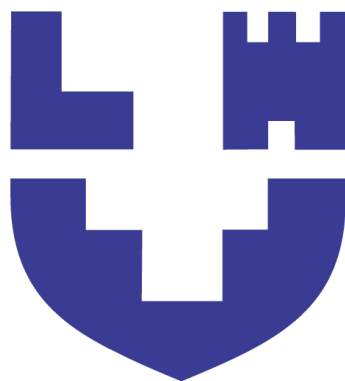


**Міністерство освіти і науки України
Луцький національний технічний університет**



Arts and Engineering: Architecture, Construction, Design

Навчальний посібник

для здобувачів вищої освіти

галузь знань - G Інженерія, виробництво та будівництво,

спеціальності - G17 Архітектура та містобудування,

G19 Будівництво та цивільна інженерія,

галузь знань - B Культура, мистецтво та гуманітарні науки,

спеціальність - B2 Дизайн,

денної та заочної форм навчання

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А 67

До друку

Голова вченої ради факультету освітніх, цифрових та соціальних технологій _____
Г. А. Герасимчук

Затверджено вченою радою освітніх, цифрових та соціальних технологій ЛНТУ, протокол
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Видання містить тексти, систему лексико-граматичних і комунікативних вправ спрямованих на забезпечення запасу професійної термінології іноземною мовою, на розвиток навичок усного та писемного науково-технічного спілкування.

Призначене для здобувачів вищої освіти галузі знань G Інженерія, виробництво та будівництво, спеціальностей - G17 Архітектура та містобудування, G19 Будівництво та цивільна інженерія, галузі знань - В Культура, мистецтво та гуманітарні науки, спеціальності - B2 Дизайн

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INTRODUCTION

This course is designed for students of engineering, architecture, design and construction.

It consists of six modules, each comprising three units. The course aims to present texts systematically and drill them through a wide variety of exercises. Each unit provides students with texts drawn from professional lexicons. There are also tasks that encourage creative performance and communication using professional vocabulary.

Each unit consists of:

- An authentic selection for reading, translation and study in class and independently;
- Vocabulary according to the topic. Professional terms are mostly taken from the text. They are presented as the core vocabulary.
- A number of varied comprehension exercises to help students memorise and master topic words;
- Drills to activate of the topic vocabulary and grammar;
- Activities involving communication tasks and creative performance;
- Additional texts with the tasks.

There is a Progress Check at the end of the manual, with self-assessment tasks for each unit.

Module one

THE ENGINEERING PROFESSION

UNIT ONE

Reading: Lutsk National Technical University

Word building: Prefixes of Nouns

Grammar: 1. The Noun: Number, Case and Gender.
2. The Pronoun: Personal, Possessive and Reflexive.

Supplementary

reading: A Six-Step Process to Finding a College Major



Phonetic Drills

*A tutor who tooted the flute
Tried to tutor two tooters to toot.
Said the two to the tutor:
"Is it harder to toot or
To tutor two tooters to toot?"*

He speaks Chinese and Japanese with equal ease

Words you will need.....

General Engineering Faculty

загальнотехнічний факультет

Motor-Car and Highway

автодорожній

Engineering Institute

технічний інститут

reveal v. Ant. conceal

виявляти

e.g., Key findings **revealed** that global companies prefer the industrial construction method.

carry (out) v.

виконувати

e.g. We **carried out** her instructions precisely.

! Mind the difference: *to accomplish, to execute, to effect, to perform, to do, to implement, to comply*

full time training

навчання на денному відділенні

part time training

навчатися на заочному відділенні

to give the opportunity

давати можливість

curriculum <i>n.</i>	курс навчання, навчальний план
Bachelor	бакалавр
Master	магістр
post graduate	аспірант
provide <i>v.</i>	забезпечувати, передбачати
e.g. Explanations of this kind provide some understanding of the process.	
defence <i>n.</i>	захист
defence of a thesis	захист наукової роботи
defend <i>v.</i>	захищати
e.g. Students should be ready to explain and defend their views.	
facility <i>n. pl. facilities</i>	можливості, засоби
comprehensive <i>adj.</i>	всебічний, комплексний
involve <i>v.</i>	залучати, включати в себе
e.g. These changes will involve everyone of the staff.	
Try to involve as many students as possible in the discussion.	
contest <i>n.</i>	конкурс
competition <i>n.</i>	змагання
prize-winner <i>n.</i>	призер
participant <i>n.</i>	учасник
devote (to) <i>v. Syn. dedicate</i>	присвячувати, спрямовувати
e.g. The company plans to devote more resources to advertising	
promotion <i>n.</i>	популяризація, сприяння
promote <i>v. Syn. encourage</i>	1. сприяти
e.g. A balanced diet promotes good health.	
Helen was promoted to senior manager.	2. підвищувати
<i>Ant. demote</i>	
She's in London to promote her new book. <i>Syn. sell</i>	3. просувати
bilateral agreement	двосторонній договір
maintain contacts	встановлювати зв'язки
master <i>v.</i>	оволодівати, опановувати

**be engaged in
activity**

бути залученим, зайнятим
діяльністю

comprise v.

охоплювати, включати

go in for

займатися

to go in for sports

embrace v.

охоплювати, користуватися, обіймати

Pre-reading.....

Task 1. a) While reading the text, you will come across a number of international words:

Technical, history, faculty, institute, polytechnical, industrial, interest, speciality, programme, specialist, result, economics, complex, laboratory, apparatus, international, conference, basis, method, contact, profession, music, concert, popular, sports, regional, accreditation.

b) Find Ukrainian equivalents to the following words:

Establishment, correspondence, agreement, competition, comprehensive, qualified, reorganized, the curricula, to envisage, well-equipped, bilateral, representatives, facilities, competitions.

Task 2. Answer the questions to introduce yourself:

1. What is your name? 2. Where and when were you born? 3. Where do you live? 4. What do you like doing? 5. What is your major? 6. What faculty do you study at? 7. Why should we study foreign languages?

Reading.....

Task 1. Read and translate the text.

Lutsk National Technical University

Lutsk National Technical University is one of the youngest higher educational establishments of Ukraine. It was founded as the General Engineering Faculty of Kyiv Motor-Car and Highway Engineering Institute in 1966. In 1975, it became the Branch of Lviv Polytechnical Institute, and in 1991, it was reorganised into the independent Industrial Institute. In 1997 it has got the highest - the fourth grade of accreditation, the Status of University and in 2008 it has got the status of the National University and at present its name is Lutsk National Technical University.

The students are admitted to the University on the basis of their results at the entrance examinations or Independent External Assessment Testing. It means that

the University widely opens the door to young people who are able to work and show a great interest in knowledge and the mysteries of science.

Structurally, the university comprises 4 centres, 3 colleges, 35 departments, and 7 faculties, with nearly 15,000 students. LNTU is developing ideas for 10 international and infrastructure projects, including the Art Tech auditorium, Dspace, SMART_Volyn_HUB, dormitory building No. 3, Youth Centre, and Veteran Hub LNTU.

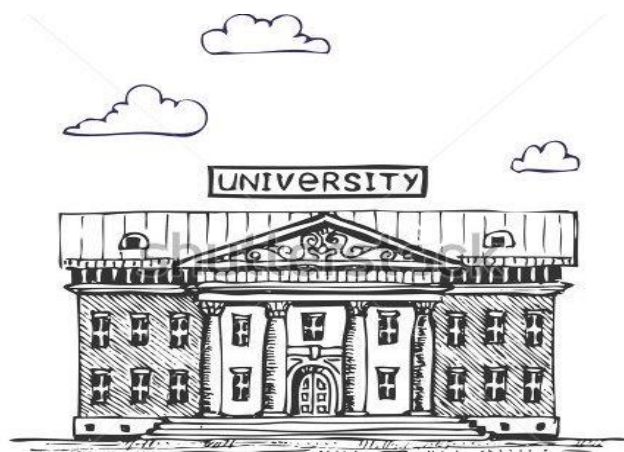
The University trains specialists for various fields of knowledge. There is full-time and part-time training at the University, the latter being for those who want to combine their work and study. There is also the Preparatory department for those who want to enter the University.

The students have the opportunity to choose their own curricula and subject courses. The university offers Bachelor's and Master's programmes. There is also a Post-graduate programme which envisages thorough training in a chosen speciality. The final result of postgraduate training is the defence of a thesis for the degree of PhD and Doctor in Engineering or Economics.

Educational and scientific work is organized and carried out by highly qualified teachers. Today, the academic staff amounts to 434 people. Among them, there are 46 Doctors of Science and 50 Professors, 329 PhDs and 298 Associate Professors, Academicians and Corresponding Members of branch academies.

The university students are involved in research work from their first year of study. The contests of students' works, competitions and exhibitions are held annually here. Many students are prize-winners in all Ukrainian student competitions and participants in international student conferences.

The University is a complex of modern lecture and study rooms, as well as well-equipped laboratories. It provides all the necessary conditions and facilities for the comprehensive education and training of future engineers, researchers and scientists.



Foreign languages are taught at all faculties of the University. To read and translate original scientific and technical literature in English, German or Polish, to speak foreign languages is the main aim of study here.

The University devotes much attention to the promotion of

cooperation with institutions of higher education in foreign countries on the basis of bilateral agreements. International contacts are maintained with higher schools in Bulgaria, the Great Britain, Georgia, Spain, Cyprus, Germany, Portugal, Romania, the Netherlands, the Czech Republic, Slovak Republic, Italy, the United States, Poland, Belgium, Sweden.

The students of the University are not only mastering their future profession, but also have a good rest. The University has all the necessary facilities for developing young people's abilities and for their relaxation. They organize evening parties with interesting concert programmes prepared by representatives of all faculties. Students participate in various sports. They have all the facilities for this: a sports complex comprising three gyms, a swimming pool, and various sports grounds. The University teams are winners of many town, regional, and all-Ukrainian competitions. Sport has become an important part of students' life.

Task 2. Give answers to the following questions:

1. When does the history of the formation and the development of LNTU begin?
2. What are the landmarks of its history?
3. Who does the University open the door for?
4. What is the structure of the university?
5. What are the main subject areas?
6. What are the University programs?
7. What does a Post-graduate program envisage?
8. What is the final result of post-graduation training?
9. What conditions and facilities does the University provide for future engineers?
10. Are the students involved in research work?
11. What countries does the University maintain contacts with?
12. What facilities does the University have for developing the abilities of young people and for their rest?

ACTIVITY

Discover specialties that one can obtain in your university. Make up a promoting report that introduces to school-leavers possibilities of study at various university departments.

DID YOU KNOW?

- The word **university** is derived from the Latin *universitas magistrorum et scholarium*, roughly meaning “community of teachers and scholars”. The term was coined by the Italian University of Bologna, which, with a traditional founding date of 1088, is considered the first university in Europe.
- The oldest existing and continually operating educational institution in the world is the University of Karueein, founded in 859 AD in Fez, Morocco.
- The largest university in the world is Indira Gandhi National Open University which is located in New Delhi, India. This public educational institution enrolls about 3, 500 000 students. This amount includes the sum of undergraduate and graduate students in active enrollment.

Practicing.....

Word-building

Affixation: Prefixes of Nouns

Prefixes of Nouns		
Prefixes	Meanings	Examples
ir-, un-, in-, il-, im-, mis-, dis-, counter-, non-	negative (негативне/заперечувальне)	ir regularity, un importance, in directness, il legality, im possibility, dis agreement, mis understanding, counter -action, non -attendance
under-, over-,	недо-, пере-, під-, взаємо-, між-	under ground, under statement over flow
sub-, inter-	взаємо-, між-	sub division, sub group, inter relation, inter action
co-, semi-	со-, пів-, напів-	co existence, co operation, semi conductor

Ex.1. Explain the meaning of prefixes and translate the words:

discomfort, counterbalance, non-fiction, mischance, underdose, overdrive, co-education, subhead, interlibrary, illiteracy, co-ordination, semicircle, submarine, semitrailer, overload, interplanetary, semitone, overtone, undertone, misfortune, over-production, disorder, irrationality, insignificance, disadvantage, unrealism.

VOCABULARY EXERCISES

Ex. 2. Find in the text:

a) antonyms to the following words and translate them into Ukrainian:

full-time training, conceal, attack, primary (results), national, was organised, defendant, unqualified, adapted literature, philological department.

b) Find in the text synonyms to the following words and word combinations and translate them into Ukrainian:

Contain, bring to the light, grant possibility, include, discussion, pay attention, collaboration, displays, accomplish, overtake (future profession).

Ex. 3. Give Ukrainian equivalents of the following:

Higher educational establishment; fourth grade of accreditation; reveal much interest to knowledge and mysteries of science; those who want to combine their work and study; those who want to enter the University; the defence of a thesis for a PhD degree in engineering or economics; exhibitions are held annually here; translate original scientific and technical literature in English, German or Polish; the promotion of cooperation with institutions of higher education in foreign countries on the basis of bilateral agreements; facilities for the development of young people's abilities and for their rest; sports complex embracing 3 gyms, a swimming pool and various sports grounds.

Ex.4. Give English equivalents of the following:

виявляти значний інтерес до знань, наукова робота, поєднувати роботу і навчання, програми підготовки аспірантів, передбачати поглиблене вивчення, захист дисертації, вчений ступінь кандидата, аудиторія, бути оснащеним, забезпечувати всіма умовами, бути залученим до науково-дослідної роботи, конкурси студентських робіт, олімпіада, приділяти багато уваги, на основі двосторонніх угод, обмінюватись досвідом, підтримувати контакти, обмін студентами, оволодіти майбутньою професією, займатися спортом.

Ex.5. Match each word in the left-hand column with the best definition in the right-hand one.

- | | |
|---------------|--|
| 1. university | a. instruction, teaching |
| 2. college | b. a person who has completed a university degree course |
| 3. don | c. short piece of writing on a subject |
| 4. syllabus | d. part of a university |

- | | |
|-------------------|---|
| 5. a postgraduate | e. one of the periods of time into which university year is divided |
| 6. exam | f. an arrangement of subjects for study |
| 7. term | g. money given by the state to a university to support a student during his/her studies |
| 8. tuition | h. a teacher |
| 9. essay | i. an institution for teaching and learning |
| 10. grant | j. a person doing studies that are done at a university after one has received one's first degree |
| 11 a graduate | k. the act or process of testing students |

Ex.6. Fill in the gaps with the word list below in the appropriate form:

reorganisation/decision / transformation / formation / resolution / branch / subordinated / introduced / improved / talented / established

1. The history of Lutsk State Technical University (LSTU) goes back as far as 1966, when according to the ____ of the former Ministry for higher and secondary specialized education of the USSR the branch of General Engineering Faculty of Kyiv Road-transport Institute was founded in Lutsk. 2. In 1971 the faculty was ____ to Ukrainian Institute of Water Transport Engineers. 3. The first director of the ____ was I.M. Khorolsky and later on V.V.Bozhydarnik. 4. Soon after a full-time education was ____ with establishing the civil engineering faculty. 5. The structure of the branch was being ____ and modified. 6. So, step by step, the branch was approaching to its memorable day - April 1, 1991 when the Council of Ministers of the USSR passed a ____ T87 on the ____ of Lutsk Industrial Institute on the basis of Lutsk Branch of Lviv Polytechnical Institute. 7. It was a great dream that had come true in sovereign Ukraine, in the time of social ____ taking place in the country. 8. ____ of the institution took place. 9. In October, 1991 the postgraduate courses were _____. 10. University teaching staff is made up of ____ people, professionals with great pedagogic and life experience.

Ex.7. Translate sentences into English using words and word combinations from the Vocabulary Notes.

1. Аспіранти роблять підготовку та ретельні наукові дослідження до захисту дисертації. 2. Заочна форма навчання дає можливість студентам поєднувати освіту і роботу. 3. Щоб оволодіти іноземною мовою студентам необхідно виконувати всі завдання, що вимагаються у курсі навчання. 4. Ми підтримуємо контакти з нашими британськими партнерами з початку вересня

минулого року. 5. Студенти денного відділення мають можливість займатися різними видами спорту у функціональному оздоровчому комплексі нашого університету. 6. Наукові дослідження магістрів та бакалаврів університету виявили фактори, які впливають на збій роботи енергетичного модуля.

Miscellaneous

Ex. 8. Choose and use.

***to carry out, to accomplish, to execute, to effect, to perform,
to do, to implement, to comply***

1. The Office of University Events strives to plan and ___ events that promote the university as a whole, as well as its initiatives and goals. 2. Every university department ___ the rules and regulations set by university administration. 3. We ___ her instructions precisely. 4. Those who ___ the course study with excellent marks can apply for a scholarship. 5. Many parents lack confidence in their ability to ___ change in their children's behavior. 6. Numerous experiments were ___ on rats over a long period. 7. Students are under continuous pressure to ___ well. 8. The newspaper was asked by federal agents for assistance and agreed to ___.

GRAMMAR EXERCISES

Ex.. 1. Give plural forms of the following singular nouns:

A conference, a subject, a course, a synopsis, a king, basis, the teacher, a man, an essay, a grant, a report, a syllabus, a house, a university, a log, a town, a shelf, a country, an exam, a skill, a hero, a half, a sandwich, a formula, an atlas, a person, an eye, a wolf, a deer, the life, a potato, video, proof, a doctor of philosophy

Memorize!

Singular	Plural
this is	these are
that is	those are
there is	there are
it is	they are

Ex.2. Transform the following sentences into plural forms:

This is a brunch.	There is a tutor in every classroom.
This is not a fish.	That is post-graduate student.
That isn't a path.	Is this a dissertation thesis?
Is that a teacher?	This is a camera.
It is a facility.	It is a sheep.

That is a university degree.	This isn't a mouse.
------------------------------	---------------------

Ex. 3. Transform the following sentences and word combinations by using the possessive case:

1. The room of my granny. 2. The questions of the teacher. 3. The wife of my brother. 4. The skates of his sisters. 5. The poems of Lina Kostenko. 6. The cars of those men. 7. The new club of the footballers. 8. The letter from her friend. 9. The car of my parents. 10. The lives of these women. 11. The classroom of the students is large. 12. The building of the UN. 13. The work of these engineers is very important.

Ex. 4. Insert the articles *a, an, the* or the pronoun *some*, where it's necessary:

1. If you want to write something on ___ blackboard, you must have ___ piece of ___ chalk. 2. Are there any students in ___ classroom? 3. My ___ father is ___ engineer. 4. My brother found out ___ interesting facts about ___ history of ___ our city. 5. ___ Dnieper is ___ longest river in ___ Ukraine. 6. There is ___ snow on ___ top of your car. 7. ___ cement is ___ very important component of ___ concrete. 8. There are ___ two kinds of reinforced concrete: with ___ ordinary reinforcement and ___ concrete with prestressed reinforcement. 9. ___ organic glass consists of ___ one synthetic resin. 10. ___ all language teaching methods must be based on ___ knowledge of ___ language taught.

Ex. 5. Insert personal pronouns in the necessary case:

1. ___ friend's children study at the university. ___ study very well. I meet ___ every morning on ___ way to the office. 2. ___ know this woman. ___ works at the factory with my mother. 3. If I see Helen, I'll ask ___ to ring ___ up tomorrow. 4. I like this radio set very much. Where did you buy ___? 5. You must be here at 7. We'll be waiting for ___. 6. I need these figures badly. I can't prepare my report without ___. 7. The lecturer gave ___ the names of all building materials. Do you know ___ features. 8. We are going to spend this weekend in the country. Will you join ___? 9. These are our watches. Your watch is golden. What colour is ___? 10. If you give me your home address, ___ will write to___.

Ex. 6. Insert reflexive pronouns in accordance with the model:

I've repaired my TV set. – I've repaired my TV set myself.

1. I'll go to the post-office ___. 2. She cooks breakfast ___. 3. We'll water the flowers ___. 4. The soldiers built the bridge ___. 5. Mother said to the boy, "You

must always make the bed ____.” 6. If I were you, I would go there _____. 7. The chief engineer went to the conference _____.

Ex. 7. Read and translate the following text paying attention on prepositions of place:

Consider the professor's desk and all the prepositional phrases we can use while talking about it.

You can sit **before** the desk (or **in front of** the desk). The professor can sit **on** the desk (when he's being informal) or **behind** the desk, and then his feet are **under** the desk or **beneath** the desk. He can stand **beside** the desk (meaning **next to** the desk), **before** the desk, **between** the desk and you, or even **on** the desk (if he's really strange). If he's clumsy, he can bump **into** the desk or try to walk **through** the desk (and stuff would fall **off** the desk). Passing his hands **over** the desk or resting his elbows **upon** the desk, he often looks **across** the desk and speaks **of** the desk or **concerning** the desk as if there were nothing else **like** the desk. Because he thinks of nothing **except** the desk, sometimes you wonder **about** the desk, what's **in** the desk, what he paid **for** the desk, and if he could live **without** the desk. You can walk **toward** the desk, **to** the desk, **around** the desk, **by** the desk, and even **past** the desk while he sits **at** the desk or leans **against** the desk.

All of this happens, of course, in time: **during** the class, **before** the class, **until** the class, **throughout** the class, **after** the class, etc. And the professor can sit there in a bad mood.

Ex. 8. Insert prepositions where necessary:

1. Look ____ these two pictures. What do you see ____ these pictures? 2. Every day Mr. Green gets up ____ 7 o'clock, goes ____ the bathroom, takes a bath and has breakfast. 3. Some students get ____ the university ____ underground. 4. Lectures begin ____ 8 o'clock. 5. Students have classes ____ week-days. 6. I presented this camera ____ my friend. 7. We arrived ____ London ____ the seventh ____ October. 8. There were lots ____ new words ____ the text we translated. 9. ____ present about 40% ____ the students have satellite or cable TV ____ home. 10. I began writing my composition __ seven o'clock and finished only __ midnight.

SUPPLEMENTARY READING

A Six-Step Process to Finding a College Major

One of the greatest stressors for college-bound high-school students – as well as for some college students – is choosing a college major. Deciding on your major (and minor) is a life decision, and one that can impact your plans beyond. This will help guide your thinking as you take steps toward choosing a college major that is best for you.

Step 1: Self-Assessment of Interests. Write down a list of activities, course subjects, and topics that interest you, inspire you. What are your likes and dislikes – about school, hobbies, work, and volunteering? If you have taken an assessment test at school (or online), you can enter some of the results here as well.

Things that Interest, Inspire Me: _____

Step 2: Examination of Skills and Abilities. One of the most important elements in choosing a major (and a future career) is a realistic review of your strengths and weaknesses, skills and abilities. It's important to take an honest view of the subjects/skills you are best at, as well as those you struggle with.

Write down your best and worst skills and abilities.

Skills That I Want to Use and Excel at: _____

Skills That I Don't Want to Use or am Weak in: _____

Step 3: Understanding What You Value About Work. Different jobs and careers offer a range of intrinsic rewards to people who work in them. For example, teachers place much greater value on educating and impacting their students' lives than on financial rewards. What are you seeking from your career? Some examples include helping society, working under pressure, group affiliation, stability, security, social status, and financial rewards.

Write down a list of what you seek from your future career.

The Values I Want From My Job / Career: _____

Step 4: Researching Occupations and Careers. Many students have an idea of the types of work they may want to do, but rarely do they have a full understanding of the requirements of the work – or even what the work fully entails. Others have never really thought about careers and have little or no knowledge of what they want to do after college. This step involves conducting research and recording the information you found about one or more potential career fields.

Potential Career Fields for Me: _____

Step 5: Information Review & Reality Check. Now that you have a better understanding of yourself and one or more potential career paths, it's time to conduct an honest appraisal of whether your skills, interests, and values are a good match with the careers that most excite you. For example, you may love the idea of becoming a doctor, but do not have the math or science skills necessary for medical school. Your task in these situations is to conduct further research to see if other career paths in the same field will be a good match for you. (Go back to Step 4 if you need to conduct more research.) Write down the list of careers and jobs that best fit you, starting with the career that best seems to fit your interests and skills.

Careers / Jobs That Best Fit Me: _____

Step 6: Matching College Majors to Career Paths. For many jobs, the choice of college major is not as important as the actual degree, but choosing a major (or combination of majors and minors) that is directly related to your choice of career often provides a deeper level of skills and understanding of the subject. Conduct research on the careers from Step 5 to help determine the best college major. For example, if you think you want to be a high school math teacher, what should you major in? Write down your list of potential majors and minors here.

Prospective Career: _____

Appropriate Major(s) / Minor(s): _____

Answer the questions :

1. What steps should one take toward choosing a college major?
2. Can you evaluate yourself? What are your likes and dislikes – about school, hobbies, work?
3. What are you seeking from your career?
4. Share the information you found about your potential career field.
5. What are the careers and jobs that best fit you?

FOR PLEASURE.....

It is never too late to mend.

It is never too late to learn.

Live and learn.

Every man is a maker of his own fortune.

What Should You Major In?



Econ. Comm. Comp. Sci. Pre-Med. Art English Philosophy



my invisible hand needs a high-five.



I hate coffee, but I love JAVA.



We're communicating right now! Who said this was hard?



I declare my social life legally dead.



I'm minoring in "being judgemental."



Here's the cliffnotes: I'm worthless.



I want to be an idealist, but I just Kant.

UNIT TWO

Reading: My Future Speciality

Word building: Prefixes of Verbs

Grammar: 1. Indefinite and Continuous Infinitive in Active/
Passive Voice.
2. Indefinite and Continuous Tense Forms in
Active/Passive Voice.
3. Structure of Sentences. Types of Questions

Supplementary

reading: Ten 'Fun and Exciting' Facts about Engineering



Phonetic Drills

*If you understand, say "understand".
If you don't understand, say "don't understand".
But if you understand and say "don't understand",
how do I understand that you understand. Understand!?*

*The educated person knows the questions and mistrusts most of the
answers.*

Words you will need.....

Civil engineering

цивільне будівництво

operate v.

управляти, приводити в дію

maintain v.

встановлювати, дотримуватись

e.g. It is important to **maintain** a constant
temperature inside the laboratory.

fortification n.

укріплення

essential (ly) adj (adv.)

суттєвий (-о), важливий (-о)

distinguish v. Syn. differentiate

розрізняти, відрізняти

e.g. Strength is the factor that

distinguishes reinforced concrete
from other alloys.

military engineering

військово-будівельна справа

responsible adj. Ant. irresponsible,

відповідальний, надійний

be responsible for

відповідати за що-небудь

e.g. Engineers are **responsible for**
building reliable roads

responsibility n. Syn. duty, obligation

відповідальність, обов'язок

occupation n.

професія, рід занять

! <u>Mind the difference:</u> <i>work, job, post, position, occupation, profession, career</i>	
communication <i>n.</i>	тут засоби сполучення
revive <i>v.</i> <i>Syn.</i> recover e.g. New government made an attempt to revive the steel industry.	відроджувати, оживати, оживляти
harbour <i>n.</i> <i>AmE.</i> harbor	пристань
scope <i>n.</i>	розмах, сфера діяльності, масштаб
sewerage <i>n.</i>	каналізація
survey <i>n.</i> <i>Syn.</i> examination, inspection e.g., We conducted a survey of parents in the village.	огляд, нагляд, інспектування
surveying <i>n.</i>	топографічна зйомка
erect <i>v.</i> e.g. It took the engineers a couple of months to erect this fortification.	споруджувати, будувати
erection <i>n.</i>	спорудження
rapid (ly) <i>adj (adv.)</i>	стрімкий (-о), швидкий (-о)
grow <i>v.</i> (<i>grew, grown</i>) e.g. Sam grew 5 cm in six months. e.g. Population is growing rapidly in the world.	1.рости 2.збільшуватись
growth <i>v.</i> <i>Syn.</i> <i>increase, height</i>	ріст, зростання, приріст, розвиток
constitute <i>v.</i> <i>Syn.</i> to denote e.g. Modern civil engineering constitutes a vital element of national industry.	становити, складати
domestic <i>adj.</i> domestic animals	домашній домашні тварини
dwelling <i>n.</i> <i>Syn.</i> residence, lodging, home, domestic dwelling	житло житловий будинок
structural engineering	проектування будівель і споруд
reinforce <i>v.</i> e.g. The engineers reinforced the wall with metal bars.	посилювати, зміцнювати, підкріплювати
reinforced concrete	залізобетон
prestressed <i>adj.</i>	попередньо напружений
precast concrete	збірний залізобетон

Pre-reading.....

Task 1. Find Ukrainian equivalents to the following words or word combinations:

railroad, engine, technicians, branches, non-military purpose, movement, troop(s), collapse, potentialities, emphasise the value, community, drainage and irrigation systems, municipal engineering, water supply, hydrology, geology, economics, proper use, multi-storey flats, various interests, with reference to.

Task 2. Answer the questions:

1. Who influenced your choice to become a university student?
2. What is your major in civil engineering?
3. Where do you anticipate working after graduation?

Reading.....

Task 1. Read and translate the text.

My Future Speciality is Civil Engineering

I am a student of Lutsk National Technical University. I study at the Faculty of Construction and Design. My speciality is Civil Engineering. Graduates of this speciality can work on municipal and industrial construction projects.

The word *engineer* is used in two ways in English. One usage refers to a professional engineer who holds a university degree and education in mathematics, science, and one of the engineering specialities. *Engineer*, however, is also used to refer to a person who operates or maintains an engine or machine. An excellent example is the railroad locomotive engineer who operates a train. Engineers, in this sense, are essentially technicians rather than professional engineers.

Civil engineering was not distinguished from other branches of engineering until 200 years ago. This term was first used to distinguish the work of the engineer with a non-military purpose from military engineering. Most early engineers were engaged in the construction of fortifications and were responsible for building the roads and bridges required for the movement of troops and supplies.

Today, the scope of civil engineering has become very broad. It is subdivided into such as construction (all kinds of buildings), highway and railway engineering, hydraulic engineering (canals, dams, drainage and irrigation systems) and municipal engineering (city planning, traffic regulation, water supply and sewerage).

Civil engineering is an extremely broad professional field. It must make use of many different branches of knowledge, including mathematics, surveying, hydrology, geology, economics, and, most recently, knowledge of computers. Civil engineering problems involve the physical, mathematical, earth, social, communications, and engineering sciences. Civil engineering projects involve many other professional areas, including law, public health, economics, management, finance and other branches of engineering. The scope and complexity of the field, and its degree of involvement with other fields, have increased rapidly with the development of modern science and technology and the growth of population and national economy. Taken as a whole, modern civil engineering constitutes a vital element of national industry, which involves large numbers of people of various special interests and occupations

When speaking about civil engineering, we must use the words "construction" and "building" correctly. The term "construction" refers to the erection and repair of all types of buildings, roads, bridges, and other structures.

The word "building" is mainly used in the sense of domestic dwellings, including houses and multi-storey flats, schools, hospitals and office blocks, while "civil engineering" is used with reference to bridges, roads, harbours, water supply and hydroelectric schemes.

The term "structural engineering" refers particularly to the calculation and design of all kinds of structures whose strength is primarily provided by steel,



reinforced, prestressed, or precast concrete, or other alloys. This work involves a great deal of mathematics and consultation with several professions. We should remember that there is no hard-and-fast dividing line between these terms.

In our country civil engineers are trained at special institutes and departments of the polytechnical institutes. Civil engineering is very popular and honorable profession!

Task 2. Answer the questions to the text:

1. What Faculty do you study at?
2. Where are the graduates of Civil Engineering able to work?
3. How does a railroad locomotive engineer differ from a professional engineer?
4. When was the term "civil engineering" used first?

5. What branches is civil engineering subdivided into?
6. What branches of knowledge must civil engineering make use of?
7. What is the difference between "construction" and "building"?
8. Where are civil engineers trained in Ukraine?
9. What subjects do Civil Engineering students study? Is it important to study English? Why?
10. What does the term “structural engineering” mean?

ACTIVITY

Explain how you became interested in becoming a civil engineer. Include what you consider to be the special aptitudes that qualify you for this career. Indicate what area of civil engineering you have chosen to go into, and what you think the future of the field itself will be.

DID YOU KNOW?

- The word engineer comes from a Latin word meaning ‘cleverness’
- One of the earliest names of *civil engineers* that has come down to us in history is that of Imhotep, the designer of the stepped pyramid at Sakkara in Egypt about 3,000 B.C.
- The oldest text in engineering is the work of a Roman architect and engineer named Vitruvius Pollio, who wrote a book in the first century B.C. about the engineering practices of his day. Many of the problems encountered by Vitruvius Pollio were similar to those that modern engineers still must confront.
- The snowboard was invented by an engineer. With some engineering twists and turns along the way, the snowboard has become a marvel of geometry, chemistry, and biomechanics.
- Branches of engineering include aerospace, biomedical, chemical, civil, computer, electrical, environmental, forensic, genetic, mechanical, military, nuclear, reverse, software and structural.

Practicing.....

Word-building

Affixation: Prefixes of Verbs

Prefixes of Verbs		
Prefixes	Meanings	Examples
re-, super-, over-, under-	пере-, недо-	rewrite , supercharge , over-estimate , under-estimate
mis-, dis-, de-	negative (негативне/заперечувальне)	misunderstand , dislike , decompose
co-, sub-	со-, пів-, напів-	co-exist , subdivide , cooperate

Ex.1. Explain the meaning of prefixes and translate the words:

rebuild, overcome, disagree, underload, overcrowd, re-do, disappear, co-operate, superheat, degenerate, reconstruct, correspond, reappear, misbehave, disconnect, underdo, miscount, devaluate, collaborate, redesign, overdevelop, mislead,

VOCABULARY EXERCISES

Ex. 2. Find in the text:

a) antonyms to the following words and translate then into Ukrainian:

to differentiate work, non-military, growth, big regress, decreased slowly, ancient, one-storeyed building, are united into, unpopular, destruction, weakness.

b) Find in the text synonyms to the following words and word combinations and translate then into Ukrainian.

progress, to recover, significance of the work, city engineering, quickly, in general, different (interests), professions, to be educated, (to use) correctly, respected profession.

Ex.3. Give English equivalents of the following.

На користь і для зручності людини, прекрасні інженери, винайдення парового двигуна, важливість їхньої роботи для суспільства, різні галузі знань, теорія конструкції, велика кількість, люди різних інтересів і занять, зведення та ремонт будинків, житловий будинок, збірний залізобетон, почесна професія.

ENGINEERING

Ex.4. Match each word in the left-hand column with the best in the right-hand column.

- | | |
|---|--|
| 1. Electrical and Electronic Engineering | a. the practical application of the findings of theoretical science so that they can be put to work for the benefit of mankind. |
| 2. Nuclear Engineering | b. an occupation, such as law, medicine, or engineering, that requires specialized education at the university level. |
| 3. Engineering | c. is dealing with permanent structures. |
| 4. Civil Engineering | d. the branch of engineering that deals with the effects and processes that result from the behaviour of tiny particles of matter called electrons. |
| 5. Mechanical Engineering | e. is a subdivision of chemical engineering which deals specifically with processes involving petroleum. |
| 6. Mining and Metallurgy | f. the branch of engineering that deals with machines and their uses. |
| 7. Chemical Engineering | g. the branch of engineering that deals with the design and construction of structures that are intended to be stationary, such as buildings, dams, and bridges. |
| 8. Petroleum Engineering | h. is dealing with the flow of water and other fluids. |
| 9. Structural Engineering | i. a modern branch of engineering that deals with the processes that result from breaking up some particles of matter. |
| 10. Hydraulic Engineering | j. the branch of engineering that deals with extracting metal ores from the earth and refining them. |
| 11. Environmental/ Sanitary Engineering | k. the branch of engineering that deals with processes involving reactions among the <i>elements</i> , the basic natural substances. |
| 12. Profession | l. is dealing with water supply, water purification, and sewer systems, as well as urban planning and design. |

Ex.4. Below are some of the projects on which a present-day engineer might work. Indicate which branch of engineering would be involved. Some of the projects may involve more than one kind of engineering; if so, indicate all of those that you think should be included.

Hydraulic engineering, automotive engineering, traffic engineering, safety engineering, petroleum engineering, hardware engineering, aerospace

engineering, aerospace engineering, structural engineering, nuclear engineering, chemical engineering, manufacturing engineering,

1. Finding a new alloy (mixture) of metals that would serve a special purpose. _____
2. A suspension bridge over a large body of water. _____
3. Designing a control system for the safe operation of a nuclear reactor in an electric power plant. _____
4. Designing the wings for a new type of airplane. _____
5. Designing an automatic switching system for telephone direct-dialing. _____
6. Designing, developing, and testing various computer equipment. _____
7. Testing the strength of materials to be used for a sports stadium. _____
8. Designing a rocket for space exploration that will use nuclear-powered motors. _____
9. Designing a process for making plastics from vegetable materials such as soy beans. _____
10. Designing canals as part of an aqueduct that will carry a water supply system across a desert to a large city. _____
11. Improving the braking system in an automobile. _____
12. The application of engineering principles to drilling for and producing crude oil and natural gas _____

Ex.5. Translate sentences into English using words and word combinations from the Vocabulary Notes.

Міське будівництво і господарство

Студенти спеціальності “Будівництво” отримують необхідні знання для проектування, створення, експлуатації, зберігання і реконструкції будівельних об’єктів і систем. Такі знання включають: сферу архітектури та будівництва; державного управління на рівні районів, міст і внутрішньоміських районів; колективних, громадських та особистих послуг. Студенти також набувають необхідні знання у сфері новітніх та енергоощадних технологій створення ефективних конструкцій, матеріалів для будівельно-монтажних робіт та реконструкції будівельних об’єктів і автомобільних шляхів відповідно до тенденцій раціонального природокористування і збереження довкілля.

Навчання студентів нерозривно пов’язане з науковою роботою в лабораторіях кафедр з використанням сучасного обладнання та програмного

забезпечення. Участь студентів у проектних та технологічних розробках допомагає успішно оволодівати професійними навиками. Студенти проходять практичну підготовку на провідних підприємствах будівельної галузі.

Диплом бакалавра напряму “Будівництво” дає змогу продовжити навчання на другому циклі – магістр за спеціальністю: “Будівництво та цивільна інженерія”. За цією спеціальністю готують фахівців для роботи в галузі будівництва, а також в інших галузях, що організаційно входять до складу будівельно-ремонтного комплексу. Спеціаліст може працювати в загальнобудівельних і спеціалізованих будівельних, проектно-пошукових і конструкторських організаціях на інженерно-технічних посадах, на викладацькій роботі в освітніх закладах і установах, виконувати експертні роботи в галузі будівництва і експлуатації житлових будинків, споруд та інженерних мереж, виконувати функції консультанта з будівництва в різних організаціях і установах.

Miscellaneous

Ex. 6. Choose and use.

work, job, post, position, occupation, profession, career

1. First I applied for a ____ when I studied at the university. 2. I am interested in ____ in engineering. 3. Bill took up his new ____ as Systems Engineer. 4. He will take up his ____ as Dean of Construction and Design Faculty in September 2013. 5. State your name, age, and ____ in the box below. 6. Jonson was a Mechanical Engineer by ____.

GRAMMAR EXERCISES

Ex. 1. Transform the Indefinite Infinitives into:

a) the Continuous Infinitive Active:

to build, to erect, to work, to study, to involve.

b) the Indefinite Infinitive Passive:

to distinguish, to operate, to reinforce, to constitute, to grow.

Ex. 2. Translate into Ukrainian, paying attention to Infinitives:

1. It's important to laugh a lot, and see the funny side of things when there is so much hard work to do the next day. 2. Nature has many secrets to be discovered yet. 3. She seems to be translating a scientific article at the moment. 4. The students want to be helped by the tutor. 5. An engineer also needs a sufficient command of language to be able to prepare reports that are clear and, in many cases, persuasive. 6. The use of glass in the construction of domestic dwellings

seems to be reviving. 7. Though it's dark, they are still supposed to be working on the house decoration. 8. The architect is delighted his project to be distinguished among the others. 9. A great number of elements to be used for construction are made entirely off-site and placed into position by crane.

Ex. 3. Translate into Ukrainian, paying attention to Indefinite and Continuous Tense Forms in Active and Passive Voice:

1. The achievements of Ukrainian builders who are working on the construction of our metros, railways, hydroelectric stations, etc., are well known the world over. 2. In 1960s, new specialties were organized at the institute such as lightning engineering and sources of light, purification of natural and sewage waters. 3. In 1994, as a result of accreditation, our institute started to train Bachelors and Masters of Science. 4. To be able to undergo high compressive loads is a specific characteristic of this material. 5. It is divided into chambers that will house heating and ventilating plants as well as provide garage and storage space for the building. 6. They are discussing the plans for the next year at this moment. 7. The curriculum seems to be developed especially for geniuses. 8. They were listening to the lecture of the honourable professor when the telephone rang. 9. The whole next week, we will be preparing for the test in physics. 10. The students will go to the institute on the first of September.

Ex 4. Replace the Infinitive in brackets with the necessary tense form. Present, Past, Future Indefinite / Continuous in Active and Passive Voice. Translate the sentences into Ukrainian.

It (to take) me forty minutes to get to university yesterday. 2. Hello, Pete, where you (to go)? – I (to hurry) to college. 3. When your lessons (to begin) on Monday? – They (to begin) at nine o'clock. 4. Where your sister (to be)? – She (to do) her homework in the next room. 5. It usually (to take) me an hour to do my written exercises. 6. Where Boris (to be)? I (to look) for him. – He (to have) lunch at the canteen. 7. In the evening I often (to go) to see my friends. 8. On Sunday we sometimes (to go) to the cinema or to a disco club. 9. Do you see that large building? It (to renovate) at the moment. 10. The project (to finish) by tomorrow. Do not worry.

Memorize!

to have = to have got

Memorize!

to have dinner (breakfast, lunch, supper)

to have a cup of tea (a meal, a drink)

to have a shower (a bath, a sleep, a rest, a talk, a chat)

to have a good time

Ex. 5. Fill in the spaces with the verbs to be, to have in Present, Past or Future Indefinite.

1.Bricks ___ a primitive form. 2. Common examples of beams ___ the steel beams used to support floors in the building. 3. Semenov ___ not present at classes last week. He ___ ill. 4. I ___ an architect when I grow up. I like drawing buildings and other structures. 5. Many problems of engineering practices of ancient times ___ similar to those that modern engineers _____. 6. When I come home tomorrow, all my family ___ at home. They will be discussing the reconstruction project of our apartment. 7. Engineering students usually ___ three lessons of English a week. 8. My sister ___ not ___ at home tomorrow. She ___ an excursion to the factory to see the assembly of prefabricated house. 9. Wood ___ the most ancient structural material. It ___ easy to work with and its mechanical properties ___ good.

Ex. 6. Invent questions with:

The Interrogative Words

What

When

Whom

Who

Where

Why

Which

What

How

How many bricks

How much water

Let your partner answer them. Work in turn.

Ex. 7. Make up:

A) interrogative and negative sentences:

1. Bricks were known many thousands of years ago.
2. The building profession attracts a large number of young men and women nowadays.
3. Everyone will translate this article at the lesson on Tuesday.

B) alternative questions:

1. A great variety of materials are nowadays used by builders.
2. The Romans used natural cement called pozzolana.

3. Portland cement is being sold in this street.

C) tag questions:

1. It is an honourable profession.
2. There will be no danger of his building falling on.
3. This college of municipal engineers was founded on November 12, 2002.

D) special questions:

1. During their training, students come to a construction site and learn the trade of a builder.
2. At six o'clock yesterday, we were listening to a lecture by a German professor.
3. At this time tomorrow, we shall be picking up the materials for the reconstruction of our apartment.

Ex. 8. Fill in the spaces with modal verbs may (might), can (could) or must.

1. ____ I use your spade?
2. The temperature near South Pole ____ reach minus 43 degrees Centigrade.
3. Most commercial buildings ____ have steel frames.
4. ____ I take the pen from that table!
5. Something was wrong with the car: he ____ not start it.
6. If you let us do it we ____ replace wood floor by laminate.
7. According to the law of conservation of energy, the energy spent in starting the body ____ be equal to that derived from the body when it is stopped.
8. Many factories require only one large building. Others ____ need a dozen buildings in one location.
9. Commercial buildings ____ be built according to government regulations.
10. When I was 18, I ____ take my parents' car whenever I wanted.

Memorize!

Proverbs:

Never put off till tomorrow what you can do today.

What is done cannot be undone.

Little bodies may have great souls.

Everything must have a beginning.

SUPPLEMENTARY READING

Ten 'Fun and Exciting' Facts about Engineering

From space exploration to the water slide, engineering makes our lives more 'fun and exciting.

DID YOU KNOW THAT...

1. The snowboard was invented by an engineer?

With some engineering twists and turns along the way, the snowboard has become a marvel of geometry, chemistry, and biomechanics. Since the snowboard allows deft turns, ski manufacturers have quickly adopted some of the snowboard innovations, enabling skiers to turn with less effort.

2. Engineers design running shoes for protection, performance, and comfort.

Engineers understand how much force travels from the ground through the shoe to the foot. Through engineering, weight is distributed throughout the entire foot—from heel to toe.

3. A civil engineer created the slippery part of the water slide?

A civil engineer designed a pumping system to circulate just the right amount of water to the flume. Without the right flow of water, there is no ride. Additionally, civil engineers have designed the slide to withstand the weight of people, the water, and even the force of the wind blowing on it.

4. The launch and return of spacecraft, from the Apollo to the Shuttle, is a monumental engineering triumph.

The space program has greatly expanded the world's knowledge base. The technological advancement by engineers in energy, communications, materials, structures, and computers, have made space travel possible.

5. The Ferris Wheel is considered one of the greatest engineering wonders in the world?

The first Ferris Wheel was created by Pittsburgh, Pennsylvania engineer, George W. Ferris, in 1893. The wheel is supported by two 140-foot steel towers and connected by a 45-foot axle -- the largest single piece of forged steel ever made at that time.

6. Engineers make interactive television possible?

Engineers are involved in all aspects of interactive TV technology, from designing new cables, to creating new film emulsions, to engineering better sound quality. This technology allows viewers to select any program, film, or game from more than 500 channels.

7. Engineers play an instrumental role in the theme park industry?

Theme park engineers are involved in designing, building, lighting, and even controlling the crowd flow in theme parks around the world.

8. Companies and universities are using engineers to form the Virtual Reality and Simulation Initiative?

This technology applies computer simulation and visualization to 3-D modeling projects, such as virtual offices.

