Міністерство освіти і науки України

Іноземна мова за професійним спрямуванням (англійська) Методичі рекомендації до виконання практичних занять

для студентів III - IV курсу
зі спеціальності 5.06010101 «Будівництво»
напрям підготовки «Будівництво та експлуатація будівель і споруд»
денної форми навчання

Любешів – 2015

УДК

До друку _____ Голова Навчально-методичної ради Луцького НТУ.
(підпис)

Електронна копія друкованого видання передана для внесення в репозитарій Луцького НТУ _____ директор бібліотеки.
(підпис)

Затверджено Навчально –методичною радою Луцького національного технічного університету,
протокол № _____ від _____ 2014 р.

Рекомендовано до видання методичною радою Любешівського технічного коледжу Луцького НТУ,
протокол № _____ від _____ 2014 р.

Розглянуто і схвалено на засіданні циклової комісії викладачів **гуманітарного та соціалььального спрямування** Любешівського технічного коледжу Луцького НТУ,
протокол № _____ від _____ 2014 р.

Укладач: _____
(підпис)
Рецензент: _____
(підпис)

Відповідальний
за випуск: _____ Т.П. Кузьмич, методист коледжу
(підпис)

Іноземна мова за професійним спрямуванням (англійська) [Текст]: методичні вказівки до практичних занять для студентів 3та 4 курсу зі спеціальності 5.06010101 «Будівництво», денної форми навчання/ уклад. Г.В. Смоляк − Любешів: Любешівський технічний коледж Луцького НТУ, 2015. – с. 64.

Видання містить методичні вказівки до виконання практичних робіт, перелік рекомендованої літератури. Призначене для студентів напряму підготовки «Будівництво та експлуатація будівель і споруд» денної форми навчання.

ЗМІСТ

ВСТУП

Мета та завдання курсу: формувати у студентів систему знань з іноземної мови (англійської). Поновити і поглибити знання з іноземної мови, здобутих студентами у середніх навчальних закладах, дати лінгвістичну освіту, необхідну для вільного і правильного користування іноземною (англіською) мовою. Піднести рівень культури усного і писемного мовлення та збагатити знання студентів.

Практичний курс іноземної мови (англійської) покликаний формувати мовну особистість спеціаліста, здатну до розв’язання різноманітних комунікативних завданнь у всіх актуальних сферах спілкування. Тому під час такого курсу студент повинен:

- володіти іноземною мовою (англійською);
- володіти лексичними, граматичними та стилістичними нормами іноземної мови (англійської);
- користуватись правилами мовного етикету, читанням літератури зі спеціальності з метою пошуку необхідної інформації.

Методичні рекомендації складаються з восьми розділів (Units). Структура логічна, завдання лаконічні з моделями та прикладами. Кожен розділ містить тексти, об’єднані спільною тематикою, та граматичні вправи. Тематика і складність текстового та грамматичного матеріалу визначається об'ємом технічних знань, якими володіють студенти на третьому та четвертому курсах. Тексти відібрані з урахуванням їх інформативності.

Unit 1. FROM THE HISTORY OF BUILDING

Read and translate the text.

TEXT 1. FROM THE HISTORY OF BUILDING

Many thousands of years ago there were no houses such as people live in today. In hot countries people sometimes made their homes in the trees and used leaves to protect themselves from rain or sun. In colder countries they dwelt in caves. Later people left their caves and trees and began to build houses out of different materials such as mud, wood or stones.

Later people found out that bricks made of mud and dried in the hot sunshine became almost as hard as stones. In ancient Egypt especially, people learned to use these sun-dried mud bricks. Some of their buildings are still standing after several thousands of years.

The ancient Egyptians discovered how to cut stone for building purposes. They erected temples, palaces and huge tombs. The greatest tomb is the stone pyramid of Khufu, king of Egypt. The ancient Egyptians often erected their huge constructions to commemorate their kings or pharaohs.

The ancient Greeks also understood the art of building with cut stone, and their

buildings were beautiful as well as useful. They often used pillars, partly for supporting the roofs and partly for decoration. Parts of these ancient buildings can still be seen today in Greece.

Whereas the ancient Greeks tried to embody the idea of harmony and pure beauty in their buildings, the Roman architecture produces the impression of greatness, might, and practicalness.

The Romans were great bridge, harbour and road builders. In road works the Romans widely used timber piles. They also erected aqueducts, reservoirs, water tanks, etc. Some of their constructions are used till now. It is known that the manufacture of lime is one of the oldest industries used by man. Lime is a basic building material used all over the world as today so in the ancient world. One of the Romans, Marcus Porcius Cato, gave an idea of a kiln for lime, production: its shape and dimensions. They are rough cylindrical or rectangular structures, built of stone in a hillside with an arched opening at the front to enable the fire to be made and the lime to be withdrawn. Such kilns were fired with wood or coal and were extremely inefficient. There are still many remains of kilns in some places of Great Britain as well as roads and the famous Hadrian Wall, which was erected to protect the Romans from the Celtic tribes in the first century A.D. Britain was a province of the Roman Empire for about at four centuries. There are many things today in Britain to remind the people of the Romans; towns, roads, wells and the words.

By the way, Hadrian, the Roman emperor, was also the one who suggested the absolutely new for that time idea of building the Pantheon with a dome. He constructed it, and alongside with a number of other outstanding buildings such as the Colosseum and the Baths of Caracalla, it is still there in Rome. Many ancient buildings in Rome were designed by Hadrian as well as by other Roman emperors. In a period of 800 to 900 years the Romans developed concrete to the position of the main structural material in the empire.

It is surprising, therefore, that after the fall of the Empire, much of the great

knowledge should have disappeared so completely. The knowledge of how to make durable concrete has been lost for centuries, but mention was made of it in the writings of architects from time to time.

Fusion of Roman and North European traditions in construction was reflected in many ways. Buildings combined the Roman arch and the steep peaked roof of Northern Europe. Roman traditions were continued in the architectural form known as Romanesque. London Bridge, finished in 1209, took thirty-three years to build. It consisted of nineteen irregular pointed arches with its piers resting on broad foundation, which was designed to withstand the Thames current.

The Romanian period was followed by other periods each of which produced its own type of architecture and building materials. During the last hundred years many new methods of building have been discovered. One of the most recent discoveries is the usefulness of steel as a building material.

Nowadays when it is necessary to have a very tall building, the frame of it is first built in steel and then the building is completed in concrete. Concrete is an artificial kind of stone, much cheaper than brick or natural stone and much stronger than they are. The earliest findings of concrete building fragments belonging to prehistoric times were discovered in Mexico and Peru. The town walls employed it. There are evidences that ancient Greeks also used concrete in the building purposes. The use of concrete by the ancient Romans can be traced back as far as 500 B.C. They were the first to use[4] it throughout the ancient Roman Empire on a pretty large scale and many constructions made of concrete remain till nowadays thus proving the long life of buildings made of concrete. Of course, it was not the concrete people use today. It consisted of mud, clay and pure lime, which were used to hold together the roughly broken stone in foundations and walls. It was the so-called "pseudo concrete". The idea of such building material might have been borrowed from the ancient Greeks as some samples of it were found in the ruins of Pompeii.

Practice your grammar skills.

Ex. 1. Give the degrees of comparison of the following adjectives and adverbs.

narrow, high, large, big, thoroughly, little, natural, cheap, small, many, generally,
good, bad, far, easy, interesting, correct, clear, healthy, responsible, necessary, competitive, old, beautifully, serious, much.

Ex.2. Find and correct mistakes. Remember about the degrees of comparison.

1. New York is one of the large cities in the world.
2. Her qualifications are best than those of other candidates.
3. 3.1 wish we could see each other most frequently.
4. London is more biggest than Bonn.
5. I am the younger player in our team.
6. She is most tall student in the group.
7. Tennis is not as popular as football.
8. January is colder month in the year.

9. London is one of the more interesting cities I have ever seen.
10. He is the baddest student of the faculty.
11. It takes him most than ten minutes to get to the university.
12. Canberra is more than seventy years old.
13. The pretty the girl is, more attention she attracts.
14. The harder the problem, the most time one needs to settle it.
15. Sooner come, the sooner served.
16. The more you read, the most you know.
17. The most one eats, the fatter he is.

Ex. 3. Put the questions to the sentences using the conjunctions in brackets.

1. This student translates well, (who? how?)
2. His mother worked at a factory, (whose? where?)
3. She went to London yesterday, (where? when?)
4. He is the best student of our group because he works hard. (why?)
5. They will buy these books tomorrow, (what? when?)
6. I like to read newspapers, (what?)
7. We saw this film a week ago, (what? when?)
8. The teacher gave her two interesting magazines. (whom? how many? what?)

Ex.4. Answer the following alternative questions:

1. Do you want to travel by bus or by train?
2. Is it possible or impossible to bathe in the sea in winter?
3. Does the widget work well or badly?
4. Does she play tennis or volley-ball?
5. Will he go to see his friend or ring him up?
6. Shall we dance or sing songs?
7. Did he translate this or that article?
8. Did she go to the river or to the forest?

Ex.5. Finish the tag questions.

1. We have to sign this, _____?
2. Let's go home, _____?
3. You can't speak French, _____?
4. He ought to go to Moscow, _____?
5. He will meet us at the airport, _____?
6. Students have to register before the end of the first week of class,_____?
7. The clocks will all be set back an hour on the last Sunday in October at 3. 00 a.m. to take advantage of Daylight Savings Time, _____?

Additional reading.

Ex.1. Read the text.

The people of Babylonia were rich and powerful. They were also happy. They loved each other and they enjoyed working together. But one thing was lacking. Men had only the earth to enjoy. God had kept heaven for himself and his angels. The King of Babylonia decided that his people should have Heaven as well as Earth. So he ordered them to build a great tall tower. Six hundred thousand men began making bricks and mixing mortar and piling up a building higher and higher. All day every day men carried bricks and mortar up a stairway on the east side of the tower. Then they walked down another stairway on the west to get more loads. This went on for forty-two years until the Tower was twenty-seven miles high. It was so high that it took a man a whole year to carry bricks from the ground to the top. Now the Tower had risen nearly to Heaven, and God saw that he would have to do something to keep the invaders out. Perhaps if he made it hard for people to co-operate, they would not be able to finish the Tower. To carry out his plan God sent seventy angels down to Earth. The angels had orders: first to take away the one language everybody understood, then to split the people up into groups, with each group speaking a new tongue of its own. In no time the men who made bricks couldn't talk to the men who carried them. And the men who carried bricks couldn't say an understandable word to the men who laid the bricks. Everything was a mess, and everybody blamed everybody else for not understanding. People no longer talked about the Tower of Heaven. Nobody worked there any longer. And the Tower was soon ruined.

Ex.2. Answer the questions:

1. What can you say about the people of Babylonia?
2. What did the King of Babylonia decide about his people?
3. What can you say about the process of building of the Tower?
4. What did God do to prevent people’s invasion to Heaven?
5. Why wasn’t the Tower finished?

Ex.3. Do the following tasks:

- entitle the text
- guess the main idea of the text
- divide the text into some complete parts
- supply each part with a title and give the idea of it
- give the brief retelling

UNIT 2. BUILDING UNITS

Read and translate the text.

TEXT 2. BUILDING UNITS

The first houses were built for the purpose of protecting their owners from the weather and, therefore, were very simple—a roof to keep off the rain or snow, and walls to keep out the wind.

The building erected now can be divided into two broad classifications: they are either for housing or for industrial purpose. As far as the material is concerned, the building can be divided into stone (or brick), wood and concrete types. Any building should be provided with water, electricity, ventilation and heating system.

The tiers or levels which divide a building into stages or stories are called floors. These may be of timber but in stone buildings they are made of ferro-concrete details in great and small sizes.

The coverings or upper parts of buildings constructed over to keep out rain and wind and to preserve the interior from exposure to the weather, are called roofs. These should tie the walls and give strength and firmness to the construction.

Every building must be beautiful in appearance and proportional in various parts. The interior should be planned to suit the requirements of the occupants while the exterior must be simple without any excesses.

Almost everybody sees the construction of a building and follows its progress with interest. First the excavation is dug for the basement, then the foundation walls below ground level are constructed; after this the framework is erected and clothed with various finishing materials and protected by several coats of paint.

The part upon which the stability of the structure depends is the framework. It is intended for safety carrying the loads imposed. The floors, walls, roofs and other parts of the building must be carefully designed and proportioned.

Here are the main parts of a building and their functions.

Walls and bulkheads. Outer walls of manual laying can be made of bricks and natural or artificial stones of different types. The thickness of supporting walls is determined to a great extent[1] by a number of floors and should rise downwards from floor to floor. Inner walls can also be supporting and nonstructural. A bulkhead is a nonstructural inner wall that doesn't overstep the limits of one floor. Outer walls have revetments of outdoor type and heat insulations; both sides of inner walls and bulkheads are plastered or covered by the sheets of dry plaster.

Beams. The beams of different type (logs, girth rail, balks, overlapping, crossbeams, trimmed joist, purlins) can be steel (profiled iron), ferroconcrete and wooden. Steel beams generally carry constructions of wooden decks of overlapping and coatings, bit-slice steel decks or ferroconcrete plates. Ferroconcrete beams are made in the form of monolithic load-bearing elements, and ferroconcrete plates are laid on them overlapped all the space. Wooden construction beams carry a rough floor or a deck of coatings.

Thin shells. Ferroconcrete thin shells are applied for hangars, sports halls, covered stadiums, halls and other buildings with a large free floor space.

Glass-fiber roof. Glass-fiber roof is generally covered by Teflon and

applied in large constructions having form of a marquee or tent.

Rough floors and roof deck. The gaps between beams of overlapping, crossbeams of header joist, frames and purlins are bridged by a rough floor or a roof deck forming a surface for finishing floor or roofing material.

Assemblage of constructions. Assembling of various main and auxiliary beams, girth rails, pillars and farms in the building construction is called the assemblage of a construction. The joint-mounted elements of a construction should be from appropriate materials. In the buildings with stone walls are applied wooden, steel and ferroconcrete beams. Wooden beams are combined with wooden and steel pillars, steel beams - with steel pillars and ferroconcrete beams - with ferroconcrete. Wooden rough floor and roof deck are acceptable to wooden beams and pillars and ferroconcrete rough floor and roof deck - to ferroconcrete. In buildings with steel beams and pillars overlapping and coatings are installed from cellular framing. A girderless ferroconcrete floor is widely applied in manufacturing and store industrial buildings with large temporary loads on overlapping. A girderless floor with a building-in capital is more frequently used in the buildings of hostels, tenement-houses and other buildings with small temporary loads on overlapping.

