention to the rules of reading.

Pan, pane, tap, tape, red, rede, them, theme, miss, mice, shin, shine, rob, robe, dot, dote, tub, tube, duck, duke, pad, pat, bad, bat, fan, fat, tell, tent, kid, grin, wig. Pym, Bake, pale, eke, globe, we, sweep, side, style, hole, robe, yoke, duke, sod, yon, hot, nun, hug, ruff, fume, tube, be, go, my, K, gulf, sham, shame, dense, solve, aid, hail, shut, smash, chip, chain, waist, bay, day, by, chop, chest, ship, shelf, shape, C, D, fish, chip, pea, sea, tea, beach, spring, lung, die, lie, bye, join, job, tea, tree, beech, jest, thin, freeze, this, that, these, those, foe, pie, cease, lymph, nymph, cab, cup, fact, fat, fatal, vat, vacant, back, bake, neck, yes, yet, agent, back, bacon, yell, typist, tax, sex, famous, final, cell, cent, ceiling, prince, dunce, silent, as, has, pilot, match, mate, fetch, fate, crutch, gent, gin, total, badge, open, bridge, moment, mob, pig, page, red, rage, sell, shell, human, pet, pete, student, stud, fill, file, lack, lace, music, land, mice, lake, back, bake, bike, flag, act, jade, cage, cup, yale, slab, guide, guest, shot, cap, value, due; Bare, care, chair, hair, fair, mare, pair, dare, square, rare, hare, Here, mere, near, fear, beer, cheer, dear. Fire, briar, mire, tire, liar, byre, lyre, tyre, dire. More, shore, board, roar, horse. Cure, mure, pure, lure. Fare, fair, hare, hair, here, hear, dear, deer, tire, tyre, boar, bore, sore, soar.

Bar, far, jar, star, hard, farm, harsh, starve. Her, verb, serve, bird, skirt, shirt, herb, fern, berth, germ, verse, serve. Fir, sir, birch, girl, first, third. For, nor, sort, short, lord, horse. Urn, turn, nurse, burn, perfect, fur, furl, burn, hurt, curve, purse. Word, worm, work, world, worker, farmer, former, furnish, varnish. Earl, learn, early, earth, heard.

Bar, bare, car, care, her, here, per, peer, fir, fire, sir, sire, or, ore, for, fore, cur, cure.

#### 2. Read the tongue-twisters paying attention to the rules of reading.

- 1) How many cookies could a good cook cook,  
If a good cook could cook cookies?  
A good cook could cook as many cookies  
As a good cook who could cook cookies.
- 2) Stu chews shoes, should Stu choose the shoes he chews?
- 3) Seventy seven benevolent elephants harder than it seems
- 4) There those thousand thinkers were thinking how did the other three thieves go through.
- 5) Santa's Short Suit Shrunk name of a children's book
- 6) I was born on a pirate ship Hold your tongue while saying it.
- 7) I scream, you scream, we all scream for ice-cream!
- 8) Wayne went to Wales to watch walruses.

## VOCABULARY

### 3. Transform the following adjectives into adverbs using suffix **ly**.

free, possible, deep, safe, easy, simple, high, complete, great, comfortable, hard, similar, usual, ordinary, essential, gradual, new, correct, loud, partial, wide, beautiful

### 4. Transform the following nouns into adjectives using suffix **ic**.

cube, atmosphere, history, metal, base, symbol, majesty, strategy, class, economy

### 5. Translate the following sentences paying attention to the underlined words.

1) The west side of the area is planned as the chief shopping and business centre.

-----

2) As towns grows, its center also swells and pushes out the other quarters of the town.

-----

3) The composition of the street as a whole was depended for its unity on many factors.

-----

4) Some park districts use paved areas such as concrete, asphalt and limestone.

-----

5) When you design, you don't feel like you are the most important designer in the world, you feel like you don't know anything.

-----

6) As I don't want to make something that has already been made. I need to be ahead.

-----

7) Everything in the modern house shines like the sun.

-----

### 6. Work in pairs. Match the pictures with the famous buildings of Christopher Wren. Use the Internet to find the necessary information.