9. Bioengineers are creating a new and exciting medical technology?

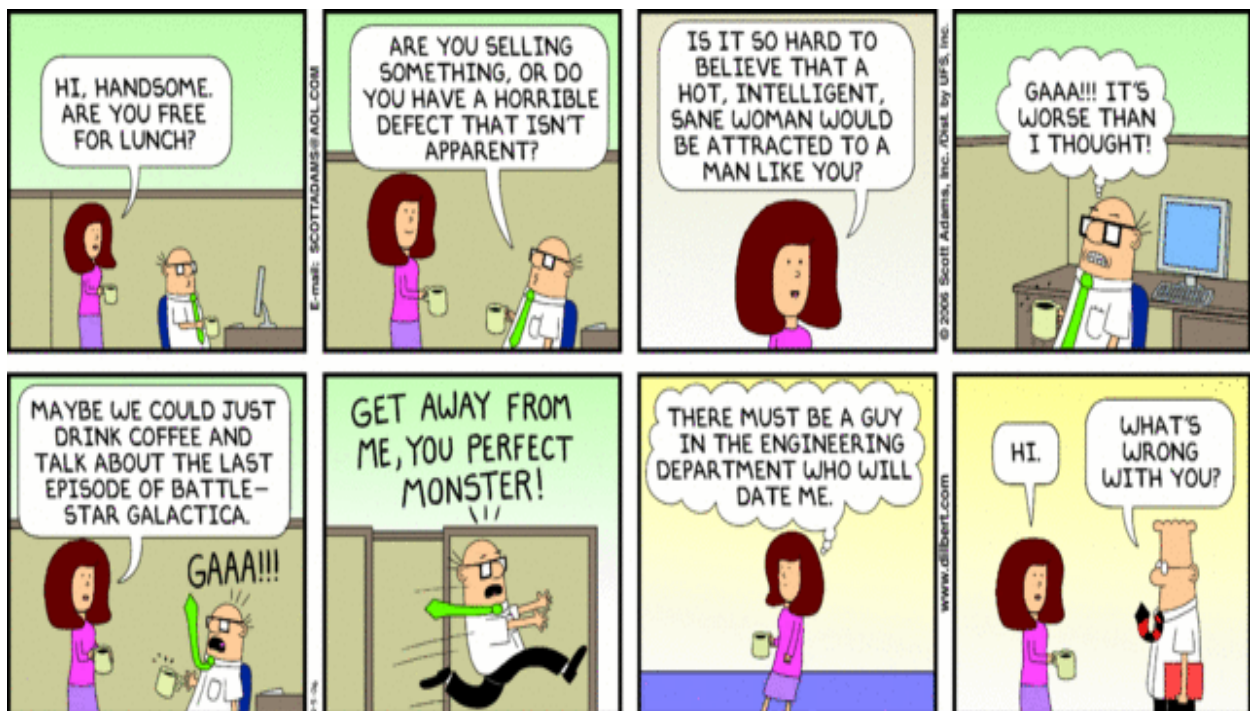
This technology will utilize virtual reality to help surgeons reconstruct facial birth defects.

10. Computer engineers, in conjunction with animators, have created special effects in movies such as "Jurassic Park," "Forrest Gump," and "Interview with the Vampire"?

Through "morphing" technology, images are digitally mastered to appear realistic.

Answer the questions on the text:

1. What specific things do engineers design, help to manufacture or build, or help to operate and maintain?
2. So are all engineers the same?
3. What engineering technology allows viewers to select any program, film, or game from more than 500 channels?
4. Engineers like to solve problems. If there are no problems handily available, they will create their own problems.
5. Do you agree that the working time for an engineer is from morning to eternity?



FOR PLEASURE.....

We shape our buildings, thereafter they shape us.

- Winston Churchill

Time 1960

UNIT THREE

Reading: Buildings

Word building: Prefixes of Adjective and Adverb

Grammar: 1. Adjective. Adverb.
2. Degrees of Comparison of Adjectives and Adverbs.

Supplementary

reading: The Structure



Phonetic Drills

*Once there lived a lad who was always very sad,
For he had not any mother and he had not any dad.*

The shortest distance between two points is under construction.

Words you will need.....

shelter *n.*, *Syn.* accommodation

притулок, укриття

shed *n.*

накриття, сарай, гараж

a cattle shed

хлів

light construction

легка конструкція

concrete frame

бетонний каркас

foundation *n.*

фундамент, основа

*e.g. It took the builders three weeks to
build the **foundation**.*

*All theories should be built on a
foundation of factual theories.*

heavy construction

важка конструкція

single-family house

будинок для однієї сім'ї

apartment *n.* *AmE – BrE flat* *n.*

квартира

apartment block *BrE =*

apartment building (house) *AmE* багатоквартирний будинок

high-rise apartment building

висотний багатоквартирний будинок

building site

будівельний майданчик

assemble *v.* *Syn.* gather together

збирати, складати, монтувати

! Mind the difference: *to assemble,
to construct, to build, to make,
to install, to erect*

assembly *n.*

e.g. The craftsman managed to put things together by using **assembly** instructions.

prefabricated houses

waste recycling

location *n.*

require *v.*

requirement(s) *n.*

to meet requirements

e.g., *If you are installing a new bathroom, it must **meet the requirements** of the Building Regulations.*

lay (out) *v. (laid, laid)*

e.g. *The garden is **laid out** in a formal pattern.*

shopping mall *AmE =*

shopping center *BrE*

draw *v. (drew, drawn)*

e.g., *Kate had drawn a cottage with a little stream running alongside it.*

draw customers

! Mind the difference: *to attract attention, to pay attention, to draw attention*

commercial buildings

industrial buildings

residential buildings

government regulations

specify *v.*

e.g. *Regulations specify how long the maintenance crew can work.*

sprinkle *v.*

fire sprinkler system

condominium

монтаж, збір

збірні будинки

переробка відходів

розташування, місцеположення

вимагати, потребувати

вимога(и), потреба(и)

відповідати вимогам

планувати, викладати

торговий центр

малювати, креслити

привертати увагу клієнтів

комерційні споруди

промислові споруди

житлові споруди

державні (законодавчо прийняті)

вимоги, норми

точно визначати, обумовлювати

бризкати, пирскати

система пожежогасіння

квартира спільного володіння,

«комуналка»

Pre-reading.....

Task 1. a) While reading the text, you will come across a number of international words:

Materials, methods, office, airports, tunnels, industrial, commercial, restaurant business, supermarkets, company.

b) Find Ukrainian equivalents to the following word combinations:

Multiple-family buildings, weight of the structure, brought to the site, oil refinery, production process, insurance companies, construction standards.

Task 2. Answer the questions:

1. In this unit, you will learn about the different types of construction. Can you define the very word “construction”?
2. What were the principal construction materials people used to build shelter in earlier times?
3. What construction materials do people use for building nowadays?

Reading.....

Task 1. Read the text carefully and translate it.

Buildings

Buildings come in many shapes and sizes. Some like single-family houses, garages and garden sheds are fairly small. The materials and methods used to make these structures are referred to as **light construction**.

Factories, office buildings, and high-rise apartments require different materials and methods. For instance, a steel or concrete frame is usually used. The frame is attached to the foundation and supports the weight of the structure. The methods and materials used to build these structures are referred to as **heavy construction**. Heavy construction methods and materials are also used to build roads, bridges, airports and tunnels.

Buildings may be classified as to their purpose. Their purpose may be residential, industrial, or commercial.

Residential Buildings

Residential buildings are those in which people live. Single-family houses are designed for just one family. Multiple-family buildings house more than one family. They include apartments and condominiums.

The frames for most single-family houses are made of wood, concrete or bricks. The bricks, wood, concrete and other materials are brought to the building

site and assembled there. Prefabricated houses are built at a factory in sections. The sections are then brought to the site, where they are assembled. Manufactured houses are built entirely in a factory. They are then transported to the site.

Industrial Buildings

Factories and oil refineries are examples of **industrial buildings**. These buildings are used by production industries. Some service industries, such as waste recycling, also need industrial buildings. Many factories require only one large building. Others may need a dozen buildings in one location. Each building is used for a different step in the production process.

Commercial Buildings

Commercial buildings are usually used by businesses, such as supermarkets and insurance companies. Libraries, schools, and churches require similar buildings even though they are not used for business. The buildings are carefully laid out so that the work of the business can be done effectively. Some buildings, such as shopping malls and restaurants should also be attractive. This

helps to draw customers.

Commercial buildings must be built according to government regulations. These regulations specify construction standards. For example, most commercial buildings must have steel frames. Others may be required to have fire sprinkler system.

Note:

BrE flat = *AmE apartment* – квартира;

AmE condominium = *syn. block* — квартира, у якій живе декілька

власників, квартира блочного або комунального типу.



Task 2. Give answers to the following questions and discuss them with your partners:

1. What kind of construction is used for houses and garages?
2. Name three structures built using heavy construction.
3. Name three classifications for buildings.
4. What is the difference between *apartment* and *condominium* in American residential buildings?
5. What are the typical modern building materials for constructing residential

buildings?

6. Why do you think a single-family house and high-rise apartment building would require different construction methods?
7. Where are industrial buildings used?
8. Why do you think commercial buildings must be built according to government regulations?
9. What type of building is your University: residential, industrial or commercial?
10. Construction designs include various types of geometric shapes. Make a list of all the shapes that you see in your university, a bridge, and an office building. Which shape do you see most frequently?

ACTIVITY

Take a walk through the neighborhood around your home or university. Make a list of the different types of buildings you see. Which construction method was used in each case, light or heavy? Present the information in the form of a multimedia presentation.

DID YOU KNOW?

- In Japan, where earthquakes are frequent, homes are made of light materials, which are safer. Roofs are of light bamboo sticks. Partitions are made of paper.
- In hot, dry climates, walls are thick to keep out the heat. Windows are narrow and there are few of them. Because there is little rain, roofs are flat.
- Steep, pointed roofs allow rain to run off easily. Bundles of grass or thatch laid on the roof also prevent rain from getting inside.
- In Tibet, many people live in tent-like "yurts." A yurt is made by covering a framework of three branches with felt.
- The ancient Romans were the first to develop central heating. Rows of earthenware pipes were laid under the floor. Hot air or water was run through them.

Practicing.....

Word-building

Affixation: Prefixes of Adjectives

Prefixes of Adjectives		
Prefixes	Meanings	Examples
un-, in-, il-, im-, ir-	negative (негативне/заперечувальне)	unimportant indirect, illegal impossible irregular
pre-, post-, anti-	до-, після-, анти-	pre-war, post-war, anti-war

Ex.1. Explain the meaning of prefixes and translate the words:

unlimited, informal, illiterate, irrational, preplanned, anti-tank, immortal, antibody, postgraduate, impure, pre-human, irreligious, illogical, antipoison, post-date, inorganic, misbehave, anticlockwise, pre-condition, inseparable, anti-fascist, antifriction, post-meridiem.

VOCABULARY EXERCISES

Ex. 2. Find in the text:

a) antonyms to the following words and translate then into Ukrainian:

Apartment building, very big, unlucky, to disassemble, light construction, to destroy, unattractive, to exclude, different (buildings), freedoms, to distract (people, attention), social (building).

b) synonyms to the following words and word combinations and translate then into Ukrainian.

Very tiny, to involve flats and blocks, factory complex, enclosed, timber (n.), appealing, manufacturing process, can reach success, to be thoroughly planed, to construct respectively to state rules, to stipulate building norms.

Ex.3. Give English equivalents of the following.

Різні фази процесу виробництва; з'являться у багатьох формах і розмірах; з'єднати з фундаментом; потребувати різних матеріалів і методів; приватні та комерційні квартири; класифікувати згідно призначення; об'єднувати приватні та комерційні квартири, потребувати схожого будівництва, будувати відповідно до державних норм, мати сталевий каркас, система пожежогасіння.

Ex. 4. Identify each of the following houses by matching pictures, types and definitions from the table:

a)

TYPES OF HOUSES

- | | |
|-------------------------------|--|
| 1. Detached House | a. is a small apartment, which combines a living room, a bedroom and a Kitchenette into a single room, barring a <u>bathroom</u> . |
| 2. Semi-Detached House | b. is a house situated in a long row of houses. They usually look the same. Both sides of each house in the row share common walls with a neighbouring house, with the exception of the houses at each end of the terrace. |
| 3. Terraced House | c. is a large building divided into flats where all the flats share a front door. |
| 4. Block of Flats | d. is built on one level (one storey). It doesn't have any stairs. |
| 5. Bungalow | e. is a small house, usually in the countryside. ____s are houses that usually come with one and a half storeys. The top floor is much smaller than the ground floor. |
| 6. Cottage | f. is a big luxurious detached house with a secure big central garden and often with a swimming pool. |
| 7. Studio | g. is a very large detached house. |
| 8. Villa | h. are two houses joined together by a common wall. |
| 9. Houseboat | i. is a small, crude shelter used as a house. |
| 10. Hut | j. stands on its own. It has no other houses joined to it. |
| 11. Caravan | k. is a boat designed and equipped for use as a house. |
| 12. Mansion | l. is a house on wheels. |

b)

A. _____



B. _____



C. _____



D. _____



E. _____



F. _____



G. _____



H. _____



I. _____



J. _____



K. _____



L. _____



Ex.5. Match the person in a left-hand column to the buildings they live in, on the right:

PLACES - BUILDINGS PEOPLE LIVE IN

- | | |
|--|-------------------------|
| 1. an Eskimo | a. a nursing home |
| 2. an American Indian living in the 19th century | b. a convent or nunnery |
| 3. a nun | c. a tent or camper |
| 4. a camper | d. bed and breakfast |
| 5. an eighty-year-old with no living relatives | e. a wigwam or tepee |
| 6. a soldier | f. 10 Downing Street |
| 7. a sailor | g. a penthouse (suite) |
| 8. a queen | h. a ranch |

- | | |
|--|----------------------------------|
| 9. vacationers who prefer a less formal and inexpensive way to have a vacation | i. barracks or living quarters |
| 10. a traveling sales representative away from home | j. a shanty, shed, cardboard box |
| 11. a tramp or bum | k. a chalet |
| 12. the British Prime Minister | l. an igloo |
| 13. skiers in the mountains | m. a hostel |
| 14. a rich married couple on vacation | n. a monastery |
| 15. a monk | o. the Whitehouse |
| 16. a successful advertising executive | p. an sea-liner carrier |
| 17. a student | q. a motel |
| 18. a cowboy | r. a villa |
| 19. the President of the US | s. palace or castle |

Ex. 6. Complete the sentences with the appropriate words from the list below. Translate the sentences into Ukrainian.

a) apartment; cabin (2); condominium; cottage; house;
hut; mansion; rambler*; townhouse

1. His family has a _____ at the beach, where they go every summer. 2. The mayor's official residence is a beautiful _____. 3. They are looking for a _____, because her mother can't climb steps. 4. The children made a _____ in the woods. 5. They will rent an _____ until they have enough money to buy a house. 6. Those airplanes have a very large passenger _____. 7. They are expecting a baby and want to move to a bigger _____. 8. _____s usually have a lot of steps. 9. The family likes to stay in a cabin in the mountains in the summer. 10. As soon as he graduated he bought a _____ in the city.

***Rambler** is a house, bigger than a cottage, that has a number of rooms that are all on one floor.

b) town hall, police station, skyscraper, pub, post-office, office,
church, car park castle, cathedral

1. I left my car in the _____ and caught the bus into the city. 2. We visited the antient _____ overlooking the village on our trip to Brownsbury. 3. They saw all the majestic _____ of France on their summer holiday. 4. He goes to _____ every Sunday. 5. I got to the _____ late this morning and my boss was very angry with me. 6. Take this

letter down to the ____ and mail it immediately. 7. We went down to the ____ for a pint of beer. 8. New York has over one hundred magnificent ____ . 9. They went to ____ to pick up his voter's registration forms. 10. We went to the ____ to report the robbery of our bicycles.

Ex. 7. Translate the following abstract using the given words and word combinations. Reproduce it.

Усе, що побудовано для задоволення матеріальних, культурних і побутових потреб людини, має загальну назву – **споруди**. З числа різноманітних по призначенню і виду споруд виділяють велику їхню групу – будівлі, тобто наземні споруди, у яких передбачені приміщення, призначені для якої-небудь діяльності людей. Наприклад, будівлями є житлові будинки, школи, театри, гаражі, цехи заводів.

Споруди, що призначені для якихось суто технічних цілей такі, як димарі, телевізійні вежі, мости, підпірні стіни і т.п., оскільки в них відсутні приміщення або вбудовані в них приміщення не визначають їхнього основного призначення, є **інженерними спорудами**.

За функціональним призначенням будівлі підрозділяються на дві групи: цивільні й промислові. До **цивільних** відносяться будівлі, призначені для обслуговування побутових, комунальних і суспільних потреб людей. У цю групу входять житлові й громадські будівлі. **Промислові** – це будівлі, в яких виконуються різні виробничі процеси, пов'язані з виробництвом сировини, її обробкою та виготовленням продукції. До **виробничих** будівель близькі за характером і призначенням сільськогосподарські будівлі.

Ex. 8. Describe your ideal place to live.

Your ideal home

- Would you rather live alone or with lots of people?
- In a town or a rural area?
- In a flat, a house or something more unusual, like a boat?
- Do you like old buildings or modern ones?
- Is there anyone in the class with the same taste as you?

Miscellaneous

Ex. 9. Choose and use.

to assemble, to construct, to build, to make, to install, to erect

1. Very slight modifications have been in this model. 2. They needed \$ 3 m to

... a bridge. 3. By the end of November, a prefabrication building had been to be brought to the site. 4. The roof frames were from thick, heavy timbers. 5. Police have barriers across the main roads into the town. 6. Companies are estimated to have ... 95,000 miles of fibre optic cable nationwide.

to attract (to grip) attention, to pay attention, to draw attention

1. Max always ... careful attention to what is being told to him. 2. Now, I would like to ... your attention to Fred, the gentleman we have all heard so much about. 3. Please ... attention to the teacher. 4. The bright colors on the poster are there to ... your attention. 5. Could I ... your attention to the statue standing at the entrance? 6. Please ... this error to the clerk's attention 7. The scary movie ... my attention.

GRAMMAR EXERCISES

Ex 1. Form the degrees of comparison from the following adjectives and adverbs:

1. Hot, long, short, clever, rapid, great, red, black, white, thin, thick, fat, nice, warm, essential, merry, small, tall, high, weak, strong, heavy, light, green, dry, clean, dirty, wide, deep, brave, harmful
2. Necessary, quickly, slowly, clearly, well, far, high, widely, poorly.

Ex.. 2. Open the brackets using the necessary form of degrees of comparison of adjectives:

1. Which is (*large*): the United States or Canada? 2. What is the name of the (*big*) port in the United States? 3. Kiev is the (*large*) city in Ukraine. 4. The London underground is the (*old*) in the world. 5. There is a (*great*) number of cars in the streets of Kyiv than in any other neighbouring town. 6. Paris is one of the (*beautiful*) cities in the world. 7. The rivers in America are much (*long*) than those in England. 8. The island of Great Britain is (*small*) than Greenland. 9. What is the name of the (*high*) mountain in Asia? 10. The English Channel is (*wide*) than the Strait of Gibraltar.

Ex.3. Insert correct degree of adjectives using as ... as and so ... as.

1. Mike is ___ tall ___ Pete. 2. Kate is not ___ nice ___ Ann. 3. My room is ___ light ___ this one. 4. This book is not ___ thin ___ that one. 5. Sergei is ___ old ___ Michael. 6. She is ___ young ___ Tom's brother. 7. Nick's English is not ___ good ___ his friend's. 8. This woman is ___ young ___ that one. 9. I am ___ thin ___ you. 10. Kate is ___ lazy ___ her brother.

Ex.4. Translate into Ukrainian.

1. The less you say, the better. 2. Unfortunately I couldn't come as early as I had promised. 3. The cat fell off the roof but it feels none the worse for it. 4. The room is nice, but not as nice as I should like. 5. The more one has, the more one wants. 6. He is not as experienced as you are. 7. The weather is changing for the better. 8. The window is as narrow as the door. 9. The soup smells good, but it tastes better. 10. How can I get to the nearest post office? 11. If he helps us, so much the better. 12. If he doesn't do his home tasks, so much the worse for him.

Ex . 5. Insert as ... as, so ... as or than.

1. Our house is not ___ big ___ yours. 2. The new cinema in our district is much bigger ___ the old one. 3. We are ___ proud of our district ___ you are of yours. 4. The house I live in is ___ old ___ the one my sister lives in. 5. Exercise 2 is easier ___ exercise 3. 6. This song is more beautiful ___ that one. 7. My composition is not ___ long ___ yours.

SUPPLEMENTARY READING

The Structure

The structure is part of the building above the foundation. It is where we spend most of our time. It has many parts and requires several processes.

There are three main structural types: frame, bearing wall, and mass.

Frame Structures

A frame for a building is like a skeleton, consisting essentially of vertical members combined with a horizontal framing pattern. For tall buildings, the use of load-bearing walls with horizontal framing members has declined steadily; non-load-bearing curtain walls are used most frequently.

The skeleton frame most often consists of multiples of the construction. For structures up to 40 stories high, reinforced concrete, steel, or composite-reinforced concrete and steel can be used in various ways. The basic elements of the steel skeleton frame are vertical columns, horizontal girders spanning the longer distance between columns, and beams spanning shorter distances. The frame is reinforced to prevent distortion and possible collapse because of uneven or vibratory loads. Lateral stability is provided by connecting the beams, columns, and girders; by the support given the structure by the floors and interior walls; and by diagonal bracing or rigid connections between columns, girders, and beams. Reinforced concrete can be used in a similar way, except that concrete shear walls

would be used instead of diagonal bracing to provide lateral stability. Newer techniques of constructing moderately high buildings include inserting prefabricated units within the skeleton frame, cable hanging, and stacking.

Most houses have wood frames. Building a wood frame takes only a few days. Special tools are not required. Standard building materials are used. Installing utilities is easy. These advantages make wood frames popular.

Bearing-Wall Structures

Bearing-wall structures have no frame. The outside walls, called bearing walls, support the weight of the building. This type of construction is usually used for one- or two-story commercial and industrial buildings. A simple single-story structure might consist of a reinforced-concrete slab laid directly on the ground, exterior masonry walls supported by the slab (or by a spread footing cast continuously around the perimeter of the building), and a roof. For low buildings, the use of interior columns between masonry load-bearing walls is still the most common construction method. Spaced columns supported by the slab or by individual spread footings may be used; however, in that case, the exterior walls can be supported by or hung between the columns. If the roof span is short, abutting planking made of wood, steel, concrete, or other material can be used to form the roof structure.

Mass Structures

Monuments, bridges, and dams may have mass structures. A large amount of material, such as concrete, is used to make them. The resulting structures are usually solid or nearly solid. There is usually little or no usable interior space.

Answer the questions on the text:

1. List the three main kinds of superstructures.
2. What is the most popular material for framing a house?
3. What are the basic elements of the steel skeleton frame?
4. What does a simple bearing-wall structure consist of?
5. What type of building is a mass-structure?

FOR PLEASURE.....

East or west – home is best.

The grass is always greener on the other side.

Module two

THE CONSTRUCTIONS

UNIT ONE

Reading: Building Construction

Word-building: Prefixes of degree and size

Grammar: 1. The Numeral
2. Pronouns *much, many, few, little*

Supplementary

reading: Construction Industry



Phonetic Drills

*She sells sea shells by the sea shore.
The shells she sells are surely seashells.
So if she sells shells on the seashore,
I'm sure she sells seashore shells.*

There's a sandwich on the sand which was sent by a sane witch.

Words you will need.....

building construction

будівельна конструкція

contractor *n.*

забудовник.

general contractor

генеральний підрядник

subcontractor

субпідрядник

terms of the contract

умови договору

craft *n.* Syn. trade, skill,

ремесло, майстерність

craftsman *n.* Syn. tradesman

ремісник, майстер

handicraft *n.*

ручна робота

assembly *n.*

монтаж, збір

e.g. The craftsman managed to put things together by using **assembly** instructions.

contemporary *adj.* Syn. modern

сучасний

dimension *n.* Syn. measurement

вимір

e.g. We'll need to know the exact

dimension of the room.

dimensional *adj.*

просторовий, вимірний

multiply *v.* Ant. reduce

множити, примножувати

e.g. Multiply the total by 12.	
<i>Syn.</i> increase	збільшувати
e.g. The amount of information available has multiplied .	
drastically <i>adv.</i> <i>Syn.</i> radically	радикально, рішуче
durability <i>n.</i>	зносостійкість, довговічність
perishable <i>adj.</i>	швидкопсувний
e.g. The shipment was delivered eventually though some of the perishable goods had gone off.	
animal hides	шкури тварин
quest <i>n.</i> <i>Syn.</i> search	пошук, розшук, розшукуваний предмет
e.g. They journeyed to the distant Molucca islands in quest of spices.	
exploit <i>v.</i>	використовувати, експлуатувати
precise regulations	чіткі вказівки
humidity <i>n.</i>	вологість
odour <i>n.</i> <i>AmE</i> odor	запах, аромат
odors from the factory	неприємні запахи з фабрики
affect <i>v.</i>	1. впливати
e.g. Many companies were badly affected by the recession.	
e.g. We were deeply affected by her death.	2. вражати, зворушувати
! Mind the difference: to affect, to effect	
employ <i>v.</i>	застосовувати, наймати
schedule <i>n.</i>	<i>тут</i> графік
keep <i>v.</i> (track of)	<i>тут.</i> відслідковувати, відстежувати
diverse <i>adj.</i> <i>Syn.</i> various	різноманітний
comply <i>v.</i> <i>Syn.</i> to execute (see Modul I/unit I)	дотримуватися, виконувати
compliance <i>n.</i>	виконання, дотримання
e.g. All works must be done properly to ensure compliance of state laws.	
general compliance	загальне дотримання
conform (to) <i>v.</i>	відповідати (чомусь)
e.g. The programs conform to a standard patterns	

convert <i>v.</i>	перетворювати, конвертувати
bid <i>n.</i> <i>Syn.</i> proposal	пропозиція, заявка
for bids	для торгу
bidder <i>n.</i>	той, хто пропонує
plumbing	водопровід, водозабезпечення
wire <i>n.</i>	дріт
electrical wiring	електропроводка
observation <i>n.</i> <i>Syn.</i> oversight	спостереження, нагляд
occupancy <i>n.</i>	розміщення, проживання
deficiency <i>n.</i>	дефіцит

Pre-reading.....

Task 1. Find Ukrainian equivalents to the following word combinations:

On-site assembly, contemporary building, structural complexes, durable natural materials, human muscle power, construction process, interior environment, dimensional coordination, powerful machinery, safety standards, quality control, electrical wiring, legally responsible, local building code.

Task 2. Think of the answers:

1. How is a construction job organized?
2. Who are the main people on the construction site? What are their duties?
3. Try to explain why safety is important on a construction site.

Reading.....

Task 1. Read and translate the text.

Building Construction

Building Construction is a procedure involved in the erection of various types of structures. The major trend in present-day construction continues away from handcrafting at the building site and toward on-site assembly of ever larger, more integrated subassemblies manufactured away from the site.

Another characteristic of contemporary building, related to the latter trend, is the greater amount of dimensional coordination; that is, buildings are designed and components manufactured in multiples of a standard module, which drastically reduces the amount of cutting and fitting required on the building site. A third trend is the production or redevelopment of such large structural complexes as shopping centers, entire campuses, and whole towns or sections of cities.

Construction

The history of building is marked by a number of trends. One is the increasing durability of the materials used. Early building materials were perishable, such as leaves, branches, and animal hides. Later, more durable natural materials such as clay, stone, and timber and, finally, synthetic materials such as brick, concrete, metals, and plastics were used. Another is a quest for buildings of ever greater height and span; this was made possible by the development of stronger materials and by knowledge of how materials behave and how to exploit them to greater advantage. A third major trend involves the degree of control exercised over the interior environment of buildings: increasingly precise regulation of air temperature, light and sound levels, humidity, odors, air speed, and other factors that affect human comfort has been possible. Yet another trend is the shift in the energy available to the construction process, from human muscle power to the powerful machinery used today.

The present state of building construction is complex. There is a wide range of building products and systems aimed primarily at specific building types or markets. The design process for buildings is highly organized and draws upon research establishments that study material properties and performance, code officials who adopt and enforce safety standards, and design professionals who determine user needs and design a building to meet those needs. The construction process is also highly organised; it includes manufacturers of building products and systems, the craftsmen who assemble them on the building site, the contractors who employ and coordinate the craftsmen, and consultants who specialise in areas such as construction management, quality control, and insurance.

All the tasks that must be done on the job are listed on schedules. Usually, the job must be finished by a date stated in the contract. Some flexibility is allowed for bad weather and other problems. Schedules help the project manager keep track of what must be done and when. (See the bar chart Fig. 2.1. which shows the start and finish date for each major task).

Fig. 2.1. Construction schedule

Project: _____

Date ____ By: _____

**FORD CONSTRUCTION
CONSTRUCTION SCHEDULE**

	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Excavation and grading	████████									
Foundations - formwork - walls		████████████████████								
Rebar		████████████████████								
Concrete		████████████████████								

Suspended slabs										
Slab on grade										
Plumbing underground										
Plumbing above ground										
Electrical underground										
Electrical above ground										
Mechanical - air conditioning										
Roofing										
Lath and plaster										
Millwork - doors - windows										
Painting										
Paving and landscaping - parking										
Hardware										
Final inspection - pick up comp.										

Construction Industry

Building construction is the product of a diverse group of subindustries, with many individuals and organizations involved in the construction of a single structure, from the manufacture of necessary components to final assembly. As a general rule, state laws require a registered architect or engineer, or both, to execute the design and to make sure that the design complies with public health, zoning, and building-code requirements. The design must at the same time conform to the requirements of the owner. The architect or engineer converts these requirements into a set of drawings and written specifications that usually are sent to interested general contractors for bids. The successful bidder or bidders in turn subcontract plumbing, painting, electrical wiring, structural frame construction and erection, and other jobs to firms specializing in these crafts.



Contractors ordinarily carry out their work under the observation of an architect and or engineer, who acts as agent of the owner. State and local inspectors review the work for general compliance with the local building code. The immediate responsibility of the contractor, architect, and engineer ends when the local authorities approve the building for occupancy and the owner accepts the building.

However, the contractor, architect, and engineer are legally responsible for any deficiencies in the construction or design for a period of several years after acceptance, the time depending on the terms of the contract and local laws.

Task 2. Answer the questions about the text:

1. How do we call procedures involved in the erection of various types of structures?
2. What is the difference between handcrafting at the building site and on-site assembly of prefabricated parts?
3. What innovation in the construction industry drastically reduces the amount of cutting and fitting on the building site?
4. What industries are engaged in the manufacture of necessary components for construction and final assembly of buildings?
5. Who is responsible for making the design to comply with public health, zoning, and building-code requirements?
6. Are owners' requirements taken into consideration by city council authorities?
7. Who is responsible to make the design to conform to the requirements of the owner?
8. What are the next steps taken after a set of drawings and written specifications ready?
9. Who usually perform plumbing, painting, electrical wiring, structural frame construction and erection, and other jobs after the design is approved?
10. Who are legally responsible for any deficiencies in the construction or design for a period of several years after acceptance?

ACTIVITY

- Interview an individual who recently worked with a contractor to build a home. Ask what the experience was like.
 - Conduct a safety inspection of the site in surrounding.
 - What precautions are necessary?
- Make a list of the requirements.

Practicing.....

Word-building

Prefixes of degree and size

arch - + enemy = arch enemy

Super- + man = superman

out - + live = outlive

sub- + divide = subdivide

sur- + charge = surcharge

extra - + ordinary = extraordinary

super + charged = supercharged

hyper - / **ultra** - + active = hyperactive

multi - + media = multimedia

mini -, **maxi** - + shirt = miniskirt, maxiskirt

macro- + economics = macroeconomics

micro- + wave = microwave

over-/ under- + estimate = overestimate/
underestimate

Ex. 1. Which prefix fits to the following words (consult the dictionary)?

weight, skirt, way, bus, bishop, do, normal, task sensitive, paid, modern, violet, marine, sleep, eat, media, national, market, human, standard, run, cassette, work.

DID YOU KNOW?

- Building construction is an ancient human activity. Human shelters were at first very simple and perhaps lasted only a few days or months. Over time, however, even temporary structures evolved into such highly refined forms as the igloo. Gradually more durable structures began to appear.
- The first shelters were dwellings, but later other functions, such as food storage and ceremony, were housed in separate buildings. Some structures began to have symbolic as well as functional value, marking the beginning of the distinction between architecture and building.
- Construction can benefit the physically challenged. Larger parking spaces, ramps instead of steps, and specially equipped restrooms make tasks easier for those with disabilities. Similar alterations to older structures will increase as society recognizes the importance of using the talents of this group of people.
- The dimensions of a rectangular construction site are 174' by 360'. How many square feet are included in the site? (Use the formula: Area = Length X Width.)

VOCABULARY EXERCISES

Ex. 2. Find in the text:

a) antonyms to the following words and translate then into Ukrainian:

On-site, present day, slowly increase, natural (materials), unavailable, simple, illegal, refusal.

b) Find in the text synonyms to the following words and word combinations and translate then into Ukrainian.

To produce, erection, present day, a lot of ways, great variety, to have a purpose, tradesman, to hire talented people, important jobs, to meet (requirements), proprietor, proposal, search, smell.

Ex.3. Give English equivalents of the following:

Складання на будівельному майданчику; суттєво зменшувати кількість різки і підгонки; будівництво цілого університетського містечка; перші будівельні матеріали, що швидко псуються; більшої висоти і діапазону; використання для більших переваг; внутрішнє оснащення будівлі; впливати на комфорт людини; визначати потреби користувачів; наймати і координувати роботу майстрів; гнучкість графіку; приймати будинок для проживання.

Ex. 4. Match the words in a left-hand column with their definitions on the right:

BUILDING MATERIALS

1. Masonry	A mixture of cement, aggregate, sand, and water. It is the most important material for masonry construction in modern times. It has great strength under compression.
2. Bitumen	A mixture of limestone and clay, which is then heated and ground into a powder.
3. Steel	Building materials such as rock, brick, or tile, often bound together by mortar or cement.
4. Portland Cement	Straw, reeds, leaves, etc., are used to make a roof, or the roof is made of them.
5. Aggregate	A hard, usually shiny substance such as iron.
6. Concrete	A product of <u>trees</u> , and sometimes other fibrous plants, used for construction purposes when cut or pressed into lumber and timber, such as boards, planks and similar materials.
7. Grout	Mixture of sand and <u>silicates</u> is generally made in a very hot fire stove called a <u>kiln</u> , and is very brittle.
8. Polymers	A binding agent made from natural tars.
9. Foam	Long chainlike compounds of elements, principally hydrogen and carbon. They are the basis for many plastics and are now being used to produce concrete with more strength and durability.
10. Clay	A thin mortar or cement used as a binding agent.
11. Wood	Small stones, gravel or crushed rock used as a building material.
12. Thatch	An alloy or mixture of iron with a small amount of carbon or some other substance that increases its strength
13. Metal	A type of soft rubber with a lot of air in it, used in furniture.
14. Glass	A type of heavy sticky earth that can be used for making pots, bricks etc.

Ex. 5. Complete the sentences with the appropriate words or phrases from the list below. Translate the sentences into Ukrainian.

Metal Rock Brush Ice Wood Glass Concrete Sand
"plastics" fabric clay masonry thatch

1. The term covers a range of synthetic or semi-synthetic organic condensation or polymerization products that can be molded or extruded into objects, films, or fibers. 2. is used as structural framework for larger buildings such as skyscrapers, or as an external surface covering. 3. panes provided humans with the ability to both let light into rooms while at the same time keeping inclement weather outside. 4. Modern buildings can be made of flexible material such as membranes, and supported by a system of steel cables, rigid or internal, or by air pressure. 5. has been the predominant building material in the modern age due to its longevity, formability, and ease of transport. 6. can be very flexible under loads, keeping strength while bending, and is incredibly strong when compressed vertically. 7. In Europe, ... roofs on homes were once prevalent, but the material fell out of favor as industrialization and improved transport increased the availability of other materials. 8. structures are built entirely from plant parts and are generally found in tropical and sub-tropical areas, such as rainforests, where very large leaves can be used in the building. 9. was used by the Inuit for igloos, but has also been used for hotels as a tourist attraction in northern areas that might not otherwise see many winter tourists. 10. Soil, and especially , provides good thermal mass; it is very good at keeping temperatures at a constant level. Homes built with earth tend to be naturally cool in the summer heat and warm in cold weather. 11. is used with cement, and sometimes lime, to make mortar for work and plaster. 12..... is a very dense material, so it gives a lot of protection too; its main drawback as a material is its weight and awkwardness.

Vocabulary Notes

mold *AmE* = **mould** *BrE* – відливати у форму, формувати

extrude – штампувати, пресувати

inclement – суворий, непривітний

rigid – жорсткий, стійкий

prevalent – поширений, переважний

Inuit – ескімоси *від Eskimo (однина)*

igloo – іглу (будинок ескімосів)

drawback – недолік, перешкода

mortar – розчин вапна

improve – покращувати, удосконалювати

Ex. 6. Translate the following abstract using the words and word combinations from the exercises above. Reproduce it.

Види, класифікація та властивості будівельних матеріалів

Розвиток науково-технічного прогресу значною мірою залежить від розширення виробництва і використання будівельних матеріалів. У процесі промислової переробки сировинних матеріалів отримують різноманітні вироби будівельного призначення: бетонні плити, цеглу, черепицю, труби, скло і скловироби, азбоцементні і пластмасові вироби, дошки і т. ін.

З будівельних матеріалів і виробів виготовляють будівельні конструкції. Основними з них є залізобетонні вироби, панелі для стін, конструкції, перекриття, фундаментні блоки, колони, ферми. Будівельні матеріали можна класифікувати за походженням, хімічним складом, технологічною ознакою, за призначенням і т. ін.

За походженням будівельні матеріали діляться на природні (гравій, пісок, глина, природний камінь, деревина, метали), тобто загального призначення, на їх основі виготовляють будівельні конструкції, і штучні, які одержують в процесі переробки природних сировинних матеріалів (цемент, щебінь, полімерні смоли, бітуми, вапно) і т. ін.

За хімічним складом поділяються на неорганічні (пісок, глина, графіт й т. ін.) і органічні будівельні матеріали (деревина, пластмаси, фарби, бітуми і т. ін.).

За технологічною ознакою будівельні матеріали діляться на такі основні групи: природні кам'яні матеріали, керамічні матеріали і вироби, вогнетривкі, мінеральні в'язкі речовини і вироби на їхній основі, силікатні і азбоцементні матеріали і вироби, скло і скловироби, теплоізоляційні, дерев'яні, пластмасові і металеві вироби.

За призначенням на: конструкційні, оздоблювальні, теплоізоляційні. У процесі експлуатації будівельні матеріали зазнають впливу різноманітних факторів, які змінюють їхні споживчі властивості.

Vocabulary Notes

властивості - **properties**

отримувати - **to obtain**

скловироби - **glassware**

полімерні смоли - **polymer resins**

вогнетривкі - **refractory**

хімічний склад - **chemical composition**

змінювати - **to alter**

теплоізоляційні - **insulation**

ферма (бетонна або металева конструкція) – **truss**

Mechanical Properties of Materials

If a material has high ductility, its shape can be changed

DUCTILITY

without breaking it. Aluminum is very ductile. This is why it is used in foils, such as food wraps, that are meant to be shaped or folded.



COMPRESSIVE STRENGTH

Compressive strength is the opposite of tensile strength. It is the ability of a material to resist being crushed. The foundation of a building must have compressive strength.

ELASTICITY

If a material is elastic, it can be pulled or pushed out of shape, but it will return to its original shape. Rubber is an elastic material.

A material has plasticity if it will keep its new shape after it has been deformed. Modeling clay is a plastic material.

PLASTICITY



Shearing is pushing a material in opposite

SHEAR STRENGTH

directions at the same time. This is what happens when you tear a sheet of paper in half. You pull one half toward you and the other half away from you.



When you're fatigued, you're tired.

Fatigue strength is the ability to carry a load over and over again without wearing out. The metal

FATIGUE STRENGTH

used to make airplanes must have fatigue strength. Otherwise, over time the plane will develop fatigue cracks.

BRITTLENESS

When a force is applied to brittle materials, they break easily. Window glass is brittle.

HARDNESS

A hard material cannot be scratched or dented easily.

Diamonds are the hardest natural material. They must be cut with special tools.



TORSION STRENGTH

Torsion is a kind of twisting action. A material that has high torsion strength cannot be twisted easily.



TENSILE STRENGTH

Tensile strength is the ability of a material to resist being pulled apart. Materials with tensile strength are usually very dense or compact. If a rope used for tug-of-war has little tensile strength, it will break.

Impact strength is the ability of a material to withstand a

IMPACT

STRENGTH

sudden blow. If you ride your bike into a brick wall, you will discover the wall has impact strength.

Miscellaneous

Ex. 7. Choose and use.

to affect, to effect / affect, effect

1. The volcanic eruption _____ ed the entire country. 2. Your answer will not _____ your grade on the test. 3. Your answer will have no _____ on your grade on the test. 4. What he said to her _____ ed her deeply. 5. The patient asked how the medication would _____ her energy level. 6. The speaker said that her organization wanted to _____ a major change in the party's platform. 7. Joe talked with Janis, but his words had almost no _____ on his friend's actions. 8. One _____ of the new lenses is my ability to read more easily. 9. Adding salt to the batter _____ s the taste of the cake. 10. The _____ s of the storm will not be clear for years.

GRAMMAR EXERCISES

Ex 1. Fill in the blanks with 'many', 'much', 'a few' or 'a little'

Example: We haven't _____ time left; we've only _____ minutes more.

We haven't **much** time left; we've only **a few** minutes more.

1. He has got _____ debts to settle, but he hasn't got _____ money. 2. It's not good to eat too _____ cakes even though they are delicious. You'll have to practise _____ self-restraint. 3. He doesn't have _____ liking for her, but there are _____ occasions when he can't help admiring her. 4. You can do _____ better if you put in _____ more effort. 5. She hasn't _____ children but she has _____ difficulty in making ends meet. 6. She bought only _____ records because she hadn't brought _____ money with her. Besides, she had _____ other things to buy. 7. _____ competitors took part in the Walkathon, but only _____ managed to reach the finish-line. 8. There's _____ trouble at the new foundry because _____ of the workers there have threatened to go on strike. 9. They encountered _____ difficulties because only _____ of them were really experienced at mountaineering. The rest had only _____ experience. 10. There wasn't _____ dirt on the floor, so she did not bother to sweep it. Moreover, she had _____ other things to do. 11. Most of the others have had their lunch. There are only _____ pieces of fish and _____ soup left for you.

Ex. 2. Fill in the blanks with 'few', 'little', 'a few' or 'a little'

1. _____ learning is a dangerous thing. 2. I've had _____ drinks but I'm not drunk. 3. You won't change her mind so there is _____ use in trying. 4. Michael Cane was born in South London, not the East End. _____ people know that. 5. I need _____ help. I'm

a bit stuck. 6. There weren't many people there. Just _____. 7. Will you have _____ strawberries? They're very good. 8. Will you have _____ more ice-cream? We might as well finish it. 9. There's _____ point in continuing. We're all too tired. 10. Could you spare me _____ minutes? 11. I don't know if we can fit the cupboard into our house. There's _____ space as it is. 12. All this kitten needs is _____ love and attention. 13. There's _____ I can do about this. It's outside my control. 14. Martin is a good student. He has _____ problems with English. 15. Generally Peter is good but sometimes he has _____ problems.

Ex. 3. Underline the noun in each sentence and write 'C' or 'U' to show whether the noun is countable or uncountable.

1. That is a very good painting. ____ 2. I don't like coffee. ____ 3. I need two clean glasses. ____ 4. She bought a new iron yesterday. ____ 5. They've got plenty of coal. ____ 6. Would you like some chicken? ____ 7. Too much cake isn't good for you. ____ 8. She ate a whole chicken. ____ 9. How much flour did you buy? ____ 10. Hope keeps me going. _____

Ex. 4. Use the correct form of the given nouns to complete the following sentences.

language party fun vegetable information fruit money hair advice sleeve

1. We can buy fresh _____ from the supermarket. 2. Mrs Lee went to the travel agent for some _____ about the tour to Japan. 3. I can't wear this shirt. The _____ are too long. 4. How many _____ does Jenny speak? 5. Miss Ng spends a lot of _____ on clothes. 6. I don't know what to do. Please give me some _____. 7. Karen has beautiful _____. 8. We had a lot of _____ at the party last night. 9. Susan enjoys going to _____. 10. Alan eats a lot of _____.

Ex. 5. Choose the correct answer.

1. She burst into _____ (tear/ tears) when she heard the bad news. 2. Peter and Jack shake _____ (hand/ hands) and become friends again. 3. She can't see what is written on the blackboard without her contact _____ (len/ lens). 4. The two sisters took _____ (turn/ turns) at sitting up with their sick mother. 5. Quite a number of _____ (DJ/ DJs) have extended their careers to singing. 6. If you want to get well, you should take the doctor's _____ (advice/ advices). 7. Mary never does her _____ (homework/ homeworks). 8. Johnny has lost his _____ (luggage/ luggages). 9. The factory workers stopped working and took (a rest/ rest). The children sat on the _____ (grass/ grasses).

Adjectives and adverbs (well/ good)

Ex. 6. Put in good or well.

1. I play tennis but I'm not very _____. 2. Your exam results were very _____. 3. You did very _____ in your exams. 4. The weather was very _____ while we were on holiday. 5. I didn't sleep very _____ last night. 6. How are you? Are you doing ____? 7. George speaks German very _____. 8. George's German is very _____. 9. Our new business is going very _____ at the moment. 10. I like your mansion. It looks _____.

SUPPLEMENTARY READING

Construction Industry

Building construction is the product of a diverse group of subindustries, with many individuals and organizations involved in the construction of a single structure, from the manufacture of necessary components to final assembly. As a general rule, state laws require a registered architect or engineer, or both, to execute the design and to make sure that the design complies with public health, zoning, and building-code requirements. The design must at the same time conform to the requirements of the owner. The architect or engineer converts these requirements into a set of drawings and written specifications that usually are sent to interested general contractors for bids. The successful bidder or bidders in turn subcontract plumbing, painting, electrical wiring, structural frame construction and erection, and other jobs to firms specializing in these crafts.