Stairwells. Construction norms and rules demand that in certain conditions stairs are made in closed stairwells. In stairwells should be only necessary window opening and doorway, the latter should be furnished with automatically closed fire doors. Flight of stairs should be made from uninflammable materials. The number and the width of stairs, leading to the exit, are determined by the density of human stream[3] in the case of evacuation.

The materials of floor topping. The materials of floor topping can be divided into rigid and elastic. Concrete, terrazzo, ceramic tile, marble, flag stone pertain to the rigid floor topping. To elastic one – linoleum, cork roll coatings, cork, elastic-bedded, bituminous, vinyl-plastic tile and wooden floor topping. Wooden floor toppings are mostly made from pine, spruce, oak, maple or birch.

Roofing materials. A roof with slopes is fitted with such roofing materials, as shingles, ruberoid and asbestos tile, ceramic, cement and metal tile, copper, zinc, aluminum and tin-plate steel sheet, aluminum and steel (uncovered or zinced) corrugated sheet, as well as ruberoid. For flat and slightly sloping roofs is more appropriate a coating in the form of several strata of base felt sodden by[4] asphalt or tar, agglutinated by bituminous (on straw oil) or coal-tar (on anthracene oil) clearcole and filled up by gravel. On flat roofs, that assume walking on their surface, ceramic tile, slate or flag is bedded over[5] the roof covering using bitumen astringent. However on such roofs protective measures against leakage are necessary.

Decoration of inner walls. In industrial, store buildings, sports halls and the buildings of many other types special decoration of inner walls and ceiling is not necessary. In buildings with decoration inner walls and ceiling are, as a rule, covered by plaster. After that decorative painting is made. It is possible to revet the surfaces of walls and ceiling with plywood, sheets of dry plaster, asbestos cement panels and various types of fiberboards, nailed directly to wooden stanchions and battens.

Windows and doors. In doorways and window openings boxes for lashing

of windows rum and doors[6] are installed. They are trimmed by decorative platbands and different cover plates, generally wooden. To improve fire-resistance wooden joiner elements covered by sheet metal are used. The highest fire-resistance is achieved by using hollow metal elements. The windows of industrial buildings are frequently made from easy rolled steel or aluminum sections.

Ex.1. General understanding. Answer the following questions to the text:

1. What was the purpose of the first houses?
2. What types of building do you know?
3. What do we call a floor?
4. What is a purpose of the roof?
5. What are the stages of the construction of a building?
6. What is a bulkhead?
7. What types of beams do you know?
8. Where are thin shells and glass-fiber roof used?
9. What is an assemblage of a construction?
10. How should stairwells be equipped according to the construction norms and rules?
11. What types of roof do you know?
12. By what means can you decorate the inner walls?
13. Is it possible to improve the fire-resistance of a window?

Practice your grammar skills

Ex.1. Translate the following sentences. Explain the meaning of the modal verbs ***can****,* ***may*** *and* ***must****.*

1. He can translate this text without a dictionary. Can you translate it without a dictionary? — No, I cannot (I can't), I am not an expert in English.
2. Can a little boy lift a car? — No, he can't. He cannot do it because the car is too heavy for him.
3. If you cannot have the best, make the best of what you have.
4. May I smoke here?—Yes, of course you may, but you mustn't. You better smoke only in the smoking-room.
5. May we use a dictionary at the exam?—I think, you needn't.
6. The teacher said that we might use a dictionary, if we could not do without it.
7. The students must stand up when the professor comes in.
8. Must the students stand up, when the professor comes in? — Yes, they must.
9. When must the lecture begin? — According to the timetable, the lecture must begin at 9.30 a.m.

Ex.2. Translate the sentences with modal verbs or their equivalents.

1. Я б з задоволенням прийняв ваше запрошення, але я не можу відмінити свою зустріч.
2. Чи можу я сказати йому всю правду? Я впевнений, що він нічого не знає про фінансовий стан компанії.
3. Працівникам нашої компанії не дозволяється палити в офісах.
4. Ви можете залишити цю інформацію у секретаря.
5. Їм не дозволили відстрочити платежі.
6. Якщо вони не зможуть розрахуватися з боргами протягом місяця, їх оголосять банкрутом.
7. Коли я там працював, тільки головний менеджер міг підписувати такі документи. Тільки суд може призначити ліквідаторів неплатоспроможної компанії.
8. Якщо ви зможете врятувати цю компанію, ви отримаєте подяку від президента.
9. Якщо він щось вирішив, ніхто не може вплинути на нього.

Ex. 3. Complete the following sentences with an appropriate modal verbs:

1. You _____ be joking. The house is not worth that much.
2. It's not good time to visit Italy. The weather ____ be awful at this time of the year.
3. She _____ be ill. She looks so pale.
4. It _____ be true.
5. You _____ see interesting samples at the exhibition.
6. It _____ be late as the offices are closed.
7. This contract _____ to be profitable.
8. It's impossible. It _____ be the correct answer.
9. She _____ be at home. I saw her in the office 10 minutes ago.
10. I _____ have some new information for you tonight.
11. He has been working all day. He _____ be very tired.
12. There _____be another rise in the price of sugar soon.
13. He _____ get this job. He has got all necessary qualifications.
14. I am not sure whether I can help you. I _____ not have enough time.

Exercise 4. Translate into English:

1. Не може бути, щоб він дав згоду виконати таку кількість роботи за такий короткий строк.
2. Не може бути, щоб вони досі не вирішили цього питання.
3. Зараз вони, можливо, вже закінчили свій дослід.
4. Тобі потрібно було зателефонувати йому вчора, ти знав, що він хворий.
5. Звичайно, ти повинна була попередити їх раніше. Чому ти цього не зробила?
6. Він, можливо, не усвідомив одразу всієї важливості повідомлення.
7. Щось, можливо, затримало його.
8. Вони, можливо, не скоротили свої витрати. Ось чому вони зараз є боржниками.
9. В неї, мабуть, не було жодного шансу попередити мене заздалегідь.

До цього часу він, можливо, сплатив вже всі борги.

Additional reading

Read the text

The Great Pyramid is the only one of the Seven Wonders of the Ancient World that still stands. It was built at the order of the Pharaoh Cheops, who once ruled Egypt. More than 100,000 slaves laboured for twenty years to build it. They had no machines, not even carts — all the work was done by human strength alone. Yet each huge block was so well laid that the Pyramid has stood for 5,000 years. Near the Great Pyramid in Egypt stands a huge sculptured rock called the Sphinx. The face is that of a man, perhaps the Pharaoh Khafre who had it built almost 5, 000 years ago. But the body is that of a lion, and between its great stone paws is a small temple. Since no one knows exactly why the Sphinx was built, it remains a symbol of mystery — a riddle. In Babylon, one of the great cities of the Ancient World, there was a famous garden which amazed visitors for hundreds of years. It was called the Hanging Gardens, because it was built along arches and towers and looked like a wall of flowers and green shrubs. The garden was kept alive by a hidden pool on the highest terrace, from which the water was drawn to appear in a series of fountains. The gardens were built by King Nebuchadnezzar, who is mentioned in the Bible as the cruel conqueror of Jerusalem. The greatest god of the ancient Greeks was Zeus, for whom the Roman name was called Jupiter. The greatest statue of Zeus was at Olympia, where the famous Olympic Games were held in its honour. The statue was 40 feet high — about seven times a man's height — and was made of marble, decorated with pure gold and ivory. After 1,000 years, an earthquake tumbled it down. The temple of Artemis is one of the most famous temples of the ancient world. It stood for 600 years in
Ephesus, a great city of Syria. The temple was sacred to Artemis, also called Diana, goddess of the moon. The finest sculptors and painters of Greece decorated this beautiful building, which was destroyed by the barbaric Goths. Only a few pieces of statues columns remained. They were dug up by modern scientists. Few remember the tiny kingdom of Caria, which once flourished in what is now southwestern Turkey. But the name of its king, Mausolus, is known because of the word "mausoleum"—a massive tomb. The original Mausoleum, built in memory of this king by his widow, Queen Artemisia, was so magnificent that it was one of the Wonders of the Ancient World. Rhodes, an island near Greece, was one of the richest and busiest towns of the ancient world. Standing across the entrance to its big harbour, was a huge statue of the sun god Helios, famous as the Colossus of Rhodes. Although ships sailed beneath these giant feet, the Colossus was not as large as the American Statue of Liberty. The most famous lighthouse in ancient times was the Pharos of Alexandria built by Alexander the Great. It guarded the harbour of Alexandria, in Egypt, and light atop a high tower could be seen for sixty miles. To keep the beacon the powerful electric lamps behind glass lenses used in our lighthouses were not yet.

Ex.2. Answer the questions:

1. What is a mausoleum?
2. Who destroyed the Temple of Artemis?
3. Describe the Hanging Gardens.
4. Where was the greatest statue of Zeus?
5. What is Rhodes famous for?
6. Why was the Pharos built?

Ex.3. Do the following tasks:

- entitle the text
- guess the main idea of the text
- divide the text into some complete parts
- supply each part with a title and give the idea of it
- give the brief retelling

UNIT 3. SOME BUILDING PROFESSIONS

Read and translate the text.

TEXT 3. SOME BUILDING PROFESSIONS

A man, who has been an apprentice for some years in a building trade and has therefore enough skill to be considered a skilled worker at his trade, is called tradesman or craftsman.

He may be a carpenter-and-joiner, bricklayer, mason, slater-and-tiler, plumber, electrician, house painter, glazier, floor-and-wall tiler, plasterer, paper-hanger, steeplejack, hot water fitter and so on.

Bricklayer is a tradesman who builds and repairs brickwork, lays and joints salt glazed stoneware drains, sets, chimney pots, manhole frames and fireplaces. He renders brickwork, including the insides of manholes. A sewer and tunnel bricklayer is a specialized bricklayer. In some districts of Great Britain, bricklayers also fix wall and flooring tiles and slating and lay plaster and granolithic floors. But elsewhere these are plasterer's specialities.

Carpenter is a man who erects wood frames, fits joints, fixes wood floors, stairs and window frames, asbestos sheeting and other wall-board. He builds or dismantles wood or metal formwork. The two trades of carpenter and joiner were originally the same, and most men can do both, but specialize in one or the other. In the USA the term "carpenter" includes a joiner. The word is derived from the French word charpente, which means a wood or metal framework.

Joiner is a man who makes joinery and works mainly at the bench on wood, which has been cut and shaped by the machinists. His work is finer than the carpenter's, much of it being highly finished and done in a joinery shop which is not exposed to weather.

In Scotland a joiner is a carpenter-and-joiner.

Mason is a stone worker or stone setter. In Scotland and the USA a bricklayer is usually also a mason. A fixer or a fixer mason or a builder mason is a mason who sets prepared stones in walls, whether the stone be only facing or to the full wall thickness.

Plasterer is a tradesman who may be a fibrous plasterer or a plasterer in solid work. The latter lays successive coats of plaster or rendering and fixes fibrous plaster such as mould cornices and wall pattern. He can use a horsed mould, erect lathing for plaster, and apply stucco.

A construction manager, or CM, provides services similar to those of general constructor, but represents client's interest during all phases of the building process - design as well as construction. They are usually paid a negotiated fee for the scope of services rendered.

For example, working with the architect during design, the CM provides updated cost projections so that a client will know probable costs, which the project evolves. A general constructor, however, doesn't usually enter the scene until after the design is complete.

The CM decides who bids the job, picks up the request for invitation to bid, evaluates the bids, and awards work to the most reasonable bidder. The CM also prepares contracts and sends them out to the subcontractors. The owner signs the contracts with each subcontractor, unlike a general constructor who signs these

contracts. As a result, the subcontractors are under the CM's direction.

The CM may also be responsible for the safety of workers on the construction site.

Ex.1. Add the missing information from the text.

1. …is called tradesman or craftsman.
2. A fixer or a fixer mason or a builder mason is a mason who…
3. In the USA the term…
4. In some districts …, and slating and lay plaster and granolithic floors.
5. …, including the insides of manholes.

Practice your grammar

*Ex.1. Remember the difference between the use of the verbs **make** and **do.***

make		
Certain	a contribution	a mistake
a journey	a complaint	a charge
Money	a choice	a discovery
Sure	an excuse	use of
a trip	an inquiry	room for
Do		
Good	a sum	an experiment
Harm	one's best	a favour
Business	one's duty	a test
Lessons	damage	the room
Work	housework	the washing-up

a) Insert the necessary verb: do or make.

1. If he ... a mistake, he will have to... his lesson again.
2. It will only ... you good.
3. Don't worry; I will try to ...my best to help you.
4. She would like to ... a journey to Italy this summer.
5. Housewives usually ... their washing-up on Saturdays.
6. He just... an excuse and disappeared.
7. We are to ... choices pretty often in our lives.
8. It will not... you any harm.
9. If a person likes his or her business, he or she will... it thoroughly.
10. The earthquake... a lot of damage to the location.
11. Joseph .. .his test better than anybody else in the group.
12. Joiner is a man who ... joinery.

Ex.2. Translate the following sentences with PASSIVE VOICE.

1. Engineering is divided into many branches.
2. A joinery shop must not be exposed to weather,
3. Walls are built to enclose areas and carry the weight of floors and roofs.

4. The word is derived from the French word charpente, which means a wood or metal framework.

5. First the excavation is dug for the basement, and then the foundation walls below ground level are constructed.

6. The joiner's work is finer than the carpenter's, much of it being highly finished and done in a joinery shop.

7. An outlet for this air should be provided in order to have good ventilation.

8. Many new methods of building have been discovered during the last hundred years.

9. Operational acceptance of the project takes place when the guarantee test has been successfully completed and the guarantees met.

10. After the war more than 90% of the old part of the city was left in ruins.

11. In 1954 the last tram was removed from the streets.

12. The town was perched on the hill.

Ex.3. Translate into English:

1. Коло послуг нашої компанії було розширене минулого року.
2. Ці товари завжди купуються для перепродажу.
3. Права споживача захищаються державою.
4. Цей закон був прийнятий кілька років тому.
5. Ця інформація завжди розповсюджується рекламними агенціями.
6. Смаки споживачів будуть досліджуватися нашим маркетинговим відділом.
7. Клієнтам нашого банку будуть запропоновані значні знижки.
8. Побутові послуги сплачуються за допомогою пластикової картки.
9. Спільне підприємство було створене своєчасно, і зараз ми маємо великий прибуток.
10. Ми не можемо повірити вашим словам, оскільки всі ваші вимоги були задоволені.