1



2



3



4

5

6

1) St Stephen Walbrook is a church in the City of London, part of the Church of England's Diocese of London. The present domed building was erected to the designs of Sir Christopher Wren following the destruction of its medieval predecessor in the Great Fire of London in 1666. It is located in Walbrook, next to the Mansion House, and near to Bank and Monument Underground stations. The present building was constructed in 1672-9 to a design by Sir Christopher Wren, at a cost of £7,692. It is rectangular in plan, with a dome and an attached north west tower.

2) St Paul's Cathedral, London, is a Church of England cathedral and seat of the Bishop of London. Its dedication to Paul the Apostle dates back to the original church on this site, founded in AD 604. St Paul's sits at the top of Ludgate Hill, the highest point in the City of London, and is the mother church of the Diocese of London. The present church dating from the late 17th century was built to an English Baroque design of Sir Christopher Wren, as part of a major rebuilding program which took place in the city after the Great Fire of London, and was completed within his lifetime. The cathedral is one of the most famous and most recognizable sights of London, with its dome, framed by the spires of Wren's City churches, dominating the skyline for 300 years. At 365 feet (111 m) high, it was the tallest building in London from 1710 to 1962, and its dome is also among the highest in the world.

3) Greenwich Hospital was a permanent home for retired sailors of the Royal Navy, which operated from 1692 to 1869. Its buildings were later used by the Royal Naval College, Greenwich and the University of Greenwich, and are now known as the Old Royal Naval College. The word "hospital" was used in its original sense of a place providing hospitality for those in need of it.

- 4) The College Library is based over two floors and a gallery. It was designed by Christopher Wren in 1676 and completed in 1695. The library is a single large room built over an open colonnade on the ground floor of Nevile's Court.
- 5) The Sheldonian Theatre, located in Oxford, England, was built from 1664 to 1669 after a design by Christopher Wren for the University of Oxford. The building is named after Gilbert Sheldon, chancellor of the University at the time and the project's main financial backer. It is used for music concerts, lectures and University ceremonies, but not for drama until 2015 when the Christ Church Dramatic Society staged a production of *The Crucible*.
- 6) St. Nicholas Cole Abbey is a church in the City of London located on what is now Queen Victoria Street. Recorded from the twelfth century, the church was destroyed in the Great Fire of London in 1666 and rebuilt by the office of Sir Christopher Wren.

## READING

7. **What are the most famous places of interest in London you know about?**
8. **Skim the text and explain why Christopher Wren is considered to be one of the greatest architects in the world.**

### **The architecture of Christopher Wren**

He was a prominent man of science and renowned architect at the height of the Scientific Revolution, but he did not exploit principles of theoretical mechanics in designing his buildings.

In the crypt of St. Paul's cathedral in London is a tombstone with the inscription (translated from the Latin): "Reader, if you wish to see my monument, look around you". The epitaph marks the tomb of Sir Christopher Wren who designed the cathedral and some 50 churches as well as libraries, hospitals and royal residence in England. Wren was also one of Britain's most renowned men of science in the era of Isaac Newton, Robert Hook and Robert Boyle.

Wren's dual eminence in architecture and science stemmed from a paradoxical career. Although Wren was a professor of astronomy, Charles II appointed him the chief architect of England. He achieved his scientific reputation (and the presidency of the Royal Society) in spite of having published almost nothing. As an architectural theorist he repudiated exposed buttresses. Yet, in St. Paul's he employed them freely. He called for the application of statics to building, but the principles of applied mechanics he recommended were incorrect; indeed, their application would have resulted in structural failure. He often objected to useless ornamentation in architecture. Nevertheless, his most impressive technical accomplishment – the brick cone that carries the lantern, the bell and the cross of St. Paul's is hidden by an ornamental shell that has no structural purpose.