Contractors ordinarily carry out their work under the observation of an architect and or engineer, who acts as agent of the owner. State and local inspectors review the work for general compliance with the local building code. The immediate responsibility of the contractor, architect, and engineer ends when



the local authorities approve the building for occupancy and the owner accepts the building. However, the contractor, architect, and engineer are legally responsible for any deficiencies in the construction or design for a period of several years after acceptance, the time depending on the terms of the contract and local laws.

Answer the questions to the text:

1. Who executes the design of a building?
2. What is sent to the interested general contractors for bids?
3. Who usually perform plumbing, painting, electrical wiring, structural frame construction and erection, and other jobs after the design is approved?
4. Could you specify subcontractors who take part in building construction?
5. Who are legally responsible for any deficiencies in the construction or design for a period of several years after acceptance?

FOR PLEASURE.....

An hour may destroy what an age was building.

(English proverb)

***He who did not help building the minaret, thinks that it just
grew out from the ground.***

(Turkish proverb)

Communities begin by building their kitchen.

(French proverb)

UNIT TWO

Reading: Elements of a Building

Word-building: Prefixes of degree and size

Grammar: 1. Perfect Infinitive in Active and Passive Voice
2. Perfect Tense Forms in Active and Passive Voice

Supplementary

reading: Four Types of Foundation and their Uses



Phonetic Drills

Betty Botter bought some butter but, said she, the butter's bitter.

If I put it in my batter, it will make my batter bitter.

But a bit of better butter will make my bitter batter better.

*So she bought some better butter, better than the bitter butter,
put it in her bitter batter, made her bitter batter better.*

So 'twas better Betty Botter bought some better butter.

Ann and Andy's anniversary is in April.

Words you will need.....

foundation *n.*

pile foundation

caisson foundation

exterior *n.* *Ant.* interior

e.g. You needn't paint the entire **exterior**
of your home to create a fresh look.

impose *v.*

transmit *v.* *Syn.* transfer

partition *n.*

load *n.*

dead load

live load

essential *adj.*

spread *v.* *Syn.* distribute

e.g. He **spread** out the papers on the table
and began to draw a plan.

support *v.* *Syn.* promote

фундамент

фундамент на палях

кесонний фундамент

екстер'єр, зовнішній вигляд

накладати, переносити

передавати

перегородка, поділ

навантаження

власна вага, сталe навантаження

змінне навантаження

істотний, необхідний

розстилати, *тут* поширювати

підтримувати, сприяти

anchor v.

e.g. The button was **anchored** to the cloth with heavy thread.

anchor n.

exert v.

e.g. It's good to **exert** control over what you can, but don't go crazy.

consolidate adj. Syn. *thicken*

cohesive adj. Ant. non-cohesive

settlement n.

occur v.

e.g. When did the accident occur?

prevent v.

! Mind n. the difference: *obstruct, forestall, prevent, preclude, precede, obviate*

subsidence n.

bear v. (*bore, born, borne*),

e.g. The four pillars **bear** the arch. —
Чотири колони підтримують арку

collapse v.

e.g. The roof had **collapsed** long ago under the weight of snow.

collapse n.

permanent adj. Ant. *temperate*

distortion n.

motion Syn. *movement*

excessive adj.

excessive motion

occupant Syn. *lodger*

rupture n.

e.g., The flood led to the dam's rupture.

investigate v.

e.g. Before building large structure engineers must **investigate** the soils to determine the health of the area.

sink (*sank, sunk*) v. Syn. *drown*

закріплювати, чіпляти

якір, анкер

викликати, встановлювати, виявляти;

ущільнений, об'єднаний

згуртований, зв'язаний, здатний до зчеплення

осідання, просідання траплятися, відбуватися

попереджати, упереджати, перешкоджати

осідання, падіння

нести, зносити, витримувати навантаження, терпіти,

руйнуватися, зазнавати краху, обвалюватися

руйнування, обвал, катастрофа постійний, сталий

спотворення, деформація

рух

надмірний

непомітний рух

мешканець

розрив, прорив

досліджувати, обстежувати

топити, тонути, опускатися

e.g. The tower is slowly sinking .	
fault <i>n</i> .	помилка, недолік, несправність
crust <i>n</i> .	кірка, кора
liquefy <i>v</i> .	перетворювати на рідину
e.g. The cooled, compressed process stream is expanded to liquefy the natural gas.	
quake <i>n</i> .	землетрус
solid material	твердий матеріал
fraction <i>n</i> .	дрібна частинка, фракція
slide <i>v</i> .	ковзати, прослизати
surface <i>n</i> .	поверхня
encounter <i>v</i> . <i>Ant.</i> avoid	стикатися, зустрічати
e.g. I first encountered him when studying in Cambridge	
magnitude <i>n</i> .	величина
footing <i>n</i> . <i>Syn.</i> foundation	основа
pile <i>n</i> .	стояк, куча, паля
strip <i>v</i> .	знімати, здирати, обрізати
strip <i>n</i> .	
strip foundation	
reinforced-concrete <i>n</i> .	залізобетон

Pre-reading.....

Task 1. a) While reading the text, you will come across several international words:

Economically, classify, analyses, ventilating, air-conditioning, acoustical systems, television, telephone, temperature, vibration, tendency, method.

b) Find Ukrainian equivalents to the following words or word-combinations:

telephone-wiring systems, to ensure stability; supporting ground; load-bearing walls; construction phase; underlying geologic conditions; lightweight buildings; to sink into the ground; bearing pressure; bend of foundation under loading.

Task 2. Answer the questions:

1. What stages of the building process do you know?
2. What parts of a house can you name?
3. What is important to start with in a house construction?
4. Have you ever heard about “dead” or “live” loads?

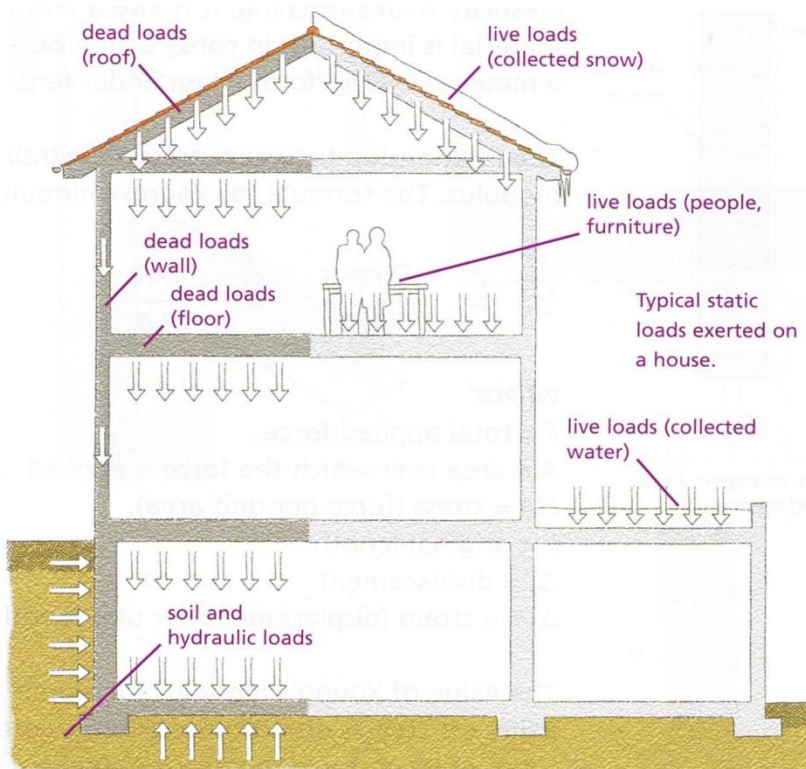
Reading

Task 1. Read and translate the text.

Elements of a Building

The major elements of a building include the following: (1) the foundation, which supports the building and provides stability; (2) the structure, which supports all the imposed loads and transmits them to the foundation; (3) the exterior walls, which may or may not be part of the primary supporting structure; (4) the interior partitions, which also may or may not be part of the primary structure; (5) the environmental-control systems, including the heating, ventilating, air-conditioning, lighting, and acoustical systems; (6) the vertical transportation systems, including elevators, escalators, and stairways; (7) communications, which may include such subsystems as intercommunications, public address, and closed-circuit television, as well as the more usual telephone-wiring systems; and (8) the power, water supply, and waste disposal systems.

Building Loads



The loads imposed on a building are classified as either “dead” or “live.”

Dead loads include the weight of the building itself and all major items of fixed equipment. Dead loads always act directly downward, act constantly, and are additive from the top of the building down.

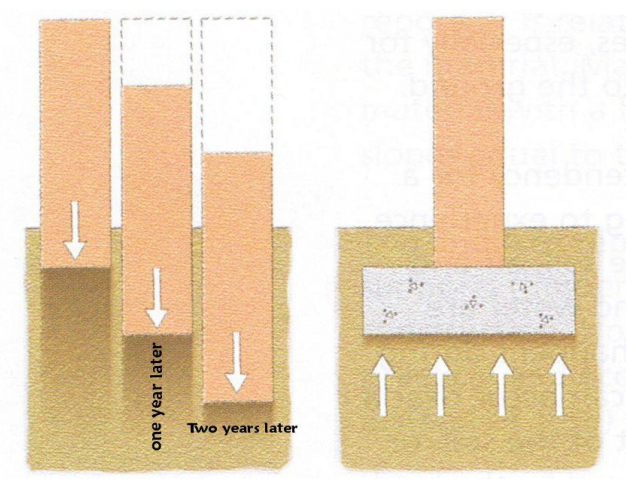
Live loads include wind pressure, seismic forces, vibrations caused by machinery, movable furniture, stored goods and

equipment, occupants, and forces caused by temperature changes. Live loads are temporary and can produce pulsing, vibratory, or impact stresses. In general, the design of a building must accommodate all possible dead and live loads to prevent the building from settling or collapsing and to prevent any permanent distortion, excessive motion, discomfort to occupants, or rupture at any point.

Foundations

A foundation is the part of a structure that transfers the loads from the structure to the ground. It is essential that loads are safely and evenly distributed over the supporting ground to ensure the stability of the building. In most cases, we do not see the foundation of a building because it is below ground level.

In addition to supporting the weight of the building, the foundation provides a level base on which to build. While we usually think in terms of the building's weight keeping it in place, in some cases, especially for taller buildings, the foundation actually anchors the building to the ground. A properly designed foundation will limit settlement, i.e. the tendency for a new building to sink into the ground. It is normal for a building to experience some settlement. This is because most soils are a mixture of the soil, air and water. When the building load is exerted on the soil, air and water are driven out, and the soil consolidates. In non-cohesive soils this happens during the construction phase, although in cohesive soils (e.g. clay) it can occur over a period of years.



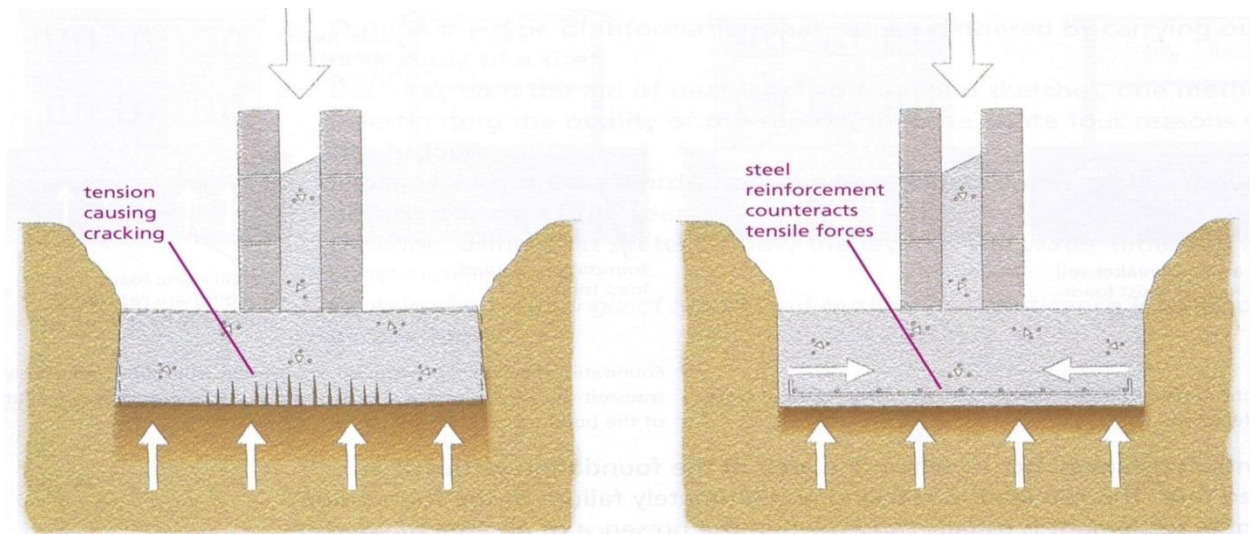
The function of a foundation can be summarised as follows:

- to transmit all building loads to the ground
- to limit settlement and prevent subsidence
- to provide a level bed on which to build
- to anchor the structure to the ground

A foundation is always wider than the element (e.g. wall or column) that it supports. This is so that the load is spread over a greater area. The bearing pressure exerted on the soil by a structure is the force per unit area. For example, if the bearing pressure is 100 kN/m^2 , this could be 10 kN exerted on 10 m^2 or 5 kN exerted on 20 m^2 .

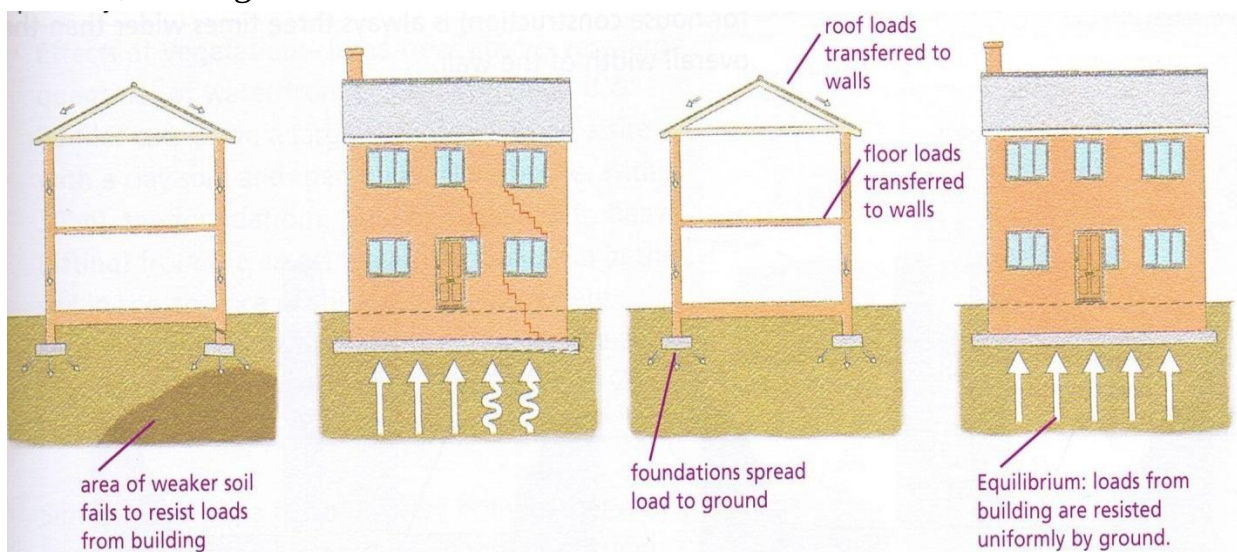
Therefore, as the area increases, the force exerted decreases. By increasing the area of a foundation under a house, the force exerted per square metre on the soil is decreased. For this reason, a traditional strip foundation (commonly used for house construction) is always three times wider than the overall width of the wall. In this illustration a structure without foundations will sink. A three times wider foundation will support all load without movement.

Strip foundation: the lower portion of the strip is stretched (tension) as the foundation bends under loading. Placing steel reinforcement in the foundation counteracts this and ensures the foundation remains stable.



Ground Conditions

If a building is to be constructed in an area that has a history of earthquake activity, the earth must be investigated to a considerable depth. Faults in the crust of the earth beneath the soil must obviously be avoided. Some soils may liquefy when subjected to the shock waves of a quake and become like quicksand. In such cases, either construction must be avoided altogether or the foundation must be made deep enough to reach solid material below the potentially unstable soil. Certain clay soils have been found to expand 23 cm or more if subjected to long cycles of drying or wetting, thus producing powerful forces that can shear foundations and lift lightweight buildings. Some soils with high organic content may, over time, compress under the building load to a fraction of their original volume, causing the structure to settle. Other soils tend to slide under loads.



Foundations differential settlement will occur if an area of softer soil is undetected. (See image above on the left). Above on the right, a properly designed foundation will safely and evenly transmit the load over the supporting ground to ensure the stability of the building. Now, there is not cracking in the house frontage.

Task 2. Give answers to the following questions:

1. What are the main parts of a foundation? Describe their function.
2. What does the structural design of a building depend greatly on?
3. Why is it essential that the loads to be spread safely and evenly over the supporting ground?
4. In what case the construction company has to investigate the earth to a considerable depth?
5. In what cases construction must be avoided altogether or the foundation must be made deep enough?
6. What soils in some way often perform differently?
7. What is usually done by a construction company if the soil under a proposed building varies so greatly over the entire site?
8. What are the main goals of soil and geologic analyses before construction of a building?
9. What is the most traditional type of a foundation?
10. Why do you think concrete is a good material to use for foundation?

ACTIVITY

Work as part of a group to lay out the foundation to model a home. Describe the process of designing and building the footings and foundation walls (begin with constructing the form, mixing and pouring the concrete)

Practicing.....

Word-building

Prefixes of degree and size

arch - + enemy = arch enemy
Super- + man = superman
out - + live = outlive
sub- + divide = subdivide
sur- + charge = surcharge
extra - + ordinary = extraordinary
super + charged = supercharged
hyper - / **ultra** - + active = hyperactive
multi - + media = multimedia

mini -, **maxi** - + shirt = miniskirt, maxiskirt
macro- + economics = macroeconomics
micro- + wave = microwave
over-/ under- + estimate = overestimate/ underestimate

1. Which prefix fits to the following words (consult with the dictionary)?

weight, skirt, way, bus, bishop, do, normal, task sensitive, paid, modern, violet, marine, sleep, eat, media, national, market, human, standard, run, cassette, work.

DID YOU KNOW?

- 66% of all foundations crack within the first year of being poured.
- Poured concrete is generally required to stay in the concrete forms for about 7 days. However, the removal of the concrete forms is typically done 1-2 days after the concrete is poured. Because of this, concrete cannot meet its strength factor, based on 7 or 28 days, which can result in weaker and cracked concrete
- Concrete typically reaches 50% of its strength factor in 7 days and 90% in 28 days and takes years to fully cure. However, although concrete gets stronger as it gets older it also becomes more brittle
- Concrete does not require much water to achieve maximum strength. In fact, a wide majority of concrete used in residential work has too much water. Water is added as a labour saving device to make the concrete easier to install. This excess water cannot only promote cracking but it can severely weaken the concrete
- 60% of all homes built on expansive soils suffer from foundation distress.

Ex. 2. Find in the text.

a) antonyms to the following words and translate then into Ukrainian:

interior, roof, horizontal, live (load), permanent, comfort of, minor (items), (to) rise, (to) build up, unstable, temperate, non-cohesive, decrease, long-distance, (to) revive, strong (materials), (to) avoid (doing smth).

b) synonyms to the following words and word combinations and translate then into Ukrainian:

Firmness, lift, conversation, movement, moisturizing, lift, (to) transform, raise up, additional assignment, (to) go down, lodger, foundation, movement, growth, (to) withstand, (to) distribute, (to) drown, (to) strengthen, mistake, thicken (adj).

Ex. 3. Give English equivalents of the following.

1. Тип фундаменту будівлі значною мірою залежить від природи ґрунту та основних геологічних умов. 2. Існують ґрунти, що мають тенденцію ковзати під вагою будівель. 3. При будівництві споруди у сейсмічно небезпечній

місцевості земля повинна бути обстежена досить глибоко. 4. Будівництво метро на цій ділянці було припинено через недостатнє дослідження ґрунту. 5. Тип фундаменту залежить від типу будинку, ґрунту, ваги будівельних вантажів і рівня ґрунтових вод. 6. Будь-який фундамент несе навантаження на будівлю зверху вниз. 7. Сучасні багатоповерхові будинки оснащені новими системами вентиляції, кондиціонування та опалення. 8. Стрічковий фундамент є традиційним видом для зведення житлових споруд. 9. Перед початком будівництва архітектори детально розробляють тип фундаменту, щоб уникнути усадки споруди. 10. Жителі нестійкого будинку помітили руйнування і деформації споруди.

Ex. 4. Match each tool in the left-hand column with its purpose in the right-hand column.

CONSTRUCTION TOOLS

1.	Rule <i>AmE</i> Tape measure <i>BrE</i>	a.	is used in construction to smooth out a concrete sidewalk.
2.	Transit	b.	smooth and trim wood by shaving off thin pieces.
3.	Tri square	c.	electric tool to turn a screw
4.	Wood chisel	d.	is used to cut wood.
5.	Wood float	e.	is used in construction to shape pipes or tubes that protect wires and cables.
6.	Pipe bender	f.	is used to measure distance.
7.	Level	g.	pneumatic portable drill used to drill rock, break up pavement, etc
8.	File	h.	has rows of teeth cut into their metal surfaces
9.	Smoothing planes	i.	in laying out a site for construction ____ is used by surveyors to measure vertical and horizontal angles.
10.	Saw	j.	a removable boring head used on certain kinds of drills, as a rock drill.
11.	Jackhammer	k.	Electrically rotating cutting tool that is pushed into material to make holes.
12.	Screw-gun	l.	is used to lay out 90-degree angles.
13.	Hand power drill	m.	determines whether or not a surface is level.
14.	Pliers	n.	also <i>hatchet</i> a hand tool with one side of its head forged and sharpened to a cutting edge, used for felling trees, splitting timber, etc

15.	Wrench	o.	an appliance for holding an object while work is done upon it, usually having a pair of jaw
16.	Vise	p.	are makes either smooth or rough cuts in the wood.
17.	Axe	q.	is used to tighten nuts and bolts.
18.	Bit	r.	used to hold fasteners in place during installation.

Ex. 5. Choose correct word to label every picture:

CONSTRUCTION HEAVY EQUIPMENT

concrete mixer, front-end loader, bulldozer, backhoe, trencher, crawler crane, tower crane, truck crane, paver

A. _____



B. _____



C. _____



D. _____



E. _____



F. _____



G. _____



H. _____



I. _____



Ex. 6. Complete the sentences with the appropriate words from the list below. Translate the sentences into Ukrainian.

pile, soil, earth, loading, foundation (3), building (4)

1. The most common types of ___ systems are classified as expensive and cheap.
2. The structural design of a ___ depends greatly on underlying geologic conditions.
3. If a ___ is to be constructed in rural area, the ___ must be investigated to a considerable depth.
4. Some ___s with high content of iron may, over time, compress under the ___ load to a fraction of their original volume.
5. Floor ___s range from 450 to 1,500 kilograms per square meter.
6. The ___s in these buildings support considerably heavier loads than those of residential buildings.
7. ___s are made of stainless steel, plastics and bricks.
8. The ___ chosen for any ___ depends only on depth of groundwater level.

Ex. 7. Translate the following abstract using the words and word combinations from the vocabulary list. Reproduce it.

Перш ніж починати роботи по зведенню фундаменту, з'ясуємо: на якому ґрунті стоятиме будинок, визначимо глибину промерзання у районі будівництва, рівень ґрунтових вод та вартість фундаменту. Для цього буде потрібно провести геологічні дослідження на ділянці. Тобто з'ясувати геологічну будову землі, стійкість ґрунтів на місці де передбачається будівництво. Отримані дані дозволять встановити глибину закладання фундаменту та величину допустимих тисків на ґрунт, спрогнозують стійкість майбутньої споруди, величину опадів, які очікуються тощо. Нехтувати геологами або використовувати дані геологічних досліджень сусідніх місцевостей небажано. Немає ніякої гарантії, що на вашому майданчику такі ж ґрунти, як і на сусідній ділянці. Якщо присутній складний рельєф, підземні річки, зведення будинку зажадає колосальних коштів на укріплювальні заходи що, в підсумку, буде коштувати замовникові занадто дорого. Тому, для якісного будівництва будинку обов'язково потрібно провести геологічні дослідження ділянки. Лише після цього можна починати підбір фундаменту і роботу над проектною документацією.

Miscellaneous

Ex. 8. Choose and use.

forestall, prevent, preclude, precede, obviate, obstruct

1. Sometimes people are mobilized to ___ things from happening.
2. The women's title game will ___ the men's championship game on March 12.
3. The authorities

are doing what they can to ____ ecological catastrophe. 4. You can't ____ all problems just by increasing the number of regulations. 5. Make sure the teacher's bench doesn't ____ the board. 6. This new evidence ____s the need for any further enquiries.

GRAMMAR EXERCISES

Ex. 1. Transform the Indefinite Infinitives into:

a) the Perfect Infinitive Active:

To break, to shed, to keep, to spoil, to take, to become, to give;

b) the Perfect Infinitive Passive:

to string, to bind, to hit, to grind, to hew, to bend, to get, to put;

c) the Perfect Continuous Infinitive Active:

to build, to dig, to lay, to burn, to make, to rise, to cut.

Ex. 2. Translate into Ukrainian paying attention into Perfect Infinitives:

1. The Egyptians seem to have made some use of iron a number of centuries before our era. 2. The participants were happy to have been shown prefabrication process. 3. They are supposed to have been working at house decoration for the last two months. 4. They remembered to have been told about Egyptian method to erect such impressive stone constructions. 5. I am sorry to have spoilt the design draft project that you have made. 6. The students were delighted to have been brought to the industrial exhibition where they could examine modern facing materials. 7. Sorry not to have taken into account your ideas of waste recycling. Your proposal was worth regarding. 8. He is very upset not to have installed air-conditioning in his office and now he suffers from extreme heat. 9. The architect is delighted to have used new method of tall building construction. 10. They seemed to have been waiting for ages.

Ex.3. Examine the table of the Tense Forms in Active Voice. Give examples of "markers" typically used in every case:

Table of Perfect Tense Forms in Active and Passive Voice:

		Present	Past	Future	Future -in-the-Past
Active	Perfect	I have built	I had built	I shall have built	I should have built
		He has planned	He had planned	He will have planned	He would have planned

		I have been building	I had been building	I shall have been building	I should have been building
Perfect Continuous		He has been planning	He had been planning	He will have been planning	He would have been planning
Passive	Perfect	They have been built	They had been built	They will have been built	They would have been built
		It has been planned	It had been planned	It will have been planned	He would have been planned
	Perfect Continuous				

Ex. 4. Translate into Ukrainian, paying attention to Perfect Tense Forms:

1. It is due to the serious attention given to the architectural aspects of industrial buildings that a number of architecturally good buildings have been erected in the past few years. 2. Quick transportation linking the suburbs and the city has been provided. 3. At the beginning of the 19th century, mechanical processes came into everyday use and by the end of the century had almost entirely replaced the ancient hand-fashioned methods. 4. A great number of fine houses have been constructed in the suburbs of our large towns and cities. 5. By the time they arrive, we will have been waiting for 4 hours! 6 I've been working in the garden, that's why my hands are so dirty. 7. Chef Jones had been preparing the restaurant's fantastic dinners for two years before he moved to Paris. 8. The development of science and technology has been of great help in mechanizing and speeding up construction. 9. Industrial methods have been used for building a new shopping center. 10 Since the Middle Ages, brickwork has been in constant use everywhere.

Ex. 5. Make all possible changes to transform the verbs in the predicates from Active into Passive:

1. They have recently constructed a huge plant in the town of N. 2. When we got to the stadium, we found that they had cancelled the game. 3. "Industrial" has built a new hospital near the airport. 4. He had been drawing a landscape for an hour when I came. 5. The police have found the people they were looking for. 6. The car was three years old but they look to have not used it very much. 7. There were some problems at first but we have solved them. 8. When I entered the room I found that somebody had stolen my umbrella. 9. Researchers of this laboratory have developed new equipment for TV communication via outer space. 10. The vegetables did not taste very good. You had been cooking them for too long.

Ex. 6. Make up:

A) interrogative and negative sentences:

1. He had been given all necessary instructions before he left for the airport.
2. By the time we finish, we will have been painting for 4 hours.
3. Steel has come into general use nowadays in the construction of different buildings.

B) alternative questions:

1. They have been building this house for three months.
2. They will not have trusted him.
3. Accommodation for Mr Brown has been reserved.

C) tag questions:

1. They will have finished working by the evening.
2. We have not agreed to this issue.
3. All the ordered raw materials had been delivered by the end of the year.

D) special questions:

1. When I am sixty, I'll have built more than fifty houses. (Who, How many)
2. During recent years, the value of aluminium as an architectural metal has been increasingly recognized. (What, When)
3. The general problem of maintaining comfortable conditions in an occupied room has been the subject of study for many years. (What, How long)

Ex.7. Change Infinitives into correct tense form.

1. The Nobel Prize (to award) to British scientists for this outstanding discovery.
2. Lasers (to use) by communication and building workers, drillers etc. They (to make) to help doctors and scientists in their research.
3. Experts believe that by the end of the decade lasers (to use) in many fields of technology.
4. The scientist (to complete) his research by the beginning of the conference.
5. My father just (to return) from a business trip.
6. New methods of obtaining polymers (to apply) lately.
7. The flexible line, that recently (to develop) at our plant, has greatly improved the production process.
8. A great number of experiments at the research institute (to make) before the flood defence system was worked out.
9. Our workshop (to equip) with new multipurpose machine-tools by the time when the reconstruction of the plant is over.
10. The construction of the road (to complete) when the commission arrived.

SUPPLEMENTARY READING

Four Types of Foundation and their Uses

Foundation of building as the name implies is the starting of a building construction on site really. Types of building, nature of soil and environmental conditions are the major determinant of type of foundation.

1) **Strip foundation** - This is the most common type, it is mainly used where you have strong soil base and non-waterlogged areas. Most small buildings of just a floor are constructed with this type of foundation.

Depends on the structural engineers recommendation, the depth of your foundation could be from 600mm to 1200mm mostly for small scale buildings. When the soil is excavated, a level at which the concrete will settle evenly is established, then concrete is poured this may be from 150mm (6") thick to 450mm (18") thick depending also on building after that block is set round the trenches at the center of foundation, the foundation usually follows the block lines. The blocks are then layed to d.p.c level before another concrete is poured on top, this is the german or oversite concrete. This type seems to be the cheapest.

2) **Pad foundation**-This is where isolated columns (pillars) are casted from the foundation to carry a slab at the top of the ground. This is mostly used when you want to make use of the under of building as parking space or when the other space is not conducive to have foundation. Imagine you are planning to build a house across a flowing stream and you want a situation where you can use your boat to pass under the building because the stream is under. Then you may not need to dig foundation that will cut across the river but just by applying columns (pillars) at the edge of the river like a bridge, these columns are thus isolated and there foundations are reffered to as pad.

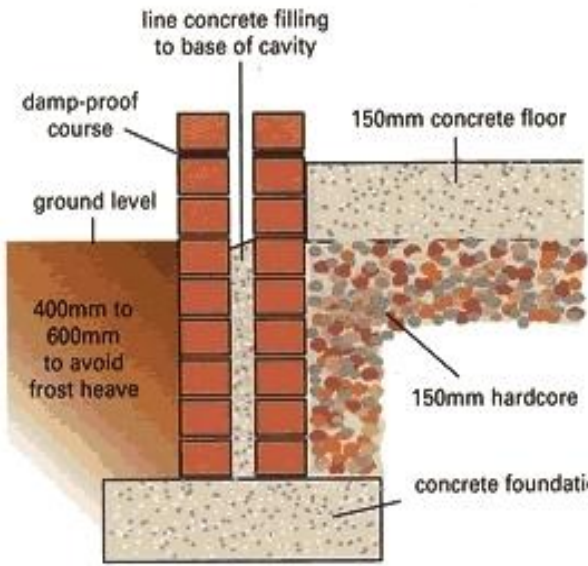
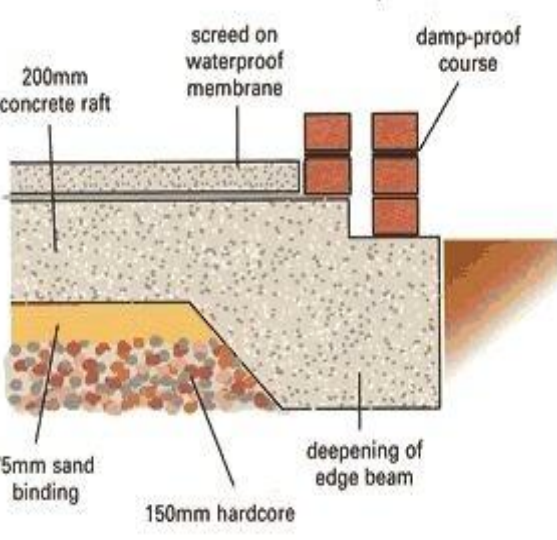
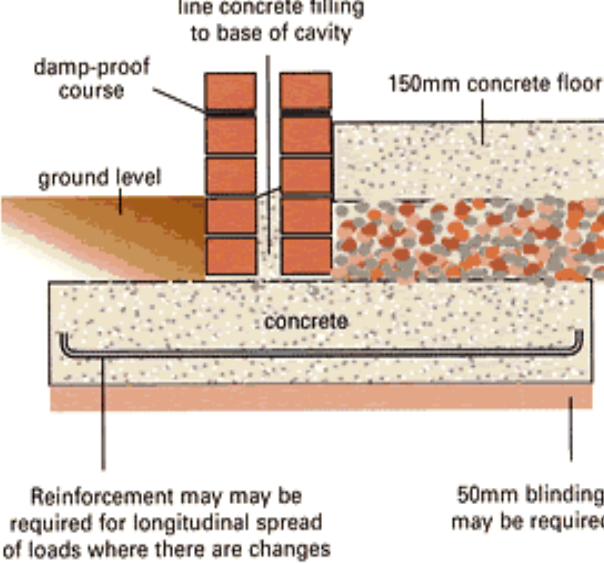
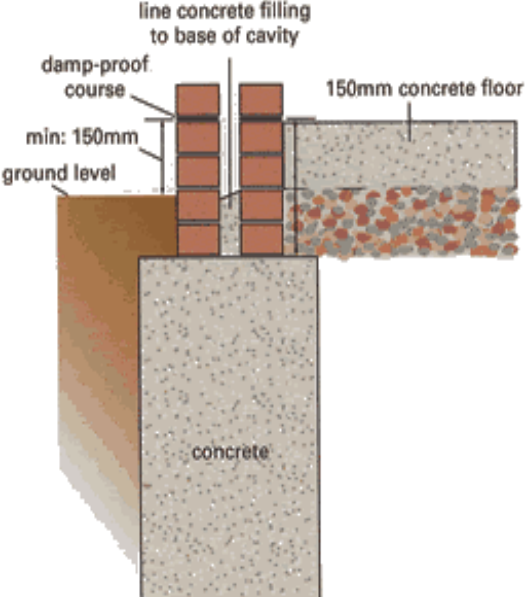
3) **Raft foundation**-This is where you have concrete spread around your building from the base of foundation all through to the german floor/oversite concrete/ground floor slab. It is mainly used in areas where the soil are sandy and loose, you spend more on this than the other previous two most of the time. It is also recommended in waterlogged areas but with buildings of less storeys It has a ground beam which shuts out from the foundation base and is also attached to the ground floor slab to form a network of concrete embedded round the building space. The ground beam are usually from 600mm to 1200mm for low buildings.

4) **Pile foundation**-The most expensive and the strongest type of foundation, this requires specialist engineering to do. The soil are bored deep down the earth and filled with concrete to be able to support loads of multistory building on top. Most

skyscrapers are constructed with this foundation type; a waterlogged area of high building may also require this. It is the costliest hence it is used for high rise building mostly.

Answer the questions to the text:

1. What are the factors that determine the type of foundation?
2. What is the most common type of the foundation?
3. What is the difference between Strip and Pad foundations?
4. What is the difference between Pile and Raft foundations?
5. Is Pile foundation the costliest? Why?

Strip Foundation	Raft Foundation
 line concrete filling to base of cavity damp-proof course ground level 400mm to 600mm to avoid frost heave 150mm concrete floor 150mm hardcore concrete foundation	 200mm concrete raft screed on waterproof membrane damp-proof course 75mm sand binding 150mm hardcore deepening of edge beam
Pad Foundation	Trench Fill Foundation
 line concrete filling to base of cavity damp-proof course ground level 150mm concrete floor concrete Reinforcement may be required for longitudinal spread of loads where there are changes 50mm blinding may be required	 line concrete filling to base of cavity damp-proof course min: 150mm ground level 150mm concrete floor concrete

UNIT THREE

Reading: Building a Structure
Word-building: Prefixes of time and order
Grammar: Revision of Tenses and Voices
Supplementary reading: Utility Systems



Phonetic Drills

William always wears a very warm woollen vest in winter.

*Victor, however, will never wear woollen underwear
even in the Wild West.*

These thousand tricky tongue twisters trip thrillingly off the tongue.

Words you will need.....

create v. Syn. produce, make	створювати
insulate v.	ізолювати
insulator n.	ізолятор
resist v.	протистояти, протидіяти
e.g. The station was designed to withstand a powerful earthquake and also to resist a tsunami.	
resistance n.	опір, протидія
bonding	зв'язок, кріплення
Stretcher bonding	ланцюгова зв'язка
English bonding	зв'язка англійський вид
Flemish bonding	зв'язка фламандський вид
masonry n.	кам'яна кладка
define v. Syn. determine	визначати
e.g. They disagreed on how to define "liberal."	
overlap v.	перекривати, частково покривати
lateral adj	бічний
disperse v.	розсіюватись, розповсюджуватись
throughout adv.	всюди, по всьому
pattern n. Syn sample	шаблон, модель

single skin wall	стіна в одну цеглину
collar joint	муфтове з'єднання
partition n.	перегородка
drywall n.	гіпсокартон
joist n.	балка
tile n.	кахель, черепиця
rafter n.	кроква
truss n.	ферма (металева або дерев'яна конструкція)
attach v. (to) Ant. detach e.g. Please, attach a photograph to an application with a staple.	прикріпляти
fibreglass n.	скловата
shingle wood	шліфовані пластини дерева
asphalt n.	асфальт
sheathing n.	обшивка
roofing felt	руберойд
protect v. Ant. attack e.g. Wax protects a floor as well as makes it shine. ! Mind the difference: <i>preserve, defend, keep, guard, protect</i>	захищати, оберігати
loss n. Ant. gain e.g., It was difficult to cope with the loss of an old friend. ! Do not confuse: <i>loose, loosen, lose, loss</i>	втрата, шкода
admit v. Syn. receive	приймати, пропускати
glazing n.	скління
double-glazing window	вікно з подвійним склом
reduce v.	знижувати, зменшувати
insulation n.	інфільтрація
draught n.	протяг, тяга
coat v. Syn cover e.g. He coated the wall with paint.	покривати, крити
hang (hung,hung) v.	вішати, висіти
prehung adj.	попередньо підвішений
hinger n.	завіса

Figure 3.1

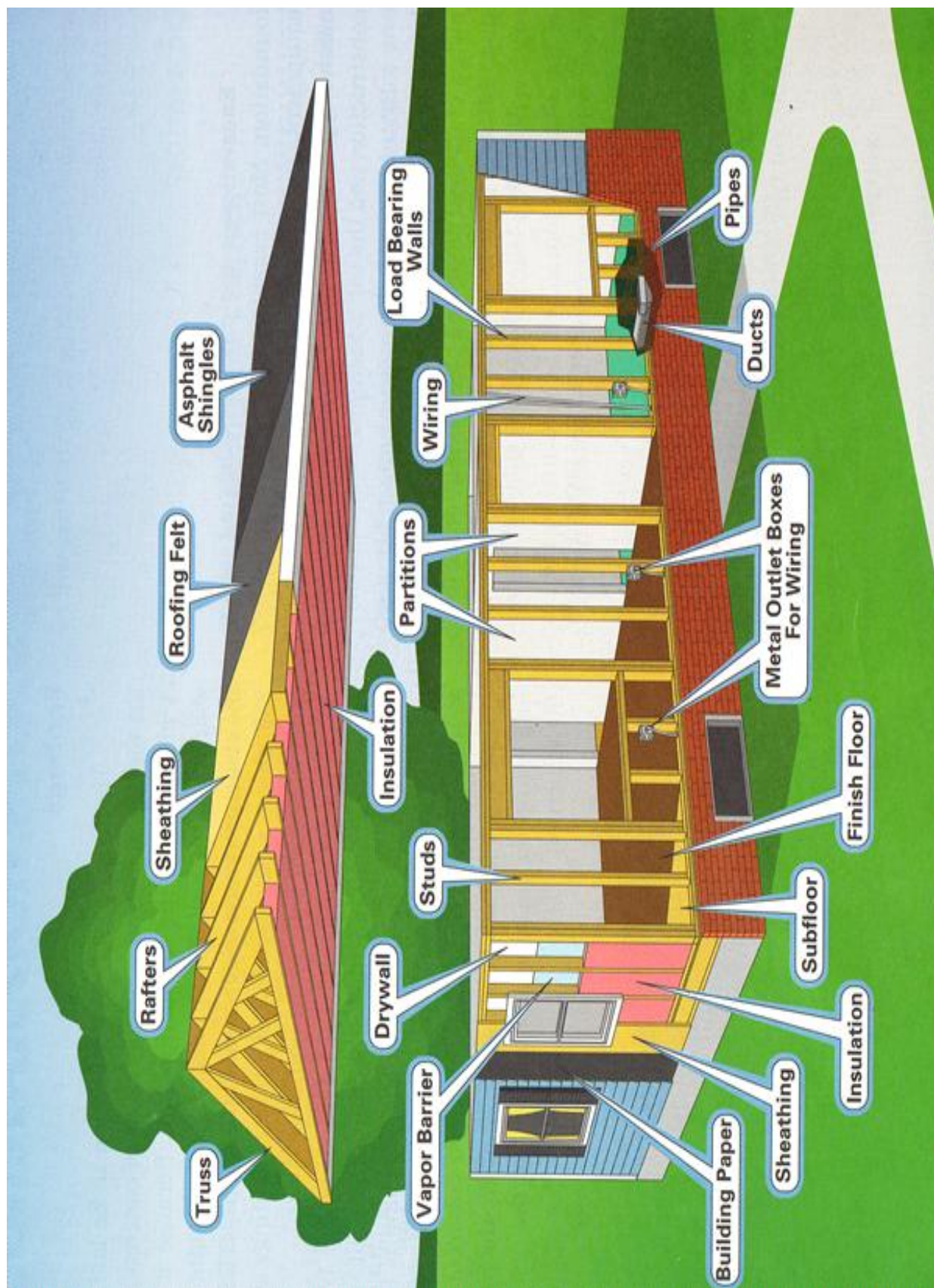
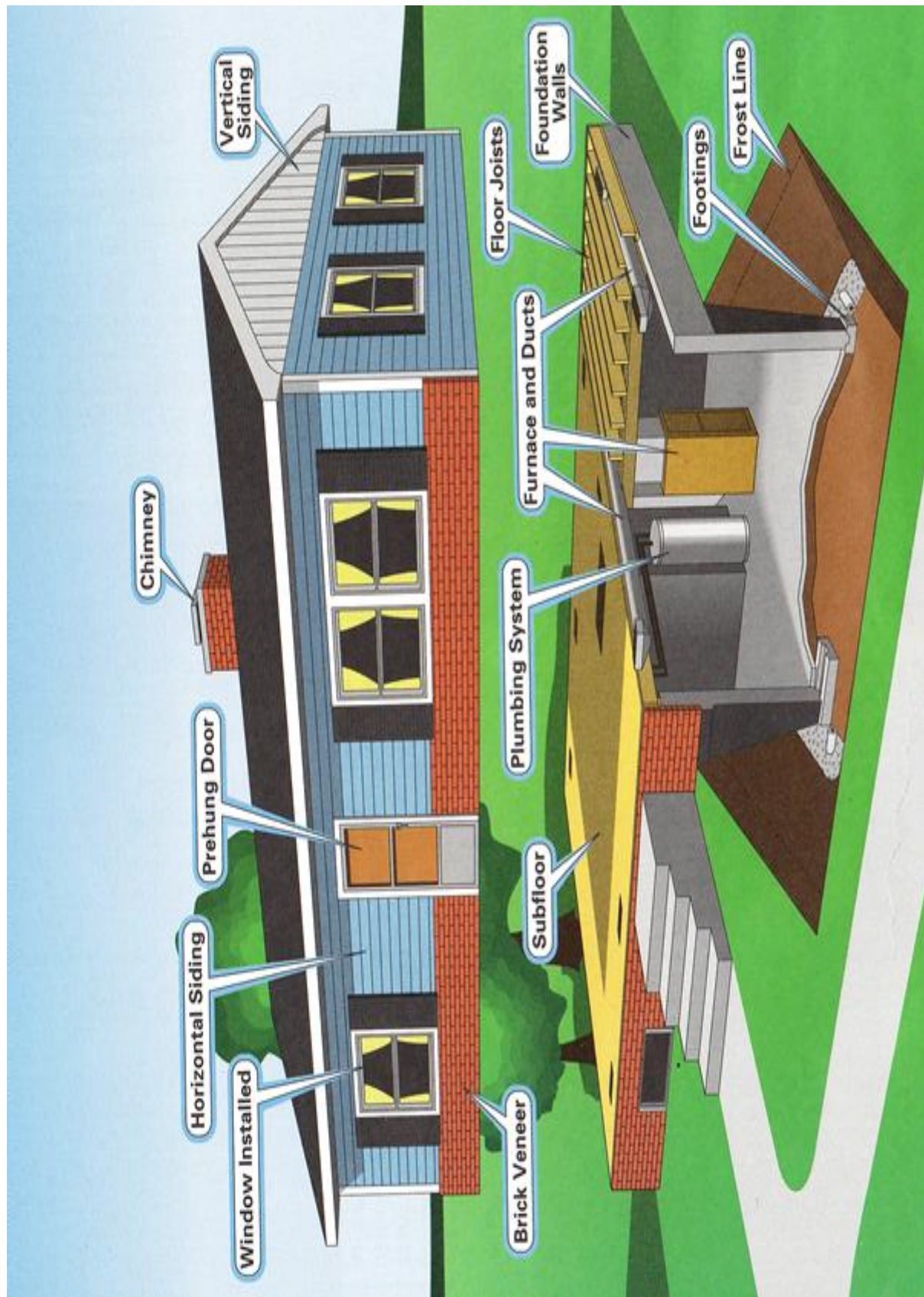


Figure 3.2



Pre-reading.....