Ex.4. Choose the correct answers:

1. He knew why he was chosen/ had been chosen.
2. He was shocked/ had been shocked by his boss's attitude.
3. We are just sent/ have been sent new information.
4. Everything will be done/ will have been done by the end of the week.
5. He is interviewed/ is being interviewed now.
6. My application is still considered/ is still being considered by the managers.
7. The letters has just been brought/have just been brought.
8. He explained that a new job was offered/had been offered to him in February.
9. She was never made/has never been made such an exciting proposal.
10. My computer is repaired/ is being repaired now.

Additional reading

Read and translate the text.

All buildings, except simple ones, are built according to drawings, specifications, construction norms and rules developed by architects and civil engineers. Construction works are generally fulfilled by a contractor who is obliged in the written document to build a definite building according to drawings and specifications for a definite payment named a lump sum, or for the amount of actual expenses plus fixed award or a definite percent of actual expenses. The maximal guaranteed amount of expenses is frequently indicated in the agreement. The main contractor resorts to the services of subcontractors making some contracts on the execution phase, such as plastering, painting, roofing and plumbing works, for a lump sum, or for the amount of actual expenses plus fixed award or a definite percent of actual expenses. The contractor appoints a foreman, who - being a person in charge - constantly assists at a building site, co-ordinates the work of different specialists and on behalf of the main constructor exercises the general control of construction works. The architect also has his representative who controls compliance to drawings and specifications. If a customer makes changes in drawings and specifications, then the architect after the concordance gives the contractor a written instruction about these changes. If these changes result in the increase of costs, then before the works are carried out a written agreement about the size of extra payment is made.

Answer the following questions to the text:

1. According to what are all buildings built?
2. What new building professions have you learnt from the text? Can you describe the responsibilities of people of these professions?

UNIT 4. BUILDING MATERIALS

Read text 4 "BUILDING MATERIALS IN CONSTRUCTION". Indicate the most common building materials and say where and why people use them.

TEXT 4. BUILDING MATERIALS IN CONSTRUCTION

Materials that are used for structural purposes should meet several requirements. In most cases it is important that they should be hard, durable and easily fastened together.

The most commonly used materials are wood, stone, brick, concrete, steel, glass, plastics, etc. They all differ in hardness, durability, strength, weight, fire- and decay- resistance and, naturally, cost.

Wood is the most ancient structural material. In comparison with steel wood is lighter, cheaper, easier to work with and its mechanical properties are good. On the other hand, wood has certain disadvantages. First, it burns and is therefore unsuitable for fire-proof buildings. Second, it decays.

Stone belongs to one of the oldest building materials used by man. Stone is characteristic of many properties. They are mechanical strength, compactness, porosity, sound and heat insulation, and fire-resistance. Stone is widely used for foundations, walls and steps of buildings, for the supports of piers, and bridges, and for finishing and decorating all sorts of structures.

Bricks were known many thousand years ago. Bricks are hard and easily fastened together with the help of mortar. A brick building is strong, durable and weather resistant.

Concrete is referred to as one of the most important materials. Mass concrete was employed by the Egyptians and the Romans but the use of steel reinforcement did not begin until the nineteenth century. Concrete is a mixture of cement, sand and crushed stone, made into a paste with water. It forms a hard, durable mass and is used largely for the foundations and walls of houses and for structures under water.

Steel has come into general use with the development of industry. Its manufacture requires special equipment and skilled labour.

Glass and plastics are also widely used nowadays in the construction of different kinds of buildings. The raw materials employed in the manufacture of glass are limestone, sand, soda ash, sodium sulfate, cullet (broken glass), and a small amount of aluminia. Glass is unaffected by gasses and most acids.

Plastics is a name for various organic derivatives of resin, cellulose, and protein.

All building materials are divided into three main groups:

1) Primary (main) building materials such as rocks and artificial stones, timber and metals are used for bearing structures.

2) Secondary (auxiliary) materials are used for the interior parts of the buildings, for the interior finish of structures.

3) Cementing or binding materials such as lime, gypsum and cement are the three materials most widely used for the purpose of binding together masonry units, such as stone, brick and as constituents of wall plaster.

Building materials can be further categorized into two sources, natural and synthetic. Natural building materials are unprocessed or minimally processed by industry, such as timber, sand, lime or stone. Whereas synthetic materials are made in industrial settings after some human manipulations, such as plastics and petroleum based paints. Cement, clay products and concrete are also examples of artificial buildings materials.

The designer must be able to select and adapt such materials of construction that will give the most effective result by the most economical means. In this choice of materials for any work of construction the civil engineer must consider many factors. These factors include availability, cost, physical properties of materials and others.

Text-Based Exercises

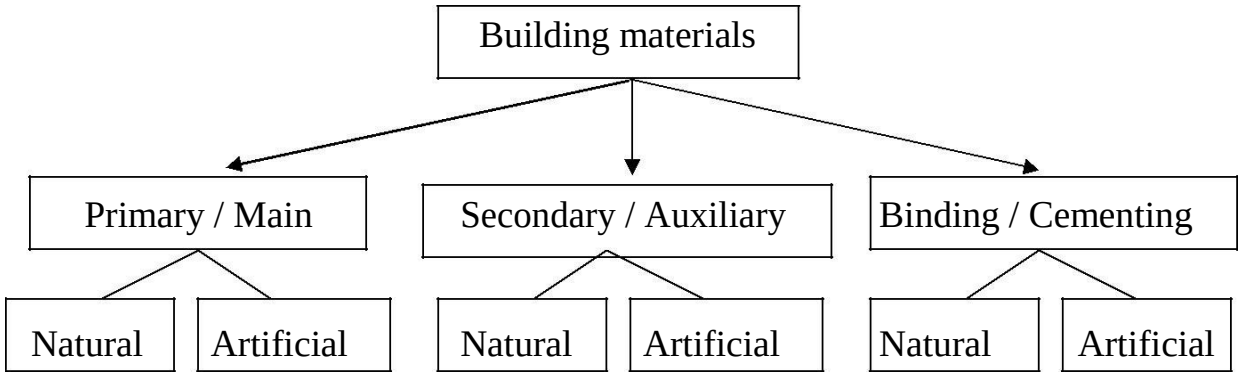
Ex.1 . The text is structurally divided into an introductory part, main part (main body) and conclusion. The main body is further sub-divided into 2 paragraphs. Say to which part of the text and which paragraph the following ideas could refer.

1. Variety of building materials and properties.
2. Classification of building materials.
3. Factors influencing the selection of materials.
4. General implications of the term ‘building’.
5. Advantages and disadvantages of the most common building materials.

Ex. 2. Expand in more detail on the following:

- the properties of material, both desirable and undesirable,
- the advantages of all the above mentioned building materials,
- the disadvantages of those materials,
- where the materials can be used.

Ex. 3. Fill in the missing information. Give 1 to 3 names of the building materials to fill in the circles at the bottom of the scheme



Describing the scheme comment on the classification of the building materials. Say where each of the materials is used.

Ex. 4. Complete the following sentences using English equivalents.

1. Materials that are used for structural purposes should…
2. They all differ in hardness, durability, strength, weight … and cost.
3. Wood is cheap, easy to work with but it has….
4. Stone is widely used for foundations, walls and steps of buildings and … all sorts of structures.
5. Bricks are hard and easily fastened together…
6. Concrete is a mixture of cement, sand and crushed stone …
7. The manufacture of steel … and skilled labour.
8. Primary building materials are used ….
9. Binding materials such as lime, gypsum and cement are most widely used ….
10. Synthetic materials are made … after some human manipulations.
11. The designer must be able … materials of construction.
12. In the choice of materials for any work of construction … must consider many factors.

Read and translate the text 5. with a dictionary.

TEXT 5. BUILDING MATERIALS

White Portland Cement. The chemical composition and characteristics of white Portland cement are similar to those of ordinary Portland cement except that the latter is of a grey colour. The colour of white cement is due to the raw materials used and special precautions taken in its production. The materials are pure limestone and china (white) clay, the iron oxide content being less than 1 per cent. White cement is more expensive than ordinary cement. It is used in places where, for ornamental purpose, the white colour is desirable.

Portland Blast-Furnace Cement. This is a mixture of ordinary Portland cement and blast-furnace slag. The slag is mixed with ordinary cement clinker and passed to a ball mill for thorough incorporation and fine grinding. The proportion of slag must not exceed 65 per cent, and that of Portland cement clinker not less than 35 per cent.

High Alumina Cement. It is dark brown in colour. It contains about 40 per cent each of lime and alumina with about 15 per cent of iron oxides. This cement sets at about the same rate as Portland cement but gains strength very rapidly. Owing to the chemical activity after hardening for the first 24 hrs, it requires very wet curing conditions. This cement is several times more costly than ordinary Portland Cement.

Tufa Cement Tufa Cement is formed by grinding pulverized tufa with an approximately equal volume of Portland cement. Tufa is a rock of volcanic origin, consisting of 65 to 75 per cent silica and 10 to 15 per cent alumina, with some of the silica soluble.

Sedimentary Rock. This division comprises those stones which are chiefly employed for building purposes. Most of these rocks are formed of fragments of igneous rocks, which have been deposited by water in layers or strata. As successive layers were formed these sediments became hardened and consolidated by great pressure and were cemented together by sandy or clayey paste or by a chemical substance (such as carbonate of lime) conveyed by the percolating water.

Other rocks of this division are formed from remains of marine organism (shellfish, etc) and chemically by precipitation. The principal sedimentary rock are sandstones and limestones.

Sandstones. These consist of grains of quartz (sand or silica) held together by a cement or matrix. Sandstones are classified according to the nature of the binding material thus siliceous sandstones, calcareous sandstones and argillaceous sandstones. Sandstones form one of the most valuable materials. The durability of sandstones depends very largely upon the cementing material. Siliceous sandstones are therefore generally considered to be the most durable of the sedimentary rocks, as the binding material of silica is highly resistant to acid attack. The excellent state of preservation of many ancient, buildings 'built of this stone is evidence of this. City buildings constructed of sandstone often assume a drab appearance owing to the dark colour.

Read and translate the text 6.

TEXT 6. MODERN BUILDING MATERIALS (Part I)

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 (pine, fir, cypress, sequoia) and hardwoods (oak, maple, and nut). Timber is at present not so much used in building construction, as in railway engineering, in 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.

A brick is best described as a "building unit". It may be made of clay by moulding and baking in kilns, of concrete, of mortar or of a composition of sawdust and other materials.

There exists variety of bricks for different purposes: ordinary, hollow or porous, lightweight, multicolor bricks for decorative purposes, etc. Bricks are usually laid in place with the help of mortar.

The shape and convenient size of brick enables a man to grip it with an easy confidence and, because of this, brick building has been popular for many hundreds of years. The hand of the average man is large enough to take a brick and he is able to handle more than 500 bricks in an eight-hour working day.

It is necessary, therefore, for the "would be" bricklayer to practise handling a brick until he can control it with complete mastery and until he is able to place it into any desired position.

The brick may be securely handled by placing the hand over the surface of the upper part of a brick and by placing the thumb centrally down the face of the brick with the first joints of the fingers1 on the opposite face. It is better to protect the thumb and the fingers with leather pads, which also prevent the skin from rough bricks.

Sometimes natural stones such as marble, granite, basalt, limestone and sandstone are used for the construction of dams and foundations. Marble, granite and sandstone are widely used for decorative purposes as well, especially with the

public buildings.

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.

Granite. Related to effusive rocks, it consists of grains of three minerals: quarts, specular stone and field spar. Depending on the color of field spar granite has battleship-gray, pink, red or (less frequently) black color. It is hard and badly yields to working-up. As granite has such qualities as small porosity and large frost proof, it is used for outer facing work of walls, bases and pillars. It is also used as a basement for the extra heavy constructions of production jackets, pillars etc.

Limestone. It is related to sediments containing calcium carbonate. It is a very valuable material for the erection of basements (in the form of dummy stone), as well as for facing works of buildings.

Marble. It is a natural stone formed from sediments of limestone and dolomite in the local compressions of geocorona. Marble in the form of gang-sawn polished plates is mainly applied for inner facing work of public buildings, as well as for floors, steps, window sill planks and other products.

Metals. Aluminium, 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, for girders, frames, etc. Various shapes are employed in construction.

Plastics are artificial materials used in construction work for a vast number of purposes. Nowadays plastics, which are artificial materials, can be applied to almost every branch of building, from the laying of foundation to the final coat of paint. Synthetic resins are the main raw material for plastics. Plastics have some good advantages as they are lighter than metals, not subject to corrosion, and they can be easier machined. Besides, they are inflammable, they can take any color and pattern, and they are good electrical insulators. More over, they possess a high resistance to chemical action.

A lot of decorative plastics, now available, have brought about a revolution in interior and exterior design. But plastics are used now not only for decoration. These materials are sufficiently rigid to stand on their own without any support. They can be worked with ordinary builders' tools.

Laminate is a strong material manufactured from many layers of paper or textile impregnated with thermosetting resins. This sandwich is then pressed and subjected to heat. Laminate has been developed for both inside and outside use. It resists severe weather conditions for more than ten years without serious deformation. As a structural material it is recommended for exterior work. Being used for surfacing, laminate gives the tough surface.

Foamed glass is a high-porosity heat insulating material, available in block made of fine-ground glass and a frothing agent.

Foamed glass is widely used in prefabricated house building, to ensure heat insulation of exterior wall panels, and in industrial construction.

Foamed glass has a high mechanical strength, is distinguished by moisture, vapour and gas impermeability. It is non-inflammable, offers resistance to frost, possesses a high sound adsorption, and it is easily sewn and nailed.

Structural foamed glass blocks designed to fill ceilings, and for making interior partitions in buildings and rooms, to ensure heat and sound insulation.

For insulation mineral wool or cinder wool is often resorted to.

Ex.1. Answer the questions to the text:

1. What are the most important building materials?
2. Timber is not widely used nowadays, is it?
3. What is a brick made of?
4. What bricks do you know?
5. What are natural stones mainly used for?
6. Why do you think plastics can be applied to almost every branch of building?
7. What other materials are mentioned in the text?

Ex.2. Add the missing parts of the sentences from the text.

1. …for building purposes are divided into two groups called softwoods and hardwoods.
2. However, timber is still employed...
3. …ordinary, hollow or porous, lightweight, multicolor bricks for decorative purposes, etc.
4. ... they use natural stones such as marble, granite, basalt, limestone and sandstone.
5. ... while brass is frequently used for decorative purposes in facing.
6. These materials are sufficiently rigid to stand...
7. ...severe weather conditions for more than ten years without serious deformation.
8. ...to ensure heat insulation of exterior wall panels, and in industrial construction
9. It is non-inflammable offers resistance to frost, ...

Practice your grammar skills.