What is, perhaps, the most perplexing about Wren's career is the elusiveness of demonstrable connections between his science and his architecture. Because Wren

worked at the peak of the Scientific Revolution, in the second half of the 17<sup>th</sup> century, it has sometimes been assumed that he employed principles of theoretical mechanics in designing his buildings. Indeed, the Scientific Revolution seemed to promise a merger of the science of mechanics and the art of building. In 1624 Henry Wotton, the British ambassador to Venice, published a book on architecture in which he analyzed the structure of a stone arch. Moreover, in the 17<sup>th</sup> century there were people who would now be called scientists who were awarded the commissions to design and build monumental structures. In Turin, Guarino Guarini, a mathematician, devised the plans for such celebrated buildings as the church of St. Lorenzo, the Sindone chapel and the Palazzo Carignano. In Paris, Claude Perrault, a physician and an anatomist, designed the façade of the Louver and the observatory of the French Academy. In London it was Wren and Hook who collaborated as the chief architect and the city surveyor after the city was devastated by the Great Fire of 1666.

Wren was born on October, 20, 1632, in East Knoyle in Wiltshire. At an early age he was exposed to ecclesiastical tradition, a circumstance that would later influence his architecture. His father became a dean of Winsor and an uncle was a bishop of Ely. At the university of Oxford, which Wren entered in 1649, his college warden was John Wilkins, who later became a bishop of Chester. In his youth Wren also took an interest in mechanical contrivances and instruments. At Oxford he prepared an exhibition of some 50 devices, almost all of them of a practical nature, including “New designs tending to strength, convenience and beauty in building. It was at Oxford that he also began to show the mathematical ability for which Newton would praise him.

In 1657, when Wren was 25, he became a professor of astronomy at Gresham College in London, and four years later he was elected Savilian professor of astronomy at Oxford, a chair he held until 1673. Wren’s experience in architecture spanned almost 50 years. It began in 1662, when he was commissioned to design the Sheldonian Theater at Oxford, and it ended in about 1710, with the completion of St. Paul’s Cathedral. These two buildings are thought to include his most impressive solutions to engineering problems, and they exhibit two chief characteristics of his approach to architecture. The first characteristic is his reliance on classical sources, which resulted in a conservative architectural style and generally massive structures. In extreme cases, such as in parts of St. Paul’s Cathedral, the structure is so excessively heavy that it diminishes the integrity and durability of the building fabric.

The other characteristic of Wren’s design is his predilection for novel structural elements. It is these elements that have contributed to the belief that Wren’s architecture is substantially in debt to his science.

In the Sheldonian Theater the novel structural elements were timber trusses supporting the ceiling above the auditorium. In St Paul’s Cathedral, which is Wren’s most admired building, the innovative element was the dome composed of three concentric shells. Thus, these two buildings provide the subject matter for a study of the relation between Wren’s science and his architecture.

**9. Match the words with their definitions.**

crypt	неудача
epitaph	церковный
eminence	часовня
stem from	величина
to repudiate	происходить от
buttresses	приходская церковь
exposed	обстоятельства
elusiveness	отказываться
accomplishment	конус
cone	куполообразный
domical	посол
ambassador	опоры, столбы
to devastate	незащищенный
circumstances	епископ
bishop	слабое проявление
warden	достижение
contrivance	разорять
dean	изобретение
parish church	декан
cathedral	ректор
application	собор
failure	получить полномочия
to employ	слияние
to devise a plan	склонность
to collaborate	хвала
celebrated	сотрудничать
to be exposed to	применение
praise	подвергаться влиянию
to hold the chair	уменьшать
to diminish	знаменитый
predilection	заведовать кафедрой
merger	разработать план
to award commissions	применить
nevertheless	хотя
moreover	тем не менее
although	в действительности
perhaps	также как
indeed	возможно, вероятно
in spite of	более того
as well as	несмотря на

**10. Answer the following questions to the text.**

- 1) What's the name of Christopher Wren associated with in the minds of people?
- 2) What epitaph can be read on Wren's tombstone in the crypt of St. Paul's Cathedral? How can you explain its meaning?
- 3) Why do we say that Wren's career was paradoxical?
- 4) What did Wren call for in building?
- 5) What people were awarded the commissions to design and build monumental buildings of that time?
- 6) Was Wren the only eminent person who combined the art of architecture and scientific knowledge? What other outstanding architects are mentioned in the text?
- 7) Who made an impact on Wren's career?
- 8) What circumstances predetermined his interest in architecture?
- 9) What two buildings exhibit his architectural approach?
- 10) Could you name two characteristics of his approach to architecture?
- 11) What are the innovative elements that Wren used in the Sheldonian Theater and St. Paul's Cathedral?