Task 1. Find Ukrainian equivalents to the following words or word-combinations:

To support the loads, load-bearing walls, insulator layer, weather resistance, masonry walls, brickwork bond pattern, interior partitions, bottom layer, to retain the heat generated inside, to combine joists and rafters into one unit, weather stripping.

Task 2. Answer the questions:

1. What examples of structure can be found in the area you live?
2. Many new homes have few windows. Why do you think this is so?
3. What are the most popular materials for building a house?

Reading.....

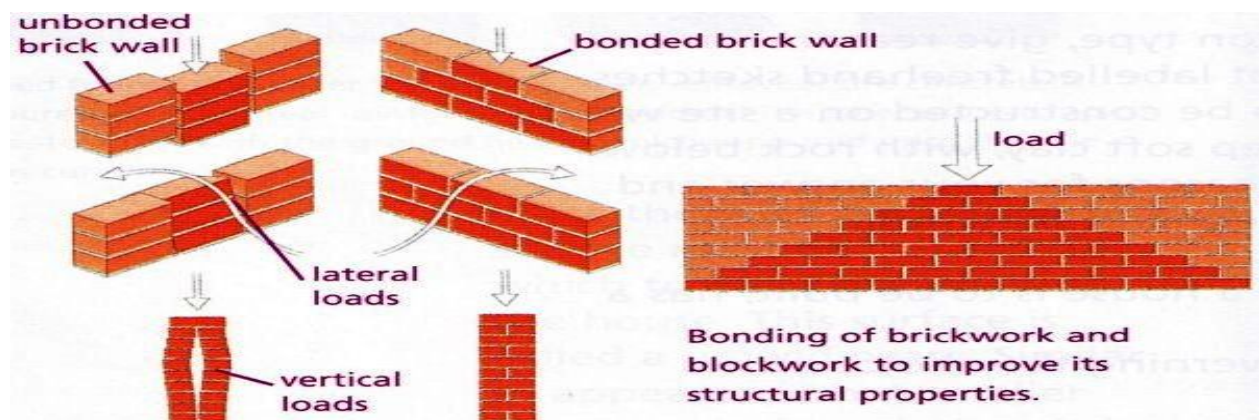
Task 1. Read and translate the text.

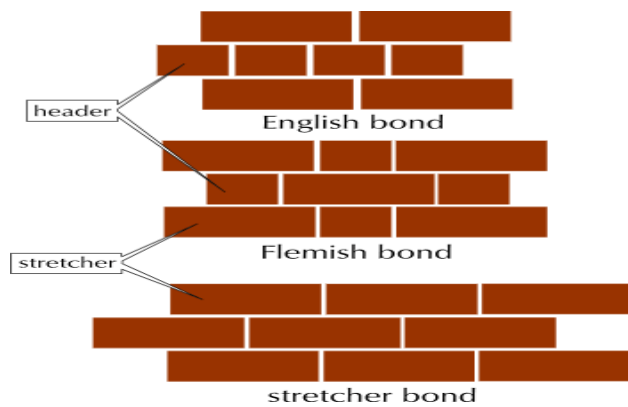
Building a Structure

Walls

The primary functions of the *external* or *exterior* walls of a house are to support the loads generated (only in case of a no-column structure) and to create a comfortable living space, which is why they are usually called *load-bearing walls*. These are usually made by two brick walls and an insulator layer (to avoid heat loss). Walls must be designed to meet a number of performance requirements, including: 1) stability and strength; 2) weather resistance; 3) thermal insulation to ensure that heat is not lost from the home.

Bonding is an essential design feature of *masonry* walls and greatly improves their strength by ensuring that it performs as a continuous unit. Bonding is defined as the overlapping of blocks or bricks to ensure that the vertical and lateral loads are dispersed evenly throughout the wall. (See the picture)





means of wall ties.

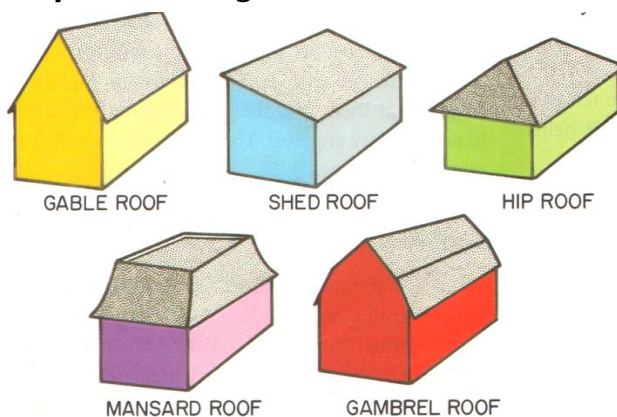
Interior (inside) walls divide the building into different rooms. Some interior walls help to bear the load. Others do not. Those that do not bear any load are called *partitions*.

Walls in commercial and industrial buildings are made using many different materials and methods. Concrete and concrete block are often used for bearing walls. Concrete, glass, steel, brick, or wood can be used for exterior walls of framed structures. Metal frames, brick, wood, plaster or drywall (large sheets that consist of plaster-like filler covered with paper) are used for interior partitions.

Floors

The primary functions of the floor are to support the imposed loads and to provide a level surface for the activities that are carried out in the home. In most houses the floor is supported by wood framing parts called joists (see Fig. 3.1.). If there is a second story, the ceiling joists of the first story support the floor of the second. Several layers of material are usually placed on top of the floor frame. The bottom layer is called the subfloor. Plywood is usually used for this. The top layer is called the finish floor which may be made of wood, carpet or tile.

Roof and Ceilings



The primary functions of a roof are to protect a building from the weather and to retain the heat generated inside. The style of roof used depends on the style and function of the building as well as the load to be carried.

Ceiling and roof in some houses are made using joists, rafters or trusses which combine joists and rafters into one unit. Rafters are the framing pieces that support the roof itself. They are attached to the ceiling joists (see Fig. 3.2.).

Roof coverings include fiberglass, tile, metal sheets, wood shingles, rolls of asphalt, and asphalt shingles. The frame for the roof is covered with plywood sheathing. The sheathing is then covered with a layer of roofing felt. The felt is a clothlike material combined with asphalt. It helps protect the roof from the weather.

Windows

The primary functions of a window are to admit light and fresh air into a building. The big problem of window is the loss of heat. So a proper thermal insulation design is very important. Double-glazing is designed to reduce the amount of heat lost through the glass, while weather stripping is designed to reduce the amount of heat lost due to air infiltration (draughts). Popular window designs are shown in picture after the text.

Wood, aluminium, steel and vinyl (plastic) are used to make window frames. Sometimes wood frames are coated with vinyl to protect wood from the weather.

Doors

Most buildings have more than one entrance for safety reasons. Entry doors are usually made of wood or steel. Steel doors are well insulated, long lasting and often attractive. Most doors are prehung. This means they are already attached with hinges to a frame (see Fig.3.1).

Task 2. Answer the questions to the text:

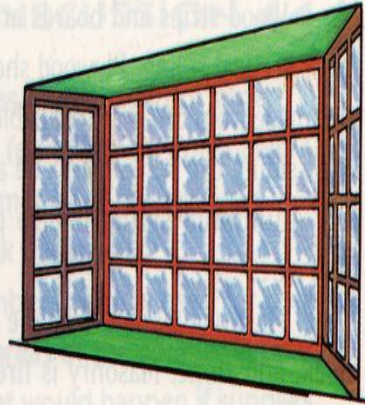
1. What are the main parts of a structure? Describe their functions.
2. What are the main performance requirements to walls?
3. Why is bonding so essential in masonry walls?
4. What bond for brick laying is considered the easiest?
5. What is plywood? How is it used for constructing a building?
6. What is the finish floor made of?
7. What is truss? How is it used in roof construction?
8. What are the functions of windows in construction?
9. What is the most popular material for framing a house?
10. What doors are safe for using?

ACTIVITY

Continue your work in the group that laid out the model of home foundation. Frame the floor, walls and roof. Finish a section with sheathing, siding, insulation, and drywall to accomplish construction. Explain your choices. Present the information in the form of a multimedia presentation.



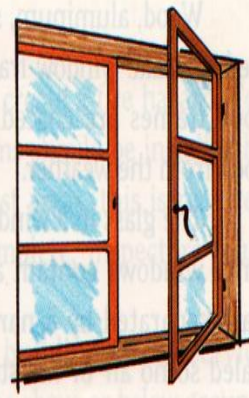
PALLADIAN



BAY WINDOW



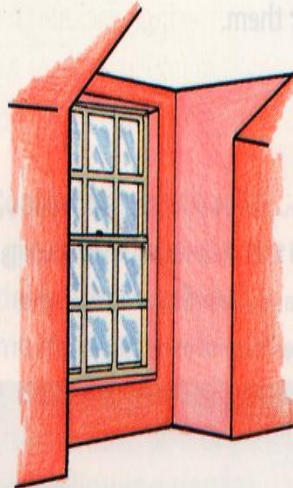
OUT-SWINGING CASEMENT



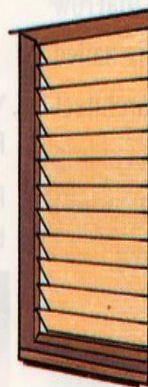
IN-SWINGING CASEMENT



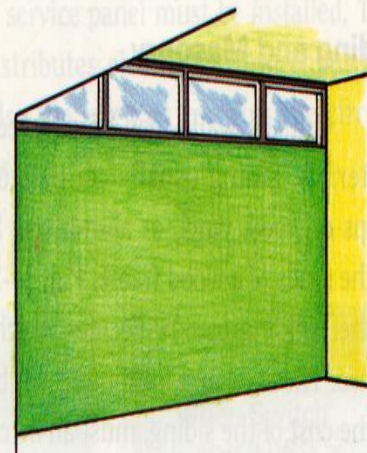
AWNING TYPE



DORMER



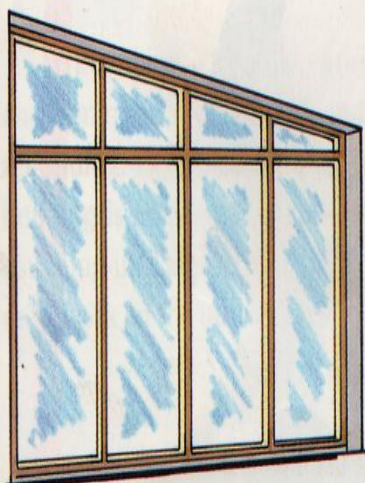
JALOUSIE



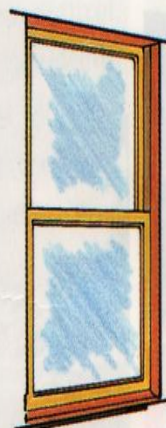
CLERESTORY



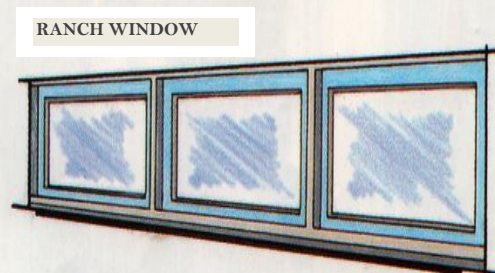
PICTURE WINDOW



SLANTED WINDOW



DOUBLE-HUNG



RANCH WINDOW

DID YOU KNOW?

- The word skyscraper originally referred to a type of sail on a sailing ship.
- A skyscraper is held together by a steel skeleton of vertical columns, horizontal girder beams and often diagonal beams for extra support. This structure distributes the immense weight in a way that ensures the integrity and safety of the building.
- Restoration work in 1990 and 2001 shifted the Leaning Tower of Pisa back to an angle of 4 degrees after it was previously leaning at an angle of 5.5 degrees.
- The roofs of the Sydney Opera House are covered in a total of 1056006 tiles.
- The Colosseum in Rome, Italy, is an elliptical amphitheatre that was completed in 80 AD. It held around 50000 spectators and was used for a variety of events including gladiator contests, animal hunts and mythology based dramas.
- Around 20000 workers helped build the Taj Mahal, a famous mausoleum and landmark in Agra, India, that attracts millions of visitors every year.
- Tall buildings need fast elevators, recent developments have led to elevators that can travel up to, and sometimes over, 1000 metres a minute (3280 feet a minute).

Practicing.....

Word-building

Affixation: Prefixes of time and order

ante- + cedent = antecedent

post- + dated = postdated,

pre- + cedent = precedent

retro- + grade = retrograde

prime- + minister = prime-minister

Ex.1. Explain the meaning of prefixes and translate the words:

Retroactive, retrospective, retrofit, post-war, postgame, postgraduate, primetime, primeval, prime-number, preceding, prefix, antidote, antigen, antidepressant

.

VOCABULARY EXERCISES

Ex. 2. Find in the text:

a) antonyms to the following words and translate then into Ukrainian:

to meet (requirements), frost, ceiling, external (wall), top (layer), ugly, to gain, to attack, to detach, to increase, single (glazing), support (n.).

b) Find in the text synonyms to the following words and word combinations and translate then into Ukrainian.

To reinforce, firmness, to secure, timber, to preserve, to defend, to keep up, to guard, counteract, fastening, to determine, exterior (wall), cover (n.), warmth reduction, available (window) design, to receive, to cover.

Ex.3. Give English equivalents of the following (consult with the text):

підтримувати створений тиск; ряд визначених вимог; значно покращувати міцність стін; рівномірно розповсюджувати тиск на стіни; два ряди цегли, з'єднані між собою; ті, які не несуть ніякого навантаження; використовувати гіпсокартон для перегородок; зберігати тепло; необхідна ізоляція; покрити фанерною обшивкою; впускати світло; захищати дерево від погодних змін.

Ex 4. Complete the sentences with the appropriate words from the list below:

partitions, interior, weight, exterior, load-bearing, studs, lumber

Translate the sentences into Ukrainian.

Buildings must be protected from the weather. For this purpose, (1) walls are made. (1) walls are usually (2) walls. This means they help support the (3) of the structure.

(4) walls divide the building into different rooms. Some (4) walls help bear the load. Others do not. Those that do not bear any load are called (5)..... .

Framing of both (4) and (1) walls is usually done with 2" x 4" (6), called (7) Sometimes 2" x 6" (6) is used for (1) walls if thicker insulation will be installed later. Because (6).... is becoming more costly, some homes are built with metal framing.

Walls in commercial and industrial buildings are made using many different materials and methods. Concrete and concrete block are often used for (2) walls. Concrete, glass, steel, brick, or wood can be used for (1) walls of framed structures. Metal frames are used for (4)..... (5)..... .

Note

studs – розпори, підпори;

lumber – порізане дерево.

Ex 5. Translate the following abstract using the words and word combinations from the vocabulary list. Reproduce it.

Основні конструктивні елементи або частини цивільних, промислових і сільськогосподарських будівель - це фундаменти, стіни і окремі опори, перекриття, перегородки, дахи, сходи, вікна і двері. Усі ці елементи по своєму призначенню підрозділяються на конструкції, що несуть, і конструкції, що захищають.

Стіни. За своїм призначенням і розташуванням в будівлі стіни діляться на зовнішні і внутрішні. Вони повинні мати необхідну міцність, стійкість і капітальну силу.

Зовнішні стіни захищають приміщення, а також людей, що знаходяться в них, устаткування і ін. від різних атмосферних дій, зайвого охолодження або перегрівання приміщень і від зовнішнього шуму. Внутрішні стіни розділяють будівлю на окремі приміщення.

Дахи і покриття. Дахи і покриття є конструкціями, що відмежовують будівлю згори і що захищають його від атмосферних опадів, а коли це потрібно, то і від зайвого охолодження зимою або перегрівання влітку. Дахи підрозділяються на горищні і безгорищні.

Вікна призначені для освітлення та провітрювання приміщень. Заповнення віконного пройму включають віконну коробку і застеленні віконні оправи.

Двері слугують для сполучення між сусідніми приміщеннями та для входу. В дверній проїмі установлюють коробки, на які вішають двері, проїми обрамляються підкосами.

Ex.6. Match each word in the left-hand column with the best in the right-hand column.

CONSTRUCTION PROCESSES

- | | |
|----------------------|---|
| 1. Bending | a. the sharp teeth on a ___blade must be harder than the material being cut. the teeth bite into the material and remove small chips. wood, metals, and plastics can all be sawn. |
| 2. Riveting | b. makes the edges of wood square and smooth so accurate cuts and measures can be made. |
| 3. Welding | c. levels and smooths wood. |
| 4. Separating | d. the act of attaching things together. |
| 5. Fastening | e. the combining of two or more materials to form a new material. |
| 6. Drilling | f. the process of breaking up, turning over, or removing |

- earth, sand, etc., as with a shovel, spade, bulldozer, or claw.
7. **Planing** g. During ____, one side of the material is compressed and the other side is stretched. surfaces.
 8. **Jointing** h. the process of fastening together pieces of metal with rivets that do not have threads.
 9. **Sawing** i. is cutting that is done with blades or dies by applying pressure.
 10. **Digging** j. the process of becoming crushed, pulverized, or powdered by friction.
 11. **Mixing** k. is done on workpieces shaped like cylinders.
 12. **Shearing** l. the process of fastening together pieces of metal by melting a bonding metal between similar metals.
 13. **Milling** m. the process used to produce flat surfaces slots, gears, and keyholes.
 14. **Turning** n. the process of cutting materials to size and shape.
 15. **Grinding** o. is done to make holes in materials.

Miscellaneous

Ex. 7. Choose and use.

preserve, defend, keep, guard, protect

1. Weather beater ... your roof from the rain. 2. These huge stone walls could easily ... local citizens against sudden attack. 3. The main goal of ecologists nowadays is working to ... our natural resources. 4. The jewels over which they kept ... were stolen. 5. Please, try to ... the ice from melting.

loose, loosen, lose, loss

1. ... of profit worries him no end. 2. After a month's diet, his jeans became too ... for him. 3. Terry had already ... one family member to the cult. He did not want to ... another. 4. She knew nothing about first aid, except that it was good to ... the collars of fainters.

GRAMMAR EXERCISES

Ex.1. Open the brackets by using one of the following tense forms: *Present, Past, Future Simple; Present, Past Continuous; Present, Past Perfect.*

It was eight o'clock in the morning and time for me to go to work. I (to look) out of the window. It (to rain) hard. "You (to get) wet through if you (to go) out now," said my mother. "No, I ... ," I answered, "I (to take) an umbrella." We (to have) five umbrellas in the house, but when I (to want) to take one, I (to find) that there (to be) not one that I could use: they all (to be) torn or broken. So I (to take) them

all and (to carry) them to the umbrella-maker, saying that I would call for the umbrellas on my way home in the evening. When I (to go) to have lunch in the afternoon, it still (to rain) very hard. I (to go) to the nearest cafe, and (to sit) down at a table. A few minutes later a young woman (to come) in and (to sit) down at the same table with me. When I (to finish) my lunch and (to be) ready to leave, I absent-mindedly (to take) her umbrella and (to start) for the exit. She (to stop) me saying that I (to take) her umbrella. I (to return) the umbrella with many apologies. In the evening I (to go) to the umbrella-maker, (to take) my five umbrellas and (to get) on the tram to go home. It so happened that the woman I (to meet) at the cafe (to ride) in the same tram. When she (to see) me with my five umbrellas, she (to say): "You (to have) a successful day today, (to have not) you?"

Ex.2.Transform the following sentences from Active into Passive Voice.

1. We received this letter after his departure. 2. Have dogs ever attacked you? 3. Bees gather honey from flowers. 4. The storm drove the ship against a rock. 5. Who discovered the circulation of blood? 6. They are selling delicious fruit ice cream there now. 7. The old man showed us the way out of the woods. 8. They offered her some interesting work. 9. The doctor prescribed her new medicine. 10. They often speak about him. 11. Everybody laughed at this funny animal. 12. We have been looking for you the whole morning.

Ex.3. Transform the following sentences from Passive into Active Voice. Begin with an appropriate subject.

1. This mountain has never been climbed before. 2. She told me that those newspapers had been carefully put away where they would not be lost. 3. Why have these cups been put here in this cupboard? 4. Nick was told to go home at once. 5. Invitations have been sent to all the old pupils to be present at the school's thirtieth anniversary. 6. All the passengers in the bus were listening to the story of the boy who had been saved from drowning by the quickness of the driver. 7. The work was finished in time. 8. The child is taken care of. 9. When was it done? 10. What museums were visited last year? 11. Have your compositions been handed in? 12. What has been said is true.

Ex.4. Transform the following sentences from Passive into Active Voice. Begin with an appropriate subject.

1. The light has not yet been turned off. 2. The boy was punished for misbehaving. 3. By three o'clock everything had been prepared. 4. The dictation was written

without mistakes. 5. Who was the poem written by? 6. Her dress was washed and ironed. 7. I was not blamed for the mistakes. 8. The papers had been looked through and corrected by the next lesson. 9. This house was built last year. 10. The letter has just been sent. 11. This article will be translated at the lesson on Tuesday. 12. When will this book be returned to the library? 13. The room was cleaned and aired. 14. Have all these books been read? 15. Whom were these letters written by?

Ex. 5. Translate into English, paying attention to the word in Active or Passive.

1. Цю статтю написав один англійський журналіст. 2. Де Мері? - Вона в бібліотеці, вона готується до доповіді. Вона вже працює три години. 3. Я вже півгодини намагаюся пригадати її ім'я, але до цих пір ще не згадав. 4. Я думала, що хліб і масло купить моя сестра. 5. Коли він прийшов додому, ми вже пішли в кіно. 6. Навесні це поле буде вкрито зеленою травою і квітами. 7. Вона сказала, що йде дощ і нам краще залишатись у будинку. 8. Нам показали багато гарних речей. 9. Вона жила в цьому будинку вже п'ять років, коли приїхав її брат. 10. Переклад буде закінчений вчасно. 11. Вона думала, що буде хороша погода. 12. Хіба ти не розумієш, що навесні буде вже три роки, як я ношу цей капелюх. 13. Цей вірш повинні вивчити всі студенти нашої групи. 14. Стаття повинна бути перекладена до п'ятої години. 15. Коли я прийшла додому, обід був вже зварений.

SUPPLEMENTARY READING

Utility Systems

Communications and Power Systems

Plumbing, electrical wiring, climate control, and communication systems must all be included in a building. Pipes and wiring go in right after the building is enclosed. This is called **rough work** or roughing-in. Later, after the interior walls are covered, work on the utilities is finished.

Main cables run vertically in open shafts, with branches at each floor running through conduits located either in the hung ceiling space or embedded in the floor slab itself. The electrical power required in buildings has increased with the number and complexity of environmental systems in operation. Because a power outage cannot be tolerated, emergency power generators are installed in an increasing number of buildings. Some buildings, particularly in remote locations, are equipped with their own primary electrical generating systems. Diesel and gas-turbine generators are used. The heat generated by these engines, instead of being wasted, is sometimes utilized for other purposes within the building.

Vertical Transportation

Elevators, especially high-speed, automatically controlled, cable-operated elevators, are the major form of vertical transportation in high-rise structures. Low-rise buildings and the lower floors of commercial buildings may also have escalators. For fire protection, it is necessary to provide at least two means of egress from every major space in a building. Therefore, in addition to elevators and escalators, all buildings, even the tallest, have two enclosed and protected stairways for their entire height.

Water Supply and Waste Disposal

Buildings must have a piped-in water supply for a variety of purposes: drinking, washing, cooking, waste disposal, internal firefighting (either through standpipes and hoses or through automatic sprinklers), and service to air-conditioning systems or boilers.

Disposal of wet and dry wastes in buildings is accomplished by a variety of devices, such as incinerators, shredders, and garbage compactors. There are also devices that assist waste-pickup and disposal systems. The usual method of carrying away waterborne waste is through piping connected to the sewer system outside the building. New technology is aimed at recycling water to reduce waste and pollution.

Answer the questions to the text:

1. When do the pipes and wiring go in construction process?
2. What types of electrical generators are used in some buildings of remote locations?
3. What utilities are usually constructed in a building for fire protection?
4. What are the purposes of piped-in water supply system in a building?
5. How are the waste-pickup and disposal systems in a building arranged?

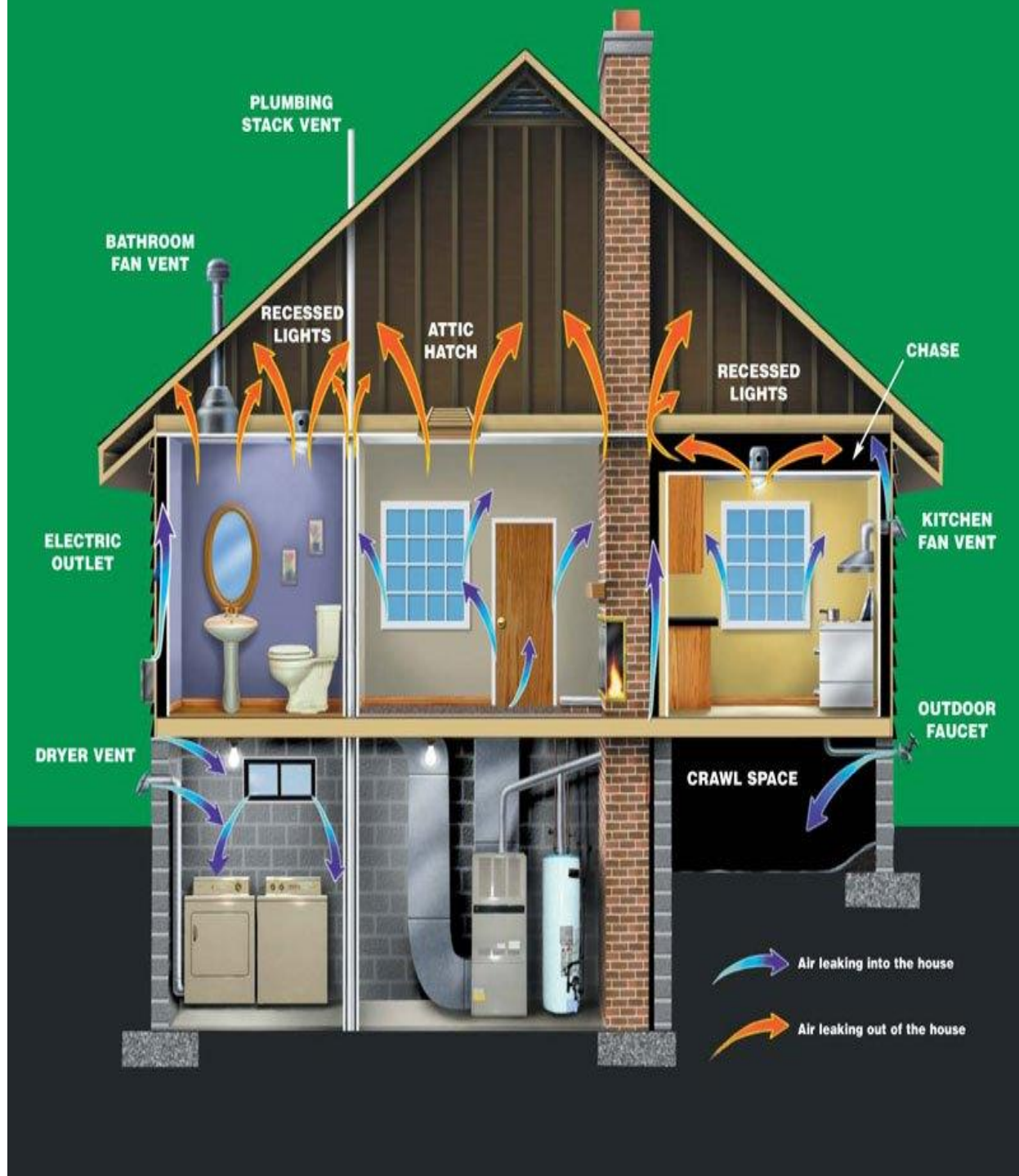
For Pleasure.....

“Living a life is like constructing a building: if you start wrong, you'll end wrong.”

Maya Angelou

“The loftier the building, the deeper must the foundation be laid.”

Your house is a system



Module three

PLANNING

UNIT ONE

Reading: City Planning

Word building: Hyphenated words

Grammar: 1. Indirect Speech.

2. Connectives.

Supplementary Reading: A Day in the Life of a City Planner.



Phonetic Drill

When I went to Warsaw,
I saw a saw that could out saw any saw
that I ever saw.
Now, if you go to Warsaw and see a saw
that could out saw the saw I saw,
I'd like to see your saw saw.

Words you will need.....

- network**, *n.* мережа, сітка, переплетення,
e.g. German **network** of OBI розрахункова система
building hypermarkets decided to
leave Ukraine.
Social **network** Twitter is currently
working on the development of
editing functions.
- transportation network** транспортна мережа
- settlement** *n.* Syn. location поселення, заселення, пункт
- community** *n.* громада, община, співтовариство
e.g. Kyiv subway went to court to
protect the interests of local
communities Kyiv.
- thinking** *n.* Syn. opinion, thought, idea, мислення, думка, міркування
mind, think, thinking, consideration
e.g. To my **thinking**, this is not a good
idea.

strategic thinking	стратегічне мислення
architecture <i>n.</i> Syn. structure, framework	архітектура, будова, структура
design <i>n.</i> Syn. design, arrangement, decor	дизайн, задум, мета, оформлення
urban design	міський дизайн
consultation <i>n.</i> Syn. advice, consultation, tutorial, conference	консультація, нарада, консиліум
public consultation	консультація з громадськістю
recommendation <i>n.</i> Syn. reference	рекомендація, посилення, довідка
policy recommendations	рекомендації з питань політики
implementation <i>n.</i> Syn. performance, execution, realization, providing	реалізація, виконання, забезпечення, здійснення
management <i>n.</i> Syn. control, administration, supervision	управління, керування, менеджмент
plan <i>n.</i> Syn. blueprint, scheme, project, draft, design	план, проект, схема, задум
planner <i>n.</i> Syn. draftsman, drawer, designer, topographer, surveyor	проектувальник, землевпорядник, плановик, топограф
approval of a unified master plan	затвердження єдиного генплану
comprehensive plans	комплексні плани
neighborhood <i>n.</i> Syn. area, district, region	район, округа, околиця, квартал
neighborhood plans	плани округи
strategy <i>n.</i>	стратегія
regulatory and incentive strategies	стратегії регулювання та стимулювання
decline <i>n.</i> Syn. decrease, reduction	занепад, зниження, спад
to represent <i>v.</i> to introduce, to produce, to show, to express	представляти, відображати, зображувати
prohibition <i>n.</i> Syn. embargo, veto	заборона
long lasting systems of prohibitions	довготривалі системи заборон
guidance <i>n.</i> Syn. leadership, guidance, direction	керівництво, управління
guidance about building sizes	вказівки про розміри будівлі
to repackage <i>v.</i>	упакувати
to remain <i>v.</i> to stay	залишатися, зберігатися, перебувати

budget <i>n.</i> e.g. The size of your budget is entirely up to you and you can edit this amount whenever you like.	бюджет, кошторис
welfare <i>n.</i> <i>Syn.</i> comfort, benefit, wealth	добробут, благополуччя, благодійність
long-range welfare	довгостроковий добробут
traffic <i>n.</i> <i>Syn.</i> movement, motion, transportation, traffic, carriage	рух, перевезення, трафік, торгівля
congestion <i>n.</i> <i>Syn.</i> overcrowding, overpopulation, congestion	затор, скупчення, нагромадження
pollution <i>n.</i> <i>Syn.</i> contamination e.g. We are both responsible for and the victims of our own pollution .	забруднення
police <i>n.</i> availability of police	поліс наявність полісу
service <i>n.</i> <i>Syn.</i> work, job, employment, service, occupation, institution, establishment, organization	служба, обслуговування, свера діяльності, праця, профілактика, служба
sanitation services	санітарні служби
limitation <i>n.</i> <i>Syn.</i> restriction e.g. But it has its limitations .	обмеження, обмеженість, межа
limitations posed by zoning and other regulations	обмеження, пов'язані із зонуванням та іншими нормативними актами
to fund <i>v.</i> <i>to</i> consolidate, to finance e.g. Funding involved for three years to replenish working capital	фінансувати, консолідувати

Pre-reading

Task 1. a) While reading the text you will come across a number of international words:

Technical, political, process, design, transportation, architecture, management, peripheral, reform, industrial, method, aspect, budget, agency, services.

b) Find Ukrainian equivalents to the following words:

Public consultation, policy recommendations, signs, urban character, respects heritage, pedestrians, traffic, feature, contemporary term, concentrate, smart

growth, depopulation, unemployment, disenfranchisement, crime, desolate urban landscapes, governmental agency, congestion, pollution, budget, existing cities.

Task 2. Answer the questions:

1. What is the difference between a city and town?
2. What are the major problems of city planning?
3. What forms of a plan do you know?
4. What is the main goal of planners?

Reading

Task 1. Read and translate the text.

City Planning

City planning (urban planning and town planning) is a technical and political process concerned with the control of the use of land and design of the urban environment, including transportation networks, to guide and ensure the orderly development of settlements and communities. It concerns itself with research and analysis, strategic thinking, architecture, urban design, public consultation, policy recommendations, implementation and management.

A plan can take a variety of forms including strategic, comprehensive plans, neighborhood plans, regulatory and incentive strategies, or historic preservation plans. Planners are often also responsible for enforcing the chosen policies.

The modern origins of urban planning lie in the movement for urban reform that arose as a reaction against the disorder of the industrial city in the mid-19th century. Urban planning can include urban renewal, by adapting urban planning methods to existing cities suffering from decline. In the late-20th century, the term sustainable development has come to represent an ideal outcome in the sum of all planning goals.



Planners can help manage the growth of cities, applying tools like zoning and growth management to manage the uses of land. Historically, many of the cities

now thought the most beautiful are the result of dense, long lasting systems of prohibitions and guidance about building sizes, uses and features. These allowed substantial freedoms, yet enforce styles, safety, and often materials in practical ways. Many conventional planning techniques are being repackaged using the contemporary term smart growth.

There are some cities that have been planned from conception, and while the results often don't turn out quite as planned, evidence of the initial plan often remains.

In contrast to traditional planning, which concentrated on improving the physical aspects of buildings and streets, modern city planning is increasingly concerned with the social and economic aspects of city living. The process of city planning is a highly complex, step-by-step procedure, usually involving a series of surveys and studies, development of a land-use plan and transportation plan, preparation of a budget, and approval of a unified master plan by various agencies or legislative bodies. City planners are usually part of an urban planning board or governmental agency that must take into account the characteristics and long-range welfare of the people of a particular urban community-their employment opportunities, income levels, need for transportation, schools, shopping areas, hospitals, parks and recreational facilities.



They must face the problems of traffic, congestion, and pollution; they must also consider the availability of police, fire, and sanitation services, the limitations posed by zoning and other regulations, and the problems of funding. In recent years, residents of many communities have demanded greater

participation in the planning of their own neighborhoods, and some planners have worked closely with community groups during various stages of the planning process.

Task 2. Give answers to the following questions:

1. What is city planning?
2. What is the origin of urban planning?
3. What does urban planning consider?
4. What can help the growth of cities?
5. What is the traditional planning?

6. What modern planning is concentrated for?
7. What is the process of city planning?
8. Who is a city planner?
9. What must city planners take into account?
10. What problems city planners must be faced?

ACTIVITY

Determine the typical problems of modern city planning. Which, in your opinion, are the most serious? How can they be got rid of? Introduce your own solutions to these problems. Present the information in the form of a multimedia presentation.

DID YOU KNOW?

- The Greek philosopher Hippodamus (5th c. B.C.) is regarded as the first town planner and ‘inventor’ of the orthogonal urban layout. Aristotle called him ‘the father of city planning’, and until well in the 20th century he was indeed regarded as such. The oldest existing and continually operating educational institution in the world is the University of Karueein, founded in 859 AD in Fez, Morocco.
- Florence was an early model of the new urban planning, which took on a star-shaped layout adapted from the new star fort, designed to resist cannon fire. This model was widely imitated, reflecting the enormous cultural power of Florence in this age.

Practicing.....

Word-building

Hyphenated words

long adj. + range n. = long-range adj

Complete and translate:

1.short + term →

2.low + grade →

3.light +weight →

4.long + distance →

5.high +quality →

6.quick+ thinking →

VOCABULARY EXERCISES

Ex. 1 . Give Ukrainian equivalents of the following.

Technical, urban design, urban environment, transportation networks, implementation, management, development, aesthetics, pedestrians, traffic, utilities, natural hazards, policy recommendations, respects heritage, feature, contemporary term, smart growth, depopulation, unemployment, crime, desolate urban landscapes, governmental agency, congestion, pollution.

Ex. 2. Give English equivalents of the following:

Виявляти значний інтерес до знань, громадські консультації, рекомендації з питань політики, вивіски, рекламні щити, міський характер, місцева ідентичність, особливість, концентрат, гармонійний ріст, безробіття, безправ'я, пустельні міські пейзажі, урядові агентства, затори, забруднення навколишнього середовища, бюджет, існуючі міста, обмеження, процес.

Ex. 3. Give synonyms to the following words:

Public , recommendation, urban, character, local, identity, traffic, feature, term, concentrate, growth, population, unemployment, crime, desolate, landscapes, agency, congestion, pollution, budget, limitation, process.

Ex. 4. Give antonyms to the following words:

Technical, urban, implementation, development, peripheral, growth, density, new, local, identity, hazard, depopulation, unemployment, disenfranchisement, crime, desolate, congestion.

Ex. 5. Fill in the gaps with the words from the table below:

1. A plan can take a variety of forms including strategic plans, comprehensive plans, neighborhood plans ... or historic preservation plans. 2.Planners can help manage the ... , applying tools like zoning and growth management to manage the uses of land. 3. In contrast to traditional planning, which concentrated on improving the physical aspects of buildings and streets, ... is increasingly concerned with the social and economic aspects of city living. 4. The process of ... is a highly complex, step-by-step procedure, usually involving a series of surveys and studies, development of a land-use plan and transportation plan, ... , and approval of a unified master plan by various agencies or legislative bodies. 5. City planners are usually part of an urban planning board or ... that must take into account the characteristics and long-range welfare of the people of a particular

urban community-their employment opportunities. 6.They must face the problems of ..., congestion, and

regulatory and incentive strategies / growth of cities / modern city planning / city planning / preparation of a budget / governmental agency / traffic / pollution /

Ex. 6. Match each word in the left-hand column with the best in the right-hand column.

- | | |
|------------------------------|---|
| 1. Public | a. зростання населення |
| 2. recommendations | b. міський |
| 3. urban | c. рух |
| 4. character | d. місцевий |
| 5. local | e. ідентичність |
| 6. identity | f. пішоходи |
| 7. pedestrians | g. забруднення навколишнього середовища |
| 8. traffic | h. характер |
| 9. feature | i. безробіття |
| 10. term | j. рекомендації |
| 11. concentrate | k. злочинність |
| 12. growth population | l. громадський |
| 13. unemployment | m. пейзажі |
| 14. crime | n. агентство |
| 15. desolate | o. термін |
| 16. landscapes | p. затор |
| 17. agency | q. функція |
| 18. congestion | r. бюджет |
| 19. pollution | s. обмеження |
| 20. budget | t. концентрат |
| 21. limitation | u. пустельний |
| 22. process | v. процес |

Ex.7. Translate sentences into English using words and word combinations from the Vocabulary Notes.

1. Міське планування може включати оновлення міст, шляхом адаптації методами міського планування існуючих міст. 2. Проектувальники можуть допомогти в управлінні зростання міст, застосовуючи такі інструменти, як зонування та нормативні акти. 3. Багато традиційних методів планування переглядається на даний час, використовуючи сучасний термін гармонійного

росту. 4. Сучасне міське планування все більше зосереджене на соціальних та економічних аспектах міського життя. 5. Процес міського планування є досить складним.

Miscellaneous

Ex. 8. Choose and use.

interesting, interested

1. They were ... in the latest motors designed by our engineers. 2. We are pleased indeed that you are ... in our suggestion of representation in this country. 3. The process of urban planning is highly complex and very 4. They are ... in our project, and the most ... point for them is pollution reduction. 5. All the pictures on display were very ... and we were even ... in buying some of them.

GRAMMAR EXERCISES

Ex. 1. Change the following statements into the reported speech.

1. "I have something to show you", I said to her. 2. "I'm going away tomorrow", he said. 3. "I've been in London for a month, but I haven't had time to visit the Tower", said Rupert. 4. "I'll come with you as soon as I'm ready", she replied. 5. "We have a lift, but very often it doesn't work", they said. 6. "I must go to the dentist tomorrow", he said. 7. "I found an old Roman coin in the garden yesterday and I am going to take it to the museum this afternoon", he said.

Ex. 2. Write these sentences in indirect speech.

1. "I'm very tired", she said. 2. "I'll see them soon", he said. 3. "I'm going to the cinema", she said. 4. "I see the children quite often", he said. 5. "I've already met their parents", she said. 6. "I stayed in a hotel for a few weeks", she said. 7. "I haven't been waiting long", she said. 8. "I'll phone the office from the airport", she said.

Ex. 3. Write these sentences in indirect speech, changing words where necessary.

1. "I'll see you tomorrow", she said. 2. "I saw her today", he said. 3. "I don't like this film", she said. 4. "I met her about three months ago", he said. 5. "I really like this furniture", she said. 6. "We visited her this morning" they said. 7. "They were here three months ago", he said. 8. "I can see you tomorrow", she said.

Ex. 4. Write these sentences as reported questions using the words given.

1. "What's your name?" he asked. (wanted to know) 2. "How old are you?" she said. (asked). 3. "Are you enjoying yourself?" he asked. 4. "When does the train

leave?" I asked. 5. "Who did you see at the meeting?" my mother asked. 6. "Did you borrow my dictionary?", he asked. 7. "Have you finished your exams?" she asked.

Ex. 5. a) Write down and translate conjunctions that can combine sentences, phrases and words (conjunctions of coordination).

b) Write down word conjunctions and conjunction words that combine a sentence (conjunctions of subordination).

what; if; that; but; or; whether; as if; provided; yet; so that; although; since; because; than; or; as; after; in order that (to); either ... or; both ... and; lest; how; why; though; which; who; neither ... nor.

Ex. 6. Place the conjunctions of their meaning:

- | | | | |
|--------|------------|-----------------|----------|
| 1) і | 4) якщо | 7) хоч | 10) чи |
| 2) але | 5) тому що | 8) для того щоб | 11) коли |
| 3) бо | 6) чим | 9) що | |

since; both ... and; nevertheless; thus; in order that; because; lest; whether; before; so that; but; as if; unless; provided; although; as though; therefore; thus; not only ... but; either ... or; for; as soon as; than; that.

Ex. 7. Translate the sentences into Ukrainian. Pay attention to the connectives.

1. You can, *at least*, find out why she is often late for classes. 2. *Maybe* they will come soon. 3. *After all*, he can help you. 4. *Frankly speaking*, I have no idea of his plans. 5. I have been invited to their wedding, but, *as a matter of fact*, I don't know what to wear to it. 6. I shall not be long, *perhaps*. 7. It is cold in winter here, *as a rule*. 8. What, *after all*, did five minutes matter?

Ex. 8. Make an English-Ukrainian pair of words that have equivalent meaning.

1) secondly; 2) perhaps; 3) however; 4) otherwise; 5) finally; 6) thus; 7) therefore; 8) by the way; 9) as a matter of fact; 10) at least; 11) to say nothing of; 12) in turn; 13) in fact; 14) in short; 15) on the one hand; 16) as a rule; 17) in other words; 18) to sum up; 19) to generalize; 20) on the contrary; 21) for instance.

1) інакше; 2) між іншим; 3) не кажучи про; 4) з одного боку; 5) навпаки; 6) по-друге; 7) однак; 8) таким чином; 9) насправді; 10) принаймні; 11) фактично; 12) звичайно; 13) можливо; 14) наприклад; 15) підсумовуючи; 16) взагалі; 17) коротше кажучи; 18) зрештою; 19) отже; 20) в свою чергу; 21) іншими словами.

Ex. 9. Translate the following Ukrainian personal and impersonal sentences into English by using the words given in the right-hand column.

1. В цій кімнаті <i>тепло</i>	1. room, is, this, it, warm, in
2. Зараз <i>сьома година</i>	2. is, o'clock, seven, it
3. <i>Важко</i> говорити іноземною мовою без помилок	3. difficult, is, it, without mistakes to speak a foreign language
4. Звідси <i>далеко</i> до вокзалу	4. far, to the station, is, it, from here
5. <i>Неможливо</i> говорити про це	5. to speak, about, it, impossible, is, it
6. <i>Треба</i> виконувати свій обов'язок	6. one's, do, must, one, duty
7. Коли не <i>знаєш</i> граматики, <i>робиш</i> багато помилок	7. makes, one, when, one, does not know, grammar, mistakes, many
8. Це <i>можна</i> знайти в довіднику	8. can, in the handbook, one, find, it

Ex. 10. Translate the following sentences into Ukrainian and define the tense forms of the predicates.

1. They will learn to use the latest electronic office equipment. 2. I was typing from 8 till 11 yesterday. 3. He has been working here since 1985. 4. We arrived at the office at 9. 5. She has already prepared a sales report. 6. At this time tomorrow, trainees will be receiving instruction on the new software. 7. The insurance agency had processed the claim by the end of the week. 8. By noon we had been working at this report for 3 hours.