Ex.3. Translate the sentences having in mind different use of the verb ***to have****.*

1. We'll have them down for a few days.
2. They had enough coal in for the whole winter.
3. I won't have you do it.
4. Please, have your brother bring the book.
5. She had her photo taken.
6. Go and have a lie down.
7. You had better attend the lectures.
8. My watch will have to be fixed by a specialist.
9. The day was cold and she had a hat and an overcoat on.
10. Will you have the goodness to visit them?
11. The knowledge of how to make durable concrete has been lost for centuries.
12. Its successful use has been developed rapidly during the last two

decades.

Ex.4. Form PARTICIPLE I of the following verbs translate them into Ukrainian:

to build, to produce, to become, to realize, to follow, think, to bring, to prevent, to move, to have, to offer, to work, to assemble, to form, to consist, to enter, to develop, to cut, to save.

Ex.5. Form PARTICIPLE II of the following verbs and translate them into Ukrainian:

to make, to produce, to burn, to install, to find, to send, to show, to take, to use, to keep, to read, to leave, to cause, to write, to get, to develop, to bring, to discover, to calculate, to change, to found.

Ex. 6. Insert Participle I of the verbs in brackets:

1. We spent about an hour (take) our papers to the office.
2. Generally (speak), this problem is rather difficult.
3. (Work) a year in Germany he returned to Ukraine.
4. He sat in his arm-chair (smoke) a cigarette.
5. Our new manager is a young man (wear) glasses.
6. The Japanese businessman bowed low and (take) my hand kissed it. Saying this, he left the room.
7. (Be) busy, he postponed his trip to Italy.
8. I stood (watch) the people who were entering the office.
9. He went to work, (leave) the letter on the dressing table.
10. The conference (take) place at the University is devoted to the problems of green tourism.

Ex.7. Inset Perfect Participle II of the verbs in brackets:

1. The work (do) we received high salary.
2. (Live) in that town all his life, he knew it very well.
3. When he (invite) he always takes part in our discussions.
4. (Find) nobody in the office, he left the room.
5. When (ask) to help them she refused without hesitating.
6. (Complete) their tests, the students handed them.
7. (Finish) our work we went for a walk.
8. (Understand) his mistake he stopped arguing.
9. (Explain) everything he sat at his place.
10. (Know) that he had enough time he wasn’t in a hurry.

Ex.8. Translate into English:

1. Коли все було готове, ми почали проект.
2. Коли роботу було закінчено, ми отримали підвищення в зарплатні.
3. Обговорені деталі контракту всі зрозуміли.
4. Зрозумівши прохання, він почав діяти.

5. Вона мені дала звіт посміхаючись.
6. Роботу було зроблено, і ми пішли додому.
7. Так як ключ було загублено, вона не змогла зайти в квартиру.
8. Так як питання було складним, ніхто не міг відповісти.
9. Бувши дуже стомленим, він залишився дома.
10. Так як квитки всі продали, ми пішли додому.

Read and translate the text 7.

TEXT 7. MODERN BUILDING MATERIALS

Concrete is perhaps the most widely spread building material used nowadays. Concrete is an artificial stone, made by thoroughly mixing such natural ingredients or aggregates as 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 get almost any desirable form, and together with steel in reinforced concrete it has very high strength, and also resists fire. Prestressed concrete is most widely used at present while prefabricated blocks are employed on vast scale for skeleton structures.

AGGREGATES FOR CONCRETE

By the simple definition from the dictionary "aggregates are the materials, such as sand and small stones, that are mixed with cement to form concrete". In other words aggregates (or cushioning materials) can be defined as a mass of practically inert mineral materials, which, when surrounded and bonded together by an active binder, form the rock. This rock is denoted by the general term concrete.

Aggregates have three principal functions in the concrete: they provide a relatively cheap filler for the concreting material, or binder; they provide a mass of particles which are suitable for resisting the action of applied loads, of abrasion, of percolation of moisture through the mass, and of climate factors; they reduce volume changes resulting from the action of the setting and hardening of the concrete mass.

All aggregates, both natural and artificial, which have sufficient strength and resistance to weathering, and which do not contain harmful impurities may be used for making concrete.

As aggregates such natural materials as sand, pebbles, broken stone, broken brick, gravel, slag, cinder, pumice and others can be used.

PRESTRESSED CONCRETE

Prestressed concrete is not a new material. Its successful use has been developed rapidly during the last two decades, chiefly because steel of a more suitable character has been produced. Concrete is strong in compression but weak when used for tensile stresses.

If, therefore, we consider a beam made of plain concrete, and spanning a certain distance, it will at once be realized that the beam's own weight will cause the beam to "sag" or bend. This sagging at once puts the lower edge of the beam in tension, and if the cross-sectional area is small, causes it to break, especially if the span is relatively large.

If, on the other hand1, we use a beam of similar cross-section, but

incorporate steel bars in the lower portion, the steel will resist the tensile stress derived from the sag of the beam, and thus assist in preventing it from breaking.

In prestressed concrete steel is not used as reinforcement, but as a means of producing a suitable compressive stress in the concrete. Therefore any beam (or member) made of prestressed concrete is permanently under compression, and is consequently devoid of crack under normal loading, or so long as the "elastic limit" is not exceeded.

Prestressed concrete is not only used for beams but is now employed extensively for columns, pipes, and cylindrical water towers, storage tanks, etc.

Add the missing parts of the sentences from the text.

1. …to produce a mixture of the proper consistency.
2. Concrete is an artificial stone, made by thoroughly...
3. ...they provide a relatively cheap filler for the concreting material, or binder;...
4. This sagging at once puts the lower edge...
5. …as a means of producing a suitable compressive stress in the concrete.
6. ...any beam made of prestressed concrete is permanently under compression...

b) Answer the questions:

1. Why is concrete more fit for foundation?
2. What floor covering is the best?
3. What colour should bedroom walls be? (kitchen walls, living-room walls)
4. What should a chimney be made of?
5. Why is it nice to have a mantelpiece?
6. What timber is considered to be the best for the window frames?
7. What professionals does a construction team need?

Practice your grammar skills.

Ex.1. Translate the sentences paying attention to the GERUND.

1. What I really like is finding out about different cultures.
2. The thing I love most is sightseeing.
3. The best thing for me is socializing with my friends.
4. Concrete is made by thoroughly mixing cement, sand and gravel.
5. All aggregates may be used for making concrete.
6. The steel will resist the tensile stress and thus assist in preventing the beam from breaking.
7. The term "engineering" means the art of designing, construction or using engines.
8. The ancient Egyptians often erected their huge buildings without thinking of their usefulness.
9. A person can't be successful without clear understanding of goals in his life.
10. It goes without saying.

11. One can't be healthy without giving up bad habits.

Ex. 2. Finish these sentences using a gerund:

1. My favorite activity is … .
2. He can't stand … .
3. He is good at … .
4. Some people just can't help … .
5. We are used to … .
6. I am interested in … .
7. This company is worth … .
8. The customer wants to know who was responsible for … .
9. I feel like … .
10. He admitted … .
11. I am thinking of … .
12. … was the key to the company's success.
13. It's no use of … .
14. Avoid … .

Ex. 3. Complete these sentences using the gerund form of one of the verbs below:

give, get, make, have, lose, help, work, discuss, get, worry, meet, analyze, cry, buy, reduce;

1. He is interested in … the shares of this company.
2. It's no use … over split milk.
3. This job involves … our international transactions.
4. We are looking forward to … the new Sales Manger.
5. It isn't worth … about it.
6. You risk … bad results.
7. As we don't agree about company policy we avoid … this subject.
8. We don't mind … overtime, if it help the company.
9. You mustn't insist on … him.
10. By delaying we risk … this contract.
11. I can't imagine not … a computer in my office.
12. He apologized for … this serious mistake.
13. He is very pleased with … the job he wanted.
14. It's no good … her advice, as she never listens.
15. Overstaffing should be solved by … the workforce.

Then read the text again and do the text-based exercises coming after the text.

TEXT 8. CONCRETE

Concrete is a construction material that consists of cement (commonly Portland cement) as well as other cementitious materials such as fly ash and slag cement, aggregate (generally a coarse aggregate such as gravel limestone or

granite, plus a fine aggregate such as sand or manufactured sand) and water and chemical admixtures.

Concrete solidifies and hardens after mixing and placement due to a chemical process known as hydration. The water reacts with the cement, which bonds the other components together, eventually creating a stone-like material. It is used to make pavements, architectural structures, foundations, motorways/roads, parking structures, brick/block walls and footings for gates, fences and poles.

Concrete is used more than any other man-made material on the planet.

Aggregates. The water and cement paste hardens and develops strength over time. Both fine and coarse aggregates are used to make up the bulk of a concrete mixture. Sand, natural gravel and crushed stone are mainly used for this purpose. However, it is increasingly common for recycled aggregates (from construction, demolition and excavation waste) to be used as partial replacements of natural aggregates, whilst a number of manufactured aggregates, including air-cooled blast furnace slag and bottom ash are also permitted. Decorative stones such as quartzite, small river stones or crushed glass are sometimes added to the surface of concrete for a decorative "exposed aggregate" finish, popular among landscape designers.

Chemical admixtures. Chemical admixtures are materials in the form of powder or fluids that are added to the concrete to give it certain characteristics not obtainable with plain concrete mixes. In nor-mal use, admixture dosages are less than 5 % by mass of cement, and are added to the concrete at the time of batching/mixing. The most common types of admixtures are:

Accelerators speed up the hydration (hardening) of the concrete. Without accelerants, concrete may take centuries to cure.

Retarders slow the hydration of concrete, and are used in large or difficult pours where partial setting before the pour is complete is un-desirable.

Air-entrainers add and distribute tiny air bubbles in the concrete, which will reduce damage during freeze-thaw cycles thereby increasing the concrete's durability. However, entrained air is a trade-off with strength, as each 1 % of air may result in 5 % decrease in compressive strength.

Plasticizers (water-reducing admixtures) increase the workability of plastic or "fresh" concrete, allowing it be placed more easily, with less consolidating effort.

Pigments can be used to change the color of concrete, for aesthetics.

Corrosion inhibitors are used to minimize the corrosion of steel and steel bars in concrete.

Bonding agents are used to create a bond between old and new concrete.

Curing. Because the cement requires time to fully hydrate before it acquires strength and hardness, concrete must be cured once it has been placed and achieved initial setting. Curing is the process of keeping concrete under a specific environmental condition until hydration is relatively complete. Good curing is typically considered to provide a moist environment and control temperature. A moist environment promotes hydration, since increased hydration lowers permeability and increases strength resulting in a higher quality material. Allowing the concrete surface to dry out excessively can result in tensile stresses, which may

cause the concrete to crack.

Also, the amount of heat generated by the exothermic chemical process of hydration can be problematic for very large placements. Al-lowing the concrete to freeze in cold climates before the curing is complete will interrupt the hydration process, reducing the concrete strength and leading to scaling and other damage or failure.

Text-Based Exercises

Ex. 1. Insert into the sentences the right word or word group from the box.

hydration process; gravel limestone; the workability; stone-like material; recycled aggregates; permeability; tiny air bubbles; chemical admixtures; the hydration; exposed aggregate finish; bonding agents; develops strength

1. The coarse aggregate in concrete is normally _____ or granite.
2. The water reacts with the cement, which bonds the other components together and creates a _____.
3. The water and cement paste hardens and _____ over time.
4. _____ from construction, demolition and excavation waste are used as partial replacements of natural aggregates.
5. Decorative stones or crushed glass are added to the surface of concrete for a decorative _____.
6. _____ are added to the concrete to obtain desirable characteristics.
7. Accelerators speed up _____ (hardening) of the concrete.
8. Airentrainers add and distribute _____ in the concrete in-creasing the concrete's durability.
9. Plasticizers increase _____ of plastic concrete to place it with less consolidating effort.
10. _____ are used to create a bond between old and new concrete.
11. A moist environment in curing promotes hydration and lowers_____ for higher quality.
12. Freezing before the curing is complete interrupts the _____.

Ex. 2. Complete the sentences.

1. Concrete consists of cement as well as other … .
2. In the chemical process of hydration water reacts with … .
3. The water and cement paste … .
4. Both fine and coarse aggregates are used to … .
5. Recycled aggregates are used as … .
6. Decorative stones such as … are sometimes used as a decorative "exposed aggregate" finish.
7. Chemical admixtures are materials in the form of powder or fluids … .
8. Retarders slow the hydration of concrete and … .
9. Air-entrainers add and distribute … .
10. Plasticizers increase the workability of "fresh" concrete allowing … .
11. Corrosion inhibitors are used to … .

12. … concrete must be cured once it has been placed and achieved initial setting.
13. A moist environment during curing promotes hydration, since … .
14. The amount of heat generated ….
15. Allowing the concrete to freeze before the curing is complete will … .
16. Improper curing can lead to … .

Additional reading.

Read and translate the text.

The Properties of Concrete

Concrete must be hard, strong, durable, dense, non-porous, fire-resisting and economical.

Concrete has proved to be durable when made of good materials, well mixed, and properly cured. Failures can be found in concrete work, but the trouble is usually caused by poor material, faulty foundations, lack of knowledge of the properties of concrete or poor workmanship. For example, some cements will give better results in sea water than others. This fact had to be established by experience and experiments.

It is more difficult to secure durable reinforced concrete than mass concrete. This is due to the reinforcing steel and the additional water required to make the concrete flow around the steel bars. When moisture reaches the steel, it will rust and the expansion caused by the rust will crack the concrete, resulting in an unsightly structure and necessary repairs. In all structures exposed to the weather the reinforcing steel must be carefully placed and well secured so that it cannot be displaced while concreting. No metal should project to the surfaces. Small wires will soon cause rust spots on the surface of the concrete if they are exposed.

Concrete, to be durable, must be made of good materials, uniform in quality, mixed with a minimum amount of water, and properly placed and protected while curing. Concrete exposed to sea water and the rise and fall of water levels, especially in cold climates where ice forms on the structures, requires special attention in the selection of the cement, aggregates, mixing, placing and curing.

With the use of dense aggregates the proportions which will produce the densest products are generally those which contain the maximum amount of coarse aggregate and still contain enough fine aggregate to produce a smooth surface. With porous aggregates used in the production of light weight units, the amount of material in the mix passing a 50-mesh sieve is generally limited and in addition more of the coarse aggregate is used to produce a unit of less density and lower weight. This is generally desirable for light weight units except where fire resistance or watertightness are important.