**GRAMMAR REVIEW**

Предлог – это служебная часть речи, отражающая пространственные, временные, причинные или другие виды отношений между двумя значимыми словами. Предлоги в английском языке являются служебной частью речи и как следствие не могут употребляться самостоятельно и изменяться. Кроме простой формы, предлоги в английском языке могут иметь производную форму, т.е. происходить от слов других частей речи (concerning, including), сложную форму и включать в себя несколько компонентов (within, without) или даже представлять собой словосочетание. В этом случае следует говорить о составных предлогах (because of, instead of, by virtue of). При этом ни один из элементов составного предлога нельзя расширить, сократить или изменить

**Производные предлоги**

- 1) barring - исключая, за исключением, кроме
- 2) concerning - относительно
- 3) considering - учитывая, принимая во внимание
- 4) depending - в зависимости
- 5) during - в течение, в продолжение, во время
- 6) granted - при условии
- 7) excepting - за исключением, исключая
- 8) excluding - за исключением
- 9) failing - за неимением, в случае отсутствия
- 10) following - после, вслед за
- 11) including - включая, в том числе
- 12) past - за, после, мимо, сверх, выше
- 13) pending - в продолжение, в течение, до, вплоть
- 14) regarding - относительно, касательно

### **Сложные предлоги**

- 1) alongside - около, рядом, у
- 2) within - внутри, внутрь, в пределах, не далее, не позднее чем
- 3) outside - вне, за пределами, за исключением
- 4) upon - на, у, после, в
- 5) onto на, в
- 6) throughout - через, по всей площади, длине, на всем протяжении
- 7) wherewith - чем, посредством которого

### **Составные**

- 8) according to - согласно
- 9) ahead of - до, в преддверии
- 10) apart from - несмотря на, невзирая на
- 11) as far as - до
- 12) as for - что касается
- 13) as of - с начиная с; на день, на дату; на момент, от - (такого-то числа)
- 14) as per - согласно
- 15) as regards - что касается, в отношении
- 16) aside from - помимо, за исключением
- 17) as well as - кроме, наряду
- 18) away from - от, в отсутствие
- 19) because of - из-за
- 20) by force of - в силу
- 21) by means of - посредством
- 22) by virtue of - в силу, на основании
- 23) close to - рядом с
- 24) contrary to - против, вопреки
- 25) due to - благодаря, в силу, из-за
- 26) except for - кроме
- 27) far from - далеко не
- 28) for the sake of - ради
- 29) in accordance with - в соответствии с
- 30) in addition to - в дополнение, кроме
- 31) in case of - в случае
- 32) in connection with - в связи с
- 33) in consequence of - вследствие, в результате
- 34) in front of - впереди
- 35) in spite of - несмотря на
- 36) in the back of - сзади, позади
- 37) in the course of - в течение
- 38) in the event of - в случае, если
- 39) in the middle of - посередине
- 40) in to (into) - в, на
- 41) inside of - за (какое-л время), в течение
- 42) instead of вместо

- 43) in view of - ввиду
- 44) near to - рядом, поблизости
- 45) next to - рядом, поблизости
- 46) on account of - по причине, из-за, вследствие
- 47) on to (onto) - на
- 48) on top of - на вершине, наверху
- 49) opposite to - против
- 50) out of - из, изнутри, снаружи, за пределами
- 51) outside of - вне, помимо
- 52) owing to - из-за, благодаря
- 53) thanks to - благодаря
- 54) up to - вплоть до, на уровне
- 55) with regard to - относительно, по отношению
- 56) with respect to - относительно, по отношению

**11. Translate the following sentences into Russian.**

- 1) By means of this device we can do the research in time.  
-----
- 2) The building is being done according to the schedule.  
-----
- 3) In order to protect the surface from weathering it is covered with special substance.  
-----
- 4) Due to the special chutes the bricks were dumped in the basement.  
-----
- 5) The monument was restored in spite of many difficulties.  
-----
- 6) There is a high building in front of the park.  
-----
- 7) Owing to his works not only was the problem solved but a wholly new approach evolved.  
-----
- 8) In addition to the usual methods of building they made use of the new approach.  
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**12. Translate the following sentences into Russian.**