SUPPLEMENTARY READING

A Day in the Life of a City Planner

City planners help design cities and make such determinations as the height of buildings, the width of streets, the number of street signs, and the design and location of street "furniture" (everything from bus stops and lampposts to newsstands and wastebaskets). Deciding how a city is set up involves creativity, and a career in city planning demands the knowledge of basic engineering principles, the ability to compromise, political diplomacy, and financial acumen. Strong analytic skills and sheer force of will be required to be a successful urban planner.

Every building or structure must be designed with an understanding of its relationship to other elements of the city, such as coordinating the construction of water and power facilities, while still allowing people access to light, heat, and fresh water, or designing housing complexes that will be close to public

transportation. Aesthetic design, another feature that the planner must consider, can be the subject of hot debate. The urban planner has to design with an understanding of the policies of the city and create economically viable plans. This last consideration factor can be difficult—urban-planning projects nearly always run over budget and past deadline, and even the most frugal design can be expected to run into opposition from some quarter.

The planner begins by surveying sites and performing demographic, economic, and environmental studies to assess the needs of the community and encourage public participation in the process. If the planner is redeveloping an area (as opposed to groundbreaking or landfilling it), he or she must evaluate existing buildings and neighbourhoods before determining what can be done to change the standing structures. During these phases, planners work closely with economic consultants to formulate a plan that makes sense for both the economy of the region and the residents. The next step is to create maps and designs.

When the architects draft plans for the construction of bridges, radio and telephone towers, and other large pieces of infrastructure, the urban planner works closely with them. The planner does substantial research regarding zoning and landscaping laws. Occasionally, urban planners must also design or refurbish the town's zoning regulations on building usage, in a manner that is best for the region. He meets with community groups to obtain information on transportation and land usage.



Financing is a delicate aspect of the profession, which requires that the planner unite social, budgetary, and developmental concerns to respond to the community's need for progress, while still presenting a fiscally sound proposal to governments and private investors.

Answer the questions:

1. What work is carried out by city planner?
2. What skills are required to become a successful urban planner?
3. What plans has to design an urban planner?
4. What is the main aspect of the profession?

FOR PLEASURE.....

Lost time is never found again.

UNIT TWO

Text: Surveying

Word building: Compound nouns

Grammar: Sequence of Tenses (Active + Passive).

Supplementary Reading: Land Surveying.



Phonetic Drills

*There was a young lady of Cork,
Whose Pa made a fortune in pork;
He bought for his daughter
A tutor who taught her
To balance green peas on her fork.*

Words you will need.....

surveying *n.*

топографічна зйомка, геодезія

measure *v.*

вимірювати

e.g. The route **measures** 3 kilometres.

measuring tape

вимірювальна стрічка

accuracy *n.*

точність, правильність, акуратність

e.g. The manufacturer promises that
the application of new drives
improves **accuracy** in devices.

project *n.*

проект, план, новобудова

e.g. This **project** will provide
a reduction of energy companies
and increase their energy efficiency.

route *n.*

маршрут, траса, засіб, курс

plane *n.*

площина, рівень

plane *adj.*

плоский, площинний

geodetic *adj.*

геодезичний

surface *n.*

поверхня, земна поверхня

e.g. If such an asteroid fell on
the **surface** of the planet, it could
cause the end of the world.

curvature *n.*

кривизна, викривлення, згинання

elevation *n.*

висота, височина, підвищення

boundary *n.*

межа

precise <i>adj.</i>	чіткий, точний
precise boundary	точна межа
precise elevation	точна висота
steel <i>n.</i>	сталь
steel tape	мірна стрічка
plumb <i>v.</i>	1) виставляти, вимірювати чітко
e.g. The play plumbs the depth of human nature.	
e.g. The new house has been wired and plumbed	2) проводити сантехнічні роботи
plumber <i>n.</i>	слюсар-сантехнік
e.g. The plumber is almost finished plumbing the apartment.	
plumb bob	важіль
tripod <i>n.</i>	штатив, триніжок
expansion or contraction of the tape	збільшення або скорочення стрічки
diagram	діаграма
slope <i>n.</i>	схил, нахил, спуск, узгір'я
arc <i>n.</i>	дуга, арка, вигин
theodolite <i>n.</i>	теодоліт
stadia <i>n.</i>	далекомірна лінійка
stadia hairs	тонкі вимірювальні лінії
contour line	контурна лінія
rod <i>n.</i> <i>Syn. core, bar, stalk, spill</i>	стрижень, стержень, прут
visibility <i>n.</i>	видимість
tide <i>n.</i>	морський приплив чи відплив
average <i>adj. Syn mean</i>	середній, середньостатистичний
averaging the tides	усереднення припливів
bench <i>n.</i>	мілина, уступ кар'єру
altimeter <i>n.</i>	висотомір, альтиметр
pressure <i>n.</i>	тиск, напруга, тиснення
target <i>n.</i>	об'єкт, ціль, мета
lens of the camera	об'єктив камери
depth <i>n.</i>	глибина, западина
bedrock <i>n.</i>	корінна порода, скельна основа
earthquake zone	зона землетрусу
hollow <i>adj.</i>	порожнистий

bore v.	бурити, свердління, бурові роботи
<i>e.g. To build the tunnel they had to bore through the solid rock.</i>	
drill	сверло
limestone n.	вапняк
blast of dynamite	вибух динаміту

Pre-reading.....

Task 1. a) While reading the text you will come across a number of international words:

Geodetic, horizontal, vertical, transit, theodolite, contour, altimeter, mosaic, geological, gravimeter, magnetometer, seismograph

b) Find Ukrainian equivalents to the following words and word combinations:

project, design, surface, highways, dams, tunnels, plane, geodetic, distances, elevation, boundary, acre, length, telescopic instrument, transit, vertical and horizontal angles, sexagesimal system, pole, aerial photography, scale, shape, sphere, earthquake zone, vibration, seismic wave, man-made earthquake, blast of dynamite

Task 2. Answer the questions:

1. Why is surveying important in civil engineering ?
2. What devices are used to measure distances?
3. What professionals are involved into surveying?

Reading.....

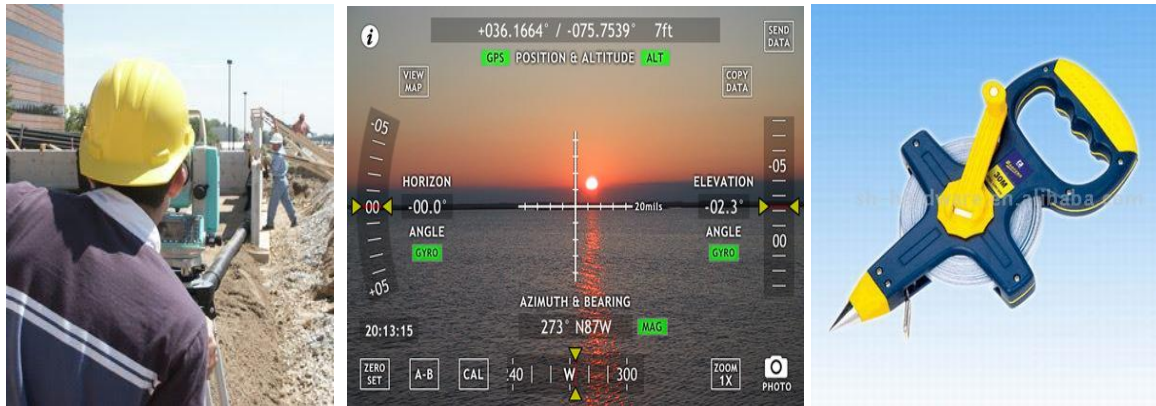
Task 1. Read and translate the text.

Surveying

Before any civil engineering project can be designed, a *survey* of the site must be made. *Surveying* means measuring– and recording by means of maps– the earth's surface with the greatest degree of accuracy possible.

There are two kinds of surveying: *plane* and *geodetic*. Plane surveying is the measurement of the earth's surface as though it were a plane (or flat) surface without curvature. Within areas of about 20 kilometers square – meaning a square, each side of which is 20 kilometers long – the earth's curvature does not produce any significant errors in a plane survey. For

larger areas, however, a geodetic survey, which takes into account the curvature of the earth, must be made.



The different kinds of measurements in a survey include distances, elevations (heights of features within the area), boundaries (both man-made and natural), and other physical characteristics of the site. Some of these measurements will be in a *horizontal plane*; that is, perpendicular to the force of gravity. Others will be in a *vertical plane*, in line with the direction of gravity. The measurement of angles in either the horizontal or vertical plane is an important aspect of surveying in order to determine precise boundaries or precise elevations.

In plane surveying, the principal measuring device for distance is the steel tape. In English-speaking countries, it has replaced a rule called a *chain*, which was either 66 or 100 feet long. The 66-foot-long chain gave speakers of English the *acre*, measuring ten square chains or 43,560 square feet as a measure of land area. The men who hold the steel tape during a survey are still usually called *chainmen*. They generally level the tape by means of *plumb bobs*, which are lead weights attached to a line that give the direction of gravity. When especially accurate results are required, other means of support, such as a tripod a stand with three legs can be used. The indicated length of a steel tape is in fact exactly accurate only at a temperature of 20° centigrade, so temperature readings are often taken during a survey to correct distances by allowing for expansion or contraction of the tape.

Lining up the tape in a straight line of sight is the responsibility of the transitman, who is equipped with a telescopic instrument called a *transit*. The transit has plates that can indicate both vertical and horizontal angles, as well as leveling devices that keep it in a horizontal plane. Cross hairs within the telescope permit the transitman to line up the ends of the tape when he has them in focus.

A special telescopic instrument that gives more accurate readings of angles than the transit is called a *theodolite*. In addition to cross hairs, transits and theodolites have markings called *stadia hairs* (stadia is the plural of the Greek word *stadion*, a measure of distance). The stadia hairs are parallel to the horizontal cross hair. The transitman sights a *rod*, which is a rule with spaces marked at regular intervals. The stadia hairs are fixed to represent a distance that is usually a hundred times each of the marks on the rod. That is, when the stadia hairs are in line with a mark on the rod that reads 2.5, the transit is 250 meters from the rod. Stadia surveys are particularly useful in determining *contour lines*, the lines on a map that enclose areas of equal elevation.



Contour maps can be made in the field by means of a *plane-table alidade*. The *alidade* is a telescope with a vertical circle and stadia hairs. It is mounted on a straight-edged metal plate that can be kept parallel to the line of sight. The surveyor can mark his readings of distances and elevations on a plane (or flat) table that serves as a drawing board. When the marks representing equal elevations are connected, the surveyor has made a contour map.

II

Heights or elevations are determined by means of a *surveyor's level*, another kind of telescope with a bubble-leveling device parallel to the telescope. A *bubble level*, which is similar to a carpenter's level, is a tube containing a fluid that has an air bubble in it. When the bubble is centered in the middle of the tube, the device is level. The surveyor sights a rule called a level rod through the telescope. The rod is marked off to show units of measure in large, clear numbers. The spaces between the marks usually are alternately black and white in order to increase visibility. The number that the surveyor reads on the level rod, less the height of his or her instrument, is the vertical elevation.

Heights are given in relation to other heights. On maps, for example, the usual procedure is to give the elevation above sea level. Sea level, incidentally, can be determined only after averaging the tides in a given area over a definite period. A survey carried out by level and rod often gives the elevation in relation to a previously measured point that is called a *bench mark*.

Approximate elevations can also be measured with an *altimeter*, which is a device that takes advantage of changes in atmospheric pressure. Readings taken with an altimeter are usually made at two, and sometimes three, different points and then averaged. The readings must be corrected for humidity and temperature, as well as the weight of the air itself.

Aerial photography is another modern method of surveying. A photograph distorts scale at its edges in proportion to the distance the subject is from being in a direct vertical line with the lens of the camera. For this reason, the photographs for an aerial survey are arranged to overlap so that the scale of one part joins the scale of the next. This arrangement is called a *mosaic*, after the pictures that are made from hundreds of bits of colored stone or glass.

In addition to measuring surfaces for civil engineering projects, it is often necessary to make a *geological survey*. This involves determining the composition of the soil and rock that underlie the surface at the construction site. The nature of the soil, the depth at which bedrock is located, and the existence of faults or underground streams are subsurface factors that help civil engineers determine the type and size of the structural foundations or the weight of the structure that can rest on them. In some areas, these can be critical factors. For example, Mexico City rests on a lakebed with no bedrock near the surface; it is also located in an earthquake zone. The height and weight of buildings must therefore be carefully calculated so that they will not exceed the limits that are imposed by the site.

Geological samples are most often obtained by *borings*, in which hollow drills bring up cores consisting of the different layers of underground materials. Other devices that are used in geological surveys are *gravimeters* and *magnetometers*. The gravimeter measures the earth's gravitational pull; heavier rocks like granite exert a stronger pull than lighter ones like limestone. The magnetometer measures the strength of the earth's magnetic field. Again, the denser the rock, the more magnetic force it exerts.

A third instrument is the *seismograph*, which measures vibrations, or seismic waves, within the earth. It is the same instrument that is used to detect and record earthquakes. In a geological survey, it is used by setting off small, man-made earthquakes. The waves created by a buried dynamite blast reflect the different kinds of rock beneath the surface; hard or dense rocks reflect the waves more strongly than soft or porous rocks.

Task 2. Answer the questions :

1. What may some engineering projects require? For what reason?
2. What kind of survey takes into account the curvature of the Earth?
3. What is used in modern surveying instead of a chain? How is it levelled?
4. How are distances measured between elevations? How are distances sometimes measured on a slope?
5. How are angles measured? What two different systems are in use?
6. How can stadia hairs be used to determine distance? What are stadia surveys particularly useful for determining?
7. What can be used to make contour maps in the field?
8. What is a bubble level? Which surveying instrument is it used with?
9. What device can be used to determine approximate elevations? What does this device take advantage of?
10. How can distances be measured by means of light or sound waves? Where is this method particularly useful?

Special Terms



Surveying: Measuring the earth's surface.

Plane surveying measures surfaces as though they were flat, without taking into account the earth's curvature, whereas *geodetic surveying* includes calculations for the curvature. A **surveyor** is the person who makes a *survey*.

Horizontal Plane: Perpendicular to the force of gravity.

Vertical Plane: In line with the direction of gravity.

Plumb Bob: Lead weights attached to a line to show the direction of gravity.

Chain: A device 66 feet long (surveyor's chain) or 100 feet long (engineer's chain) for measuring distance. Today, a steel tape has replaced the chain, but the men who hold the tape are usually still called *chainmen*.

Breaking Chain: Measuring distances with less than the full length of the tape.

Transit: A telescopic device that can be used for measuring distances and horizontal and vertical angles. The person who uses the device is a *transitman*.

Theodolite: A special kind of transit that gives more accurate readings of angles than a standard transit.

Stadia Hairs: Lines in a transit that are used in determining distances. *Stadia* is the plural of *stadion*, a Greek word for a measure of distance, about 607 feet.

Rod: A rule with measurements marked at fixed distances. The person who holds it is a *rodman*.

Contour Lines: The lines on a map that indicate points of equal elevation (height). Plane-table Alidade: An alidade is another kind of telescope used to measure both distances and vertical angles. It is set on a plane-table (a flat table), which a surveyor can use as a drawing board to make maps in the field.

Surveyor's Level: Another kind of telescope with a *bubble level*, a tube of fluid with an air bubble in it. The surveyor can sight a rule called a *level rod* through the telescope in order to measure elevation. Bench Mark: A point whose elevation has been previously determined and marked. It is used as a basis for additional measurements.

Altimeter: A device that measures elevation by means of atmospheric pressure.

Mosaic: In aerial surveying, an overlapping arrangement of photographs that eliminates distortion at the edges of the pictures. Triangulation: In geodetic surveying, measuring a network of triangles based on points on the earth's surface.



Geological Survey: Determining underground conditions, such as types of soil and rock beneath the surface.

Boring: The process of bringing up samples of subsurface soil and rock by means of a hollow drill. Each sample is also called a boring.

Gravimeter: A device that measures the Earth's gravitational pull.

Magnetometer: A device that measures the strength of the Earth's magnetism.

Seismograph: A device that measures the strength of vibrations (seismic waves) within the earth.

ACTIVITY

Together with the engineering tutor, choose a surveying instrument and take measurements. Describe the surveying process and results. Present the information in the form of a multimedia presentation.

DID YOU KNOW?

- In ancient Egypt, when the Nile River overflowed its banks and washed out farm boundaries, boundaries were re-established by a rope stretcher, or surveyor, through the application of simple geometry.
- Continental Europe's cadastre was created in 1808.
- The simplest method for measuring height is with an altimeter – basically a barometer – using air pressure as an indication of height.
- In Roman religion, Terminus was the god who protected boundary markers. The name was the Latin word for such a marker and sacrifices were performed to sanctify each boundary stone.
- George Washington, Abraham Lincoln, John Adams, and Thomas Jefferson were all Land Surveyors before taking office as the President of the United States?
- Surveying is one of the oldest known Professions? Egyptian Land Surveying 3,000 B.C.
- The duties of the surveyor in Ancient Egypt covered a number of aspects, including boundary definition and building construction. The need for surveying was a consequence of the civilized society in Ancient Egypt.

Word-building

Compound nouns

Rod *n.* + man → rodman

Transit *n* + man → transitman

Make up compound nouns by adding “ – man” and translate them.

1.sail

2.craft

3.post

4.police

5. woods

6.work

7. journey

8.yacht

VOCABULARY EXERCISES

Ex.1. Arrange the words into pairs of synonyms and translate them into Ukrainian:

examination, measure, unfilled, expansion, graph, next to, form, stroke, seismic activity, reduction, inspection, shape, discharge, investigate, district, together with, stripe, intension, short form, illustration, volcanic activity, region, empty, detonation.

Ex.2. Arrange the words into pairs of antonyms and translate them into Ukrainian:

new building, expansion, empty, solid, charge, contraction, hollow, old building, flexion, extension, discharge, full.

Ex.3. Give English equivalents of the following.

інспектування, геодезія, дозування, правильність, акуратність, новобудова, місцеположення, засіб, площа, площинний, земна поверхня, згинання, мірна стрічка, крутий схил, дуга, далекомірна лінійка, контурна лінія, мілина, тиснення, об'єктив камери, корінна порода, зона землетрусу, бурові роботи, вапняк, вибух динаміту.

Ex.4. Complete the sentences with appropriate words from the list below and translate them into Ukrainian.

*Highways, distances, location, dams, sound waves,
tunnels, characteristics, technology*

Some engineering projects— like 1)__, 2)__, or 3)__, - may require extensive surveying in order to determine the best and most economical 4)__or route.

The different kinds of measurements in a survey include 5)___, elevations (heights of features within the area), boundaries (both man-made and natural), and other physical 6)___ of the site.

Modern 7)___ has been used for surveying in instruments that measure distance by means of light or 8)___.

Ex.5. Match each word in the left-hand column with the best in the right-hand column.

- | | |
|-----------------------|---|
| 1. Horizontal plane | a) A tube of fluid with a bubble of air that is used by surveyors and carpenters to determine a horizontal level. |
| 2. Vertical plane | b) Horizontal and vertical lines within a telescope that permits focusing. |
| 3. Plane surveying | c) Lines parallel to the horizontal cross hair in a telescope that is used to measure distances. |
| 4. Geodetic surveying | d) In line with the direction of gravity. |
| 5. Transit | f) A point whose elevation has been determined so it can be used as a basis for other measurements. |
| 6. Cross hairs | g) Measuring the earth's surface as a flat plane. |
| 7. Stadia hairs | j) Measuring the earth's surface to take into account its curvature. |
| 8. Contour lines | k) A device for measuring the earth's gravitational pull. |
| 9. Bubble level | l) A device that indicates elevation by means of atmospheric pressure. |
| 10. Altimeter | m) A device for measuring the strength of vibrations within the earth. |
| 11. Bench mark | n) A device for measuring the strength of the earth's magnetic field. |
| 12. Boring | o) Perpendicular to gravity. |
| 13. Gravimeter | p) Lines on a map that enclose areas of equal elevations. |
| 14. Magnetometer | q) A sample of subsurface soil and rock obtained by a hollow drill. |
| 15. Seismograph | r) A telescopic device to measure distances and horizontal and vertical angles. |

Ex.6. Translate the following abstract using the given words and word combinations. Reproduce it.

Геодезія

Найпростіший і найбільш часто використовуваний метод вимірювання відстані між двома точками на землі називається ланцюгом зйомки. У ланцюзі зйомки розміщується дюймова масштабна лінійка, яка лежить в прямій лінії між двома точками.

Кути зйомки вимірюються спеціальними інструментами, які названо теодолітами. У своїй найпростішій формі теодоліт - це телескоп, який встановлено над горизонтальною круговою шкалою, яка досить схожа на транспортир. Це позначається в градусах, хвилинах і частках хвилин.

Теодоліт також дозволяє вимірювати кути у вертикальній площині, наприклад, кут між горизонтальною і верхньою частинами висотного будинку або височини. Маршрутна зйомка являє собою огляд необхідних для розміщення та будівництва транспорту або ліній зв'язку, таких як шосе, залізниці, канали, лінії електропередач та трубопроводів. Попередня робота складається з топографічної зйомки.

Зйомка міста – це термін, який часто застосовується у роботі при розбивці на ділянки і муніципальних обстежень, проведених у зв'язку із будівництвом вулиць, систем водопостачання та каналізації. Карта і дані, отримані геодезистами, використовуються інженерами-будівельниками у багатьох варіантах.

Miscellaneous

Ex. 7. Choose and use.

last lately

The different kinds of measurements are used in a survey 2. . The *mosaics* I saw ... are made from hundreds of bits of colored stone or glass. .3. It must be a year since I ... saw you. 4. Have you been doing anything interesting ... ? 5. Your ... paragraph though really made merethink things.

GRAMMAR EXERCISES

Ex.1. Translate the following sentences and explain the use of Sequence of Tenses:

1. We asked our guests if they had had a good journey. 2. Ann said she would be sixteen next September. 3. She said that she had not met him before. 4. I found out that they had gone to the Crimea. 5. Tom said that he was staying in England for another year. 6. She asked whether there was much snow there in

winter. 7. Ann asked John if he liked her new dress. 8. His father said that they could go. 9. We said that we should finish the experiment as soon as possible. 10. Ann asked if she might have another piece of cake. 11. No one knew the men who were standing outside the room. 12. If the payment is to be in dollars, the customer is not permitted to purchase a stronger currency. 13. Although the book was written, it probably would have gone unnoticed were it not for the efforts made by General Motors to discredit its author.

Ex.2. Complete the following sentences, using an appropriate form of the verb.

1. Suddenly she gave a loud scream and ... to the ground. (fell / had fallen / has fallen) 2. After questioning he ... to go home. (allowed / was allowed / had allowed). 3. They would have won if they ... a bit harder. (played / had played / play). 4. She to say that she disagreed. (heard / was heard / had heard). 5. Although they..... defeated, they did not lose heart. (were / are / have been). 6. Our teacher taught us that virtue.... its own reward. (is / are / will be). 7. The teacher asked the boys whether they the problems. (had solved / have solved / will solve). 8. He declared that he would not believe it even if he ... it with his own eyes. (see / saw / would see). 9. The room ... but the police failed to find anything suspicious. (searched / was searched / had searched). 10. The government has announced that taxes ... (would be raised / will be raised / will raise)

Ex.3. Translate into Ukrainian, paying attention on the tense forms used in Ukrainian and English.

1. When he learnt that his son always received excellent marks in all the subjects at school, he was very pleased. 2. When he learnt that his son had received an excellent mark at school, he was very pleased. 3. We did not know where our friends went every evening. 4. We did not know where our friends had gone. 5. She said that her best friend was a doctor. 6. She said that her best friend had been a doctor. 7. I didn't know that you worked at the Hermitage. 8. I didn't know that you had worked at the Hermitage. 9. I knew that you were ill. 10. I knew that you had been ill. 11. We found that she left home at eight o'clock every morning. 12. We found that she had left home at eight o'clock that morning.

Ex.4. Rewrite the following sentences in the past tense. Pay attention on the correlation of tense forms in the subordinate and main clauses.

1. My uncle says he has just come back from the Caucasus. 2. He says he has spent a fortnight in the Caucasus. 3. He says it did him a lot of good. 4. He says he feels

better now. 5. He says his wife and he spent most of their time on the beach. 6. He says they did a lot of sightseeing. 7. He says he has a good camera. 8. He says he took many photographs while travelling in the Caucasus. 9. He says he will come to see us next Sunday. 10. He says he will bring and show us the photographs he took during his stay in the Caucasus.

Ex. 5. Open the brackets and use the verbs in the correct tense and voice forms.

1. That door (paint) yesterday. 2. Michelangelo (paint) the Sistine Chapel. 3. Michael Schumacher (drive) for Ferrari in 2003. 4. In the UK, everyone (drive) on the left. 5. Inter-city trains (usually/drive) by men. 6. The 'La Stampa' newspaper (read) by two million people in Italy. 7. My car (steal)! Call the police!!!! 8. The thieves (steal) the gold last week. 9. The Queen (open) the bridge tomorrow. 10. The bridge (destroy) by the storm last night.

Ex.6. Put the following sentences into Passive voice.

1. You must take the box to the station. 2. You can cross the river on a raft. 3. The workers can finish building the house very soon. 4. You must return the books the day after tomorrow. 5. You must do three of these exercises tomorrow. 6. You can find the book you need in any library. 7. We must send these letters at once. 8. I can easily forgive this mistake. 9. You can find such berries everywhere. 10. You must do this work very carefully.

Ex. 7. Translate the sentences into English

1. Вона попросила мене щоб я допоміг зробити заміри території.
2. Головний інженер сказав, що наше бюро буде робити топографічну зйомку для будівництва школи.
3. Наталка попросила мене дати їй карту, яку ми підготували до заліку.
4. Представник фірми сказав, що інспектування будівлі показало багато недоліків основної конструкції.
5. Мій одногрупник попросив щоб я показав йому прилади які ми вивчили на попередньому занятті.
6. Менеджер сказав, що вони обговорили ціну два дні тому мене його зачекати. Банглійські бізнесмени приїдуть у Київ сьогодні. минулого тижня він підписав цей контракт.
7. Його батьки залишили квартиру, в якій вони прожили 20 років.
8. Сьогодні ми практикувались вимірювати кути теодолітом, якій подарували нам німецькі бізнесмени.

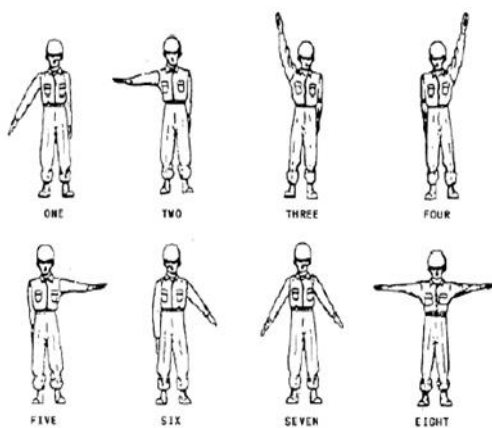
SUPPLEMENTARY READING

Cadastral land surveyors

Cadastral land surveyors are licensed by governments. In the United States, cadastral surveys are typically conducted by the federal government, specifically through the Cadastral Surveys branch of the Bureau of Land Management (BLM), formerly the General Land Office (GLO). They consult with USFS, Park Service, Corps of Engineers, BIA, Fish and Wildlife Service, Bureau of Reclamation, etc. In states that have been organized per the Public Land Survey System (PLSS), surveyors carry out BLM Cadastral Surveys in accordance with that system.

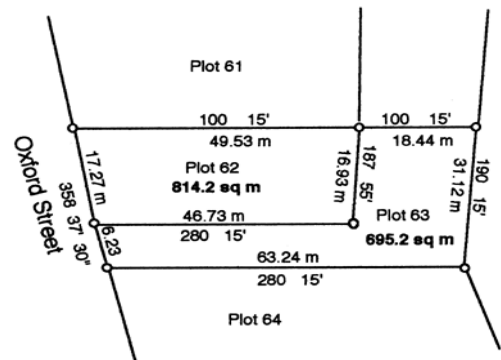
A common use of a survey is to determine a legal property boundary. The first stage in such a survey, known as a resurvey, is to obtain copies of the deed description and all other available documents from the owner. The deed description is that of the deed and not a tax statement or other incomplete document. The surveyor should then obtain copies of deed descriptions and maps of the adjoining properties, any records from the municipality or county, utility maps and any records of surveys. Depending on which region the survey is located in some or most of this information may not be available or even exist. Whether the information exists or not a thorough search should be conducted so that no records are neglected. Copies of deeds usually can be located in the county recorder's office and maps or plats can usually be found at the county recorder or surveyor's office. These arrangements will vary state to state and survey system to survey system so some familiarity maybe needed. When all the records are assembled, the surveyor examines the documents for errors, such as closure errors. When a metes and bounds description is involved, the seniority of the deeds must be determined. The title abstract usually gives the order of seniority for the deeds related to the tract being surveyed and should be used if available. After this data is gathered and analyzed the field survey may commence.

The initial survey operations should be concentrated on locating monuments. In urban regions or a city, monuments should be sought initially but in the absence of monuments property corners marked by iron pins, metal survey markers, iron pipes and other features that may establish a line of possession should be located. When the approximate positions for the boundaries of the property have been



located a traverse is run around the property. While the control traverse is being run, ties should be measured and all details relevant to the boundaries should be acquired. This includes but is not limited to locating the property corners, monuments, fences, hedge rows, walls, walks and all buildings on the lot.

The Surveyor then takes this data collected and compares it to the records that were received. When a solution is reached the property corners that are chosen as those that best fit all the data are coordinated and ties by direction and distance are computed from the nearest traverse point. Once this has been established the features on the lot can be drawn, dimensions can be shown from these features to the boundary line and a map or plat is prepared for the client.



Answer the questions:

1. Whom are cadastral land surveyors licensed by?
2. What is a common use of a survey?
3. Where is the survey located?
4. Where can copies of deeds be located?
5. What does surveyor do when all the records are assembled?
6. When may field survey commence?
7. What operations should be concentrated on locating monuments?
8. How does a surveyor reach a solution when comparing collected field data against historical records, and what is the final step in presenting this data to a client?

FOR PLEASURE.....

A dream becomes a goal when action is taken toward its achievement.

Every tub must stand on its own bottom.

The time for action is now.

It's never too late to do something.

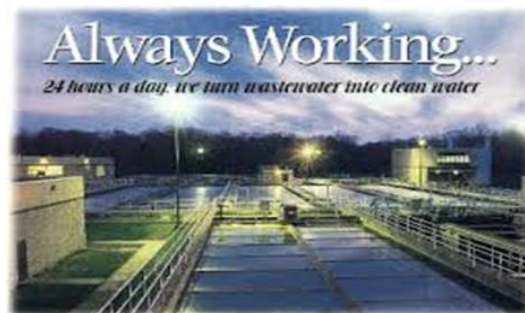
UNIT THREE

Reading: Environmental/Sanitary Engineering

Word building: Combined words

Grammar: Revision of Sequence of Tenses and Indirect Speech.

Supplementary reading: What is Sanitary Engineering?



Phonetic Drills

*If you want to buy, buy,
If you don't want to buy, bye bye!*

Flies fly but a fly flies

Words you will need

waste(s), n	відходи
dispose, v.	утилізувати, збувати, розташовувати
excess water	надлишкова вода (стоки)
sewer n. Syn. sink	колектор, стічна труба, каналізація
sewer systems	каналізаційні системи
evidence, n. Syn. proof, argument	доказ, факт, свідчення
pipeline n. Syn. pipe, artery ['ə:təri]	трубопровід, магістраль
penalty n. Syn. punishment	штраф, покарання, стягнення
penalties for disposing	штрафи за утилізацію, за скид стоків
stream n. Syn. flow, current	струмок, течія, потік
well n. Syn. source, bore	колодязь, джерело, свердловина
cesspool n. ['sespu:l]	вигрібна яма; стічний колодязь
disease n. Syn. illness, affection	відстійник; клоака
typhoid n. ['taifOid]	хвороба, захворювання
purification n. Syn. cleaning,	черевний тиф
purify, v ['pju(ə)rifai]	очищення, рафінування
bed of sand n.	очищати
contaminate, v [kən'tæmineit]	устілка з піску, нижній шар піску
solid, n ['sɒlɪd]	збруднювати, заражати
odor n. ['əʊdə] Syn. scent, aroma	тверде тіло
bubble, v	запах, душок, аромат, пахощі
bubble aeration	насичувати бульбашками (повітря)
	барботаж

aeration, *n* [e(ə)'reɪf(ə)n]
treatment, *n*. *Syn.*
shoot, *v* [ʃu:t] (shot, shot),
chlorination, *n* [klɔ:ri'neɪf(ə)n]
chlorine, *n* ['klɔ:ri:n]
population growth
trash *n*. *Syn.* rubbish
liquid wastes
solid wastes
consumption *n*. *Syn.* using
runoff water
by-product, *n*
drainage, *n* ['dreɪnɪdʒ]
release, *v* [rɪ'li:s]
render harmless
sedimentation *n*. [ˌsedɪmən'teɪf(ə)n]
activated-sludge process

sludge *n*. *Syn.* mud, slush

demand, *n* [dɪ'mɑ:nd]

pose (v) the problem

dump, *v*

landfill, *n*

incinerator, *n* [ɪn'sɪnəreɪtə]

furnace, *n* ['fɜ:nɪs]

ash *n*. *Syn.* cinder

fume *n*. *Syn.* vapor, smoke

harmful fumes

emission *n*. *Syn.* release

seek, *v* (sought, sought)

recycling, *n* [rɪ:'saɪklɪŋ]

fertilizer, *n* ['fɜ:taɪlaɪzə]

reuse, *v*

disposal, *n* [dɪs'pəʊz(ə)l]

in disposal

waste disposal

провітрювання, насичення газом

тут обробка; знешкодження

стріляти; вистрілювати

хлорування

хлор

зростання чисельності населення

сміття

рідкі відходи, стічні води

тверді відходи

споживання

сток, стічні води, надлишкова вода

проміжний або побічний продукт

дренаж, осушення

звільнити (від)

знешкодити, знищити

осідання; відкладення (випад) осаду,

біохімічна очистка стічних вод

активним мулом

грязь, сльота; мул, осад; відстій

вимога, наполегливе прохання; запит

формулювати, викласти проблему

звалювати, скидати (у купу)

закопування сміття, відходів; звалище

сміттєспалювальна піч

піч (технічна); вагранка; топка

зола, попіл

пара, дим

шкідливі випари

викид, виділення, емісія

шукати

повторне використання (відходів)

добриво

використовувати вдруге

розміщення, розташування

у розпорядженні

розміщення /поховання/ відходів

Pre-reading.....

Task 1. a) While reading the text you will come across a number of international words: system, aspect, hydraulic, archeological, fountain, storm, public, connection, transport, filtration, filter, proportion, spray, oxygen, bacteria, gas, chlorine, drainage, combination, chlorination, fashion, emission.

b) Find Ukrainian equivalents to the following words or word-combinations: sanitary engineering, safe water supply systems, waste materials, sewer systems, fountains, pipelines, storms, solid wastes, streams, wells, disease, harmful bacteria, runoff water, biological means, natural purification processes, harmless, huge furnaces, ash, fertilizer, fuel, aluminum cans, environmentalist, solution.

Task 2. Think of the answers:

1. What does environmental/sanitary engineering deal with?
2. Have you ever heard about chlorination?
3. What does recycling mean?

Reading.....

Task 1. Read and translate the text.

Environmental/Sanitary Engineering

Environmental/Sanitary engineering is concerned with providing clean, safe water supply systems for towns, cities, and rural areas. It is also concerned with disposing of excess water and waste materials by means of *sewer* systems. Many aspects of environmental/sanitary engineering are directly related to *hydraulic* engineering.

A great deal of *archeological* evidence has revealed the importance of water supply systems in the ancient world. The water was delivered to fountains, where people collected it in pots and then carried it to their homes; only a few buildings and residences had connections to the main pipelines. Like other sewer systems of ancient times, it was intended to carry off the water from storms or the waste water from the public baths. There were penalties for disposing of solid wastes in it.

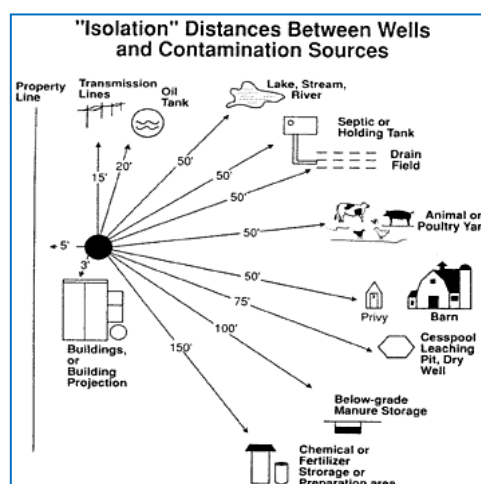
After the fall of the Roman Empire, water supply and sewer systems received relatively little attention until modern times. In the Middle Ages in Europe, water came from streams and wells, while wastes were disposed of in *cesspools* or even returned to the same streams from which the water was taken. After the connection between water supply and certain diseases such as typhoid was established in the nineteenth century, cities and towns all over the world built safe water supply systems.

In addition to transporting water over long distances, modern water supply systems also use several *techniques* for purification. One of them is *filtration*. The water is passed through a *filter* that consists of a bed of sand or gravel, which removes a large proportion of the solids that might otherwise contaminate the supply. Another process is *aeration*. Sprays of water are shot into the air, where sunlight and oxygen help kill bacteria and also remove gases with an unpleasant odor or taste; or air is bubbled into or through the water. A third method involves treatment with chemicals, usually chlorine, to kill harmful bacteria. The process is known as *chlorination*.

Part of providing a safe water supply is disposing of liquid and solid wastes. This problem has become acute in recent years not only because of world-wide population growth, but also because of the vast amount of waste created by industrial processes and by the great mountains of trash that are the by-product of increased consumption.

A large number of modern *drainage* systems use the same sewers to dispose of domestic wastes and runoff water from storms. Many of these systems were designed to empty into streams or other bodies of water where nature itself purified the water over a period of time. Now, however, the amount of waste has become so great that many streams and lakes and even the seas have become polluted. More and more treatment plants are being built to purify water before it is released back into the environment. Therefore, the modern trend is to build separate drainage systems for storm runoff and for domestic wastes so that the treatment plants do not have to process the runoff water, which is relatively unpolluted.

There are a number of different methods by which solid wastes can be removed or rendered harmless. Several of them are ordinarily used in combination in treatment plants. One of the processes is *filtration*. Another is *sedimentation*, in which wastes are allowed to settle until they become solid or semisolid and can be removed. There are also techniques in which water can be treated by biological means, by using some kinds of bacteria to kill other kinds, or by chemical means, as in *chlorination*. One of the most successful methods is called the *activated-sludge process*. It involves using compressed air to increase and control the rate of biological reactions that purify the wastes. In effect, treatment plants speed up natural purification processes so that the water that is finally released



from them is essentially harmless. Present-day concern over environmental pollution has increased the demand that waste water should be treated to the fullest degree possible before it is returned to the environment.

Vast amounts of *trash* have also posed problems in disposal. Much of it has been used as *landfill* by dumping in swampy areas or in shallow water so that the area can be made useful. A great deal of it has also been burned in *incinerators*, huge furnaces that reduce the wastes to ash. Incinerators, however, are out of *fashion* today because they release harmful fumes into the air. Many of them are being redesigned to control these emissions more effectively; at the same time other solutions are being sought.

One modern method of disposing of trash and domestic wastes is recycling, which simply means using the waste material again. The wastes from treatment plants, for example, can be used as fertilizer. It can also be used as fuel. In fact, some treatment plants fill their own energy needs by burning their waste products to provide steam for generating electricity. Similarly, some kinds of trash can be collected separately – glass, newspapers, and aluminum cans, for example. All of these materials can be processed for reuse. In some cases, trash has also been compacted to serve as fuel.

The concern for a cleaner environment together with the need to conserve and reuse our resources has created a challenge for which sanitary engineers, working with environmentalists, will be called upon to find new solutions over the next few years.

Special Terms

Activated-sludge Process: Treating wastes with compressed air in order to encourage biological reactions that destroy harmful bacteria.

Aeration: Process of purifying water by either shooting sprays of water in the air, where sunlight helps to kill bacteria, or bubbling air into or through the water.

Cesspool: A well or hole in the ground used for waste disposal.

Chlorination: Process of purifying water by treating it with ***chlorine*** which kills bacteria.

Environmental/Sanitary Engineering: The branch of civil engineering that deals with water supply, drainage, and waste disposal systems.

Filtration: Process of purifying water by passing it through sand or gravel to remove solids.

Incinerator: A furnace in which trash is burned.

Landfill: Disposal of trash in wet areas for the purpose of reclaiming them, or the use of trash to build up new land.

Recycling: Reclaiming some kinds of trash – aluminum cans, for example – so that the material in them can be melted down and reused.

Reservoir: An artificial body of water created to store water.

Sedimentation: A purification process in which wastes are allowed to settle until they become solid enough to be removed.

Sewer: A duct or pipe for carrying off waste material or excess water.

Sewage Treatment Plant: A plant where harmful substances are removed from sewage.

Trash: Waste material such as paper, cans, bottles, and so on.

Task 2. Answer the questions to the text:

1. What is environmental/sanitary engineering concerned with?
2. What evidence do we have of the existence of Roman water supply systems? What was done about water supply and waste disposal in the Middle Ages in Europe?
3. Why did cities and towns all over the world begin building safe water supply systems in the nineteenth century?
4. What are some of the water purification techniques that are currently used?
5. What is part of providing a safe water supply? Why has this problem become acute?
6. What two purposes do a large number of modern drainage systems serve?
7. What has happened as a result of the large amount of waste?
8. What steps are being taken to overcome the problem of water pollution?
9. What is one of the most successful methods by which solid wastes can be removed or rendered harmless?
10. What is a modern method of disposing of trash and domestic wastes?

ACTIVITY

Describe the water supply, drainage, and sewage disposal system of your community. You should indicate the source of the water, the way it is transported to the community, and the steps taken to keep it pure. You should also indicate whether there is a combined or separate sewer system for runoff water and domestic wastes, where the wastes are released, whether there are sewage treatment plants, and if so what processes are used. Present the information in the form of a multimedia presentation.

DID YOU KNOW?

- The most impressive systems were built by the Romans, whose aqueducts still stand in modern Italy, Spain, France, and Turkey. Rome itself had a water supply estimated at 50 million gallons a day, or about 50 gallons a day for each resident of the city.
- Environmental Engineering has had its own identity since about 1900 as a branch of civil engineering. Initially called, Sanitary Engineering.
- Water treatment has been used since the beginning of recorded history. Early methods were simple like heating, filtration through gravel and sand, and boiling. In the mid-nineteenth century water disinfection with chlorine was discovered
- Domestic and industrial waste water treatment is needed to prevent water pollution in receiving streams.
- Environmental engineering practitioners have developed and improved primary, secondary, and tertiary wastewater treatment processes to provide excellent wastewater treatment.
- Sanitary engineers work for municipalities and are highly trained professionals with a diverse range of engineering skills.

Practicing.....

Word-building

dark adj. + hair n. **ed** → dark-haired **adj. n.**

Ex. 1. Complete and translate:

- 1.narrow, mind →...
2. many, side →...
- 3.grey, hair →...
- 4.quick, wit →...

VOCABULARY EXERCISES

Ex. 2. Find in the text:

a) antonyms to the following words and translate them into Ukrainian:

neglect, not provide, disconnect, give, give back, old, destroy, dangerous, pollution, unpleasant, solid, liquid, reduce, waste, compatible, polluted, harmful, processing, together, do not use.

b) synonyms to the following words and word combinations and translate them into Ukrainian.

disturb, trouble, supply, bring, link, appoint, remove, get, obtain, recent, place, secure, filtering, clearing, bad, strong, pointed, raise, individual, inoffensive, elimination, processing, individual.

Ex.3. Give English equivalents of the following.

Сантехніка, безпечні системи водопостачання, відходи, каналізаційні системи, фонтани, трубопроводи, шторм, громадські лазні, тверді відходи, струмки, колодязі, хвороба, шкідливі бактерії, стоки води, біологічні засоби, природні процеси очищення, нешкідливий, величезні печі, ясен, добрива, паливо, скло, газети, алюмінієві банки, еколог, розчин, метод утилізації сміття та побутових відходів переробки, очисні споруди, добриво, паливо, спалювання відходів своєї продукції, пар для вироблення електроенергії.

ENGINEERING

Ex.4. Match each word in the left-hand column with the best in the right-hand column.

- | | |
|-----------------------------------|--|
| 1. Water purification | a. is an industrial structure designed to remove biological or chemical waste products from water, thereby permitting the treated water to be used for other purposes. |
| 2. Wastes | b. is the application of engineering methods to improve the sanitation of human communities |
| 3. Recycling | c. any materials unused and rejected as worthless or unwanted; "they collect the waste once a week"; "much of the waste material is carried off in the sewers" |
| 4. Waste management | d. is a process to change materials (waste) into new products to prevent waste of potentially useful materials, reduce the consumption of fresh raw materials, reduce energy usage, reduce air pollution (from incineration) and water pollution (from landfilling) by reducing the need for "conventional" waste disposal |
| 5. A biological agent | e. are substances or objects, which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law |
| 6. Environmental pollution | f. is the process of removing undesirable chemicals, biological contaminants, suspended solids and gases from contaminated water. |

- | | |
|---|--|
| 7. Bacteria | g. is the collection, transport, processing or disposal, managing and monitoring of waste materials. |
| 8. A wastewater treatment plant (WWTP) | h. is a separate underground carriage system specifically for transporting sewage from houses and commercial buildings to treatment or disposal. |
| 9. A sanitary sewer | i. process or activity by which water is provided for some use, e.g., to a home, factory, or business. The term may also refer to the water supply provided in this way. |
| 10. Sanitary engineering | j. also called bio-agent or biological threat agent - any bacterium or virus or toxin that could be used in biological warfare |
| 11. Water supply | k. are microscopic organisms that form a huge invisible world around us, and within us. |
| 12. Waste material | l. is the introduction of harmful pollutants into a certain environment that makes an environment unhealthy to live in. |

Ex.5. Complete the sentences with the appropriate words from the list below. Translate the sentences into Ukrainian.

public health and safety, spread of disease, public waterways and lands, environmental and industrial pollutants, remediation strategies, habitation or consumption, fluid mechanics, closed treatment and irrigation systems, occur, towns, villages, and cities, economic and demographic statistics

1. The sanitary engineer must also typically apply the principles of ... in order to channel and direct the flow of ... as well as open systems that ... naturally, such as rivers, estuaries, and other bodies of water. 2. The majority of jobs in this field are usually found within the public works department of various 3. Sanitary engineers engage in collecting and analyzing social data, such as ... relevant to specific populated areas. 4. A sanitary engineer is a professional skilled in applying certain engineering principles in order to preserve... . 5. On the contrary, the job is primarily focused on protecting people from the ... by employing various measures to prevent ... from becoming contaminated with environmental and industrial pollutants. 6. Another major aspect of the job is developing ... to make land and water systems safe for ... once more.