The strength of plain concrete depends upon the quality of the cement, the strength and character of the aggregate, the quantity of cement in a unit of volume, and the density of the concrete. Other things being equal the strongest concrete is that containing the largest amount of cement in a given volume of concrete, the strength of the concrete varying directly as the amount of cement. With a given quantity of cement in a unit of volume, the strongest concrete is that in which the aggregates are proportioned so as to give a concrete of the greatest density that is of the greatest weight per unit of volume. The strength of concrete also depends

upon the methods used in mixing, upon the care taken in measuring the ingredients, and in mixing and placing the concrete. Concrete exposed to the air hardens more rapidly than protected concrete. The setting of cement is a chemical change brought about by the addition of water to the cement, the strength increasing very rapidly the first few days, after which the mixture slowly hardens and increases in strength.

Concrete has poor elastic and tensional properties, but it is strong in compression. Its tensile strength is only one-tenth of its compressive strength. The compressive strength of plain concrete varies between wide limits, depending upon the cement, the proportions of cement and aggregates, and the methods of mixing, and depositing, and the age.

Ex.1. React to the following statements:

3. The main qualities of concrete are hardness, strength, durability, density and fire-resistance.
4. Concrete has proved to be durable when made of good materials, well mixed, and properly cured.
5. Failures are never found in concrete work.
6. It is more difficult to secure mass concrete than durable reinforced concrete.
7. Concrete must be made of good materials, uniform in quality, mixed with a minimum amount of water, and properly placed and protected while curing.
8. Concrete exposed to the air hardens slower than protected concrete.
9. Concrete has strong elastic and tensional properties, and it is also strong in compression.
10. The compressive strength of plain concrete depends upon the cement, the proportions of cement and aggregates, and the methods of mixing, and depositing, and the age.

Read text "CONCRETE". When reading find answers to the following questions?

1. What do you need to make concrete?
2. What is hydration?
3. Where is concrete used besides architectural structures?
4. What materials can be used as aggregate?
5. When are admixtures added to the concrete mix? What are their functions?
6. What conditions are necessary for concrete curing?
7. What damage can improper curing cause?

TEXT 9. MATERIALS SCIENCE: PLASTICS

Materials science or materials engineering is an interdisciplinary field involving the properties of matter and its applications to various areas of science and engineering. This science investigates the relationship between the structure of materials and their properties. It includes elements of applied physics and chemistry, as well as chemical, mechanical, civil and electrical engineering. With significant media attention to nanoscience and nanotechnology in the recent years, materials science has been propelled to the forefront at many universities.

Metals, polymers and ceramics constitute an important part of materials science. Polymers are the raw materials (the resins) used to make what we commonly call plastics. Plastics consisting of one polymer are referred to as simple. Thus, organic glass (plexiglass) consists of one synthetic resin. But in the building field we usually deal with complex plastics, e. g. plastics consisting of a polymer and other components.

As is known, the term plastics covers a range of synthetic or semi-synthetic organic condensation or polymerization products that can be molded or extruded into objects or films or fibers. Their name implies that in their semi-liquid state they are malleable, or have the property of plasticity. Plastics vary immensely in heat tolerance, hardness, and resiliency. Combined with this adaptability, the general uniformity of composition and lightness of plastics ensure their use in almost all industrial applications today.

Polymers which are in current widespread use include polyethylene, polypropylene, polyvinyl-chloride, polystyrene, nylons, polyesters, acrylics, polyurethane, and polycarbonates. Plastics are generally classified as "commodity", "specialty" and "engineering" plastics.

PVC (polyvinyl-chloride) is a commodity plastic; it is widely used, inexpensive, and annual production quantities are huge. This plastic has an incredible array of applications, and its fabrication and processing are simple and well-established. To modify its material proper-ties various chemicals and compounds are added to the polymer base.

Polycarbonate would be normally considered as engineering plastic. Engineering plastics are valued for their superior strengths and other special material properties. They are usually not used for disposable applications, unlike commodity plastics.

It should be noted here that the dividing line between the various types of plastics is not based on material but rather on their properties and applications. For instance, polyethylene (PE) is a cheap polymer commonly used to make disposable shopping bags and trash bags, and is considered a commodity plastic, whereas Medium-Density Poly-ethylene (MDPE) is used for underground gas and water pipe.

Plastics combine all the fine characteristics of a building material owing to their inherent valuable and diverse properties. The architects and engineers have also turned to them to add beauty to modern homes and offices. Being a comparatively recent invention plastics have found today a wide application not only in construction, but many other industrial fields (machine-building, aviation, textile industry, etc.).

Scan text 2 "MATERIALS SCIENCE: PLASTICS" and find the paragraph which describes:

- the properties of plastics,
- the importance of the materials science,
- the application of plastics for different industrial purposes,

- consumer plastics,
- simple and complex plastics,
- engineering plastics,
- the most widespread plastics.

Reading Comprehension Exercise

Ex. 1. Say if it is true or false. Correct the wrong statements quoting the relevant information from the text.

1. Materials science or materials engineering studies the proper-ties of materials and their applications in science and engineering.
2. Polymers are the raw materials used to make cements.
3. Plastics consisting of one polymer are referred to as simple.
4. In the building industry complex plastics are more common.
5. Plastics include synthetic or semi-synthetic organic condensation or polymerization products.
6. Plastics aren't malleable and don't have the property of plasticity.
7. The general durability and hardness of plastics ensure their use in all industrial applications.
8. Plastics are generally classified as natural and artificial plastics.
9. PVC (polyvinyl-chloride) is well-established due to simple processing.
10. Engineering plastics are valued for their superior properties.
11. Engineering plastics are disposable like commodity plastics.
12. Polyethylene (PE) is used to make disposable packaging bags and underground gas and water pipe.
13. Plastics combine fine characteristics of a building material due to their diverse properties and beauty.

TEXT 10. NATURAL STONE: FAR MORE THAN JUST ANOTHER BUILDING MATERIAL

Natural stone has been used for every function imaginable, from weapon to a bartering currency. ___1___ The various ways it can be installed in a project are limited only by the creative imagination of the designer and technical understanding of the installer.

Each mason's workmanship is unlike that of another, and each mason's project is unlike his last. ___2___ The project can be structural, aesthetic, or both. The effect can be powerful or subtle and, yet, ever changing with the mood of the day or season.

Each different kind of stone has its own unique graining. ___3___The rift will run perpendicularly to the bedding grain of a sedimentary stone. The stone cutter would need to identify the rift in order to successfully cut the stone. This is one example of the knowledge a stone cutter would need.

The master stone cutters who worked the quarries in the United States' early years are a reflection of the different cultures that helped settle America. Master stone cutters have come from Sweden, Ger-many, Italy and Ireland, to name a few.

___4___

The many different availabilities of texture, color, hardness and a workable nature of natural stone lend to an ability to express any de-sired outcome. The abundant choices in appearance and uses of natural stone, coupled with the abounding skills of the mason and creative genius of an architect or designer, present possibilities that no other medium could. ___5____ .

The increased availability of natural stone is due mostly to the innovations of stone processing equipment and tooling. ___6 ____ . Improved methods for quarrying and new ways of processing all of the stone removed from the ground can result in greater profit for the quarries and a greener product than any imitations.

____7____ . It has a history of use that is part of the human race. The stone industry has been able to take advantage of technological advances that improve yield and offer more options. Natural stone is a gracious compliment to any modern setting.

A) Most stones have a graining referred to as the “rift.”

B) Stone also is timeless.

C) Stone is far more than just another building material.

D) The use of natural stone is as much about people and cultures as it is about the material.

E) These abounding options give natural stone an opportunity to communicate any desired result.

F) These advancements have increased production, lowered costs and made available new products.

This is one of the remarkable aspects of natural stone.

Unit 5. BUILDING HOUSES

Read the text again and do the text-based exercises coming after the text.

TEXT 11. BUILDINGS AND THEIR TYPES

In architecture, construction, engineering and real estate development the word ‘building’ may refer to any human-made structure used for sheltering any use or for continuous residence.

A building as a shelter represents a physical division of the human habitat standing more or less permanently. It is a place of comfort and safety which protects a human being and his property from direct harsh effect of weather like rain, wind, sun.

The buildings all differ in the manner of their construction, use, or occupancy.

A building is a civil engineering construction which is raised on a foundation and is generally made of stone, concrete blocks, bricks and mortar or cement. Frame construction embraces all buildings with exterior walls of wooden framework sheathed with wood shingles or siding; veneered with brick, stone, or terra cotta; or covered with stucco or sheet metal. Such buildings naturally have floors and partitions of wood. Buildings serve several needs of society, primarily as shelter from weather and as general living space, to provide privacy, to store belongings and to comfortably live and work.

Types of buildings depend upon social functions and may be classified according to the role in the community. The types of buildings may be domestic, educational, office, industrial, recreational, etc.

Residential buildings are called houses/homes, though buildings containing large numbers of separate dwelling units are often called apartment buildings (blocks) to differentiate them from the more 'individual' house.

Building types may range from one-room wood-framed, masonry, or adobe dwellings to multi-million dollar high-rise buildings able to house thousands of people. Increasing settlement density in buildings (and closer distances between buildings) is usually a response to high ground prices resulting from many people wanting to live close to work or similar attractors.

Industrial buildings comprise another significant type of construction. This type of construction involves factories, laboratories, food-processing plants, mines, office buildings, stores, garages, hangars and other storage facilities, exhibition halls, etc.

Any building requires a certain amount of internal infrastructure to function, which includes such elements like heating and cooling, power and telecommunications, water and wastewater etc. Especially in commercial buildings (such as offices or factories), these can be extremely intricate systems taking up large amounts of space (sometimes located in separate areas) and require regular maintenance.

The building of houses is fundamental for human development. It is very important for family and for general social development. The house is a place to live in, so it must be comfortable and healthy.

So, to be a good house it must comply with a few basic functions.

• It should be a functional and healthy environment for those that live in it.
• Inside one must be protected from wind, cold, heat, rain, sand and dust.
• It should last for many years without requiring much mainte-nance.

Houses vary according to their location; they change due to cultural differences and also due to the local resources available to create them. In cold places houses must be more compact and have thick walls and small windows to resist the cold; they also have heating systems. In the forest areas the houses are made from wood, in the mountains they are made from stone, in areas with clay they are made from brick. In areas where there is seismic activity it is important to consider this when designing the structure of the house.

Many types of houses are difficult to build as they require a lot of knowledge and work to create them. The techniques of construction or the methods by which structures are formed from particular materials are influenced not only by the availability and character of materials but also by the total technological development of society.

Post-Reading Vocabulary Exercises

Ex. 1. Insert into the sentences the right word or word group:

available; settlement density; foundation; regular maintenance; apartment buildings; human habitat; technological development; a good house; be protected; sheathed with; without requiring; seismic activity

1. A building as a shelter represents a physical division of the _____ standing permanently. 2. A building is a civil engineering construction which is raised on a _____ . 3. Frame construction embraces all buildings with exterior walls of wooden framework _____ wood shingles or siding. 4. Buildings containing large numbers of separate dwelling units are often called _____ (blocks). 5. Increasing _____ in buildings and closer distances between buildings is usually a response to high ground prices. 6. In commercial buildings there can be extremely intricate systems requiring _____ . 7. To be _____ the building must comply with a few basic functions. 8. The building should last for many years _____ much maintenance. 9. The types of houses change due to the local resources _____ to create them. 10. In areas where there is _____ it is important to consider this when designing the structure of the house. 11. The techniques of construction are influenced by the total _____ of the society. 12. Inside the house one must _____ from wind, cold, heat, rain, sand and dust.

Ex.2. Complete the sentences.

1. The word ‘building’ may refer to … . 2. A building as a shelter represents … . 3. A building is generally made of … . 4. Buildings serve several needs of society … . 5. According to the role in the community the buildings may be … . 6. Residential buildings are called … . 7. Industrial buildings involve … . 8. Internal infrastructure includes such elements like … . 9. To be a good house the building

must comply with … . 10. In cold places houses must be … . 11. In areas where there is seismic activity … . 12. The techniques of construction are influenced by …

Text-Based Exercises

Ex. 1. Arrange the sentences in the logical sequence of the text above.

A) The buildings all differ in the manner of their construction, use or occupancy.

B) The building protects a human being from harsh effect of weather like rain, wind, sun.

C) Increasing settlement density in buildings is usually a response to high ground prices.

D) Many types of houses are difficult to build as they require a lot of knowledge and work to create them.

E) Types of buildings depend upon social functions and may be classified according to the role in the community.

F) In areas where there is seismic activity it is important to con-sider this when designing the house.

G) The house is a place to live in, so it must be comfortable and healthy.

H) The word 'building' may refer to any human-made structure used for sheltering any use or for continuous residence.

I) Houses vary due to cultural differences and also due to the lo-cal resources available to create them.

J) Frame construction embraces all buildings with exterior walls of wooden framework.

Industrial buildings comprise factories, laboratories, office buildings, stores, garages, etc.

Ex.2. Summarise the text. For each of the parts give the key statement and support it with the chosen additional information.

Read text 12 more thoroughly. Consult the list of additional vocabulary. Be ready to do the assignments after the text.

TEXT 12. BUILDING HOUSES

Most houses are built of wood, brick, stone and concrete. In the construction the first step to make is a careful survey of the site. A surveyor measures the plot of land or site and makes a plan of it. After the plot of land has been chosen, and it is then time to decide what kind of house is to be built. An architect draws pictures of what the house will look like when it is built. He draws plans to show the size of the house, the shape of the rooms and where all the fittings must go in the house. Every detail of a house must be carefully planned. The working plan itself is called a blueprint. Without a blueprint the work-men would make all sorts of mistakes and waste a lot of time.

Further on quite a lot of people work together to make the house. The building process takes place under the supervision of foremen and engineers, and

the structure is put up by bricklayers, carpenters, plasterers, plumbers, painters, locksmiths, glass-cutters, etc.

Copies of the plan are made and are given to the builder. The builder then marks out the shape of the house on the site. He does this with wooden pegs and tape. Everything is now ready for the workmen to start. They dig away the top-soil and cut trenches about two or three metres deep along the tapes. The workmen mix cement, sand, pebbles and water in a cement mixer to make concrete. They use the concrete to fill in the bottoms of the trenches. This is called laying the foundations. The walls of the house will be built on the concrete foundations.

The man who builds walls is called a bricklayer. The bricks are stuck together with mortar. When the walls of the house are too high for the bricklayer to reach, the first scaffold is made. A scaffold is a platform of planks for the workmen to stand on. This is usually held up by a frame of steel tubes. Extra scaffolds are put up as the workmen need them. As the bricklayer works he often looks at the plans. Then he will know where to build in the doors, windows and ventilators.