- 1) Несмотря на сложные условия, строительство удалось закончить в срок.  
-----
- 2) Благодаря его знаниям и таланту, человечество имеет возможность восхищаться его величайшими архитектурными творениями.  
-----
- 3) Для того чтобы закончить работу в срок, работа была распланирована поминутно.  
-----
- 4) Вместо того чтобы использовать традиционные методы, архитектор применил совершенно новый подход к строительству.

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## **SPEAKING**

- 16. Make up a short summary of the text (5-6 sentences).**
- 17. Make a presentation about one of the churches designed by Christopher Wren.**

## **EXTRA TEXTS FOR HOME READING**

### **Text 1**

Wren based his design for the Sheldonian Theater on the Roman theater of Marcellus as it was depicted in the 16<sup>th</sup> century by Sebastiano Serlio, a Bolognese painter and architect. The Roman prototype had the shape of a horseshoe and was open at the top, covered only by a canvas awning. Wren's design was a polygonal approximation to the shape of the Roman theatre and had a permanent roof. Wren also provided for multiple uses of the building: the basement had to house the presses of the university and the attic had to store books printed there.

The design was notable mainly as a departure from the Gothic tradition of the building at Oxford. Although biographers of Wren have generally found that the design lacks the quality of his mature style, they have admired the flat auditorium ceiling constructed without supporting columns. Support for the ceiling is provided by the heavy trusses concealed in the attic. The originality of employing a truss to create a long, unobstructed ceiling can be judged from the fact that in 1663 Wren displayed a model of the theater at the Royal Society. The structure of the truss, however, is disappointing. The truss bears a greater resemblance to a medieval truss than it does to the more efficient triangulated truss, which minimizes bending forces. The Venetian architect Andrea Palladio had described the role of the triangulated truss in bridge construction in "The Four Books of Architecture", published in 1570. Wren had an access to Palladio's work, and so we have concluded that either he didn't appreciate the greater efficiency of the triangulated form or he did not make the connection between the structure of bridges and the structure of buildings.

We found, however, that the deficiency of Wren's design would not result in severe distress under normal loading. The original trusses were replaced in 1802, so that perhaps the weight of the stored books was greater than anticipated.

The Great Fire of 1666 had two salutary consequences. It halted the plague that had been sweeping through London and it gave Wren an opportunity to deploy his genius as an architect. One of the most pressing needs was the rebuilding of the parish churches, which had formed the backbone of the social and spiritual life of the city. Within days Wren developed a plan for reconstructing London. Although his plan was not adopted, he was soon appointed the principal architect for the rebuilding of the city. In that capacity, and later as a surveyor, he attended to the reconstruction of the parish churches, which constitute a major part of his architectural legacy. At the same time Wren directed much of his interest to the prospect of rebuilding St. Paul's Cathedral, which had been heavily damaged in the fire.

## Text 2

### St Paul's Cathedral



St Paul's Cathedral, London, is an Anglican cathedral, the seat of the Bishop of London. It sits on Ludgate Hill at the highest point of the City of London. Its dedication to Paul the Apostle dates back to the original church on this site, founded in AD 604. The present cathedral, dating from the late 17th century, was designed in the English Baroque style by Sir Christopher Wren. Its construction, completed in Wren's lifetime, was part of a major rebuilding program in the City after the Great Fire of London.

The cathedral is one of the most famous and most recognisable sights of London. Its dome, framed by the spires of Wren's City churches, has dominated the skyline for over 300 years. At 365 feet (111 m) high, it was the tallest building in London from 1710 to 1967. The dome is among the highest in the world. St Paul's is the second-largest church building in area in the United Kingdom after Liverpool Cathedral.