Ex.6. Translate the following abstract using the given words and word combinations. Reproduce it.

Санітарна техніка (Комунальні служби)

Сантехніка – це застосування інженерних методів, щоби поліпшити санітарію людських спільнот, в першу чергу, забезпечуючи вивіз і утилізацію

відходів життєдіяльності людини, і постачання безпечної питної води.

Навички у цій області, як правило, використовуються для профілактики захворювань людей, гарантуючи постачання здорової питної води, видалення сміття з населених пунктів, і так далі. У порівнянні з (наприклад), електротехнікою або машинобудуванням, які працюють і з закритими системами, сантехніка - це міждисциплінарна галузь, яка може включати такі елементи, як гідравліка, конструктивне моделювання, інформаційні технології, проектування, мікробіологія, патології та інші підрозділи в науці про довкілля та екологічні технології.



Хоча сантехніка може бути тісно пов'язана з дизайном каналізацій, очищенням стічних вод, переробними центрами, громадськими звалищами та іншими речами, термін відноситься і до (наприклад) плану дій з нейтралізації наслідків забруднення води або забруднення ґрунту в конкретній області.

Miscellaneous

Ex. 7. Choose and use.

learn, know

1. I was surprised to ... that Environmental Engineering has had its own identity since about 1900. 2. Did you ... that the most impressive systems were built by the Romans, whose aqueducts still stand in modern Italy, Spain, France, and Turkey. 3. I ... from the article that Continental Europe's cadastre was created in 1808. 4. Do you ... that

GRAMMAR EXERCISES

Ex. 1. Translate the sentences paying attention to the construction of the ... the.

1. The shorter the half-life period of an element, the greater its radioactivity. 2. The faster the object moves, the greater the air resistance. 3. The higher the temperature of a metal, the higher its resistance. 4. The more you read, the more you learn. 5. The larger the water-pipe, the more water passes through it. 6. The shorter the wire, the less its resistance to current flow. 7. The greater the number of free electrons in a substance, the better that substance conducts electricity.

Ex. 2. Translate into Ukrainian.

1. The less you say, the better. 2. Unfortunately I couldn't come as early as I hadpromised. 3. The cat fell off the roof but it feels none the worse for it. 4. The

room is nice, but not as nice as I should like. 5. The more one has, the more one wants. 6. He is not as experienced as you are. 7. The weather is changing for the better. 8. The window is as narrow as the door. 9. The soup smells good, but it tastes better. 10. How can I get to the nearest post-office? 11. If he helps us, so much the better. 12. If he doesn't do his home tasks, so much the worse for him. 13. The sooner you do it, the better. 14. He is getting still weaker. 15. This time you've made fewer mistakes. 16. The more we study, the more we know. 17. He is not so industrious as his brother. 18. My train starts in a minute. I can't wait for him any longer.

Ex.3. Insert as ... as, so ... as or than.

1. Our house is not ___ big ___ yours. 2. The new cinema in our district is much bigger ___ the old one. 3. We are ___ proud of our district ___ you are of yours. 4. The house I live in is ___ old ___ the one my sister lives in. 5. Exercise 2 is easier ___ exercise 3. 6. This song is more beautiful ___ that one. 7. My composition is not ___ long ___ yours.

SUPPLEMENTARY READING

What is Sanitary Engineering?

Sanitary engineering is a design and construction speciality that confronts issues related to public health. Professionals in the field design new sanitation systems and renovate existing structures to improve health and safety. By integrating mechanical, chemical, and biological engineering, they can deliver



better water quality and waste removal for citizens. Most sanitary engineering projects are headed by government agencies, but private companies and consulting firms also contribute.

Proper sanitation is essential to preserve the health of humans and wildlife. Without proper systems to safely dispose of waste and purify water resources, people are at serious risk of contracting deadly diseases. Sanitary engineers consult with chemists, physicists, and environmental scientists to determine the best ways of improving public systems. They research many different methods when designing a new system to dispose of hazardous waste or remove particulates from drinking water.

Like engineers in other specialties, sanitary engineering professionals draw

blueprints, make computer models, and develop prototypes before initiating a new construction project. They run computer simulations and small-scale physical experiments to test the effectiveness of a system. A team of engineers might, for example, want to improve a wastewater treatment plant by installing new centrifuges to separate large particles from the water. They would put a small centrifuge through a series of lab tests to confirm the method's effectiveness before submitting plans to the plant developers.

Once a design is approved, engineers often act as supervisors at construction sites. They oversee construction to make sure that blueprint details are followed exactly. Once a structure is completed, engineers inspect the quality of workmanship, test the system, and determine if adjustments need to be made.

Sanitary engineering is a constantly evolving industry, and new technologies are being developed every year. Professionals who choose careers in the specialty stay up-to-date on the latest innovations by reading journals, attending seminars, and participating in continuing education courses. It is also important for engineers to know about current regional and federal laws regarding the use of certain chemicals to make sure their plants comply with safety standards.

People who are interested in sanitary engineering careers can find out about the requirements by contacting municipal government agencies and consulting firms in their regions. Entry-level jobs as laborers and engineering assistants can usually be obtained with minimal experience and high school diplomas. A person who wants to become a senior engineer and lead projects typically needs to hold at least a bachelor's degree in an engineering specialty, pass a licensing exam, and gain several years of experience.

Answer the questions:

1. What are the duties of sanitary engineers?
2. Why is proper sanitation so essential?
3. What units are responsible for carrying out sanitary engineering projects?
4. What are the duties of sanitary engineers at construction sites?
5. What are the requirements for the position of a senior engineer?

FOR PLEASURE.....

“What's the use of a fine house if you haven't got a tolerable planet to put it on?” — Henry David Thoreau, Familiar Letters

Module four

TRANSPORTATION SYSTEMS: ROADS, BRIDGES, TUNNELS UNIT ONE

Reading: Roads

Word building: Suffixes of Nouns

Grammar: 1. The Modal Verbs. The Modal Verb **Can**
2. The Modal Verb **May**
3 The Equivalents of Modal Verbs **Can, May**

Supplementary

Reading Roads Weren't Built for Cars



Phonetic Drill.....

*I thought a thought
But the thought I thought
Was not the thought
I thought I thought.*

Words you will need.....

transportation *n. Syn conveyance*

перевезення, транспортування

accomplishment *n. Syn fulfilment , execution*

виконання, завершення, досягнення

highway system

сітка (система) шляхів(доріг)

footing, *n Syn. foundation , base , basis*

базис, фундамент, основа, опора

firm *adj e.g. Something that is firm is fairly hard and does not change much in shape when it is pressed.*

міцний, твердий, стійкий, непохитний

surface, *n*

поверхня

on the surface

на перший погляд, поверхово,

surface, *attr*

поверховий, зовнішній

surface politeness

показна ввічливість

surface, *v.*

1) обробляти поверхню; покривати поверхню 2) впливати на поверхню (про підводний човен) 3) примусити піднятися на поверхню
поверхня зносу, поверхня тертя, верхнє покриття дороги

e.g. *The track is surfaced with cement.*

— *На дорозі цементне покриття.*

wearing surface - *the top layer of a road that carries the traffic; road surface. Syn. carpet, topping*

rest, *v*

триматися, перебувати, ґрунтуватися

appear, v

drainage ['dreɪnlɪɡ]

penetrate, v

curve, n. Syn. *bend, turn*

curve, v

! Mind the difference: to curve, to bend,
to crook

crown, n

Idiom: keep the crown of the causeway
(або causey) *I keep the crown of the*
causey when I go to the borough.

(W. Scott, 'The Antiquary', ch. XXI) —
Я завжди їду в місто не по узбіччю, а
по середині дороги

camber, n ['kæmbə]

convex, adj

ground, v

watertight, adj

wagon, n

carriage, n

tire, n

rubber tires

smooth, adj

bind, v (*bound*)

tar, n [tɑː]

Idiom: to beat the tar out of smb.

access, n

intersection, n Syn. *crossing, crossroad*

interchange, n

clover, n

cloverleaf interchange

angular, adj /'æŋ.gjə.lər/

eliminate, v

in favour BrE = **favor** AmE **of** Syn. *to*
be replaced by; to the advantage of; on

з'явитися

поверховий водовідвід, стік, дренаж,
каналізація

проникати, просочуватись,
проходити крізь

кривизна, дуга, поворот

гнути, згинати, вигинатися

вигин, корона

йти посередині дороги або вулиці
(*crown* - центральна частина дороги
або вулиці)

вигин, випуклість

випуклий, вигнутий

утрамбувати, закласти фундамент,
грунтувати

водонепроникний

фургон

екіпаж

шина

гумові покриття

гладенький, рівний

зв'язувати

смола, дьоготь, гудрон

побити когось мало не до смерті;

відлупцювати

доступ, підхід

перехрестя, роздоріжжя

розв'язка, перехрестя з естакадою

конюшина

транспортна розв'язка у формі листка
конюшини

кутовий, наріжний, загострений

усувати, ліквідувати, знищувати

на користь, із-за чогось; замість;
взамін

the side of , pro , (all) for , giving support to , approving of ,
lane, n

exit, n

exit, v

e.g. When he saw the sign, he exited the freeway. — Побачивши знак, він звернув з автостради.

steep, adj

slope, n

hazard, n

a safety hazard

landscape, v

road border

vehicle, n

traffic, n

concrete, n

crush, v

crushed rock

cut, n

cut, v

fill, n

density, n

subway, n *Syn. underground railway*

remove, v

pave, v

strip, n

take off , v

turnpike, n

remain, v

improve, v

lay down, v

compact, v [*ˈkɒmpækt*]

elevated railway

dense, adj

полоса (дороги) пришвидшення руху,
дорога з одно-стороннім рухом
вихід

виходити, звернути з дороги

крутий, стрімкий

спуск, спад, нахил

ризик, небезпека

загроза/небезпека травмування

упорядковувати ділянку

узбіччя дороги

засіб пересування

транспорт

бетон

товкти, роздавлювати

щебінь

кар'єр, котлован

бурити, копати, рити, проривати
(яму, канал, тунель)

насип

щільність, компактність

метро, підземна залізна дорога

пересувати; переміщати, усувати;
виносити

мостити, брукувати, викладати

злітно-посадкова смуга

злітати (літакові)

застава, де стягується дорожній збір;

(turnpike road) платна дорога

(автомагістраль); головна магістраль

залишати(ся)

покращувати

покласти

стискувати, ущільнювати

залізна дорога на естакаді, підвісна

густий; щільний, компактний

Pre-reading.....

Task 1. While reading the text, you will come across a number of international words:

Transportation, aspect, communication, province, principle, modern, foundation, modern, adequate, automobile, asphalt, kilometer, design, maximum, minimize, monotony, system, material, airport.

Task 2. Think of the answers:

1. In this unit you will learn about the transportation systems. Can you define the very word “transportation”?
2. When, in your opinion, were the first roads built?
3. Where, in your opinion, are the best roads nowadays? Name the countries.

Reading.....

Task 1. Read the text carefully and translate it.

Transportation System: Roads

Transportation has always been one of the most important aspects of civil engineering. One of the great accomplishments of Roman engineers was the highway system that enabled rapid communication between Rome and the empire's provinces.

Modern highways are still built according to the principles laid down in the eighteenth and early nineteenth centuries by a Frenchman, Pierre Tresaguet, the Englishman Telford, and a Scot, John L. McAdam. These men designed the first modern roads that had a firm *footing*, the surface on which the foundation rested. Their roads also included good *drainage* and a *wearing surface* – the top level that directly receives traffic wear – that could not be penetrated by water. Both Tresaguet and Telford used a heavy foundation of stones, on top of which a base course of lighter crushed stones and a wearing surface of still smaller stones were built up. Their roads were also slightly curved in a crown or camber so that the water would run off. McAdam realized that the soil itself could bear the weight of the road when it was compacted or pressed down, as long as it remained dry. He was able therefore to eliminate the heavy cost of the stone foundation by laying a base course of crushed stone on top of a compacted footing. The iron wheels of the carriages of his day ground the stones of the top level into a continually smoother and more watertight surface.

These roads were adequate during the nineteenth century when wagons and carriages had tires made of iron or steel. When the automobile appeared at the

beginning of the twentieth century, however, its rubber tires broke up the smooth surfaces. Therefore, the top layer was bound together more firmly by mixing the crushed rock with tar or asphalt. Millions of kilometers of roads throughout the world today have this kind of surface.

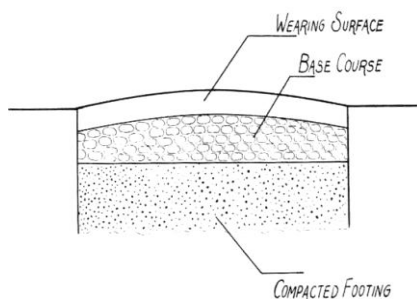
Basically, roadbuilding has improved in only two ways in the twentieth century. The first improvement involves using concrete for the wearing surface. The other is traffic engineering, the design of highways for high-speed, heavy-volume traffic, highways that are economical to build and safe for vehicles and their passengers. Traffic engineering has produced the modern express highway, or freeway, that has only limited access and maximum safety controls. The angular intersections common on older roads have been eliminated in favor of cloverleaf interchanges or others with even more complicated designs. Modern freeways usually have special lanes where traffic can either slow down before exiting or speed up upon entering. Extreme curves or steep slopes are minimized so that the traffic can continue to move without slowing down. Since monotony has proved to be a safety hazard, traffic engineering even includes landscaping the road's borders.

Special Terms

Footing: The surface on which a foundation rests.

Wearing Surface: The top level of a road that receives the wear of traffic.

Base Course: The level of a road between the footing and the wearing surface; it is usually made of crushed rock.



Crown: A slight convex curve in the surface of a road to permit drainage. It is also called camber.

Compacting: Pressing down in order to make a material like sand or soil denser and firmer.

Traffic Engineering: The design of highways for high-speed, heavy-volume traffic, emphasizing the concept of maximum use at minimum cost.

Cloverleaf Interchange: An intersection between two roads designed like a four-leaf clover. It allows cars to switch from one highway to another without interrupting traffic flow.

Cut; Fill: A cut is a land area from which earth is being removed. A fill is a land area where earth is being deposited.

Soil Mechanics: A new science that deals with the classification of different

kinds of soils according to density, stability, and so on. *Soil stabilization* techniques are used for making soils denser or firmer.

Runway: The paved strip on which airplanes land or take off at an airport.

Urban Rapid Transit Systems: Public transportation systems in cities. They include subways (underground railways), elevated railways, and bus and trolley lines. Each system is designed for and operated at higher speeds.

Task 2. Give answers to the following questions and discuss them with your partners:

1. Whose principles of road-building are still applied to the building of modern highways?
2. What elements were included in the roads that Pierre Tresaguet, Telford and John L. McAdam designed?
3. How did the roads designed by McAdam differ from those designed by Tresaguet and Telford?
4. Why were McAdam's roads adequate in the nineteenth century but inadequate in the twentieth?
5. How was the surface of such roads first improved to handle automobile traffic?
6. In what two ways was road-building improved in the twentieth century?
7. What kind of roads has traffic engineering produced?
8. What is the wearing surface of a road?
9. What is the base course of a road?
10. What is traffic engineering?
11. What is a cloverleaf interchange?
12. What do urban rapid transit systems include?

ACTIVITY

Exchange your email addresses and phone numbers. You will have to write down your partner's details and check carefully that everything is correct. Before you start the activity, learn:

at for @

dot for . in an email address (don't say *point*)

dash for – (sometimes *hyphen* in British English)

underline for _ (sometimes *underscore* in British English)

upper case for ABC

lower case for abc

Invite your partner to come to you by car and explain the direction of travel in your email letter.

DID YOU KNOW?

1. The first land roads took their origins from trails which were generally used to move from one hunting territory to another.
2. By 3,000 BC the first road systems appeared in Mesopotamia and asphalt was used to pave roads in Babylon by 625 BC.
3. The Persian Empire had a road of 2,300 km in the 5th century BC.
4. The first major road system was established by the Roman Empire from 300 BC and onwards, mainly for economic, military and administrative reasons. It relied on solid road engineering methods, including the laying of foundations and the construction of bridges.
5. The French, through central government efforts, build their Royal Roads system spanning 24,000 km, over which a public transport service of stage-coaches carrying passengers and mail was established.
6. The British, mainly through private efforts, built a 32,000 km system of turnpikes where tolls have to be paid for road usage.
7. A network of 3 million km of roads, most unpaved, was in operation in the United States in the 19th century and by the early 20th century.
8. 1794 marks the beginning of modern road transportation with the first mail coach service between London and Bristol, operating under a timetable.

Practicing.....

Word-building

Affixation: Suffixes of Nouns

Suffixes of Nouns		
Suffixes	Meanings	Examples
-ion/-sion/	form nouns from verbs	rebellion, compression
-tion/-ation		creation, explanation
-ance,-ence		assistance, difference
-age		breakage, bondage
-ure		pressure, pleasure
-ing		building, reading
-ment		development, government
-al		burial, portrayal

-ity	form nouns from adjectives	similarity, familiarity
-ness		darkness, tenderness
-ancy -ency		constancy, frequency

Ex.1. Explain the meaning of suffixes and translate the words:

appointment, mixture, spending, prosperity, pleasure, manufacture, efficiency, advantage, insurance, possession, responsibility, primacy, evaluation, payment, inequality, taxing, redundancy, competition, package, decision, future, security, arrival, limitation, admission, pressure, guidance, delicacy, thinking, acquaintance, training, equipment, majority, reliability, cooking

VOCABULARY EXERCISES

Ex. 1. Find in the text antonyms to the following words and translate them into Ukrainian:

Industrial engineering, slow, ancient, light, bottom, to worsen, a simple design, a straight line, extremely slow, prudence – caution, to quicken – to speed up, to exclude, to disappear, extended, wet, damage – decline, rural.

Ex.2. Find in the text synonyms to the following words and word combinations and translate them into Ukrainian:

Waterproof, area, to allow, various, airliner, to carry the weight, a street, to plan – to intend, crushed rock, risk, carrier, earth.

Ex 3 . Look through the text and find the English equivalents for:

Згідно закладених принципів, швидке сполучення, провінції імперії, відповідати вимогам, виготовлені з заліза та сталі, сповільнювати чи прискорити (швидкість, хід), тип поверхні, економічний та безпечний, перехрестя під кутом, злегка вигнутий посередині, чотирьох-листова конюшина.

Ex 4. Complete the sentences with the appropriate words from the list below: surveys, a layer, complex, foundation, prepared, affect, expensive, surface. Translate the sentences into Ukrainian.

Building a modern highway is (1)..... and (2)..... A four-lane highway may cost several million dollars *per mile*. Because highways (3)..... the environment, an impact study may have to be done. Maps and (4)..... may be

made to select the best route. Sometimes aerial photographs are necessary. Because roads must have a good (5)....., highway engineers must test the soil.

Before construction begins, the soil underneath must be packed down and (6)..... for paving. Then (7)....., called a base, is added. Some roads may have several base layers. Finally, the road (8)..... is laid on top.

Ex 5. Translate the following abstract using the given words and word combinations. Reproduce it.

Дороги використовуються людьми протягом усієї історії. Близько 5000 років тому єгиптяни споруджували дороги для будівельних цілей. Вони використовувалися для перевезення гігантських кам'яних блоків та інших матеріалів до пірамід. У Європі деякі дороги, побудовані римлянами багато століть тому, були перетворені на сучасні дороги.

Сьогодні дороги необхідні для транспортування легковим автомобілем. Автомобілі є важливою частиною повсякденного життя більшості з нас. Дороги також використовуються вантажівками для доставки сировини на заводи, будівельні майданчики та до споживачів.

Автомобіль має багато переваг, але має також і недоліки: забрудненість повітря та високе споживання енергії є, ймовірно, найсерйозніші. Ці два негативних фактори змушують шукати нові та вдосконалені методи для систем громадського транспорту.

Vocabulary Notes:

the Egyptians – єгиптяни

to turn into – перетворити

a building site – будмайданчик

improved methods – вдосконалені методи

energy consumption – споживання енергії

construction purposes - цілі будівництва

originally built by the Romans – збудовані римлянами

a truck - вантажівка

throughout history– протягом історії

Ex. 6. Match expressions on the left with the statements on the right.

- | | |
|--------------------------|--|
| 1.Footing | A place where earth is deposited or dumped during construction. |
| 2Base course | A convex curve in the surface of a road that permits drainage |
| 3.Wearing surface | •The paved strip on which aircraft land or take off at an airport. |
| 4.Crown | •The surface on which a foundation rests. |

- 5.Compacting** The top level of a road that directly receives wear from traffic.
- 6.Cut** •A new science dealing with the classification of different types of soils.
- 7.Fill** •A layer of crushed rock that rests on a footing for a road.
- 8.Soil mechanics** •Crushed rock laid on top of a footing for a railroad roadbed.
- 9.Runway** •A place from which earth is removed during construction.
- 10. Ballast** •Pressing down soil to make it denser and firmer

Ex. 7 Write the Past form of the following verbs into one of three columns according to the pronunciation of the ending «-ed»: [t], [d], [ld]. Translate them.

To rest, to include, to penetrate, to crush, to curve, to realize, to compact, to press, to remain, to eliminate, to appear, to mix, to improve, to involve, to use, to design, to produce, to limit, to eliminate, to slow, to minimize, to mark, to expand, to rely

Miscellaneous

Ex. 8. Choose and use: make for (move quickly towards); **make up** (1 invent (story, poem, etc); 2 make an amount complete; 3 compose; 4 reconcile; 5 prepare (by mixing)); **make oneself up**: put cosmetics on; **make up for**: compensate for **make out** (1complete; fill in ;2 distinguish; 3 understand).

1. I'm sure he made the whole story 2. I'll make forgetting our anniversary. 3. We decided to make the nearest beach. 4. He made the cheque to me personally. 5. Your writing is so bad, I can't make what you've written. 6. She spends hours making herself every morning.

GRAMMAR EXERCISES

Ex. 1. Translate sentences into Ukrainian. Pay attention to the translation of the equivalents of modal verbs.

We	$\left\{ \begin{array}{l} \text{can} \\ \text{are able to} \\ \text{could} \\ \text{were able to} \\ \text{shall be able to} \end{array} \right\}$	help him	They	$\left\{ \begin{array}{l} \text{may} \\ \text{are allowed to} \\ \text{might} \\ \text{were allowed to} \\ \text{will be allowed to} \end{array} \right\}$	be present at the lesson
----	--	----------	------	--	--------------------------

Ex. 2. Translate the following sentences. Explain the meaning of the modal

verbs can and may.

A 1. He can translate this text about roads 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.

B 1. May I smoke here? – Yes, of course you may, but you mustn't. You better smoke only in the smoking-room. 2. May we use a dictionary at the exam? – I think, you needn't. 3. The teacher said that we might use a dictionary, if we could not translate without it.

Ex. 3. Use equivalents instead of modal verbs.

1. His friends can help him in his studies. 2. I could meet you at the metro station. 3. They may continue the experiment in the laboratory. 6. You may keep this book as long as you need it. 7. The team of experts can study the present situation with roads in the country. 9. Could you speak English a year ago?

Ex. 4. Ask your partner if you may perform the following actions. Work in pairs.

EXAMPLE: to use these substances for the experiment

A: May I use these substances for the experiment?

B: Yes, you may. You may use these substances for the experiment.

to elaborate the plan of the research

to experiment with a new firm *footing*

to demonstrate the characteristics of this runway at an airport

to observe the cloverleaf interchange building process

Ex.5. Your friend wanted to do a lot of things in the practical class yesterday. Ask him if he was allowed to do all of them.

EXAMPLE: to demonstrate the new applications of granular materials for roads

A: Were you allowed to demonstrate the new applications of granular materials

for roads? B: No, I wasn't. But I will be allowed to do it tomorrow.

to test the performance characteristics of bitumen

to use a new type of cement

to study the structure of asphalt

to observe how road is reconstructed

Ex. 6. Discuss with your friend which of these things may be done.

EXAMPLE: the road surface / to be made of crushed limestone

A: May the road surface be made of crushed limestone? B: Certainly it may. It may be made of crushed limestone. or B: I'm afraid it may not. It may not be made of crushed limestone

- a) the successful engineering of a road / to be relied on modern construction techniques
- b) licence/ to be required for placing building materials on the highway
- c) more appropriate pavement design / to reduce pavement costs

Ex. 7. Correct mistakes in the following sentences.

1. The roads with good *drainage* and *a wearing surface* could not to be penetrated by water.
2. The soil itself could bears the weight of the road when it was compacted or pressed down, as long as it remained dry.
3. McAdam be able eliminate the heavy cost of the stone foundation by laying a base course of crushed stone on top of a compacted footing.
4. Steep slopes are minimized and traffic cans to continue to move without slowing down.
5. In the 20th century roadbuilders be allowed use the concrete for the wearing surface.

Ex. 8. Translate the sentences using your active vocabulary:

1. Хороше транспортне сполучення може стати передумовою вибору ділянки для будівництва гіпермаркету.
2. Дорога матиме вигин посередині, щоб вода могла стекти.
3. Автомобілі з резиновими покриттями не могли їхати по мокрій ґрунтовій дорозі.
4. Ми змогли / Нам дозволили взяти участь у проектуванні нової розв'язки біля міста Рівне.
5. Ви можете використати плакати або слайди у презентації «Найцікавіші дороги світу».
6. Технологія стабілізації ґрунту може зробити ґрунт більш компактним та твердішим.

Ex. 9. Revision. Complete the song with the simple past of the verbs:

Because you loved me – Celine Dion

For all those times you _____ (stand) by me.
 For all the truth that you _____ (make) me see.
 For all the joy you _____ (bring) to my life.
 For all the wrong that you _____ (make) right.
 For every dream you _____ (make) come true.
 For all the love I _____ (find) in you
 I'll be forever thankful baby.
 You're the one who _____ (hold) me up.
 Never _____ (let) me fall.
 You're the one who _____ (see) me through, though it all.

CHORUS:

You _____(be) my strength when I was weak.
You _____(be) my voice when I couldn't speak.
You _____(be) my eyes when I couldn't see.
You _____(see) the best there _____(be) in me.
_____ (lift) me up when I couldn't reach.
You _____(give) me faith
'coz you _____(believe).
I'm everything I am
because you _____(love) me.
You _____(give) me wings
and _____(make) me fly.
You _____(touch) my hand I could touch the sky.
I _____(lose) my faith,
you _____(give) it back to me.
You _____(say) no star _____(be) out of reach.
You _____(stand) by me
and I _____(stand) tall.
I _____(have) your love I _____(have) it all.
I'm grateful for each day you _____(give) me.
Maybe I don't know that much,
but I know this much is true.
I _____(be) blessed because
I _____(be) loved by you.

CHORUS

You _____(be) always there for me.
The tender wind that _____(carry) me.
A light in the dark shining your love into my life.
You've been my inspiration.
Through the lies you _____(be) the truth.
My world is a better place because of you.

Ex 10. Revision. Complete the gaps using the appropriate past tense.

1. No one (hear) the doorbell because we all (sleep) soundly.
2. When the teacher (walk) into the classroom she was surprised to see that the students ... (have) their books open and that they (study) that day's lesson.
3. When he (retire) last month he (work) for that company for 40 years.
4. Many people (drown) when the Titanic (sink) because proper precautions (passive – not take).
5. The theater (be) full. We (be) lucky we (reserve) seats.
6. When they (return)

from their vacation they (see) that someone (break) in. 7. Allen (plan) to study abroad but he (not get) the scholarship he (expect) 8. While she (put on) her makeup her hand (slip) and she (injure) her eye. 9. The doctor (smoke) while he (examine) a patient. 10. I(find) this totally unprofessional.

SUPPLEMENTARY READING

Roads Weren't Built for Cars

We have all heard the tall tale that roads were built for cars, so bicycles and pedestrians have no place on our streets. Perpetuating this myth might help some motorists sleep better at night by thinking they have an exclusive, god-given right to our streets, but it simply isn't true.

Motorists don't have an exclusive right to our streets in the first place. Driving is a privilege granted only to those who earn it (and the methods by which the government grants this privilege are questionable). That privilege can be revoked at any moment, too, by the way.

Bicyclists, on the other hand, have an inherent right to our streets. Citizens have a right to lifetime mobility – and short of cutting off our legs, this cannot be revoked for any reason.

Furthermore, roads are paid for by everyone – not just by drivers. In fact, people who don't drive cars pay disproportionately more for our streets than those who drive cars. Driving is the most highly subsidized mode of transportation. Truth be told, roads weren't built for cars in the first place. Cities with more than 100 years of history have been altered to accommodate as many cars as possible – at the expense of general liveability and the mobility rights of people who choose not to use cars.

Long before Henry Ford brought Americans the affordable personal motor vehicle, a group of advocates fought for better roads. These tireless advocates envisioned cities with better mobility and fought to make their streets safer and more enjoyable to navigate because they were tired of being treated like second-class citizens. Sound familiar yet?

It was called the “good road movement”, and on July 25th 1896, residents took to the streets in downtown San Francisco to advocate for better roads for bicycles in “The Great Bicycle Demonstration” – garnering over 100,000 people in the streets.

The next day, the *San Francisco Call* heralded these bicycle riders as “Disciples of Progress”. The bicyclists demanded that Market Street be repaved – as a wheelman explains: “The purpose for the march is three-fold; to show our strength, to celebrate the paving of Folsom Street, and to protest against the conditions of San Francisco pavement in general and of Market Street in particular. If the United Press of this city decides that Market Street must be repaved, it will be done in a year”. The demonstrations and advocacy by these wheelmen led to the swift repaving of Market Street.

The victory was short-lived, however, as combustion engines made motor vehicles the method of choice for Americans to transport themselves. Nonetheless, the wheelmen succeeded in paving the roads before being subsequently squeezed off the streets by motorists.

Bicycle sales in the United States sadly dropped from a whopping 1.2 million in 1899 to just 160,000 in 1909 due to the rise of the car. The bicycle rose again during the Great Depression of the 1930’s and again in the 1990’s.

(James D. Schwartz is the editor of *The Urban Country*

See more at: <http://www.theurbancountry.com/2011/07/roads-werent-built-for-cars.html#sthash.ljaE5CdD.dpuf>)

Answer the questions:

1. What were some motorists certain about?
2. Who pays for roads?
3. Whom were roads built for, in the first place?
4. Why did the bicycle sales drop in the USA at the beginning of the 20th century?

FOR PLEASURE.....

*“It is not wealth which makes good roads possible –
but, rather, good roads which make wealth possible Adam Smith*

*Life is like a highway, no matter what they say, the construction is
never finished. There’s always gonna be bumps in the road and
detours every now and then.*

Nishan Panwar

UNIT TWO

Reading: **Bridges**

Word building: Suffixes of Nouns

Grammar: 1. The Modal Verb: Must.
2. The Equivalent of the Modal Verb Must

Supplementary

reading: **Techniques of the Bridge Construction**



Phonetic Drill.....

*There are two minutes difference
from four to two to two to two,
from two to two to two, too.*

Words you will need.....

span, n	прогін (моста); відстань між опорами (арки, склепіння); довжина моста; ширина ріки; розмах рук і т.п.
span, v <i>e.g. to span a river with a bridge —</i> <i>збудувати міст через ріку</i>	з'єднувати береги, простягатися
obstacle	перепона, перешкода, завада
valley	долина, низина
hide	тут шкіра
masonry [ˈmelsqnrl]	кам'яна (цегляна) кладка
beam, n	балка, перекладка, брус
pier, n	стовп, стояк; бик (моста); опора
truss, n	кроквяна ферма
truss, v	зв'язувати, зміцнювати
deck, n	настил, їздове полотно (моста)
stay, n	несучий канат
beam bridge	балочний міст
suspension bridge	вісячий (підвісний) міст
cantilever	консоль
lift bridge	розвідний вертикально-підйомний міст
drawbridge	розвідний міст
swing, v	вертіти, повертатися, гойдатися
swing bridge	розвідний поворотний міст

bascule bridge	розвідний (розкривний) міст
viaduct, n	багатопролітний міст через долину
floodwater, n	паводкова вода
rigid, adj.	жорсткий, нерухомий, закріплений
compression, n	стискання; ущільнення; компресія
tension, n	пружність; розтягнення; натяг
thrust, n	осьовий тиск; напір, натиск
downward, adj	низхідний, спадний
wrought [rLt] iron	коване залізо
resist, v	чинити опір, протидіяти, устояти проти (чогось); перешкоджати
damage, v Syn. harm., hurt	завдавати збитків; пошкоджувати
devise, v Syn: contrive , invent	придумувати; винаходити
counterbalance, v	зрівноважувати, урівноважувати
counterbalance weight, n	противага
lack, n Syn: absence, dearth , shortage	нестача; відсутність (чогось - of) lack
deficiency , want , need.	of balance – неврівноваженість
Ant: adequacy , sufficiency	
pile,n	паля, стояк
raise, n	піднімати
! <u>Mind the difference:</u> to rise, to raise,	
to arise, to arouse	
Note: Rise (rose, risen) and arise	
(arose, arisen) are irregular and	
intransitive, i.e. they never have a direct	
object. Raise and arouse are regular	
and transitive — they are usually	
followed by a direct object. Arouse is	
often used figuratively.	
pivot, v	крутитися, обертатися (upon); надівати на стрижень
incline, v. Syn: slope , tilt	нахилитися, схилитися
strengthen,v	підсилювати(ся), зміцнювати(ся)
drive around, v	тут об'їжджати
vine	повзуча рослина, виноградна лоза
triangle	трикутник
available	доступний, наявний

Pre-reading.....

Task 1. While reading the text, you will come across a number of international words:

Track, popular, material, temperature, collapse, corrosion, inspection, transportation system, structure, diagonal, horizontal, vertical, compression, distance, massive, rhythm, to stabilize, method, technique, component, parallel, canal, type, electric motor.

Task 2. Answer the questions:

1. In this unit you will learn about the different types of bridges. What types of bridges do you know?
2. How many bridges do you have in your village, town or city?

Reading.....

Task 1. Read the text carefully and translate it.

Bridges

A bridge is a structure used to cross an area that might be difficult to cross. Without bridges, people would have to walk or drive around obstacles like mountains or valleys. Without bridges,, people would have to use boats to get across water. Bridges make it easier to get from one place to another.

Bridges have been around since ancient times. Bridges have been made from many different things even rocks, logs and animal hides. The first bridges were made by nature. Logs fell across a stream and people were to cross from one side to the other. This was the first beam bridge. Flat rocks were also used to cross ditches. Running water which wore away rock and formed an arch created the first stone bridge. People used hanging vines as a swing bridge to cross valleys.

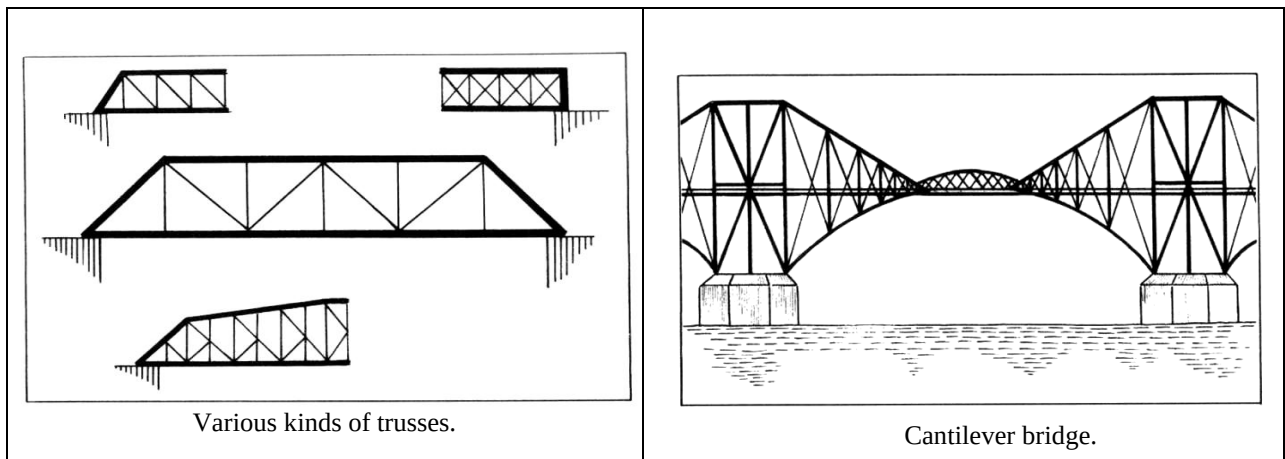
There are several types of bridges: beam bridges, cantilever bridges, arch bridges, suspension bridges, cable-stayed bridges, truss bridges, drawbridges. The main types of them are: the beam, arch, suspension, truss and drawbridge.

The sudden expansion in transportation systems that began in the eighteenth century, and still continues in our own day, has increased the need for bridges as a part of highways and railroads. Better understanding of the forces that are exerted on structures and the improved materials that became available in the nineteenth century have made it possible to build increasingly longer and stronger bridges

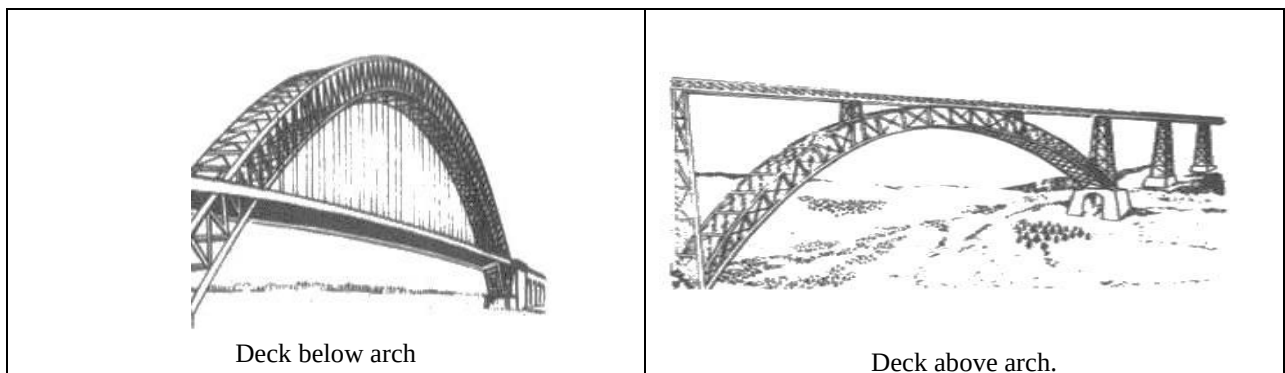
The simplest type of span is **a beam bridge**, consisting of a rigid beam between two supports. Today most simple beam bridges are strengthened by a truss, which is based on the triangle. Diagonal beams that extend between the

horizontal and vertical beams give support against both compression and tension. Trusses are not only strong but also light, because all unnecessary material has been eliminated in their design.

Another type of a beam bridge is **the cantilever**, in which a horizontal beam extends beyond its support. Cantilever bridges, like trusses, had also been built before iron and steel became available. Most cantilever bridges have two arms of truss structure that meet or support a section between them. Cantilevers enabled bridge builders to span longer distances than truss bridges. During the nineteenth century, cantilevers were frequently used to build railroad bridges.



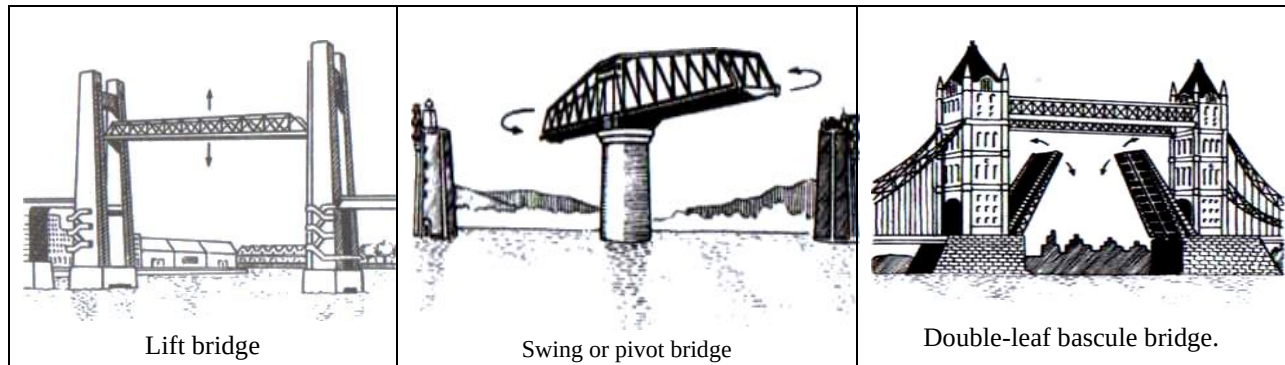
A third type of modern bridge is **the steel arch bridge**, which can carry a roadway either above or below its arch of steel beams. An arch exerts strong downward and diagonal thrusts, so the piers that support it must be especially strong.



Suspension bridges span even longer distances than other types of bridges. The deck or roadway of a suspension bridge is suspended from steel cables that are supported by massive towers. The first modern suspension bridges used linked chains made of wrought iron. When steel became available, cables of steel wires replaced chains of wrought iron. Several suspension bridges built in this manner collapsed, however, as a result of storms or the movement created by the rhythm of the loads moving across them. It was later discovered that these failures were

caused by the lack of truss supports for the deck.

The development of reinforced and prestressed concrete has given engineers other important materials for bridge building. Concrete has been used particularly for relatively short-span bridges that are a part of freeway systems. These bridges often use precast concrete beams. Many arch bridges have also been constructed of concrete.



Many bridges that pass over rivers or canals must be movable so that shipping can pass under them. One type is **the lift bridge**, with towers that can raise the entire span between them by means of counterbalances and electric motors. Another type is **the swing or pivot bridge**, which pivots the span on a pier so that the bridge can swing open parallel to the river or canal. A third type is **the bascule bridge**, which has one or two arms that can open upward at an angle by means of counterweights. A bascule with one arm is a single-leaf bridge, and with two arms it is a double-leaf bridge.

Task 2. Give answers to the following questions:

1. Why do people use bridges?
2. What were the first bridges made of?
3. What materials are used to build a bridge?
4. What has enormously increased the need for bridges?
5. What has made it possible to build longer and stronger bridges?
6. How are most beam bridges strengthened today? What advantage in addition to strength does this construction give to a bridge?
7. What kind of a bridge can span longer distances than other types of bridges?
8. How is the deck of a suspension bridge supported?
9. What happened to some of the earlier suspension bridges that had steel cables?
10. What two types of bridges are often built today with reinforced concrete?
11. Why must some bridges be movable? What are three types of movable bridges?

DID YOU KNOW?

The imposing bridges that have survived from ancient times are arched structures of heavy masonry, usually stone or brick.

Herodotus, the Greek historian of the fifth century B.C., however, mentions a wooden bridge across the Euphrates River at Babylon.

In Rome, the bridge of Fabricius, built in 62 B.C. and named for its engineer, still carries traffic across the Tiber River, as does the Sant' Angelo Bridge, built in about 136 a.d. Both of these bridges, and many other Roman bridges, have a series of arches supported by heavy piers that extend down to bedrock.

Ancient sources also mention pontoon bridges, usually in connection with military operations. A **pontoon** is a hollow drum that can float; a series of pontoons anchored to a riverbed can support a roadway.

The Incas of pre-Columbian Peru built remarkable suspension bridges, supported by cables of natural fibers, that crossed many of the deep gorges in their mountainous country.

Practicing.....

Word-building

Affixation: Suffixes of Nouns

Suffixes of Nouns		
Suffixes	Meanings	Examples
-an, -arian -ant/-ent -ee, -eer - er, -or -ician, -ist	personal names, profession	vegetarian servant, student examinee, profiteer porter, actor musician, physicist
-ite -er, -or	names of things	sybarite compressor transformer
-ess, -ine -rix, et(te) -dom, -ery	-feminine suffixes collectivity	actress, heroine, testatrix, suffragette. kingdom, confectionery
-hood, -ship		manhood, friendship

Ex1. Explain the meaning of suffixes in the following words.

childhood, electrician, engineer, economist, richness, ownership, assistant, hostess, investor, greatness, worker, humanist, builder, director, happiness, livelihood, relationship, supervisor, labourer, linguist, accountant, censorship, cleverness, designer, competitor, colonist, producer, technician, awareness, readership, boyhood, cigarette-lighter, cohabitant, bisectrix, cement, settee, chlorine, charioteer, inventiveness, employee, freedom, launderette, driver, librarian, profiteer, adulthood, physician

VOCABULARY EXERCISES

Ex.1. Arrange the words into pairs of antonyms and translate them into Ukrainian:

strong, vertical, replace, lack, increase, complex, below, simple, horizontal, frequently, to capitulate, to destroy, rarely, deplace, above, downward, to overcome, weak, decrease, upward, sufficiency, to build

Ex.2. Arrange the words into pairs of synonyms and translate them into Ukrainian:

to overlive, connection, to design, to find, a brook, a moat, trait, improved, rigid, a ditch, to eliminate, strength, a stream, stiff, to discover, empty, to survive, perfected, to remove, connexion, to contrive, soundness, characteristic, hollow

Ex 3. Complete the sentences with the appropriate words from the list below:

Shape, people, thawing, vehicles, withstand, ravines, strong, distance.