A carpenter now begins to work. He is the man who does the rough woodwork of the house. When the walls are at the level of the first floor he puts in the wooden floor joists. These are strong wooden beams which will carry the upstairs floors and hold up the ceilings in the downstairs rooms. Then the joiner fixes the window-ledges and when the walls are plastered he fixes the doors and other woodwork. Today most of the woodwork is made at a joinery works. At the joinery works, machines plane the wood smooth and cut it to the right size. Machines also make the joints ready for the men to fit the pieces together. Doors, window frames and even the stairs all come to the building site on lorries. They are ready to be fixed in the houses.

A lot of strong timber which we cannot see is used to make a roof. The highest beam is called the ridge. The sloping beams are called rafters. When the roof is on, many different workmen can come and finish off the house.

Plumbers work on all the water pipes of the house. They lay pipes to carry clean water into the house from the water mains. Plumbers also lay pipes to carry waste water away to the sewers.

Glaziers put glass in the window frames to keep out the wind and the rain. When all the wires and pipes are in place the house is ready for the plasterers. They are the men who make the ceilings and walls nice and smooth. The joiners finish all the woodwork in the house, and leave it ready for the painters and decorators.

Reading Comprehension Exercise

Ex. 1. Say if it is true or false. Correct the wrong statements and quote the relevant information from the text.

1. A surveyor draws pictures to show what the house will look like when it is built.

2. The architect draws plans and indicates the size of the house, the shape of the rooms and where all the fittings must go in the house. Without a surveyor’s plan the workmen would make all sorts of mistakes and waste a lot of time.

3. The building process takes place under the supervision of foremen and engineers.

4. The builder marks out the shape of the house on the site with stones and nails.

5. The workmen dig away the top-soil and cut trenches along the tapes.

6. A foundation is a platform of planks for the bricklayers to stand on.

7. The builder often looks at the plans to know where to build in the doors, windows and ventilators.

8. The carpenter does the rough woodwork of the house.

9. The wooden floor joists carry the upstairs floors and hold up the ceilings in the downstairs rooms.

10. At the plumber's works machines plane wood smooth and cut it to the right size.

11. Doors, window frames and stairs come to the building site ready to be fixed in the houses.

12. The highest strong beam in the roof is called a rafter.

13. The plumber's work is to put glass in the window frames.

14. The plasterers make the ceilings and walls nice and smooth.

Vocabulary and Grammar Consolidation Exercises

Ex. 2. Phrasal verbs are semantically indivisible. They need special efforts to memorize and require much practice.

A) Study the list below and memorize the meaning of the phrasal verbs.

B) Translate the sentences with the phrasal verbs from texts 1 and 2 and some more examples:

hold up - підтримувати, підпирати
take up - займати (місце)
keep out - не допускати, не впускати
finish off – завершити, доробити
put in – встановлювати
fill in - заповнювати,
build in - вбудовувати,
carry away - виносити,
dig away - викопувати

1. The structure is *put up* by bricklayers, carpenters, plasterers, plumbers, painters, locksmiths, glass-cutters, etc. 2. The builder *marks out* the shape of the house on the site. 3. The workmen *dig away* the top-soil and cut trenches. 4. The workmen use the concrete to *fill in* the bottoms of the trenches. 5. The bricklayer will know where to *build in* the doors, windows and ventilators. 6. When the walls are at the level of the first floor he *puts in* the wooden floor joists. 7. The strong wooden beams will *hold up* the ceilings in the downstairs rooms. 8. When the roof is on, many different workmen can come and *finish off* the house. 9. Plumbers lay pipes to *carry* waste water *away* to the sewers. 10. Glaziers put glass in the window frames to *keep out* the wind and the rain. 11. The internal infrastructure includes extremely intricate systems *taking up* large amounts of space. 12. All electrical work, inside and outside the house, must be *carried out* by a qualified electrician. 13. Cabinet sales person should *come down* and *mark out* the layout of

all the cabinets. 14. Mansard roof *is made up* of four slopes, two on each side of the home. 15. Houses in regions with heavy rainfall or snow have slopping roofs to allow rainwater or melted snow *to slide off* easily. 16. Failing to plan such a huge project in detail can result in various elements of the job being built in the wrong order, *slowing* the project *down* and increasing the budget.

Ex. 3. Express the following in one word, using the suffix -er/-or. Model: The person who reads is a reader. The person who builds is a builder.

1. The person who creates is ... . 2. The person whose occupation is to produce is ... . 3. The person whose occupation is to construct is ... . 4. The person whose occupation is to decorate is ... . The person who is visiting is ... . 6. The person who designs is … . 7. The person who lives in London is … . 8. The person who lives in a village is ... . 9. The person who lives in New York is ... . 10. The person who lives in Syktyvkar is ... .

Ex. 4. Look through a list of names of occupations and professions. Consult a dictionary if you are not sure about some of the names.

1. a miner
2. a doctor
3. a teacher
4. a builder
5. a dentist
6. a farmer
7. a pilot
8. a shoemaker
9. an architect
10. a fisherman
11. a driver
12. a painter
13. a carpenter
14. a photographer
15. a bricklayer
16. a locksmith
17. a mechanic
18. a student
19. a watchmaker
20. a musician
21. a writer
22. an actor
23. a singer
24. a designer
25. a welder
26. a building engineer
27. a plasterer

A) Say a few sentences about the professions listed above. Model:
A miner is a worker. He works in a mine. He mines coal or other minerals.

B) Say a few words about the different professions of your friends and relations.

Ex. 5. Answer the following questions and then make up your own sentences to describe something or somebody or some procedure.

1. What is called a survey?
2. What is called a scaffold?
3. What is called plastering?
4. What is called joinery?
5. Who is called a plumber?

6. Who is called a glazier?
7. Who is called a surveyor?
8. Who is called a carpenter?

Ex. 6. Choose the right form (active or passive) of the verb.

Different workmen *(employ / are employed)* in building a house. The stonemason *(builds / is built)* the foundation. The bricklayer *(is built / builds)* the walls and other parts made of bricks. He *(lays / is laid)* the bricks one on the top of another and *(is put / puts)* mortar between them with a trowel. The slater or tiler *(employ / is employed)* for putting slates or tiles on the roof. The plumber *(is fixed / fixes)* all the baths, water pipes and the sanitary fittings of drains and lavatories in the places marked for them in the plan drawn by the architect. The electri-cian *(runs / is run)* electric wires and *(is made / makes)* connections all through the house from the cellars under ground to the attics under the roof. All the doors and window-frames *(make / are made)* by the car-penter and *(are put / put)* into their places by the joiner. The latter also *(lays / are laid)* down the floor. Then the plasterer *(puts / is put)* plaster or cement over all the walls and ceilings and *(is made / makes)* them smooth. Then the walls *(paint / are painted)*, papered or whitewashed.

Ex. 7. Transform the sentences with the verb-predicate in the Passive Voice into the Active forms.

Model: Most houses are built of wood, brick, stone and concrete. They (engineers, people …) build houses of wood, brick, stone and concrete.

1. The working plan of the house is called a blueprint.
2. The bricks are stuck together with mortar.
3. When the walls of the house are too high for the bricklayer to reach, the first scaffold is made.
4. Extra scaffolds are put up as the workmen need them.
5. Today most of the woodwork is made at a joinery works.
6. Computations are done by structural engineers for buildings for the proper size of foundations.

Ex. 8. Transform the sentences with the verb-predicate in the Active Voice into the Passive.

Model: A surveyor measures the plot of land. The plot of land is measured (by a surveyor).

1. The architect draws plans to show the size of the house, the shape of the rooms.
2. The builder then marks out the shape of the house on the site.
3. They use the concrete to fill in the bottoms of the trenches.
4. Machines plane the wood smooth and cut it to the right size.
5. Plumbers lay pipes to carry clean water into the house.

Read text 3 "HOUSING" divided into parts. Find answers to the questions which come before each of the coming passages.

TEXT 13. HOUSING

1. What does the construction of a house start with?

Houses are built of wood, brick, stone and concrete. A lot of houses are built of prefabricated blocks (prefabs). All the parts of such houses are produced on an industrial scale in factories and assembled on the spot. The building process takes place under the supervision of foremen and engineers. The structure is put up by bricklayers, carpenters, plasterers, plumbers, painters, locksmiths, glass-cutters, etc. In the construction of a house the first step is to make a careful survey of the site and to examine the soil in order to find its bearing power. Next, the building lines are staked out. After this, the foundations are built. The excavation is dug for the basement and then followed by the actual building of the foundation walls below ground level. Then the foundation work is finished by providing anchoring sills. That is the case of a wooden building.

2. What work is the designer responsible for when building a house?

In the case of a brick structure, the building of the walls may be directly proceeded with. Foundations are to keep the floors and walls from contact with the soil, to act against the action of the frost and to prevent from settlement. The part upon which the stability of the structure depends is the framework. It carries the loads which are imposed on it. To do this work properly and safely the floors, walls, roofs and other parts of the construction must be correctly designed and proportioned. The designer determines the size of the walls, the floor joists, the beams, the girders and the parts which make up the framework. He also decides how they are to be spaced and arranged.

3. What is a lintel and where is it used?

The building of a wall consists in laying down courses of bricks and bonding them together with mortar. The instrument used by the bricklayer is called a trowel. In order to shape the brick to the necessary size or to chip it, the brick chisel and the hammer are used. Walls are constructed to enclose areas and to support the weight of floors and roofs. The walls may be solid and hollow. Besides brick, stone, concrete and other natural and artificial materials are used for the construction of walls. When doors or windows are to be made, a lintel is usually inserted in the wall above the opening. The entrance leading into the house from the street is called the front door, from the yard – the back door. The sashes are placed in position only later and so, of course, are the window panes. The panes are fastened in with the help of glazier's putty. Walls may be either covered with wall- paper or only plastered. In both cases, lathwork is first made which is subsequently covered with plaster. The chief instruments used by the plasterer are the trowel and the float.

4. How are floor boards laid?

Storeys are separated by several successive layers: the fire stop joists and rough flooring. The regular flooring is placed upon the rough floor, being supported by stringers and girders. The staircase leads to the upper floors. The

staircase consists of stairs (steps). When we ascend or descend from step to step we hold on to the banisters (hand-rails). The steps between two landings are called a flight of stairs. Floor boards are laid in several different ways. Of these the more usual are: plain jointed, when the boards are simply laid side by side, a nail is being driven in through the boards into each joist. Tongued and grooved, one board can first be nailed and the other board, upon being slipped into it, will be kept down by the form of the joint. Thus the nails are prevented from appearing on the surface of the floor.

5. What materials are usually used for covering the roof of the building?

The whole structure is crowned by the roof which covers the building and protects it from exposure to the weather. It ties the walls and gives strength to the structure. A complete roof consists of covering, sheathing, rafters, purlins and roof trusses. The covering is the outer or weather-resisting coating of the roof. The materials mostly used for the covering are shingles, slate, tiles and iron. The sheathing is the layer of boards or other material to which the covering is attached. The rafters are the inclined beams which support the sheathing. The purlins support the rafters. The roof trusses are the frames which support the roof and transmit its weight to the walls or columns of a building. The wall-plates are plates which are laid on top of the wall to distribute the weight transmitted by the trusses. The ridge is the highest horizontal line of the roof.

6. Who are the elements of internal infrastructure fixed by?

After the building of the house proper is completed there will be need to make a number of connections. The plumber fixes all the baths, water pipes and the sanitary fittings of drains and lavatories in the places marked for them in the plan drawn by the architect. The electrician runs electric wires and makes connections all through the house from the cellars under ground to the attics under the roof.

Read text 14 "HOUSES AND HOMES".

A) Read the text without a dictionary. Guess the meaning of the unknown words that you may come across.

TEXT 14. HOUSES AND HOMES

Houses are buildings that people can live, eat and sleep in. They protect you from dangers and bad weather. Most houses show the life-styles, traditions and cultures of the people who live in them. Homes and houses have different shapes and sizes. They are built of different materials that depending on the climate of the area you live in.

Long ago, people built homes with whatever building materials that they had. In Africa and some islands of the South Pacific they used grass or leaves that grew nearby. In the south-western part of the United States the Pueblo Indians used sun-dried bricks to build their houses.

Even though today you can transport materials all over the world, it is still easier and cheaper to use the materials that are at hand. There are four basic kinds of material that are used today.

In the northern part of North America and in northern Europe wood has been

the main building material for many centuries. Early settlers in America built log cabins and in Scandinavia people de-signed wooden houses with large beams and balconies.

Brick is among the oldest and most popular building material. It lasts long and is easy to get. Brick is often used to build row houses.

Early Dutch settlers brought bricks across the Atlantic to build their first houses.

Stone is the longest lasting of all building materials. Weather can-not destroy it so much and insects and animals cannot bore into it as they can into wood. Stone has been used for many centuries because it cannot be destroyed by fire. It has been used for all sorts of houses, from palaces to farmers' cottages.

In modern buildings we use concrete instead of stone and brick. It is cheaper and can be produced almost everywhere. Concrete is a mixture of sand, broken stones, water and other materials. Cement is added to hold it together. Steel rods are often put into the concrete, to hold it together when buildings get higher.

Building a house

Before you actually build a house there are lot of things you must do first. You must have a piece of land on which your house can be built, then you should ask an architect or builder to find out if there are any restrictions or limitations on building in the area. A construction drawing of the house shows the size, order of the rooms, where doors and windows are and other details. Then you usually need a building permit to start building your house.

The foundation supports your house. Construction workers start digging holes for the footings, which support the walls of the house. They are made by pouring concrete into forms that reach down below the frost line so that the house cannot move when it freezes in winter. The area that is below the ground is called the basement or cellar. Many basements have extra rooms that are used for the house’s heating or for storage. Not all houses have basements, those in wet regions are often put on stilts.

The frame is the skeleton around which the rest of the house is built. Workers put beams into the foundation that support the outside walls. Slabs are the horizontal parts of the frame that separate the floors. When the frame is finished the walls are raised.

The roof protects the house from rain and sun. Some roofs are flat others are slanted to lead rain and snow down. They are built of different materials, depending on the climate and amount of rainfall.

Interior construction

When the outside of the house is finished you must start working on the interior. Windows, doors have to be built into the frame. Wires must be laid for electricity and power. Plumbers install the pipes through which water flows. A new house has to be insulated in order to reduce heating costs and to save money. Most houses have central heating system. A furnace or boiler, mostly in the basement, warms up the water which then leads through pipes through the whole house. Cold water returns through the pipes and into the furnace where it is heated up again. More and more houses install air conditioning to cool down in the summer months.

Finally, the walls are painted and the rooms decorated.

Culture and lifestyles

Home styles around the world are different because of culture and tradition. Western-style houses and buildings are found all over the world. With their simple design they are slowly replacing traditional houses in the Middle East and Asia.