St Paul's Cathedral occupies a significant place in the national identity. Services held at St Paul's have included the funerals of Admiral Nelson, the Duke of Wellington, Sir Winston Churchill and Baroness Thatcher; jubilee celebrations for Queen Victoria; peace services marking the end of the First and Second World Wars; the wedding of Charles, Prince of Wales and Lady Diana Spencer; the launch of the Festival of Britain; and the thanksgiving services for the Silver, Golden and Diamond Jubilees and the 80th and 90th birthdays of Elizabeth II. St Paul's Cathedral is a working church with hourly prayer and daily services. The tourist entry fee at the door is £18 for adults, but no charge is made to worshippers.

The present structure of St Peter upon Cornhill was designed by Christopher Wren following the Great Fire in 1666 but it stands upon the highest point in the area of old Londinium and medieval legends tie it to the city's earliest Christian community. In 1995, however, a large and ornate 5th century building on Tower Hill was excavated, which might have been the city's cathedral.

The task of designing a replacement structure was officially assigned to Sir Christopher Wren on 30 July 1669.[14] He had previously been put in charge of the rebuilding of churches to replace those lost in the Great Fire. More than 50 City churches are attributable to Wren. Concurrent with designing St Paul's, Wren was engaged in the production of his five Tracts on Architecture.

Wren had begun advising on the repair of the Old St Paul's in 1661, five years before the fire in 1666. The proposed work included renovations to interior and exterior to complement the classical facade designed by Inigo Jones in 1630. Wren planned to replace the dilapidated tower with a dome, using the existing structure as a scaffold. He produced a drawing of the proposed dome which shows his idea that it should span nave and aisles at the crossing. After the Fire, it was at first thought possible to retain a substantial part of the old cathedral, but ultimately the entire structure was demolished in the early 1670s.

In July 1668 Dean William Sancroft wrote to Wren that he was charged by the Archbishop of Canterbury, in agreement with the Bishops of London and Oxford, to design a new cathedral that was "handsome and noble to all the ends of it and to the reputation of the City and the nation". The design process took several years, but a design was finally settled and attached to a royal warrant, with the proviso that Wren was permitted to make any further changes that he deemed necessary. The result was the present St Paul's Cathedral, still the second largest church in Britain, with a dome proclaimed as the finest in the world. The building was financed by a tax on coal, and was completed within its architect's lifetime with many of the major contractors engaged for the duration.

The cathedral survived the Blitz although struck by bombs on 10 October 1940 and 17 April 1941. The first strike destroyed the high altar, while the second strike on the north transept left a hole in the floor above the crypt. The latter bomb is believed to have detonated in the upper interior above the north transept and the force was sufficient to shift the entire dome laterally by a small amount. On September, 12, 1940 a time-delayed bomb that had struck the cathedral was successfully defused and removed by a bomb disposal detachment of Royal Engineers under the command of Temporary Lieutenant Robert Davies. Had this bomb detonated, it would have totally destroyed the cathedral; it left a 100-foot (30 m) crater when later remotely detonated in a secure location.

### **Text 3.**

#### **Moles happy as homes go underground**

The first anybody knew about Dutchman Frank Siegmund and his family was when workmen tramping through a field found a narrow steel chimney protruding through the grass. Closer inspection revealed a chink of sky-light window among the thistles, and when amazed investigators moved down the side of the hill they came across a pine door complete with leaded diamond glass and a brass knocker set into an underground building. The Siegmunds had managed to live undetected for six years outside the border town of Breda, in Holland. They are the latest in a clutch of individualistic homemakers who have burrowed underground in search of tranquility.

Most, falling foul of strict building regulations, have been forced to dismantle their individualistic homes and return to more conventional lifestyles. But subterranean suburbia, Dutch-style, is about to become respectable and chic. Seven luxury homes cosseted away inside a high earth-covered noise embankment next to the main Tilburg city road recently went on the market for \$296,500 each. The foundations had yet to be dug, but customers queued up to buy the unusual part-submerged houses, whose back wall consists of a grassy mound and whose front is a long glass gallery.