Bridges are structures used by 1) _____ and 2) _____ to make crossing areas easier in travel. Engineers build bridges over rivers, lakes, 3) _____, canyons, railroads, and highways.

Bridges must be built 4) _____ enough to safely support their own weight as well as the weight of the people and vehicles that pass over it. The bridge must also _____ natural occurrences that include weathering, earthquakes, strong winds, and freezing and 6) _____.

Engineers must consider many things -- like the 7) _____ to be spanned and the types of materials available -- before determining the size, 8) _____, and overall look of a bridge.

Ex 4. Look through the text and find the English equivalents for:

Землетрус, кам'яне знаряддя, витримувати сильні вітри, чинити опір силі,

ущелина, залізобетон, попередньо напружений залізобетон, розвідний міст, корінна підстильна порода, обертатися, однокрилий міст, противага, усунути помилку, метод.

Ex 5. Translate the following abstract using the given words and word-combinations. Reproduce it.

Сотні років тому люди будували мости через швидкоплинні річки та глибокі каньйони. Ідею створення моста первісні люди взяли у природи, коли побачили дерево, яке впало через річку.

Передусім мости були дуже простими структурами, Їх мусили будувати з дерев'яних колод, каменю і бруду (багна). Через це вони могли поєднувати тільки дуже близької відстані. Структурна цілісність моста не могла бути високою, тому що розчин ще не було винайдено і дощ повільно розмивав міст. Революція в будівництві моста прийшла з Стародавнього Риму. Інженери виявили, що подрібнене вулканічне каміння може слугувати відмінним матеріалом для приготування будівельних розчинів. Цей винахід дозволив створити набагато більш міцніші, потужніші і більш великі структури, ніж будь-яка цивілізація перед ними.

На сьогодні снують такі типи мостів: арковий, балочний, висячий, розвідний і для їхнього будівництва інженери використовують залізо, сталь, залізобетон.

Vocabulary Notes:

early people – первісні люди dirt – бруд, bagno structural integrity – структурна цілісність mortar – розчин to dissolve – розчиняти, розмивати	Ancient Rome – Стародавній Рим grinded out volcanic rocks – подрібнене вулканічне каміння to make mortar – приготувати розчин close distances – близькі відстані sturdy – міцний, стійкий
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Miscellaneous

Ex. 6. Choose and use: to arise (abstract meaning)- *a situation or problem comes into being; people become aware of it*, **to rise** – *to move upwards*, **to raise**+direct object– *to move to a higher position*.

1. The sun at five. 2. The town began from its sleep. 3. Let's the flag on the roof of our house. 4. If you agree with me your hand. 5. I needed to catch the 7.30, so I had early. 6. A problem has with the TV that I bought last week. I can't get teletext. 7. He to greet me when I entered his office. 8. I shall certainly go to Lviv next year, if the opportunity.....

Ex. 7. Test your engineering skills and try to choose the right bridge to the right location. Explain your choice in every location.



Beam



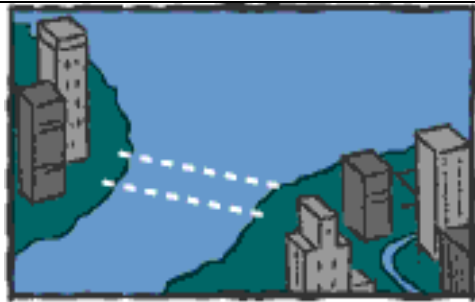
Suspension



Arch



Drawbridge



Location 1:

Build a multi-lane bridge for commuters and tourists

Span: 2,000 feet

Crossing: River

Connects: City and major highway

Special Notes:

"I want a one-of-a-kind bridge that will span our beautiful river and welcome visitors from all over the world to our thriving city. Make sure the new bridge leaves enough room for sailboats on the river. Please don't build a bridge that looks like the Golden Gate Bridge in San Francisco or the Brooklyn Bridge in New York."

- Mayor of the city Craggy Rock .

What kind of bridge should you build? (Select one and explain why?)



Location 2:

Build a bridge for rollerbladers and bikers

Span: 100 feet

Crossing: Stream

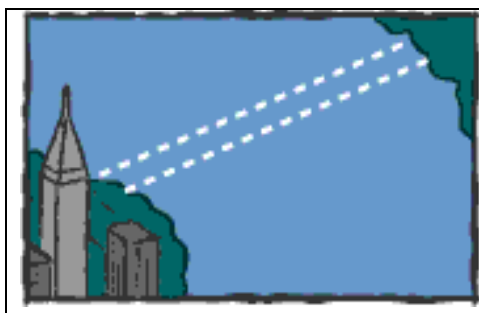
Connects: Two bike paths

Special Notes:

"We're tired of getting bumped off the road by angry drivers! We want a simple bridge -- one that will connect the bike paths in East and West Craggy Rock over the city stream. We don't have much money, so we're not asking for much. We just want to get to work every day without risking our lives!"

-- Bike-n-Blade Coalition

What kind of bridge should you build? (Select one and explain why?)



Location 3:

Build a highway bridge across a busy shipping port

Span: 5,000 feet

Crossing: Ocean bay

Connects: Island and mainland

Special Notes:

"Our records indicate that more than 500 ships pass through Craggy Rock Harbor each day. Please build a bridge that does not block the flow of water traffic. We do not want angry sailors or congestion of any kind in our harbor. Thank you."

-- The United States Coast Guard

What kind of bridge should you build? (Select one and explain why?)



Location 4:

Build a railroad bridge in a national park

Span: 500 feet

Crossing: Deep river gorge

Connects: Two rocky bluffs

Special Notes:

"We do not want the new bridge to detract from the natural beauty of Craggy Rock National Park. Please build a simple and elegant bridge -- one that does not have towers or piers."

-- The National Park Service

What kind of bridge should you build? (Select one and explain why?)

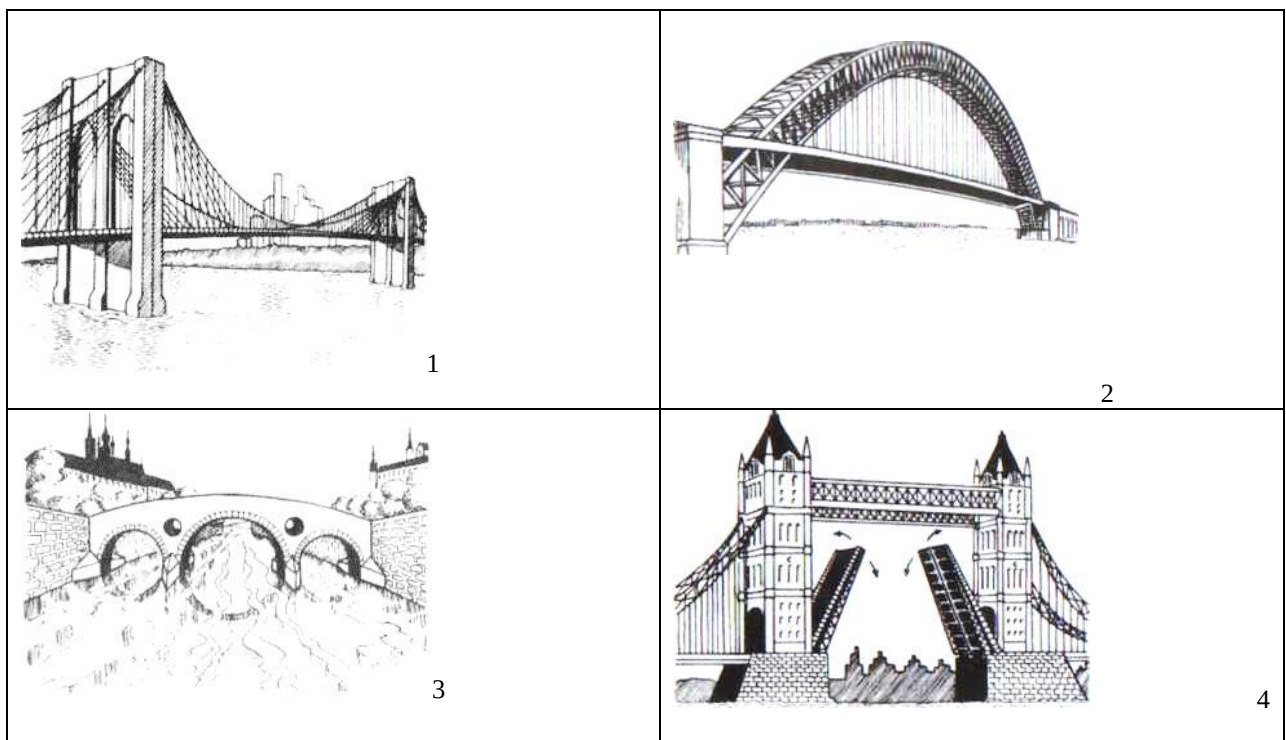
Check up yourself! <http://www.pbs.org/wgbh/buildingbig/bridge/challenge/index.html>

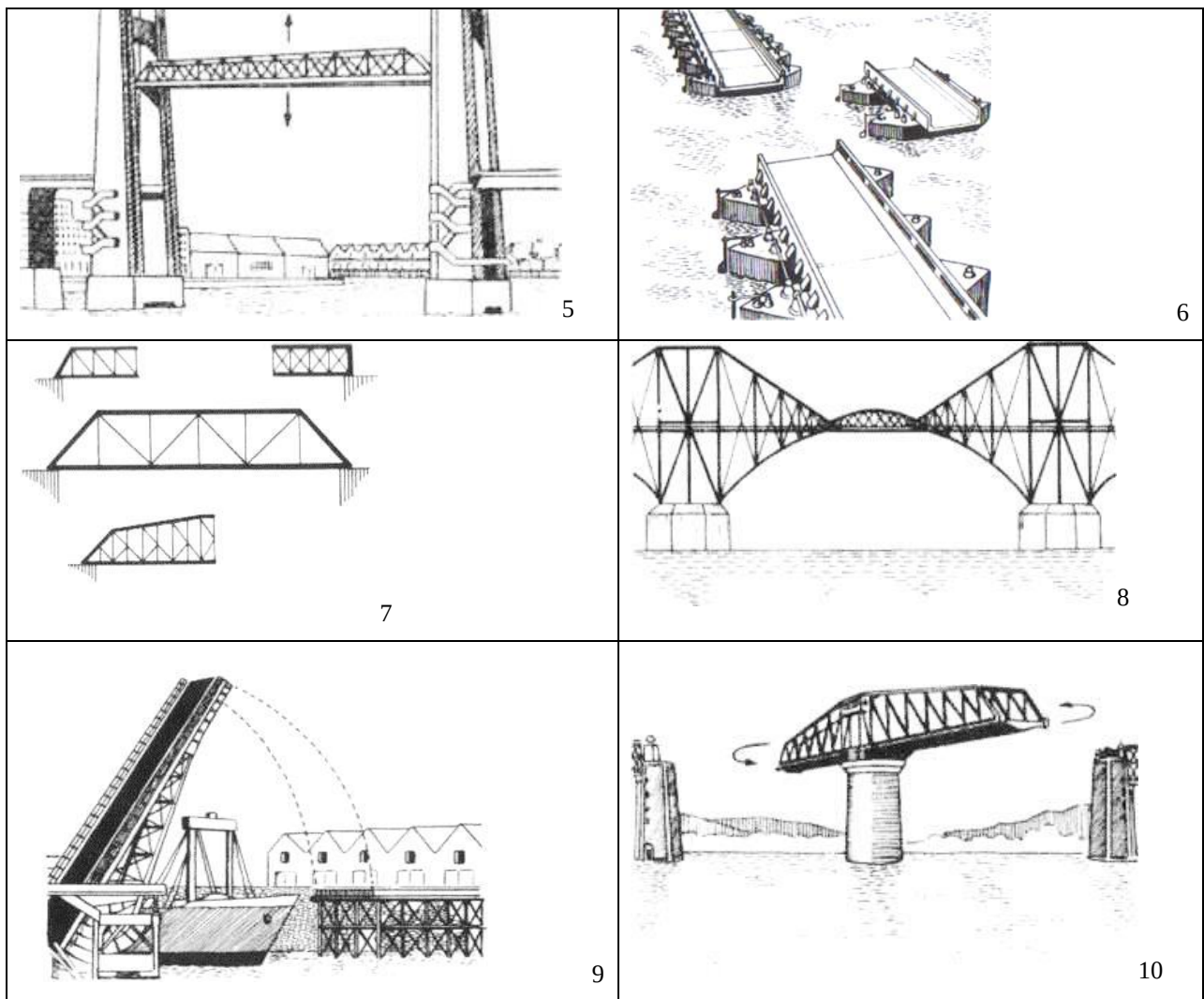
Ex. 8. Match each expression on the left with one of the statements on the right.

1.Span	•A stone or brick bridge with arches spanning the distance between piers.
2.Pontoon bridge	•A movable bridge that opens by swinging on a pivot.
3.Beam bridge	•A bridge supported by cables usually hung from towers.

4.Suspension bridge	•The traffic-bearing surface of a bridge.
5.Truss	•The distance between two supports of a bridge.
6.	
7.Cantilever	•A bridge with an arch of steel.
8.	
9.Masonry arch bridge	•A bridge consisting of a rigid beam between two supports.
10.Concrete arch bridge	•A bridge supported by hollow drums that can float.
11.Steel arch bridge	•A movable bridge that swings upward at an angle by means of a counterweight.
12.Deck	•A bridge with an arch of reinforced concrete.
13.Lift bridge	•A framework strengthened by diagonal beams between horizontal and vertical beams.
14.Swing bridge	•A movable bridge with counterweights and electric motion to raise the span.
15.Bascule bridge	A structure in which a horizontal beam extends beyond its support.

Ex. 9. Identify each of the following bridges and describe its most important characteristics.





GRAMMAR EXERCISES

Ex. 1 Say what these people must or mustn't do in these situations.

e.g.: engineers / to finish the test in half an hour

The engineers must finish the test in half an hour.

or engineers / to break safety instructions

The engineers mustn't break safety instructions.

students / to attend classes

scientists / to perform all the experiments according to the instructions

students / to be late for their practical classes

friends / to help each other in difficult situations

students / to carry out a lot of experiments

engineers / to work with faulty devices

Ex. 2 Ask your friend whether fellow students must do these things.

e.g.: to complete the test

A: Must Serhii complete the test?

B: No, he needn't, but Olesia must.

to follow these instructions

to determine the strength of material

to study the advantages of new piles for a bridge

to receive new data

to draw up a laboratory report

Ex. 3 Put these statements into Present, Past and Future using the modal verb to have to (not to have to) instead of must (mustn't).

e.g: *He must write a detailed report of the test.*

He **has** to write a detailed report of the test.

He **had** to write a detailed report of the test.

He **will** have **to** write a detailed report of the test.

1. The students must complete another series of experiments.

2. They must compare the results of two tests.

3. Alina must determine the type of a bridge.

4. The engineers must develop new types of road surfaces.

5. The scientist must elaborate on the plan of his research.

Ex. 4 Ask your friend if he had to do the following things last week.

e.g. : *to draw up a laboratory report*

A: Did you have to draw up a laboratory report last week?

B: No, I didn't. But I will have to draw up a laboratory report next week.

to study the influence of temperature on the bridge

to describe the properties of steel

to compare the properties of steel and iron

to do research on soil mechanics

to follow the procedure of the laboratory experiment

Ex 5. Ask your instructor if these things must be done.

e.g. : *a detailed report of the experiment / to be written*

Student: Must a detailed report of the experiment be written?

Instructor: Certainly it must. It must be written without mistakes.

grinded out volcanic rocks / to be used as a material for mortar

concrete / to be widely applied in construction of bridges

the conclusions / to be included in the report

the procedure of the experiment / to be described in details

Ex. 6. Correct mistakes.

1. Taras hadn't to write a detailed report of the experiment with new trusses. 2. I will must to study all the peculiarities of this technological process next week. 3. He have to deliver a report on the applications of reinforced and prestressed concrete. 4. I don't must switch on this machine without our teacher's permission. 5. We don't must build a multi-lane bridge for commuters and tourists. 6. The bridge will haven't to block the flow of water traffic. 7. Bridge builders musted to choose the right bridge to the right location. 8. Without bridges people have use boats to get across river. 9. This bridge will must to connect the city and a major highway. 10. Such type of a bridge must to have towers or piers.

Ex. 7. Translate the sentences using your active vocabulary.

1. Інженери повинні були модернізувати цей міст через річку Стир. 2. Ми будемо змушені скласти доповідь про можливість побудови підвісного мосту, щоб з'єднати лівий та правий берег міста. 3. На занятті студенти не повинні будуть визначити опірність даного мосту до землетрусу. 4. Робітники повинні використовувати залізобетон для будівництва моста. 5. Студенти повинні підготувати доповідь про один чи усі типи мостів? 6. Згідно правил міст мусить бути розвідний? 7. Цей міст мусить відповідати стандартам будівництва мосту. 8. Люди не повинні хвилюватися за якість спорудження.

SUPPLEMENTARY READING

Techniques of Bridge Construction

Bridge construction can present extraordinary difficulties. Usually the foundations for the piers must rest on bedrock and often under water. One technique for working in these conditions is by means of a cofferdam. Piles usually made of interlocking steel plates are driven into the water bed. The water is then pumped out from within the area that has been enclosed.

Another technique is the use of the pneumatic caisson. The caisson is a huge cylinder with a bottom edge that can cut into the water bed. When compressed air is pumped into it, the water is forced out. Caissons must be used with extreme care. For one thing, workers can only stay in the compression chamber for short periods of time. For another, if they come up to normal atmospheric pressure too rapidly, they are subject to the bends, or caisson disease as it is also called, which is a crippling or even fatal condition caused by excess nitrogen in the blood. When the Eads Bridge across the Mississippi River at St. Louis was under construction between 1867 and 1874, at a time when the danger of working in compressed air

was not fully understood, fourteen deaths were caused by the bends.

When extra strength is necessary in the piers, they are sometimes keyed into the bedrock—that is, they are extended down into the bedrock. This method was used to build the piers for the Golden Gate Bridge in San Francisco, which is subject to strong tides and high winds, and is located in an earthquake zone. The drilling was carried out underwater by deep-sea divers.

Where bedrock cannot be reached, piles are driven into the water bed. Today, the piles in construction are usually made of prestressed concrete beams. One ingenious technique, used for the Tappan Zee Bridge across the Hudson River in New York, is to rest a hollow concrete box on top of a layer of piles. When the box is pumped dry, it becomes buoyant enough to support a large proportion of the weight of the bridge.

Each type of bridge, indeed each individual bridge, presents special construction problems.

With some truss bridges, the span is floated into position after the piers have been erected and then raised into place by means of jacks or cranes. Arch can be constructed over a falsework, or temporary scaffolding. This method is usually employed with reinforced concrete arch bridges. With steel arches, however, a technique has been developed whereby the finished sections are held in place by wires that supply a cantilever support. Cranes move along the top of the arch to place new steel sections as the tension in the cables increases.

With suspension bridges, the foundations and the towers are built first. Then a cable is run from the anchorage - a concrete block in which the cable is fastened - up to the tower and across to the opposite tower and anchorage. A wheel that unwinds wire from a reel runs along this cable. When the reel reaches the other side, another wire is placed on it, and the wheel returns to its original position. When all the wires have been put in place, another machine moves along the cable to compact and to bind them. Construction begins on the deck when the cables are in place, with work progressing toward the middle from each end of the structure.

Answer the questions:

- 1.What extraordinary difficulties can bridge construction present?
- 2.What are the techniques for bridge construction under the water?
- 3.How are some truss bridges constructed?

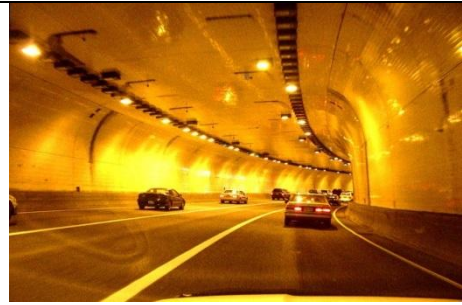
FOR PLEASURE.....

Don't build a bridge if you want to use the pillars of doubt and suspicion.

Tasneem Hameed

UNIT THREE

Reading: **Tunnels**
Word building: Suffixes of Nouns
Grammar: 1. The Modal Verb **should**
Supplementary
Reading **Interesting about Tunnels**



Phonetic Drills.....

The two-twenty-two train tore through the tunnel.

Say this sharply, say this sweetly;

Say this shortly, say this softly;

Say this sixteen times in succession.

Words you will need

mine

копальня, рудник, підкоп

water supply system

система водопостачання

canal, n [kəˈnæl] *Syn. channel, duct*

канал

the English Channel

Ла-Манш

the Chunnel

«Чаннел», назва тунелю під Ла-Маншем, що сполучає Францію та Великобританію: CH(ANNEL) + (T)UNNEL = *the Chunnel*

feat, n *Syn. exploit, great (heroic) deed*

подвиг, майстерність, сприт-ність;

!Mind the difference:

мистецтво; справа; фах, професія

бойовий подвиг - feat of arms

трудоий подвиг - the great labour

exploit

подвиги героя - the deeds of a hero

dig, v (*dug, dug*)

копати, рити

clay, n

глина ; часто земля ; мул, твань,

mud, n

бруд; сльота; твань, мул; шлам

grout, v [graʊt]

залити вапном (цементом)

gravel

гравій

slit, v (*slit, slit*)

розрізати вздовж, нарізати вузькими

смужками

slit , <i>n</i>	поздовжній розріз; щілина
soil , <i>n</i>	земля, ґрунт
shield , <i>n</i>	щит; захист
layer , <i>n</i> [leɪq]	шар, пласт; нашарування
explosive , <i>n</i>	вибухова речовина
detonate , <i>v</i>	вибухати, висаджувати в повітря; детонувати
withdraw , <i>v</i> (<i>withdrew; withdrawn</i>) <i>Syn., to take back, to remove</i>	відсмикувати (руку тощо), відходити, віддалятися; ретируватися; виймати, діставати
anticipate , <i>v</i> <i>Syn., wait, foresee</i>	передбачати, чекати, сподіватися
trench , <i>n</i>	рів, канава; котлован, траншея, окоп
trench , <i>v</i>	копати, рити (канави, рови, траншеї, окопи); прорізувати (жолобки, борозни); скопувати
beneath , <i>adv</i>	нижче; під ; внизу
bay , <i>n</i>	затока, бухта; ніша; прогін між колонами
bore , <i>v</i>	свердлити, розточувати ; із зусиллям прокладати собі дорогу (шлях)
bore , <i>n</i> <i>e.g. bore diameter —</i> <i>внутрішній діаметр, калібр</i>	діаметр, калібр
jack , <i>n</i>	важіль; домкрат, перфоратор
dredge , <i>n</i>	землечерпалка; драга
dredge , <i>v</i>	вичерпувати ; поглиблювати
pump , <i>v</i>	закачувати
suck out , <i>v</i>	висмоктувати
occasion , <i>n</i>	подія; випадок; нагода; привід
spring , <i>n</i>	джерело, жвавість, енергія, пружина;
spring , <i>v</i> (<i>sprang/sprung; sprung</i>)	стрибати, бити джерелом, виникати
fill , <i>v</i>	наповнювати
impervious , <i>adj</i>	непроникний (для - <i>to</i>);
e.g. impervious to light — <i>непроникний</i> <i>для світла</i>	несприйнятливий, глухий (до доводів тощо)
crest , <i>n</i>	гребінь (хвилі, гори, даху і т.д.)
lining , <i>n</i> [laɪnɪŋ]	підкладка; внутрішня оббивка; облицювання (каменем) ; кріплення

pilot tunnel	направляюча штольня
perform, v	виконувати ; здійснювати
fume, n	дим; кіптява
exhaust fumes	вихлопні гази
silt, n	мул, осад на дні
prefabricated, adj	виготовлений заводським способом
prefabricated section	збірна секція
immersed tube	опускна секція підводного тунелю
tail of the shield	хвостова частина
drill, v	свердлити, бурити
pneumatic [njH`mxtlk]drill	пневматичний бур для гірських порід
heading, n	напрямок проходки
cut-and-cover method	відкритий спосіб проходки тунелю
mole, n	комбайн бурового типу
dump, v	скидати, звалювати , вивантажувати
loose material	щебінь та уламки каменю, не
	утрамбований сипучий матеріал
utilize, v	утилізувати, використовувати
carbon monoxide	чадний газ
[ˈkRrbqnmq'nOksald]	
crossing, n	переправа
burst, v	лопатися
hole, n	отвір, свердловина,
sophisticated, adj	досвідчений, складний

Pre-reading.....

Task 1. While reading the text you will come across a number of international words:

Tunnel, popular, temperature, construction, canal, diameter, system, structure, distance, ventilation, method, technique, kilometers, centimeters, hydraulic, automobile, cylinder, progress, pneumatic, geological, information.

Task 2. Answer the questions:

1. Where are usually tunnels constructed?
2. What types of tunnels do you have in your location?
3. Why are such tunnels constructed?
4. What benefits do they serve?

Reading.....

Task 1. Read the text carefully and translate it.

Tunnels

Most of the tunnels before the great age of railroad construction were built in connection with mines, water supply systems, or canals. As more tunnels were built, many significant technical advances were made in boring both through underwater clay and through rock.

One of the most remarkable tunnel building feats was the construction of the first tunnel under the Thames River in London. This tunnel is still used by the London Underground Railway System. It was dug out of clay beneath the riverbed between 1825 and 1843 under the direction of Sir Marc Brunei, who had designed a tunneling shield that made the work possible. The shield offered the workers protection while they dug out clay and mud in the face of the shield. It was then moved forward by jacks so that the process could be repeated.

One of the first major tunnels built through rock was the Mont Cenis Tunnel in the Alps between France and Italy. It is fourteen kilometers long and was built between 1857 and 1871. When construction began on it, progress was only twenty-two centimeters a day. Fortunately, the pneumatic drill, which uses compressed air to bore holes in rock, was invented a few years after construction began. Thereafter, the tunneling speed was increased to two meters a day. Like most tunnels, the Mont Cenis was bored from two different headings, one in France and one in Italy, which met in the middle.

The usual technique for tunneling through hard rock is to drill holes in the face of the heading. The holes are filled with an explosive that is detonated after the workers and equipment are withdrawn to a safe distance. After fumes and rock dust have settled, the rock brought down by the explosion is removed, often on conveyor belts. In many projects a small *pilot tunnel* is driven before the full diameter of the tunnel is excavated. This technique helps engineers to determine the geological features of the rock through which the tunnel is passing so that many difficulties can be anticipated. In some cases, work on the main tunnel progresses a few meters behind the pilot tunnel so that the latter provides ventilation, always a major problem in tunneling operations.

Shields that are modifications of the one that Brunei developed for boring the Thames Tunnel are used in excavating through clay or soft rock. A shield has a sharp edge that is driven into the tunnel face by hydraulic jacks.

The top edge of the shield projects for a short distance in order to protect the workers. Behind the cutting edge is the *tail*, which has a smaller diameter. The permanent lining of the tunnel is assembled in this area. The space between the lining and the larger diameter that has been excavated by the forward part of the shield is filled with a grout that is pumped in under pressure. Modern shields are highly mechanized so that many phases of the tunneling process can be performed almost completely by machine.

Silt, the soft mud that is typical of riverbeds and other underwater tunneling sites, presents difficult problems. In Brunei's Thames Tunnel, water broke through on several occasions, and the tunnel had to be pumped dry. In addition, Brunei had loads of clay dumped into the riverbed to make it more impervious to water. Modern engineers, of course, have developed and now use more sophisticated soil stabilization techniques when they tunnel through silt, sand, or loose material such as gravel. Most underwater tunnel construction through these materials utilizes shields with compressed air.

Another technique that has come into wide use in recent years is the *immersed-tube* system. In this technique a channel is *dredged* along the line of the tunnel; in other words, silt is pumped out of the water bed. Piles are then driven along the channel, and prefabricated sections of the tunnel are lowered into place onto the piles. The tunnel sections are closed by temporary faces that are removed after all the sections have been assembled. The joints between the sections are also made watertight at this stage of construction. Finally, the channel is filled in to give the tunnel greater stability.

A technique that is often used for subway construction is the cut- and-cover method. Workers excavate a trench, inside of which the lining for the tunnel is built. It is then covered over with the earth or other fill that was originally removed. The cut-and-cover method obviously can only be used when the tunnel is immediately beneath the surface. One difficulty is that normal street traffic must often be allowed to continue during construction. In such a case, wooden beams or steel plates are laid down to cover the excavation.

Ventilation is a major problem in all tunnels, but particularly in those to be used by automobile traffic. The exhaust fumes of automobiles contain carbon monoxide, a deadly gas. Most automobile tunnels therefore have two systems of ducts. Huge fans pump in fresh air through one of them, while polluted air is sucked out through the other.

Special Terms

Tunneling Shield: A large cylinder with a cutting edge that can be moved forward

by jacks. It is used when tunneling through clay or soft rock.

Tail: The back part of a shield.

Pneumatic Drill: A compressed air machine that is used to make holes in rock.

Heading: The point from which work progresses on a tunnel. Most tunnels are bored from two headings.

Pilot Tunnel: A small exploratory tunnel bored in advance of a tunnel project along the same route. It provides geological information, as well as ventilation.

Immersed Tube: A tunnel made of prefabricated sections that are sunk into position.

Cut-and-cover: A tunneling technique. A trench is excavated and the tunnel lining assembled in it. The trench is then filled in.

Dredging: Pumping silt or sand usually from the bottom of a body of water such as a river or a harbor.

Duct: A tube or channel that carries something, as an aqueduct carries water. A system of ducts is used for ventilation in most tunnels.

Mole: A tunneling machine that can bore through hard rock.

Task 2. Give answers to the following questions:

1. Before the great age of railroad construction, why were most tunnels built?
2. When was the first tunnel built under the Thames River in London?
3. What made the construction of Brunei's Thames Tunnel possible?
4. What was one of the first major tunnels built through rock? How long is it?
5. How rapid was progress at the beginning? What increased the speed of construction?
6. What is the usual technique for tunneling through hard rock?
7. What is sometimes excavated in advance of the main tunnel? Why?
8. Why is there a space between the excavated space and the tunnel lining?
9. What is silt and where is it often encountered?
10. How did Brunei deal with the problem of water in his tunnel?

ACTIVITY 1

Pick one subway system to research. Examples include the system in Washington, D.C., considered one of the best in the world; the subway system in New York City; the "Tube" in London, England; the Metro in Kyiv, Ukraine. Research when it was built, record any new or unusual technologies or materials used in its construction, and find a map showing the system's different routes. Present the information in the form of a multimedia presentation.

DID YOU KNOW?

Channel Tunnel. (United Kingdom) is recorded to be the world's longest undersea portion of any tunnel and second largest railway tunnel. This railway tunnel was built in 1994 and is about 50,450 meters in length.

Orange-Fish River Tunnel is the water supply tunnel built in 1972 in South Africa. It is the longest in southern hemisphere with a length of 82,800 meters.

Laerdal Tunnel (Norway) is considered the longest **road tunnel** in the world. It was built in year 2000 and has a length of 24,510 meters.

Lotschberg Base Tunnel was built in 2007 and located in Switzerland. It is the world's longest **land tunnel** and a railway single track with a length of 34,577 meters.

Seikan Tunnel (Japan). It was built in 1988 with a length of 50,450 meters. It is currently the world's longest and deepest **rail tunnel**.

Seoul Subway Line 5 is found in South Korea. It serves as a **transit tunnel** that was built in 1995. The tunnel's length is about 47,600 meters. It is considered as the world's second longest fully underground subway line.

Practicing.....

Word-building

Affixation: Suffixes of Nouns

Suffixes of Adjectives		
Suffixes	Meanings	Examples
-able/-ible/ -uble -ant/-ent -ive	form adjectives from verbs	workable, convertible, soluble resistant, dependent active, positive
-ar/-ary -ic/-al -ous/ious -less -ful -y -ed/-d, -en -ish	form adjectives from nouns	molecular, primary poetic, ethical famous, curious careless, useless delightful, beautiful rainy, cloudy wooded, woollen Irish, childish

Ex.1. Explain the meaning of prefixes and translate the words:

Permanent, sunny, delicious, impervious, geographic, formal, significant, productive, Scottish, different, regular, extraordinary, electronic, faultless, temporary, remarkable, typical, geological, hydraulic, technical, possible, wooden.

VOCABULARY EXERCISES

Ex.1. Read the pairs of antonyms and translate them into Ukrainian:

permanent-temporary, wet-dry, pump-suck out, fresh-polluted, usual-specific, difficult - easy, remain-leave, safe-dangerous, inside-outside, deadly-immortal, exit-entrance, necessary - unnecessary, wide- narrow, bottom-top.

Ex.2. Read the pairs of synonyms and translate them into Ukrainian:

Crest - peak, to pump – to inject, to assemble–to collect, principal- chief, difficulty-obstacle, feat-skillful, duct – tube, beneath- below, accomplishment- fulfilment,

Ex.3. Give English equivalents of the following.

Важливі технічні поліпшення, плоскість забою в напрямку проходки, дві системи каналів, з'єднання між секціями, безпечна відстань, геологічні характеристики каменю, швидкість зроста, бурити отвір, більш складні методи стабілізації ґрунту, дерев'яні балки, збірна секція, відкритий спосіб проходки тунелю.

Ex. 4. Fill in each of the blanks in the following sentences with the appropriate word or phrase.

1. A tunneling shield is moved forward by _____.
2. The face of a tunneling shield has a larger _____ than its tail.
3. The lining of a tunnel excavated by means of a shield is somewhat smaller than the area excavated; the space is filled in by a _____ pumped in under pressure.
4. _____ drills, which operate with compressed air, are used to bore holes in hard rock.
5. When holes have been bored in hard rock, they are filled with an _____ which is then detonated.
6. A pilot tunnel is often bored in advance of the main tunnel in order to determine the _____ features that will be encountered.
7. It is common practice today to use soil _____ techniques for tunneling through silt, sand, or gravel.
8. When a tunnel is being built immediately beneath the surface, the _____ method is often employed.
9. Where traffic has to continue above a shallow trench, wooden _____ or _____ plates are often laid down to provide a surface.
10. _____ is a major problem in automobile tunnels because exhaust fumes contain carbon monoxide, a deadly gas.

11. Fresh air is pumped in through one _____, while polluted air is sucked out through another.
12. A _____ is a new type of machine that can bore through hard rock.

ACTIVITY 2

Describe briefly the tunneling technique that would be used to bore through each of the different kinds of material given below. If more than one technique could be used, describe both. Present the information in the form of a multimedia presentation.

1. Clay or soft rock.
2. Silt, sand, or gravel.
3. Hard rock.
4. Earth or loose rock immediately below the surface.

Ex.7. Translate the text into English. Reproduce it.

Тунелі.

Інженери будують різні види тунелів: тунелі під водою, тунелі у гірській породі та тунелі у м'яких земляних породах (soft-ground tunnels). Для цього використовуються різноманітні техніки. Звичною є методика прокладання тунелю через гірську породу з допомогою буріння отвору в ній. Іншою є техніка системних секцій, що опускаються під воду. Ще одна техніка побудови тунелів для метро – це прокоп тунелю відкритим способом. Однак цей метод можна застосовувати, коли тунель розміщується зразу ж під поверхнею землі.

Найбільшою проблемою в усіх тунелях, а особливо у тих, які використовуються автомобільним транспортом, є проблема вентиляції. Тому більшість таких тунелів мають дві системи труб для вентиляції. Свіже повітря закачується в одну з них, в той час як забруднене повітря висмоктується через другу.

Miscellaneous

Ex. 8. Choose and use: work on (be busy with); work out (1. find by reasoning; 2. turn out successfully); work up (develop)

1. We can't work this mathematical equation. 2. I wanted to become a tunnel builder but I didn't work..... . 3. Let's work..... the best route from Kyiv to Lutsk. 4. He is working a new tunnel project at the moment. 5. After a day working on a building site, I had really worked an appetite.

GRAMMAR EXERCISES

Ex. 1 Find in the text *Tunnels* sentences with the words *few, a few*. Explain their use.

Ex.2. Give advice to your friend in the following situations. Use the modal verb *should*.

e.g.: A: / I have an examination tomorrow.

B: Well, you should work very hard tonight.

What should I do?:

1. I don't know how to draw up a report of my experiment. What should I do? 2. I'm very tired after the practical class. 3. I'd like to know more about bridges. 4. I'd like to buy builder helmet. 5. I want to become a civil engineer but I don't know what I must study and at what University. 6. I want to quit smoking. 7. I won 100,000 dollars and I don't know how to spend it. 8. I found a wallet which had 2,000 dollars in it. Should I spend it? 9. I have a headache. 10. I hate working. 11. I feel sad. What should I do? 12. I am always late. What should I do? 13. I have a cold. What should I do? 14. I am new in this city. I would love to meet some people. What should I do? 15. I want to get rich quickly. What should I do? 16. I need a car but I don't have enough money. What should I do? 17. My girlfriend left me. I feel depressed. What should I do? 18. I need to find a job of a civil engineer. What should I do? 19. I need to learn English much faster. 20. My girlfriend/boyfriend is seeing another boy/girl. I saw a message in his/her mobile phone. What should I do?

Ex. 3. Translate the sentences into English:

1. Вам слід почати будувати мости для швидкісного транспортного сполучення. 2. Тобі слід використати технологію прокладання тунелю через гірську породу. 3. Вам слід вивчити досвід Брунея. 4. Для прокладання тунелю для метро слід використати відкритий спосіб проходки тунелю. 5. Оскільки вентиляція є головною проблемою в тунелях, вам слід мати дві системи труб: одну для вихлопних газів, а другу для свіжого повітря.

Ex.4. Write the appropriate form of the infinitive.

- | | | | |
|----------------------|--------------------|-----------------------|-------|
| 1 she finished | (to) have finished | 6 it is brought | |
| 2 he was driving | | 7 they are studying | |
| 3 it has been taught | | 8 it will be accepted | |
| 4 they had come | | 9 it was written | |
| 5 she tries | | 10 she has left | |

Ex.5. Fill in the correct form of the infinitive.

I've looked everywhere, but the file appears ...*to have been misplaced*... (misplace).

1He is not old enough..... (allow) to stay out late.

2Since her illness she seems.....(find) work difficult.

3The little dog seems (lose) its master.

4 I don't think I'll be able to make it tomorrow. I'm supposed..... (meet) Jane for lunch.

5 She was only pretending(read); she was really daydreaming.

6 No one is..... (admit) to the concert without a ticket.

7 I need you (help) me prepare the project about technique for tunneling through hard rock.

8 The accident is believed(cause) by reckless driving.

9Aren't you supposed (look after) your notes about the construction of Brunei's Thames Tunnel at the moment?

Ex. 6. Open the brackets, using the correct form of the infinitive.

1. He seems (to read) since morning about this tunneling technique. 2. She seems (to work) at his problem since she came here. 3. He appears (to know) French well. He is said (to spend) his youth in Paris. 4. You seem (to look) for trouble. 5. They seemed (to quarrel). I could hear their angry voices. 6. They are supposed (to work) at the problem for the last two months. 7. They seemed (to wait) for ages.

SUPPLEMENTARY READING

Interesting about Tunnels

Tunnels provide some of the last available space for cars and trains, water and sewage, even power and communication lines. Today, it's safe to bore through mountains and burrow beneath oceans - but it was not always this way. In fact, it took engineers thousands of years to perfect the art of digging tunnels.

Roman engineers created the most extensive network of tunnels in the ancient world. They built sloping structures, called aqueducts, to carry water from mountain springs to cities and villages. They carved underground chambers and built elegant arch structures not only to carry fresh water into the city, but to carry wastewater out.

By the 17th century, tunnels were being constructed for canals. Without roads or railways to transport raw materials from the country to the city, watery highways became the best way to haul freight over great distances.

With trains and cars came a tremendous expansion in tunnel construction.

During the 19th and 20th centuries, the development of railroad and motor vehicle transportation led to bigger, better, and longer tunnels.

Today, not even mountains and oceans stand in the way. With the latest tunnel construction technology, engineers can bore through mountains, under rivers, and beneath bustling cities. Before carving a tunnel, engineers investigate ground conditions by analyzing soil and rock samples and drilling test holes.

There are three steps to a tunnel's success. Today, engineers know that there are three basic steps to building a stable tunnel. The first step is excavation: engineers dig through the earth with a reliable tool or technique. The second step is support: engineers must support any unstable ground around them while they dig. The final step is lining: engineers add the final touches, like the roadway and lights, when the tunnel is structurally sound.

Based on the setting, tunnels can be divided into three major types: Soft-ground tunnels are typically shallow and are often used as subways, water-supply systems, and sewers. Because the ground is soft, a support structure, called a tunnel shield, must be used at the head of the tunnel to prevent it from collapsing. Rock tunnels require little or no extra support during construction and are often used as railways or roadways through mountains. Years ago, engineers were forced to blast through mountains with dynamite. Today they rely on enormous rock chewing contraptions called tunnel boring machines. Underwater tunnels are particularly tricky to construct, as water must be held back while the tunnel is being built. Early engineers used pressurized excavation chambers to prevent water from gushing into tunnels. Today, prefabricated tunnel segments can be floated into position, sunk, and attached to other sections.

Answer the questions:

1. What did the Roman engineers build?
2. What are the three steps to a tunnel's success?
3. What are the types of the tunnels?

FOR PLEASURE.....

There is a light at the end of every tunnel. Proverb

“The light at the end of the tunnel is not an illusion. The tunnel is.”

Module five

DESIGN IN CONSTRUCTION

UNIT ONE

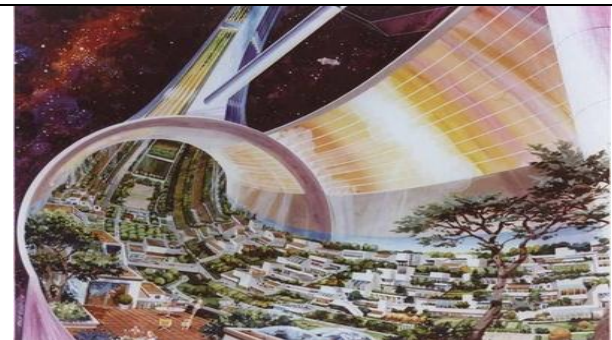
Reading: The History of Interior Design

Word-building: Suffixes of Verbs

Grammar: 1. Zero Conditional.
2. First Conditional

Supplementary

Reading: The History of Interior Design



Phonetic Drills

*If two witches were watching two watches,
which witch would be watching which watch?*

*To know everything is to know nothing.
A good beginning makes a good ending.*

Words you will need.....

evidence

доказ, свідчення

cave, n

печера

hut

хатина, халупа, барак

dome

купол, склепіння

decorate, v

прикрашати, декорувати

employ, v

наймати, вживати, застосовувати

beautify, v

прикрашати

lavish, adj

марнотратний, щедрий, багатий

lavish, v

бути щедрим, дарувати, роздавати

*e.g. If she lavished as much care on the
children as she does on the dog, the
family would be better off.*

note, v

помічати, звертати увагу

glow, v

розжаруватися, сліпуче сяяти

tapestry, n

тканина ручної роботи; гобелен

elaborate

детально розробляти

carve, v (past carved, p.p. carved,
carven) [kɑ:v]

вирізувати, витісувати, висікати

exaggerate, v

перебільшувати

grandeur, n [ˈgrɪnGɔ]

велич, пишнота, шляхетність

produce, v	виробляти, продукувати
chandelier [ˈʃændəlɪər]	канделябр, люстра
motif, n [ˈmɒtɪf]	основна тема, лейтмотив
fashion <i>Syn. vogue</i>	мода
<i>in fashion, in vogue</i>	за модою, в моді
<i>out of fashion, out of vogue</i>	не в моді; те, що вийшло з моди
<i>all the vogue</i>	останній крик
<i>to have a vogue</i>	бути популярним
<i>to come into vogue</i>	ввійти у моду
<i>to bring into vogue</i>	вводити у моду
<i>to acquire vogue</i>	набути популярності
fashionable, adj	модний, фешенебельний
match, v	підходити, добирати до пари
adopt, v	приймати, добирати, вибирати
juxtapose, v [ˌdʒʌkstəˈpəʊz]	розташовувати поруч, зіставляти
emerge, v [ɪˈmɜːdʒ]	виявлятися, виходити, впливати;
	справляти сильне враження
imposing, adj	імпозантний
horrify, v	викликати жах, шокувати
defiance, v [dɪˈfaɪəns]	виклик, непокора
explicate, v	розвивати (думку) ; розгортати
	(ідею), пояснювати, з'ясовувати,
	тлумачити
recover (from), v	видужувати, оклигувати (від)
flourish, v	пишно рости, процвітати
blossom, v	цвісти
slogan, n	лозунг, гасло, девіз
awareness, n	компетентність, поінформованість

Pre-reading.....

Task 1. While reading the text you will come across a number of international words, translate them: to decorate, form, culture, building construction, sculpture, vase, mosaic, style, ornamental, colour, velvet, period, detail, drama, classic form, to combine, revolution, design standards, theory, profession, decorator, harmony, utopian idea, glamour, symptoms, fantasy, minimalistic.