In big cities where there is not enough space people often live in apartments. They appear in all kinds of sizes and forms - from one-room apartments to apartments with balconies or terraces or even penthouses. Town houses or row houses are often found in cities. They have separate street entrances but often share the same walls.

Many suburban residents live in single-family houses with their own yards and gardens. Sometimes they are built in groups that are owned and sold by a company. In rural areas farmhouses usually stand alone, surrounded by fields, barns and huts.

In some parts of the world people don't always live in the same place. They move their homes constantly. Mobile homes are becoming more and more popular, especially in America. They can be loaded onto a truck and towed from one place to another.

B) Read the text again and make a list of additional topical vocabulary (10 to 15 words and word-combinations). Consult a dictionary to finalize the choice of the Russian equivalents. Memorise the new vocabulary.

UNIT 6. FOUNDATION

Read text 15 "FOUNDATIONS IN CONSTRUCTION". In the text point out the introductory part, the main part and the conclusion.

Find out the differences between shallow and deep foundations, total settlement and differential settlement and some other essential details concerning foundations.

TEXT 15. FOUNDATIONS IN CONSTRUCTION

Every building needs permanent stability. In order to have stability, buildings should have foundations. A foundation is a structure that transfers loads to the ground. Foundations are generally broken into two categories: shallow foundations and deep foundations.

Shallow foundations are usually embedded a meter or so into soil. One common type is the spread footing. It consists of strips or pads of concrete (or other materials) which extend below the frost line and transfer the weight from walls and columns to the soil or bedrock. Another common type is the slab-on-grade foundation where the weight of the building is transferred to the soil through a concrete slab placed at the surface.

Deep foundations are used to transfer a load from a structure through an upper weak layer of soil to a stronger deeper layer of soil. There are different types of deep foundations including piles, drilled shafts, caissons, piers, and earth stabilized columns. Historically, piles were wood, later steel, reinforced concrete, and pretension concrete. Sometimes these foundations penetrate bedrock.

The primary design concerns are settlement and bearing capacity. When considering settlement, total settlement and differential settlement is normally considered. Differential settlement is when one part of a foundation settles more than another part. This can cause problems to the structure the foundation is supporting. It is necessary that a foundation should not be loaded beyond its bearing capacity or the foundation will "fail". For a typical modern three-bedroom detached house the total of the dead and imposed loads is about 120 tonnes and most types of ground can easily carry this load using simple foundations. The exact dead and imposed loads can be easily calculated.

Other design considerations include scour and frost heave. Scour takes place when flowing water removes supporting soil from around a foundation (like a pier supporting a bridge over a river). Frost heave occurs when water in the ground freezes to form ice lenses.

Changes in soil moisture can cause expansive clay to swell and shrink. This swelling can vary across the footing due to seasonal changes or the effects of vegetation removing moisture. The variation in swell can cause the soil to distort, cracking the structure over it. This is a particular problem for house footings in semi-arid climates where wet winters are followed by hot dry summers.

When structures are built in areas of permafrost, special consideration must be given to the thermal effect the structure will have on the permafrost. Generally, the

structure is designed in a way that tries to prevent the permafrost from melting.

Text-Based Exercises

Ex. 1. Arrange the sentences in the logical sequence of the text above.

A) Changes in the moisture content can cause expansive clay in the soil to swell and shrink.

B) Deep foundations are used to transfer the load from the structure through an upper weak layer of soil to a stronger deeper layer of soil.

C) Differential settlement occurs when one part of a foundation settles more than another part.

D) For permanent stability buildings should have foundations.

E) Foundations are generally broken into two categories: shallow foundations and deep foundations.

F) Frost heave occurs when water in the ground freezes to form ice lenses.

G) In areas of permafrost the structure should be able to prevent the permafrost from melting. Most types of ground can easily carry the load of a typical modern three-bedroom detached house with simple foundations.

H) Scour takes place when flowing water removes supporting soil from around a foundation.

I) Spread footing consists of strips or pads of concrete which extend below the frost line.

J) The foundation should not be loaded beyond its bearing capacity.

K) The slab-on-grade foundation transfers the weight of the building to the soil through a concrete slab at the surface.

L) The spread footing transfers the weight from walls and columns to the soil or bedrock.

M) The variation in swell can cause the soil to distort, cracking the structure over it.

N) There are different types of deep foundations including piles, drilled shafts, caissons, piers, and earth stabilized columns.

O) Total settlement and differential settlement are normally considered.

Ex. 2. Give summary of the text. For each of the parts give the key statement and support it with the chosen additional information.

Post-Reading Vocabulary Exercises

Ex. 3. Insert into the sentences the right word or word group.

soil moisture; thermal effect; loads; to distort; spread footing; to prevent; swell; ice lenses; bedrock; a concrete slab; design concerns; scour; differential settlement; simple foundations; bearing capacity; deep foundations; a particular problem

1. A foundation is a structure that transfers _____ to the ground.
2. The _____ consists of strips or pads of concrete (or other materials)

which extend below the frost line.

3. The spread footing transfers the weight from walls and columns to the soil or _____ .

4. The slab-on-grade foundation transfers the weight of the building to the soil through _____ at the surface.

5. _____ transfer a load from a structure through an upper weak layer of soil to a stronger deeper layer of soil.

6. The primary _____ are settlement and bearing capacity.

7. With _____ one part of a foundation settles more than another part.

8. The foundation should not be loaded beyond its _____ or the foundation will "fail".

9. Most types of ground can easily carry loads of 120 tonnes using _____ .

10. _____ takes place when flowing water removes supporting soil from around a foundation.

11. Frost heave occurs when water in the ground freezes to form _____ .

12. Changes in _____ can cause expansive clay to swell and shrink.

13. The variation in can cause the soil _____, cracking the structure over it.

14. This is _____ for house footings in semi-arid climates with wet winters and hot dry summers.

15. Special consideration must be given to the _____ the structure will have on the permafrost.

16. The structure is designed in a way that tries _____ the permafrost from melting.

Ex. 14. Complete the sentences.

1. We normally consider … settlements.
2. The foundation should not be loaded … .
3. A foundation is a structure … .
4. Historically, piles were … .
5. Foundations are generally broken into … .
6. Frost heave occurs when … .
7. The variation in swell can cause … .
8. The spread footing consists of … .
9. In areas of permafrost special consideration must be given to … .
10. Deep foundations are used to … .
11. Every building needs … .
12. Differential settlement is … .
13. A typical modern three-bedroom detached house can carry … .
14. Other design considerations include … .
15. Shallow foundations are … .
16. The different types of deep foundations include … .
17. Scour takes place when … .
18. Changes in soil moisture can cause … .
19. The primary design concerns are … .
20. The slab-on-grade foundation transfers … .

For more specific information concerning foundations read text 16 "TYPES OF FOUNDATIONS" and get ready to answer the questions following the text and the list of vocabulary.

TEXT16. TYPES OF FOUNDATIONS

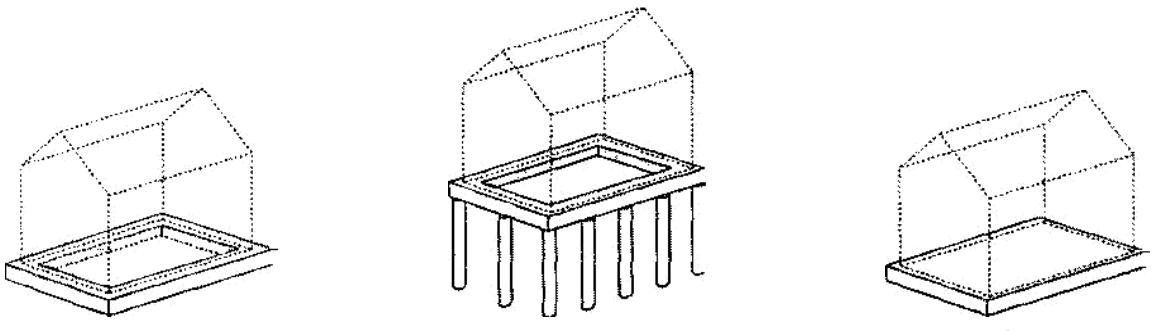
Foundation construction is an integral part of home building. It is what the whole house rests on. A firm foundation is a must, so don't use sand. The simplest and most common form of foundation comprises a strip of concrete under all the load-bearing walls. The depth and width of the concrete strip is determined by the nature of the ground and the load of the building.

Most soils consist of a mixture of solid particles, water and air. In addition, the soil near the surface of the ground will also contain organic material and this top soil must never be used as a base for a foundation. It varies greatly in volume due to changes in water content and is very unstable due to the amount of organic material it contains.

Increasing the pressure on a soil by applying the load of a building squeezes some of the water out of the soil causing it to consolidate and allowing slight settlement of the structure above. In non-cohesive soils such as sands, water movements are rapid and a building will normally complete its settlement during its construction. Cohesive soils such as clay lose their water much more gradually and buildings may slowly settle for many years before equilibrium is reached. The softer clays contain large amounts of water and thus permit extensive settlement.

Concrete has only been common in foundations for just over 100 years. In its simplest form it is a mixture of ordinary Portland cement, stone and water, mixed in varying proportions. Because of concrete's high strength, bricklayers can usually start building on the foundations a few days after it has been poured.

There are three basic types of foundation used in housing and these are shown in the diagram below. Of the three, the strip foundation is by far the most common.



1. 2. 3.

1. *Strip Foundation* - strip of concrete under all loadbearing walls. The strip width and depth depends on building load and nature of ground.
2. *Pile Foundation* - long, slender concrete members used to transfer loads through weak or unstable soil to ground of higher loadbearing capacity.
3. *Raft Foundation* - concrete raft which spreads loads over whole ground floor area.

In practice both traditional strip and trench fill foundations be-come uneconomic if the required depth is more than 1000mm. There is a large volume of excavated material to dispose of and in wet weather the open trenches need constant cleaning out and may well require temporary support to prevent the banks collapsing. A sensible alternative is to use piled foundations.

Piling can take place in freezing or wet weather which can often stop traditional foundation methods. In addition there is less excavated material to dispose of. There are a variety of piling systems suitable for housing.

In granular soils such as compact sands and gravels end bearing piles can be used. Their use in housing is very rare as these soils are generally ideal for strip foundations. However, on blocks of flats they may sometimes offer cost savings over strip foundations. End bearing piles can be formed in a number of ways. Two of the most common are driven preformed (precast) piles and driven, cast inset piles.

Pier foundations are sometimes used as an alternative to piling. If the ground is full of old basements or other obstructions, or if the ground is too steep for piling rigs, pier foundations are sometimes specified. They usually comprise a series of thick concrete piers, formed inset, which support a reinforced concrete ground beam. Large concrete rings, usually used for drainage inspection chambers, can provide a permanent formwork for the wet concrete. A typical house might be supported by six or eight piers. When constructing pier foundations it is usually necessary to excavate the whole area below the building to the required depth of the piers. When the piers have been poured the ground is replaced.

Ex. 1. Rearrange the statements in the correct order to make a summery of the text.

1. Each of the basic types of foundations has advantages and limitations.
2. Bearing pressure and the type of soil cause different degrees of consolidation and settlement.
3. Pier foundations aren’t economic but help in solving problems with ground and obstructions.
4. End bearing piles have special uses and are specific for manufacturing.
5. Concrete is used to produce simple but strong foundations.
6. The depth and width of the concrete strip is determined by the nature of the ground and the load of the building.

Expand on each item with one or more sentences to retell the text.

PILE FOUNDATIONS

The durability of a structure *(depends / is depended)* on how the foundation *(builds / is built)* and on the property of the ground.

Prior to the beginning of the last century buildings *(put up / were put up)* mostly on stable ground. Bands of stone and baked bricks bound together by lime mortar *(served / were served)* as foundations.

Our ancestors could not even imagine on what kind of ground we *(would build / would be built)*. Towns and cities *(have appeared / have been appeared)* in places where there had recently been swamps, on the permafrost ground of the northern regions of the country. Pile foundations *(use / are used)* widely there.

Piles *(used / were used)* in ancient times. Peter the Great widely *(used / was used)* piles in building the city. Interestingly, Ivan the Great's bell tower in the Kremlin (about 500 years old) also *(stands / is stood)* on a peculiar pile foundation. The base *(comprises / is comprised)* of round, closely bound upright logs from 120 to 180 cm high. Upon the piles *(rests / is rested)* a massive stone slab. The piles *(sub-merge / are submerged)* in water to protect the wood from destruction.

During the last few decades pile boring *(has found / has been found)* wide application. First a bore hole *(fills / is filled)* with steel framework, then with concrete, and the pile is ready.

Read text 16 "FOUNDATIONS AND TYPES OF SOILS".

A) Read the text without a dictionary. Guess the meaning of the unknown words that you may come across.

TEXT 16. FOUNDATIONS AND TYPES OF SOILS

It is a well-known fact that there exist different kinds of soil. It is also a well-known fact that the structure of the upper stratum of the soil is of great importance for excavation. The foundation of a building should never be placed on organic soils because soils of this kind are easily decomposed. They are decomposed because water and wind change their structure. So, if the upper stratum of soil is organic, it must be removed from the construction area in order to guard the foundation of the building against water and wind erosion. Further excavation may take place only after the upper organic stratum has been removed. In colder climates the foundations of buildings should be placed below the level to which the ground freezes in winter.

Natural Foundations. The soils comprised under this head may be divided into two classes. (1) Those whose stability is not affected by water, and which are firm enough to support the structure, such as rock, compact gravels, and hard clay, and (2) soils which are firm enough to support the weight of the structure, but whose stability is affected by water, such as loose gravels, sand, clay and loam.

Foundations on Rock. To prepare a rock foundation, all that is generally necessary is to cut away the loose and decayed portions and to dress the surface so exposed to a plane as nearly perpendicular to the direction of the pressure as practicable; or, if the rock forms an inclined plane, to cut a series of plane surfaces, like those of steps, for the walls to rest upon. If there are any fissures in the rock they should be filled with concrete.

Foundations on Gravel, etc. In dealing with soils of this kind usually nothing more is required than to cover them with a layer of concrete of width and depth sufficient to distribute the weight properly.

Foundations on Sand. Sand is almost incompressible so long as it is not

allowed to spread out laterally, but as it has no cohesion, and acts like a fluid when exposed to running water, it must be treated with great caution.

Foundations on Clay. Clay is much affected by the action of water, and hence the ground should be well drained before the work is begun, and the trenches so arranged that water does not remain in them. In general, the less a soil of this kind is exposed to the action of the air, and the sooner it is protected from exposure, the better for the work. The top of the footings must be carried below the frost line to prevent heaving, and for the same reason the outside face of the wall should be built with a slight batter and perfectly smooth. The frost line attains a depth of six feet in some of the northern states.