The Dutch are not the only would-be moles. Growing numbers of Europeans are burrowing below ground to create houses, offices, discos and shopping malls. It is already proving a way of life in extreme climates; in winter months in Montreal, Canada, for instance, citizens can escape the cold in an underground complex complete with shops and even health clinics. In Tokyo builders are planning a massive underground city to be begun in the next decade, and underground shopping malls are already common in Japan, where 90 percent of the population is squeezed into 20 percent of the land space.

Building big commercial buildings underground can be a way to avoid disfiguring or threatening a beautiful or "environmentally sensitive" landscape. Indeed many of the buildings which consume most land - such as cinemas, supermarkets, theatres, warehouses or libraries - have no need to be on the surface since they do not need windows.

There are big advantages, too, when it comes to private homes. A development of 194 houses which would take up 14 hectares of land above ground would occupy 2.7 hectares below it, while the number of roads would be halved. Under several meters of earth, noise is minimal and insulation is excellent. "We get 40 to 50 enquiries a week," says Peter Carpenter, secretary of the British Earth Sheltering Association, which builds similar homes in Britain. "People see this as a way of building for the future." An underground dweller himself, Carpenter has never paid a heating bill, thanks to solar panels and natural insulation.

In Europe the obstacle has been conservative local authorities and developers who prefer to ensure quick sales with conventional mass produced housing. But the Dutch development was greeted with undisguised relief by South Limburg planners because of Holland's chronic shortage of land. It was the Tilburg architect Jo Hurkmans who hit on the idea of making use of noise embankments on main roads. His two-floored, four-bedroomed, two-bath roomed detached homes are now taking shape. "They are not so much below the earth as in it," he says. "All the light will come through the glass front, which runs from the second floor ceiling to the ground. Areas which do not need much natural lighting are at the back. The living accommodation is to the front so nobody notices that the back is dark."

In the US, where energy-efficient homes became popular after the oil crisis of 1973, 10,000 underground houses have been built. A terrace of five homes, Britain's first subterranean development, is underway in Nottinghamshire. Italy's outstanding example of subterranean architecture is the Olivetti residential centre in Ivrea. Commissioned by Roberto Olivetti in 1969, it comprises 82 one-bedroomed

apartments and 12 maisonettes and forms a house/ hotel for Olivetti employees. It is built into a hill and little can be seen from outside except a glass facade. Patnzia Vallecchi, a resident since 1992, says it is little different from living in a conventional apartment.

Not everyone adapts so well, and in Japan scientists at the Shimizu Corporation have developed "space creation" systems which mix light, sounds, breezes and scents to stimulate people who spend long periods below ground. Underground offices in Japan are being equipped with "virtual" windows and mirrors, while underground departments in the University of Minnesota have periscopes to reflect views and light.

But Frank Siegmund and his family love their hobbit lifestyle. Their home evolved when he dug a cool room for his bakery business in a hill he had created. During a heatwave they took to sleeping there. "We felt at peace and so close to nature," he says. "Gradually I began adding to the rooms. It sounds strange but we are so close to the earth we draw strength from its vibrations. Our children love it; not every child can boast of being watched through their playroom windows by rabbits.

## REFERENCES

1. Книга для чтения по английскому языку для инженерно-строительных и автодорожных вузов: Учебное пособие/ Составители: Синявская Е.В., Улановская Э.С. – М.: Высшая школа, 1981. – 96с.
2. Полякова Л.С., Суворова Е.В. Теория языка: уч. пособие. – Магнитогорск: Изд-во Магнитогорск. гос. техн. ун-та им. Г.И. Носова, 2015. – 54с.
3. Cotton D., Falvey D., Kent S. Market leader. New edition. Pre-intermediate English course-book. – Edinburgh, Harlow, Essex, England, 2007. – 160p.
4. Cotton D., Falvey D., Kent S. Market leader. New edition. Intermediate English course-book. – Edinburgh, Harlow, Essex, England, 2007. – 160p.

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**Суворова Елена Владимировна  
Савинова Юлия Анатольевна**

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пр. Ленина 38

ФГБОУ ВО «Магнитогорский государственный  
технический университет им. Г.И. Носова»  
Кафедра иностранных языков по техническим направлениям  
Центр электронных образовательных ресурсов и  
дистанционных образовательных технологий  
e-mail: ceor\_dot@mail.ru