The tearing power of clay and loamy soils may be greatly in-creased:

(1) By increasing the depth.

(2) By drainage. This may be accomplished by a covering of gravel or sand, the thickness depending upon the plasticity of the soil, and by surrounding the foundation walls with a tile drain. If springs are encountered the water may be excluded by sheet pilings, puddling or plugging the spring with concrete.

(3) By consolidating the soil. This may be done by driving short piles close together, or by driving piles, then withdrawing them and filling the space immediately with damp sand well rammed. If the soil is very loose and wet, sand will not be effective, and concrete will be found more satisfactory.

Artificial Foundations. When the ground in its natural state is too soft to bear the weight of the proposed structure, recourse must be had to artificial means of support, and, in doing this, whatever mode of construction is adopted, the principle must always be that of ex-tending the bearing surface as much as possible.

Foundations on Mud, silt, marshy or compressible soils are generally formed in one of three ways:

(1) By driving piles in which the footings are supported.

(2) By spreading the footings either by layers of timber, steel beams, or concrete, or a combination of either.

(3) By sinking caissons of iron or steel, excavating the soil from the interior, and filling with concrete.

Read the text again and make a list of additional topical vocabulary (10 to 15 words and word-combinations). Consult a dictionary to finalise the choice of the Russian equivalents. Memorise the new vocabulary.

Discussions

2. 1. What materials are commonly used for foundations in our region? Which are rare?

3. What does the construction of a foundation depend on? How does it affect the choice of the material and type of foundation?

4. What would you recommend (concerning the foundation) to your friend if he decides to build a suburban single-family house in Syktyvkar?

Describe in detail the stages in foundation construction, keeping in mind the major requirements.

UNIT 7. WOOD AND WOOD-BASED MATERIALS

Read text 18 "WOOD" and find information on the following:
- unprocessed wood, its forms and uses,
- processed wood, its form and uses,
- engineered wood, its forms and uses.

Then read the text again and do the text-based exercises coming after the text.

TEXT 18. WOOD

Wood is a product of trees, and sometimes other fibrous plants, used for construction purposes when cut or pressed into lumber and timber, such as boards, planks and similar materials. It is a generic building material and is used in building any type of structure in most climates. Wood can be very flexible under loads, keeping strength while bending, and is incredibly strong when compressed vertically. There are many differing qualities to the different types of wood, even among the same tree species. This means that specific species are better for various uses than others. And growing conditions are important for deciding quality.

Historically, wood for building large structures was used in its unprocessed form as logs. The trees were just cut to the needed length, sometimes stripped of bark, and then notched or lashed in to place.

In earlier times, and in some parts of the world, many country homes or communities had a personal woodlot from which the family or community would grow and harvest trees to build with. These lots would be tended like a garden.

With the invention of mechanizing saws came the mass production of dimensional lumber. This made buildings quicker to put up and more uniform. Thus the modern western style home was made.

Lumber or timber is wood in any of its stages from felling to readiness for use as structural material for construction, or wood pulp for paper production.

Lumber is supplied either rough or finished. Besides pulpwood, rough lumber is the raw material for furniture-making and other items requiring additional cutting and shaping. It is available in many species, usually hardwoods. Finished lumber is supplied in standard sizes, mostly for the construction industry, primarily softwood from coniferous species including pine, cedar, hemlock, fir and spruce, but also some hardwood, for high-grade flooring.

Wood has been an important construction material since humans began building shelters, houses and boats. New domestic housing in many parts of the world today is commonly made from timber-framed construction. In buildings made of other materials, wood will still be found as a supporting material, especially in roof construction, in interior doors and their frames, and as exterior cladding. Wood to be used for construction work is commonly known as lumber in North America. Elsewhere, lumber usually refers to felled trees, and the word for sawn planks ready for use is timber. Wood is also commonly used as shuttering material to form the mould into which concrete is poured during reinforced

concrete construction.

Wood unsuitable for construction in its native form may be broken down mechanically (into fibers or chips) or chemically (into cellulose) and used as a raw material for other building materials such as chip-board, engineered wood, hardboard, medium-density fiberboard (MDF), oriented strand board (OSB). Such wood derivatives are widely used: wood fibers are an important component of most paper, and cellulose is used as a component of some synthetic materials. Wood derivatives can also be used for different kinds of flooring, for example, laminate flooring.

Reading-Comprehension Exercises

Ex. 1. Say which of the sentences are taken from another context. Name the numbers.

1. Wood may be broken down mechanically or chemically and used as a raw material for composite boards or engineered wood.
2. Wood is used for construction purposes as lumber and timber, such as boards, planks and similar materials.
3. Today, solid wood furniture is becoming increasingly hard to find and can be very expensive.
4. Individual houses in many parts of the world today are commonly made as timber-framed constructions.
5. Different types of wood have many differing qualities which are useful for construction purposes.
6. Wood is sometimes burned as a fuel, and hardwood is preferred over softwood as it creates less smoke and burns longer.
7. As a rule, finished lumber is supplied for the construction industry as softwood from coniferous species but also some hardwood, for high-grade flooring.
8. If the preservative is applied correctly, it extends the productive life of lumber by five to ten times.

Ex. 2. Answer the questions relying on the information from the text. Give short answers.

1. Is wood a product of fibrous plants like trees?
2. Are boards, planks and similar materials named lumber or timber?
3. Is wood strong and flexible under loads?
4. Is wood used for building in its unprocessed form?
5. Did the invention of mechanizing saws influence the production lumber?
6. Is rough lumber used as raw material for furniture-making or construction?
7. Is individual housing made from timber-framed construction?
8. Is wood used as a supporting material or shuttering material?

9. Are wood derivatives used in construction?

Ex. 3. Fill in the gaps with the proper preposition from the suggested list: of, for, in, under, as.

Product _____ trees; used _____ construction purposes; used _____ building; flexible _____ load; different types _____ wood; important _____ deciding quality; production _____ dimensional lumber; material _____ construction; available _____ many species; to supply _____ standard sizes; commonly known _____ lumber; unsuitable _____ construction.

Text-Based Exercises

Ex. 4. Insert into the sentences the right word or word group from the box.

flexible under loads; unsuitable for construction; timber-framed; harvest trees; wood pulp; dimensional lumber; furniture-making; laminate flooring; coniferous species; growing conditions; fibrous plants; sawn planks; oriented strand board; supporting material; unprocessed form

1. Wood is a product of trees, and sometimes other _____ .
2. Wood can be very _____, keeping strength while bending, and strong when compressed vertically.
3. And _____ are important for deciding quality.
4. Historically, wood for building large structures was used in its _____ as logs.
5. In earlier times many country homes or communities had a personal wood-lot from which they would grow and _____ to build with.
7. With the invention of mechanizing saws came the mass production of _____ .
8. Lumber is wood for use as structural material for construction, or _____ for paper production.
9. Rough lumber is the raw material for _____ and other items requiring additional cutting and shaping
10. Finished lumber is supplied in standard sizes, primarily soft-wood from _____ for high-grade flooring.
11. New domestic housing today is commonly made from _____ construction.
12. Wood is found as a _____ in roof construction, in interior doors and their frames, and as exterior cladding.
13. Outside America lumber usually refers to felled trees, and the word for _____ ready for use is timber.
14. Wood _____ is broken down mechanically (into fibres or chips) or chemically (into cellulose).
15. Wood can be used for other building materials such as chip-board, engineered wood, hardboard, medium-density fiberboard (MDF), _____ (OSB).
16. Wood derivatives can also be used for kinds of flooring, for example, _____ .

Ex. 5. Complete the sentences.

1. Wood is cut or pressed into lumber and timber, such as … .
2. It is a generic building material and is … .
3. There are many differing qualities to … .
4. The trees were just cut to the needed length, sometimes … .
5. In earlier times many country homes or communities had … .
6. With the invention of mechanizing saws … .
7. Lumber or timber is wood in any of its stages from … .
8. Finished lumber is supplied in standard sizes for the construction industry, primarily … .
9. … is commonly made from timber-framed construction.
10. In buildings made of other materials, wood will still be found as … .
11. Wood is also commonly used as … .
12. Wood unsuitable for construction in its native form may be … .

Read through text 19 "PREPARING A WOOD-FRAME HOUSE CONSTRUCTION" and then choose the best sentence given below to fill in each of the blanks. E. g.: 2- b

TEXT 19. PREPARING A WOOD-FRAME HOUSE CONSTRUCTION

Wood-frame house construction continues to predominate in many countries. ___1___ In fact, a wood-frame house represents an environmentally responsible choice. Wood is a renewable resource which, if properly managed and utilized, can enhance our quality of life, sustain our natural environment, and contribute to the economy.

Due to a wide variety of homes in terms of style and size, and the differences in building techniques, ___ 2___ Many factors apply, such as whether a single house or a whole subdivision is being built, as well as other factors such as weather, site conditions and the availability of labour and materials.

___3___ It is assumed that a typical two- or three-bedroom house is being built by an average builder employing subtrades. The steady decline in construction time is due largely to the introduction of sheet and panel goods, such as drywall and plywood, factory-built components such as roof trusses, windows and cabinets, and plastic piping for sanitary plumbing. Specialized power tools and equipment also helped re-duce manual labour. ___4___ If it is a very large or highly detailed building, 20 or more weeks may be needed. On the other hand, completing a small, simple dwelling may only require eight to ten weeks.

There are a number of stages in constructing a house which must be properly planned, coordinated and executed by the builder.

___5___ The amount of time needed to develop a complete set of plans, estimate the cost of the dwelling, arrange for financing and obtain a building permit and all other required approvals, will vary considerably. Providing access to the building

site and arranging for temporary power may also take place during this stage.

It is important for do-it-yourself and less experienced builders to obtain advice on local conditions and practices. ___6___ .

Sentences to be inserted

a) The first stage is also referred to as the pre-construction stage.

b) It is difficult to say exactly what is a typical house construction process.

c) The description of the typical house construction process is based on the wood-frame house construction techniques.

d) In fact, a wood-frame house represents an environmentally responsible choice.

e) It is also important to add in several weeks time to allow for unavoidable delays.

f) Thus, normally, about 16 weeks is required from start to finish.

Read text 20 "ABOUT WOODEN HOUSES" divided into parts. Find answers to the questions which come before each of the coming passages.

TEXT 20. ABOUT WOODEN HOUSES

1. Why has wood become an appealing building materal?

Wood is one of the most endurable building materials, which can be seen from a number of Scandinavian wooden houses that are over 600 years old. In modern times, a pervasive trend is ecological efficiency, the tendency to turn to nature and healthy living in all aspects. This is why the wood, due to its ecological, biological and economic advantages, has again become an appealing material for the construction of houses and other wooden buildings.

2. Due to what are wooden houses included into the low-energy category?

Technological evolution and the modern design of wooden houses led to combining tradition and technology to produce safe, environmentally friendly and sound wooden houses suitable to man. Modern technology provided greater durability and stability of wood, while the typical shortcomings of traditional wood constructions have been eliminated by advanced design methods. Wooden houses offer ideal harmony with nature, simultaneously providing excellent thermal and sound insulation and humidity regulation. Due to such insulation, wooden houses fall in the category of low-energy houses that retain heat in winter while being pleasantly cool during summer.

3. Where does wood accumulate energy from?

Research has shown that the fire risk is considerably lower with log houses than with typical constructions. Wooden houses also exhibit more seismic endurance as they are less affected by earth tremors than typical constructions. The construction of a wooden house in itself is an entirely dry method of building, which, in addition to faster building, enables you to move into a healthy and pleasant space immediately after the completion of the works.

The wood as biomass represents the sun energy accumulation along with the carbon from air and minerals from the ground, in the growth process of the trees

(photosynthesis) and then the transformation in tissues that within a year form a growth ring (yearly ring).

The accumulation of the yearly rings during the years forms the wood itself that represents another form of energy, a living resource, regenerable, with many uses.

As an energy resource and raw material, the wood has to be rationally exploited and rationally used.

4. What does rational use of wood imply?

Rational exploitation means capitalisation of the wood that reached the age of exploitation, but with a continue assurance of a new forest, by sylvic treatments and afforestation projects. Rational use means wood processing on a high level, using it in constructions in many varied and useful ways, using modern technologies.

In constructions field the wood is a raw material used for thou-sands of years, but nowadays when the planet's resources diminishes, the wood has to be appreciated and used with skills and respect. *5. In what is our responsibility concerning nature?*

Appreciating the wood we are appreciating the environment and ourselves. Following that idea, we are to do our work as wood houses constructors with skills, responsibility and professionalism, wishing to bring into your homes the sunlight improved by the wood's warmth and beauty.

Our common duty is to understand that we have to live in balance with the nature and not to dominate it, in order to pass to our children the joy of breathing a pure air on a clean planet.

UNIT 8: ARCHITECTURE: ITS FORMS AND FUNCTIONS

Read and translate the text

ARCHITECTURE: ITS FORMS AND FUNCTIONS

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. 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.

Architecture is an art. Its nowadays 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 civilisation. This paradox of change and repetition is clearly illustrated in any architectural style.

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 round the globe. During many centuries mankind admires the architecture of ancient Greece or Roman Empire as well.

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. 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.

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 as of engineering so of 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.

6.General understanding. Answer the questions to the text

1. What is architecture?
2. What is the oldest book to set forth the principles of construction?
3. How should mankind deal with the heritage of the past?
4. What three basic factors in architecture were listed nearly two thousand years ago?
5. Why architecture is a difficult art?
6. What can we say about any truly great building?
7. What integration must an architect achieve?

7.Let Is *talk about architecture.*

1. What famous Russian/English architectors do you know?
2. Among Seven Wonders of the World there were some famous buildings and constructions. Do you know them?
3. What famous architectural complexes in Russia do you know?

What do you think about your city/town architecture?

Іноземна мова за професійним спрямуванням (англійська) [Текст]: методичні вказівки до практичних занять для студентів 3 та 4 курсу зі спеціальності 5.6010101 «Будівництво», денної форми навчання/ уклад. Г.В. Смоляк − Любешів: Любешівський технічний коледж Луцького НТУ, 2014. – с. 64.

Комп'ютерний набір і верстка : Г.В. Смоляк
Редактор: М.І. Богуш

Підп. до друку _____2015 р. Формат А4.
Папір офіс. Гарн.Таймс. Умов.друк.арк. 3,5
Обл.вид.арк. 3,4. Тираж 15 прим. Зам. 417

Редакційно-видавничий відділ
Луцького національного технічного університету
43018, м. Луцьк, вул. Львівська, 75
Друк – РВВ ЛНТУ