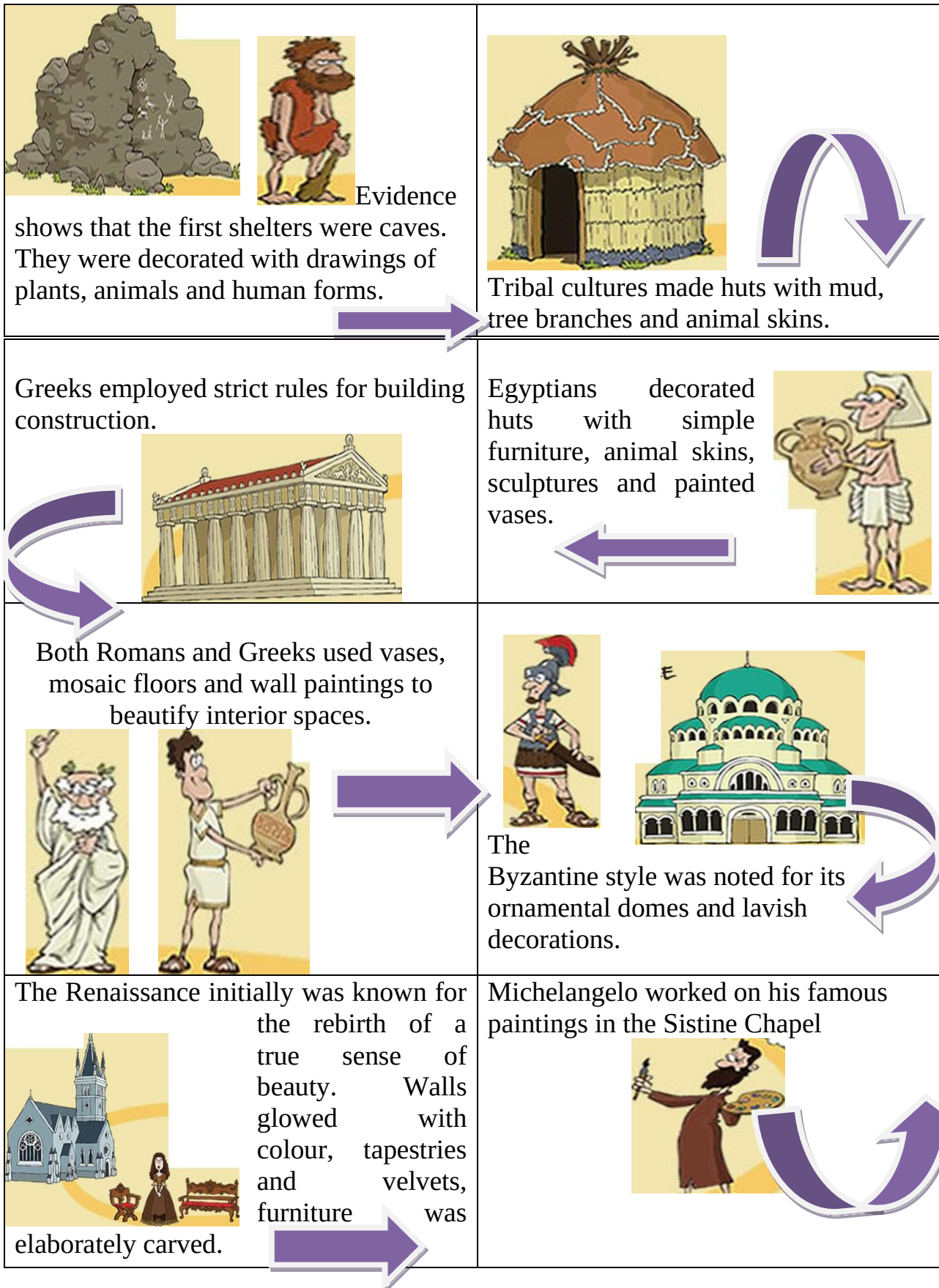
Task 2. Answer the questions:

1. When did people begin, in your opinion, to decorate their dwellings?
2. What styles of design do you know?

Reading.....

Task 1. Read the text carefully and translate it.

The History of Interior Design



 Baroque was a period of artistic style which used exaggerated detail to produce drama and grandeur. Rooms were rich with chandeliers and mirrors.	Regency style was a new interpretation on greek styles with emphasis on classic form. Most regency furniture combined egyptian, chinese and gothic motifs with neo-classical elements. It was fashionable for chairs and curtains to match. Red was very popular. 
Art nouveau was an inspired by forms. 	The industrial revolution opened up interior design to the common man. Interior design magazines came into vogue. 
The aesthetic movement was radical and was away for reformers to show their defiance of design standards of the age. The 'art for arts sake' slogan was adopted which turned victorian values upside down. 	Eclecticism draws inspiration from multiple theories and styles-design. Styles are created by juxtaposing elements from varoius eras. 
Interior design emerged as the profession. Elsie de Wolfe was a prominent interior decorator at the time and photos in magazines helped spread eclectism to middle classes. 	The beaux arts style took its name from France. It was imposing and grand and horrified many. 
Frank Lloyd Wright credited for early success of modernism movement by creating the prairie style house. 	Dutch for the style: <i>De Stijl</i> was a dutch artistic movement which explicated a new utopian idea of harmony or order. 

International style blossomed in 1920'. Le Corbusier, Ludvig Mies van der Rohe and Walter Gropius were big names for modern architecture. 	There was a radical simplification of form, a rejection of ornamental and adoption of glass, steel and concrete as preferred materials. As countries recovered from the war there was a return to prosperity.
 'Suburban sprawl'- clusters of houses were developed and interiors were designed by home owners.	Artdeco flourished internationally throughout the 1930'. It represented glamour, elegance and modernity, featured simple clean lines, striking colours, and stylish patterns. 
 Vinyl was the flooring product of choice.	After WWI air travel increased speed of communication and increased awareness of design. 
 Post modernism mixed various styles. The movement was synonymous with fantasy and freedom.	 Post modernism borrowed styles from the past to create eclectic designs.
A revival of traditional style of post modernism. New works were built on basis of classic principles. 	The late 90's saw interior design of sky rocket thank to TV makeover shows like "Changing Rooms". 
 ... 	Contemporary interior design sees bright, bold colours matched with neutrals, smooth lines and a minimalistic look.  

Task 2. Give answers to the following questions:

1. What was the first human's dwelling?
2. What materials did early people use to build their dwellings?
3. How did Egyptians, Romans and Greeks decorate their dwellings?
4. What styles were mentioned in the text?
5. What was the Byzantine style noted for?
6. What was the Renaissance initially known for?
7. Which style used exaggerated details?
8. What style was red popular for?
9. When did interior design magazines come into vogue?
10. What did the 'art for arts sake' slogan mean?
11. Who was the first prominent interior decorator?
12. What style is the mixture of various styles?
14. What are the features, in your opinion, of a contemporary interior design?

ACTIVITY

Make a list of all design-styles you know. Choose one of them and characterize it according to the following questions:

- When and where did the style appear?
- What does/did the style represent?
- What type of furniture characterizes the style?
- What colours prevail in this style?
- Whose name(s) is this style connected with?

Present the information in the form of a multimedia presentation.

DID YOU KNOW?

The Pioneers of Interior Design

Jean-Henri Jansen (1854-1928), a dutch designer launched one of the first ever international interior design companies 'Maison Jansen' (House of Jansen) in 1880, which became renowned for designing and creating exceptionally beautiful and high quality furniture which would be utilized in a multitude of interior decoration projects.

Elsie de Wolfe (1865-1950) is the first lady of interior decoration. This Victorian stage actress was credited by many to be the inventor of the modern profession of interior design. Elsie disliked Victorian tastes altogether, her designs were therefore generally made up of light and bright colors, contrary to the drab and gloomy Victorian décor coupled with unnecessary excesses such as heavy velvet draperies. This was a pioneering departure from the contemporary designs of the time. Elsie's influence continues to be felt in the modern world of interior design.

Practicing.....

Word-building

Affixation: Suffixes of Verbs

Suffixes	Meaning	Example
-ate	make the word a verb	eradicate
-en	become	enlighten
-ify, -fy	make or become	terrify
-ize, -ise	become	civilize

Ex.1. Explain the meaning of suffixes and translate the words: awaken, harden, economize, activate, falsify, clayen, equalise, amplify, fasten, minimize, loosen, uglify, analyze, evaporate, deepen, neutralise, speacify, allocate, horrify, utilize, formulate, medicate, popularize, moisten, estimate, prettify, authorize, strengthen, frashen, lighten, standardise, graduate, demonstrate, wooden, explicate, antagonize, boxen, wikify, brighten, zombify, realise.

VOCABULARY EXERCISES

Ex. 1. Find in the text:

a)antonyms to the following words and translate them into Ukrainian:

to destroy; vogue; old; decline; to decrease; failure; rural style; out-of-fashion; ugly; palace; dark colours; exterior design; decay; unknown; ancestor.

b)synonyms to the following words and word combinations and translate them into Ukrainian:to come into fashion; trend; wasteful; decorative; wealth; modern; explanation; consciousness; proprietor; to shine; inlay, rebirth; motto.

Ex. 2. Give Ukrainian equivalents of the following.

To employ strict rules, to draw inspiration from juxtaposing elements, art for art sake, to be imposing and grand, utopian idea, rejection of an ornamental, a return to prosperity, strikny colours, stylish patterns, awareness of design, TV makeover shows, contemporary interior design, exaggerated detail, the rebirth of a true sense of beauty, lavish decorations, tribal cultures, prominent interior decorator.

Ex.3. Give English equivalents of the following:

Візантійський стиль; барокко; англійський ампір; модерн; Сикстинська

капела, неокласичний стиль/боз-ар, неконтрольоване розростання міста за рахунок передмість, стиль прерії, гармонія і порядок, демонструвати непокору стандартам дизайну; меблі епохи регентства; сміливі кольори; свідчення вказують; мозаїчна підлога; “перевернути з ніг на голову”; проста людина; Перша світова війна; швидкість сполучення; радикальне спрощення; оксамит.

Ex. 4. Fill in each of the blanks in the text with the appropriate word given below.

Design Development

The term “design” appeared not long ago. The direct translation of this term from English firstly gave us an approximate meaning of “painting”; but now we can use it also in the meaning of constructing or planning. In 1907 there was founded an industrial union in Germany, which united _____, architects, artists and merchants. Its creation was demanded by economic and esthetic causes in order to win the international market. The founder, an architect German Mutezius, was there as a president of the union “Werkbund” till 1914. As a goal the union wanted to reorganize _____ into the industrial one and to create some common or ideal samples for manufacturing; they “led a struggle” with extra decoration of goods. Their program was devoted to using and the best ideas and opportunities in art, trade, manufacturing in order to unite the largest industrial representatives. The most important event of that period was the..... of Peter Berence as an art director to a great Electric Company that produced different electric staff:____, motors, tools. As the owner wanted the production _____ all over the world market, so he was interested in creating a new image of his firm (that was an innovation in promotion of goods of that period). In 1919 in a little German town Weiniar, there was founded the “Bauhaus”– the first institution to _____artists for the work in industry. The head of the establishment was Germanic architect Walter Gropius, a former Peter Berence's student.

During a very short period the “Bauhaus” managed to become a large design-training center. Having moved in Dessau the college was given a building containing study-rooms, workshops and _____. But after its Head had left for Russia in 1930 the college was closed.

Words: a hostel, train, invitation, lamps, to widespread, the handicraft production, selecting, industrialists

Ex. 5. Learn some information from Fig. 1 and answer the questions:

1. What practical and theoretical courses did students study in “Bauhaus”?
2. Were the students of “Bauhaus” well prepared for their future job? Give your reasons. Use as the beginning the following expressions: *In my view/opinion; To my mind; I think that...; From my point of view....; As I see it...; Personally I think...;*

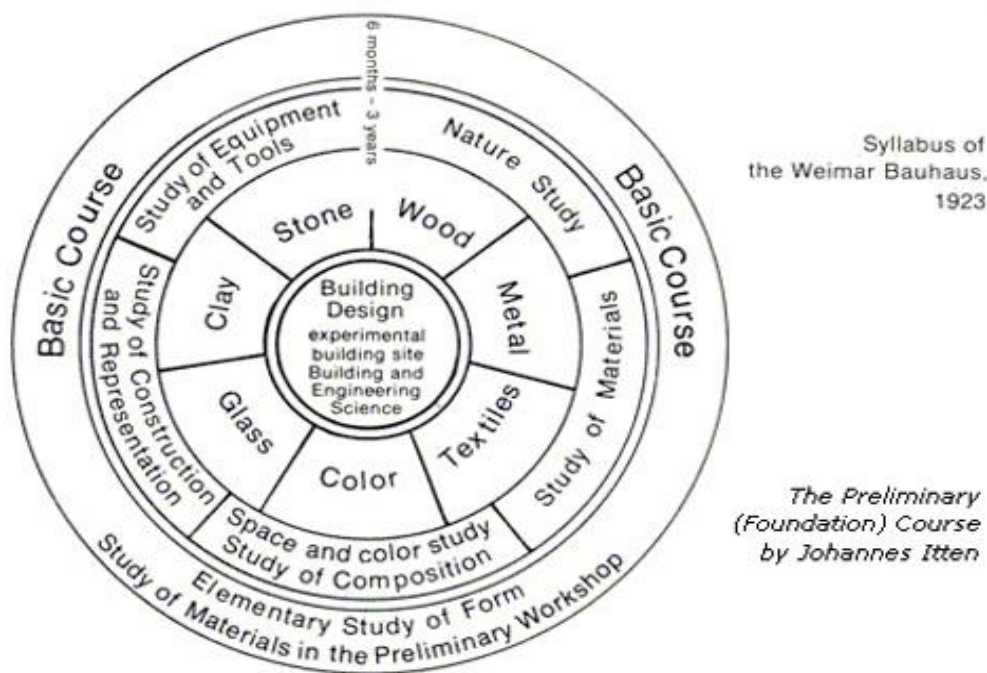


Fig.1. Syllabus of the Weimar Bauhaus, 1923

Ex. 6. Translate the text into English. Reproduce it.

Історія дизайну

Термін «дизайн» виникнув давно і спочатку означав «малювання», але зараз вживається у значенні «будування» і «планування».

Історія дизайну інтер'єру розпочалася ще з первісного житла – печер. Перші люди прикрашали печери малюнками тварин і людей. У древні часи люди будували житло з брудну/мулу, глини, гілля дерев та шкур тварин. Пізніше прикрашали житло шкурами тварин, скульптурами та вазами.

Римляни та греки використовували мозаїчну підлогу та розфарбовували стіни.

На сьогодні відомо багато стилів дизайну інтер'єру: візантійський, ренесанс, барокко, англійський ампір, модерн, неокласичний стиль, стиль

прерій, модерн, пост-модернізм, артдеко, контемпорарі, інтернаціональний, еклектицизм та інші. Одними з перших відомих дизайнерів інтер'єру є данець Джин-Генрі Янсен та американська актриса Елсі де Вульф.

У Німеччині у 1907 році утворилася промислова спілка з метою реорганізувати ремесляне виробництво у промислове, котра об'єднала промисловців, архітекторів, митців та торговців. Надалі було засновано «Баухаус» – великий центр підготовки дизайнерів, - де готували митців для роботи у промисловості.



За навчальним планом 1923 року студенти вивчали природознавство, матеріали, простір та колір, форму, композицію, устаткування та інструменти, рисунок. Результатом впливу Баухаусу на промисловість та архітектуру того часу стало спрощення та уникнення надмірної декорації будівель та товарів.

Miscellaneous

Ex. 7. Choose and use: do away with (abolish); do down(speak badly of sb); do in (kill); do out (clean); do up (1 fasten, tie 2 redecorate); do with (1. need, want; 2. have a connection with); do without (manage to live or continue without).

1. No one can do water for more than two days. 2. The death penalty was done in Britain many years ago. 3. You'd better do your shoes or you'll trip over your laces. 4. He was arrested for doing a woman with a gun. 5. It's so hot, I could do a nice cool drink.

GRAMMAR EXERCISES

Ex.1. Translate the sentences (Zero Conditional):

1. If you heat water, eventually it boils. 2. If people don't eat or drink, they die. 3. If people eat too much, they get fat. 4. People die if they don't eat. 5. Snakes bite if they are scared. 6. If babies are hungry, they cry. 7. If you visit London, go on the London Eye. 8. If unemployment is rising, people tend to stay in their present jobs. 9. If you've done that, go and have a coffee. 10. When you go on holiday, take plenty of sun cream. It'll be very hot. 11. When I'm concentrating, please don't make so much noise. 12. When I've finished an article, I always ask Kate to read it through. 13. Unless he asks you politely, refuse to do any more work on the project. 14. Unless prices are rising, it's not a good investment. 15. Unless you've

been there yourself, you don't really understand how fantastic it is.

Ex.2. Translate the story: When it rains, my roof leaks. When my roof leaks, the walls get wet. When the walls get wet, they get moldy. When they get moldy, I get sick. When I get sick, I go to the doctor. When I go the doctor, he always says the same thing, "Fix your roof!"

Ex.3. Answer the questions:

1. Do you keep a secret if a friend asks you to? 2. Do you laugh if you make a silly mistake? 3. If you have a choice, what kind of style do you prefer to use? 4. If you have a lot of work, do you do it right away or leave most of it for the next day? 5. If you have a large insect in the house, do you scream? 6. If you have friends over for dinner, do you cook most of the food or order from the restaurant?

Ex.4. Translate the sentences into English:

1. Якщо ви перебуваєте у Лондоні, то бачите Вестмінстерське абатство. 2. Якщо у помешканні добираються за червоним кольором штори та стільці, то цей дизайнерський стиль відомий як ампір. 3. Коли Ви відвідуєте Львів, то бачите будівлі у різних стилях: від ренесансу до модернізму та конструктивізму. 4. Коли архітектор обдумує проект будинку, він завжди дотримується будівельних стандартів та правил безпеки. 5. Якщо вони не вказують стиль декорування – обери за своїм смаком. 6. Якщо я втомлений, то я відпочиваю слухаючи музику. 7. Якщо ви заблудилися у місті, то слід запитати напрямок до нашого готелю. 8. Якщо ви ретельно готуетесь до пар, то ви отримуєте хороші бали.

Ex.5. Read and translate the sentences (The First Conditional):

1. If we take John, he'll be really pleased. 2. If you give me some money, I'll pay you back tomorrow. 3. If they tell us they want this lamp, we'll have to give it to them.

Ex.6. Choose the correct form of each verb to complete each sentence.

1. You _____ better if you turn on the lamp.
a) are able to see b) will be able to see
2. If you _____ an apple every day, you'll be very healthy.
a) eat b) will eat
3. If you don't put so much sugar in your coffee, you _____ so much weight!
a) won't put on b) don't put on
4. She _____ completely different if she cuts her hair.
a) will look b) looks

5. You won't pass the course if you _____.
 a) won't study b) don't study
6. If a deer _____ into your garden, it _____ all your plants.
 a) gets / will eat b) will get / eats
7. You _____ heart disease if you eat too much meat.
 a) will get b) get
8. If I _____ some eggs, how many _____?
 a) cook / will you eat b) will cook / do you eat
9. If we don't protect the elephant, it _____ extinct.
 a) will become b) becomes
10. You'll pay higher insurance if you _____ a sports car.
 a) buy b) will buy

Ex.7. Put the correct form of each verb in brackets:

1. If you (not study), you (fail) the test. 2. We (die) if we (not get) help soon! 3. If you (look) in the magazine, you (find) some interesting design projects. 4. If there (be) no oil in the engine, the car (break) down. 5. I (lend) you my water colours if you (need) them. 6. The sea level (rise) if the planet (get) hotter. 7. If you (eat) your sandwiches now, you (not have) anything for lunch! 8. You (be) safe in an accident if you (wear) your seatbelt. 9. If he (save) all his money, he (be able to go) on holiday to Paris. 10. I (not come) with you if you (not bring) Andrii!

Ex.8. Translate the sentences into Ukrainian:

1. Якщо ти підготуєшся до пари, то одержиш високий бал. 2. Якщо ви будете цікавитись стилем 30-х років 20 століття, то ви познайомитесь з артдеко. 3. Якщо студенти будуть вивчати історію дизайну, то вони розпочинатимуть з житла первісних людей. 4. Якщо ви будете цікавитись забудовою старої частини міста, то ви дізнаєтесь багато захоплюючих фактів. 5. Якщо він буде реконструювати квартиру, то він звернеться до вашого дизайнерсько-проектного бюро. 6. Якщо я стану будівельником, я збудую енергозберігаючий будинок. 7. Місто стане чистим, якщо усі дбатимуть про це. 8. Якщо ви прикрасите кімнату у гуртожитку своїми картинами, кімната стане затишною. 9. Якщо ви вивчатимете основні ознаки стилів дизайну, це допоможе вам у роботі у майбутньому. 10. Якщо ви успішно завершите навчання на нашому факультеті, то зможете працювати у будь-якій будівельній компанії.

SUPPLEMENTARY READING

The History of Interior Design

The beginning

The earliest evidence dates back to when early prehistoric humans first started to settle communities using elemental tools. The fact that these cave men used to decorate their dwellings with basic drawings could lead us to believe that interior design and looking after our homes is actually a primal instinct as well as a sign of our intelligence. Tribes to this day still use natural materials such as wood, mud and animal skins to fashion a comfortable and functional home.

Egyptians, Greeks and Romans

Egyptians were known for their ornate murals which acted as beautiful documents that detailed their beliefs, history and way of life. Life was a mix of stark parallels for the Ancient Egyptians. While many workers lived in primitive houses, the magnificent buildings they are best known for were usually for one ruler or a royal family to signify their wealth and to please their gods. This early civilisation set the trend for superb, ornate interior design in the name of religion which is still plays a big part in society today.

After Ancient Egypt fell to the Romans and Greeks, cities were drastically changed due to the Greek and Roman tastes in architectural style. Democracy and a more civilised way of life allowed normal citizens to show their personal tastes through interior design. The Greeks in particular employed strict rules for constructing their massive, pillared buildings and often used beautiful vases and paintings in their homes.

Design progression in Europe

After these influential periods in history, other distinctive design styles emerged in Europe, particularly Gothic architecture alongside the indulgent beauty seen during the Italian Renaissance. Again, the focus for many large scale buildings was based around religion with carvings, tapestries and murals which stretched over entire ceilings and walls. Beauty and function were equally important.

18th and 19th centuries

From Baroque's artistic exaggeration to the industrial revolution to Art Deco and Art Nouveau, interior design opened up to the common man, as fashion magazines and prints hit the shelves during the industrial revolution. Interior design was influenced by a mixture of styles from around the world as travel became more accessible. This eventually led to the age of eclecticism which drew these styles together to create personality and character.

20th and 21st century

Modernism and post-modernism soon followed. Designers became famous faces rather than behind the scenes workers. As countries recovered from war, there was a return to prosperity and a large influx in suburban sprawls. More people started to indulge in interior design as a form of escapism and personal interest. Makeover shows such as Changing Rooms also started to influence our homes and old, vintage styles were starting to be revived.

Today, it can be fair to say that we are still in an eclecticism era, as old vintage continues to be teamed with modern features. After thousands of years of groundwork, people can now play and experiment with a whole host of styles to create their perfect homes. Rather than uniformity, interior design is now fast paced with seasonal trends and forecasts for the coming year.

Answer the questions:

1. How many periods of interior design development do you know?
2. What is the primal instinct and a sign of our intelligence?
3. What was life for the ancient Egyptians?
4. When were cities changed due to the Greek and Roman tastes?
5. What rules did the Greeks employ for construction of their buildings?
6. Why was interior design influenced by a mixture of styles?

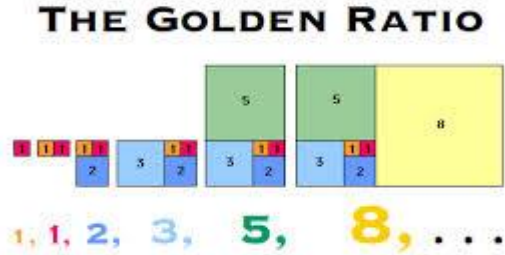
FOR PLEASURE.....

Design is a plan for arranging elements in such a way as best to accomplish a particular purpose. Charles Eames

Everything is designed. Few things are designed well. Brian Reed

There is no design without discipline. There is no discipline without intelligence. Massimo Vignelli

UNIT TWO

<u>Reading:</u> Beauty, Design, Building <u>Word-building:</u> Adjective Suffixes <u>Grammar:</u> 1. Second Conditional. 2. Third Conditional <u>Supplementary</u> <u>Reading :</u> Design vs Art	
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Phonetic Drills

An undertaker undertook to undertake an undertaking. The undertaking that the undertaker undertook was the hardest undertaking the undertaker ever undertook to undertake.

*Through three cheese trees three free fleas flew.
Freezy breeze blew.*

Big black bugs bleed big black blood in big black blotches.

Words you will need.....

identify, <i>v</i> reign, <i>n</i> [rein] emperor, <i>n</i> extensive, <i>adj</i> sequence, <i>n</i> notion, <i>n</i> durability, <i>n</i> Syn. strength utility, <i>n</i> strive, <i>v</i> (strove; striven) to fulfill, <i>v</i> inherent, <i>adj</i> superficially, <i>adv</i> furnishing store precisely, <i>adv</i> [pri'saɪslɪ] fault, <i>n</i> ratio, <i>n</i> ['reɪʃiəu] navel, <i>n</i>	встановити, виявити, ототожнити правління імператор великий, широкий послідовність поняття зносостійкість; строк служби корисність, практичність, намагатися, докладати зусилля виконувати властивий, притаманний; невід'ємний неглибоко, поверхово меблевий склад точно, чітко недолік відношення, коефіцієнт; пропорція; пупок; пуп (чого-небудь); центр;
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dimensions , <i>pl</i> [daɪ'men(t)ʃ(ə)nɪz]	розмір, величина; обсяг; розмах;
astonish , <i>v</i>	вражати
Fibonacci Numbers	числа Фібоначі
the Golden Ratio	золотий переріз, золотий поділ
phi [faɪ]	= Φ - 21-ша буква грецького алфавіту
an irrational number	іраціональне число
fraction , <i>n</i>	дріб
<i>common /vulgar/ fraction</i> — <i>простий дріб</i>	
decimal , <i>n</i> ['desɪm(ə)l]	десятковий дріб
pine cone , <i>n</i>	соснова шишка
tightly , <i>adv</i>	туго, щільно
suggestion	пропозиція, порада
pattern	зразок, приклад; зразок, шаблон; форма, модель; схема,
retail	продаж на викуп
robust , <i>adj</i> [rə'bʌst]	здоровий, міцний, сильний; дужий
solely , <i>adv</i>	єдино, тільки, винятково

Pre-reading.....

Task 1. While reading the text you will come across a number of international words: design, universal, architecture, theory, text, central, proportion, symmetry, model, illustrate, geometric forms, atmosphere, history, irrational, mathematics, principles, typically.

Task 2. Answer the questions:

1. What is beauty in your opinion?
2. Why do we think that some things, constructions or faces are beautiful?

Reading.....

Task 1. Read and translate the text.

Beauty, Design, Building

Marcus Vitruvius Pollio, the author of the oldest research on architecture which has remained till this day, worked during the reign of emperor August (20-30 BC). He wrote an extensive summary of all the theory on construction which is entitled: «Ten Books on Architecture (De architectura libri decem)». It was one of the first texts in history to draw the connection between the architecture of the body and that of the building.

Vitruvius believed that an architect should focus on three central themes when preparing a design for a building: *firmitas* (strength), *utilitas* (functionality), and *venustas* (beauty).

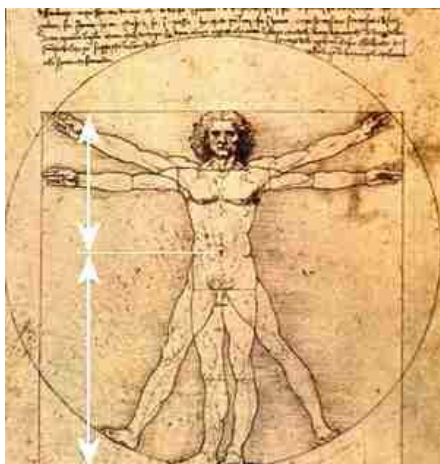
Is it possible to identify a universal sense of beauty – a definition of beauty that can be applied to all people and things at all times?

The theory of *venustas* (or beauty) is a very complicated one. Vitruvius thought that a timeless notion of beauty could be learnt from the “truth of nature”, that nature's designs were based on universal laws of proportion and symmetry. He believed that the body's proportions could be used as a model of natural proportional perfection. He showed that the 'ideal' human body fitted precisely into both a circle and a square, and illustrated the link between perfect geometric forms and the perfect body. In this way, the body was seen as a living rulebook, containing the fixed and faultless laws set down by nature.

Thus, according to Vitruvius, an architect's designs must refer to the unquestionable perfection of the body's symmetry and proportions. If a building is to create a sense of *eurhythmia* – a graceful and agreeable atmosphere – it is essential that it mirrors these natural laws of harmony and beauty.

Physical attraction depends on **ratio**. Our attraction to another person's body increases if that body is symmetrical and in proportion. Likewise, if a face is in proportion, we are more likely to notice it and find it beautiful. Scientists believe that we perceive proportional bodies to be more healthy.

Leonardo da Vinci's drawings of the human body emphasised its proportion.



Leonardo da Vinci's "Vitruvian Man",
showing the golden ratio in body dimensions

The ratio of the following distances is the Golden Ratio: (foot to navel): (navel to head). Similarly, buildings are more attractive if the proportions used follow the Golden Ratio. The Golden Ratio (or "Golden Section", Golden Mean, Divine proportion) is based on **Fibonacci Numbers**, where every number in the sequence (after the second) is the sum of the previous two numbers: 1, 1, 2, 3, 5, 8, 13, 21, ...

Let's look at the ratio of each number in the Fibonacci sequence to the one before it:

$$1/1=1$$

$$2/1=2$$

$$3/2=1.5$$

$$5/3=1.666...$$

$$8/5=1.6$$

$$13/8=1.625$$

$$21/13=1.61538...$$

$$55/34=1.61764...$$

$$34/21=1.61905...$$

$$89/55=1.61861...$$

If we keep going, we produce an interesting number which mathematicians call "phi" (**Golden Ratio** or **Golden Section** or **Golden Mean**): $\Phi=1.6180339887...$ This ratio was used by architects and artists throughout history to produce objects of great beauty (like Michelangelo's "David" and the Greek temples).



The Parthenon in Greece.



Michelangelo's David



Phi (Φ) is like pi (π) in the sense that it is an irrational number. There is no equivalent fraction for Φ and its decimal keeps going and never stops.

The Golden Ratio also occurs in nature. Such patterns we see in sunflowers, pine cones and so on. This is largely because one of the best ways to efficiently pack things tightly together is using the Fibonacci sequence.

Why are the objects that contain the Golden Ratio so pleasing? When people think of shapes with Golden section ratios they typically think of a Golden rectangle where one side divided by the other is 1.618. The Golden rectangle has been known since antiquity as one having a pleasing shape, and is frequently found in art and architecture as a rectangular shape that seems 'right' to the eye. One of the interesting properties of the golden rectangle is that if you cut off a square section whose side is equal to the shortest side, the piece that remains is also a golden rectangle.

Task 2 Give answers to the following questions:

1. When was the first book on architecture written?
2. What did Marcus Vitruvius Pollio write in that book?
3. What are the three central principles a good building should satisfy?
4. How could a notion of beauty be learnt according to Vitruvius?
5. What was used as the model of natural proportional perfection?
6. What does physical attraction depend on?
7. What synonyms to the word combination *the Golden ratio* do you know?
8. What is the Golden ratio?
9. What are the Fibonacci numbers?
10. Where is the Golden ratio used?
11. What is the Golden rectangle?

ACTIVITY:

Find out the examples of the Golden Ratio in nature. Try to find the best examples of buildings built according to this Ratio. Make up a presentation about the results of your research.

DID YOU KNOW?

According to Vitruvius, a good building should satisfy the three principles of *firmitas, utilitas, venustas*, which translate roughly as –

- Durability – it should stand up robustly and remain in good condition.
- Utility – it should be useful and function well for the people using it
- Beauty – it should delight people and raise their spirits.

According to Vitruvius, the architect should strive to fulfill each of these three attributes as well as possible. Leone Battista Alberti saw beauty primarily as a matter of proportion, although ornament also played a part. For Alberti, the rules of proportion were those that governed the idealized human figure, the Golden mean. The most important aspect of beauty was therefore an inherent part of an object, rather than something applied superficially; and was based on universal, recognizable truths.

Practicing.....

Word-building

Affixation: Adjective Suffixes

Suffixes	Meaning	Example
-able, -ible	capable of being	edible, presentable
-al	pertaining to	regional
-esque	reminiscent of	picturesque
-ful	notable for	fanciful
-ic, -ical	pertaining to	musical, mythic
-ious, -ous	characterized by	nutritious, portentous
-ish	having the quality of	fiendish
-ive	having the nature of	creative
-less	without	endless
-y	characterized by	sleazy

Ex.1. Explain the meaning of suffixes and translate the word: motivic, novelistic, polysemic, telephonic, calendrical, cylindrical, neurological, technological, zooarcheological, robustious, monotonous, harbourous, Londonesque, sculpturesque, museumesque, jargonesque, Hollywoodesque, horrifical, pseudonymous, ozonous, childish, dollish, fullish, anecdotive, projective, resultive, archless, artless, beliefless, brickless, bloomless, choiceless, colourless, wealthy, mixy, lucky, rosy, sunny, awful, beautiful, designful, careful, colourful, cultural, combinational, dozenal, global, extremal, disjunctional, includible, collapsible, existible, defectible, reflectible, engineerable, eatable, damageable, breakable, achievable, destroyable.

VOCABULARY EXERCISES

Ex. 1. a) Learn groups of antonyms and translate them into Ukrainian:

symmetry-asymmetry, proportion-disproportion, perfect-non-perfect, irrational-rational, beautiful-ugly, harmony-disharmony, healthy-ill, according-opposite

b) Find in the text synonyms to the following words and word combinations and translate them into Ukrainian.

Link, structural design of the body, magnetizm, exactly, relation, to try, to strength, the Golden Ratio, essential, preceding, to accept as true or real, in a rude manner, to concentrate.

Ex.2. Give English equivalents of the following: структура тіла; ірраціональне число; приємна та мила атмосфера; відображати природні закони гармонії та краси; поняття краси; теорія про будівництво; заповнювати щільно; правила пропорції; невід’ємна частина об’єкта; золотий переріз; траплятися у природі; від пупа до голови; упізнавана правда; золотий прямокутник; ритмічність.

Ex.3. Give Ukrainian equivalents of the following: different layouts, inherent part of an object, the rules of proportion. the idealized human figure, a Golden rectangle, pack things tightly together, to create a sense of eurhythmia, foot to navel, the fixed and faultless laws, universal laws of proportion and symmetry, to fit precisely into both a circle and a square, a living rulebook, can be applied to all people.

Ex.4. 1. Read and translate the text. Try to answer the following questions:

- a) What do the residential interior designers work with?
- b) What do the commercial interior designers work with?

2. Make up a list of objects different types of designers work with. Fill in the table:

Residential interior designer	Commercial interior designer
1. living spaces	1. spaces for government buildings

Types of Interior Design

There are a number of different interior design subfields, including residential and commercial, and within these general areas there are additional specialties. Residential professionals work with living spaces, primarily designing rooms for new or existing homes. Some even prefer working with a specific room such as the kitchen or bathroom, or planning and creating closet spaces. Many home furnishing stores have an interior designer or a team of professionals on staff who can make design suggestions and recommend furniture and other objects that will look good together in a room.

Commercial interior designers, on the other hand, plan spaces for government buildings, private businesses, or other corporate entities. Offices are a common focus of these professionals, but they may also work with schools, banks, retail establishments, and other public spaces. Some work to make hotels and restaurants functional and appealing, while others design areas in hospitals and other healthcare facilities; each field often requires specific knowledge about how the space can be used effectively by both customers or clients and staff members.

Ex.5. Translate the text into English. Reproduce it.

Золотий переріз

Вітрувіус – автор найстарішого твору про архітектуру – писав, що гарний будинок повинен задовольняти три основні принципи: зносостійкість, корисність, краса. Зносостійкість означає, що дім мусить бути у хорошому стані доволі довгий час. Корисність означає, що дім мусить слугувати для певних цілей та бути зручним. Принцип краси вимагає, щоб будівля стала об'єктом насолоди та захоплення і піднімала дух людей. Архітекторам слід намагатися втілити у життя усі три принципи при спорудженні будівлі.

Поняття краси доволі складне. Вітрувіус запропонував для вивчення краси брати за основу універсальні природні закони пропорції та симетрії.

З давніх часів людей цікавило питання: «Чому одні предмети для нашого ока більш приємні ніж інші?» Відповідь знайдено у поняттях Золотого перерізу та Золотого прямокутника. Золотий прямокутник – це прямокутник, де ділення однієї його сторони на іншу завжди даватиме число 1.618, яке називають Золотим відношенням чи Золотим перерізом.

Miscellaneous

Ex. 6. Choose and use: hold back: (hesitate, control, keep a secret), hold on (wait), hold out (endure, last), hold up (delay, rob).

1. The bank has been held twice this year. 2. Hold a minute while I get my jacket. 3. Will the car hold until we get to a garage? 4. The road works held the traffic. 5. Don't hold, tell me everything. 6. I was upset and unable to hold my tears.

GRAMMAR EXERCISES

Ex.1 Translate the sentences (The Second Conditional):

1. If I won the lottery, I would buy a big house. 2. If I met the Queen of England, I would say hello. 3. She would travel all over the world if she were rich. 4. She would pass the exam if she ever studied 5. If I had his number, I would call him. 6. If I were you, I wouldn't go out with that man. 7. If I had enough money I would buy a house with twenty bedrooms and a swimming pool.

Ex. 2 Translate the sentences (The Third Conditional):

1. If she had studied, she would have passed the exam. 2. If I hadn't eaten so much, I wouldn't have felt. 3. She wouldn't have been tired if she had gone to bed earlier. 4. He would have been on time for the interview if he had left the house at nine.

5 If you had saved your money, you could have bought a new flat. 6. If it had snowed, we could have gone skiing. 7. If we had taken a taxi, we wouldn't have missed the plane.

Ex.3. Translate the sentences (Mixed Conditional):

1. If I were you, I (to check) the facts before I accused them. 2. If she were in your position, she (to help) him by now. 3. If you (not to remind) me before, I (to forget) about it now. 4. If they (to invite) me yesterday, I (to come) to their place tonight.

Ex.4. Choose the correct form to complete the sentence:

1. If I had gone to England, I _____ missed Rachel's visit.
had.....would have
2. If I'd gone to University, I _____ liked to have studied Design.
had.....would have
3. I _____ gone to the cocktail party if I hadn't had too much work on.
had.....would have
4. I _____ recognized you if somebody hadn't told me who you were.
hadn't wouldn't have
5. I would have bought a Mercedes if I _____ been able to afford it.
had.....would have
6. I _____ sent you a postcard if I hadn't lost your address.
had would have
7. I wouldn't have told you if I _____ known that you would get upset.
had would have
8. I'd have come in earlier if I _____ known how much urgent work there was.
had would have
9. I _____ forgotten all about it if you hadn't reminded me.
had would have
10. I'd have helped you if you _____ asked me.
had would have

Ex.5. Translate into English:

1. Якби ми знали про Золотий прямокутник раніше, ми б розробили проект будинку більш привабливим для ока. 2. Якби ти прочитав про Золотий переріз, ти б зрозумів як розмістити ці деталі орнаменту. 3. Якби я не дізнався про Золотий переріз, я б не зрозумів принцип будови соснової шишки. 4. Якби я застосував правило Золотого прямокутника, то мій дизайн був би оцінений вище. 5. Якби не правило Золотого перерізу, то роботи пластичних хірургів були б не такі успішні. 6. Якби ми відвідували заняття минулого семестру, то не “завалили» б екзамен зараз.

SUPPLEMENTARY READING

Design vs Art

Design could be viewed as an activity that translates an idea into a blueprint for something useful, whether it's a car, a building, a graphic, a service or a process. The important part is the translation of the idea, though design's ability to spark the idea in the first place shouldn't be overlooked. Scientists can invent technologies, manufacturers can make products, engineers can make them function and marketers can sell them, but only designers can combine insight into all these things and turn a concept into something that's desirable, viable, commercially successful and adds value to people's lives. There are many misconceptions about design.

One definition, aired by designer Richard Seymour is «making things better for people». It emphasises that design activity is focused first and foremost on human behaviour and quality of life, not factors like distributor preferences. But nurses or road sweepers could say they, too, «make things better for people».

A **designer** is a person who designs. Classically, the main areas of design were only painting, sculpture and architecture, which were understood as the major arts. Now the classical areas are subdivided in smaller and more specialized domains of design (landscape design, urban design, exterior design, interior design, industrial design, furniture design, cloth design, and many more) according to the product designed or perhaps its means of production.

Is there any difference between an artist and a designer?

Typically a designer is given set limitations by a client. Designers combine a calculated, defined process with a client's limitations to create fresh ideas. In other words, much planning and thought has been done to meet the requirements and expectations of a client while solving the actual design problem. Without any limitations the designer will solve the mental process using his/her own vision. When a client places limitations on a project it can be helpful for the designer to successfully create the client's vision. Any designer needs to be able to explain the reasoning and thought process behind the design.

On the other hand, an artist does not have to adhere to any rules or requirements. Any good artist is able to convey an emotion, thought or feeling through his/her own rules. An artist is free to express themselves using their own vision. No artist will ever have to explain why they did something a certain way because they use their own passion and vision behind what they are trying to express.

Good Art Is a Talent. Good Design Is a Skill.

More often than not, an artist has natural ability. Of course, from a young age the artist grows up drawing, painting, sculpting and developing their abilities. But the true value of an artist is in the talent (or natural ability) they are born with. There is some overlap here: good artists certainly have a skill, but artistic skill without talent is, arguably, worthless.

Design, though, is really a skill that is taught and learned.

You do not have to be a great artist to be a great designer; you just have to be able to achieve the objectives of design. Some of the most respected designers in the world are best known for their minimalist styles. They don't use much color or texture, but they pay great attention to size, positioning, and spacing, all of which can be learned without innate talent.

Good Art Sends a Different Message to Everyone. Good Design Sends the Same Message to Everyone.

Many designers consider themselves artists because they create something visually attractive, something they would be proud for people to hang on a wall and admire. But a visual composition intended to accomplish a specific task or communicate a particular message (no matter how beautiful) is not an art. It is a form of communication, simply a window to the message it contains.

Few artists call themselves designers because they seem to understand the difference better. Artists do not create their work to sell a product or promote a service. They create it solely as a means of self-expression, so that it can be viewed and appreciated by others. The message, if we can even call it that, is not a fact but a feeling.

Answer the questions:

1. What is the definition of design and a designer?
2. What areas of design do you know?
3. Do you see any difference between an artist and a designer?
4. How do you understand the words: «Good art is a talent. Good design is a skill»?

FOR PLEASURE.....

"Beauty is a manifestation of secret natural laws, which otherwise would have been hidden from us forever." ~ Johann Wolfgang von Goethe

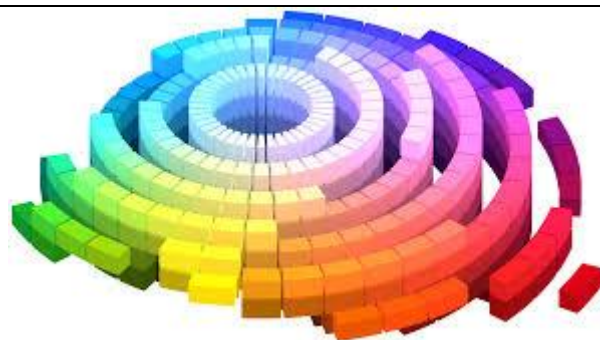
UNIT THREE

Reading: The Elements of Design

Word building: Clipping

Grammar: Wish - Sentences

Supplementary reading: The Principles of Design



Phonetic Drills.....

I wish you were a fish in my dish.

I wish I were what I was when I wished I were what I am.

Words you will need.....

two-dimensional [ˌtuːd(a)ɪ'menə(ə)nəl]

curve, *n*

wavy, *adj*

dash line

dotted line

width, *n*

height [haɪt], *n*

matter, *n*

tertiary, *n* ['tɜːʃ(ə)ri]

the Colour wheel

complementary, *n* [kəmpli'ment(ə)ri]

hue [hjuː], *n* *Syn.tint*

overlap, *n* ['əʊvələp]

pentagon, ['pentəɡən]

hexagon, *n* ['heksəɡən]

octagon, *n* ['ɒktəɡən]

cone, *n* [kəʊn]

tactile, *adj* ['tæktail]

implied, *adj* [im'plaid]

rough, *adj* [rʌf]

fizzy, *adj* ['fizi]

двовимірний, плоский

крива (лінія)

хвиляста, хвилеподібна

уривчаста лінія

намічена крапками, пунктирна лінія

ширина

висота

сутність, предмет обговорення

основний або похідний колір з

домішкою сірого

колірне колесо

додатковий колір

колір, відтінок; тон; колорит

перекривання, накладення; частковий

збіг

п'ятикутник

шестикутник

восьмикутник

конус

відчутний, тактильний

який мається на увазі;

передбачуваний, очікуваний

нерівний; шорсткий; грубий

шипучий, пінливий, ігристий

gritty , ['griti]	піщаний; з піском
enhance , <i>v</i> [in'hə:ns], [in'hɑ:ns]	збільшувати, підсилювати;
drapes , <i>n</i> [dreɪp]	порт'єра, драпірування
couche , <i>n</i> [kaʊtʃ]	кушетка; тахта; диван; ложе, крісло,
sandpaper ['sænd,peɪpə]	наждачний папір, "шкурка"
trait [treɪ(t)]	характерна риса; особливість
recurrence , <i>n</i> [rɪ'kʌr(ə)n(t)s] Syn.	повторення (чого-небудь)
repetition, reappearance	
randomness ['rændəmnis]	безладність, хаотичність, випадковий
	характер
hierarchy , <i>n</i> ['haɪərə:kɪ]	ієрархія
subconscious , <i>adj</i> [seb'kɒŋʃəs]	підсвідомий
ornate [ɔ:'neɪt]	ошатний, нарядний (про стиль)
standout , <i>n</i> ['stændaʊt]	що-небудь чудове, видатне
proximity , <i>n</i> [prɒk'simɪti]	наближення, близькість; сусідство
triangle , ['traɪæŋ(ə)l]	трикутник
rectangle , <i>n</i> ['rektæŋ(ə)l]	прямокутник
value	співвідношення тонів
rake across the surface	тут: провести рукою по поверхні,
	пошкребти
paramount , <i>adj</i> ['pærəməʊnt]	першорядний; верховний; вищий

Pre-reading.....

Task 1. While reading the text you will come across a number of international words: element, design, principle, basic, distance, component, positive, negative, colour, symmetrical, neutralize, geometric, organic, décor, visual, texture, harmony, form, tone, illustrate, composition, style, interest.

Task 2. Answer the questions:

1. What colours do you know? What is your favourite colour?
2. What geometric shapes can you see in this room? Describe this (class)room.

Reading.....

Task 1. Read and translate the text.

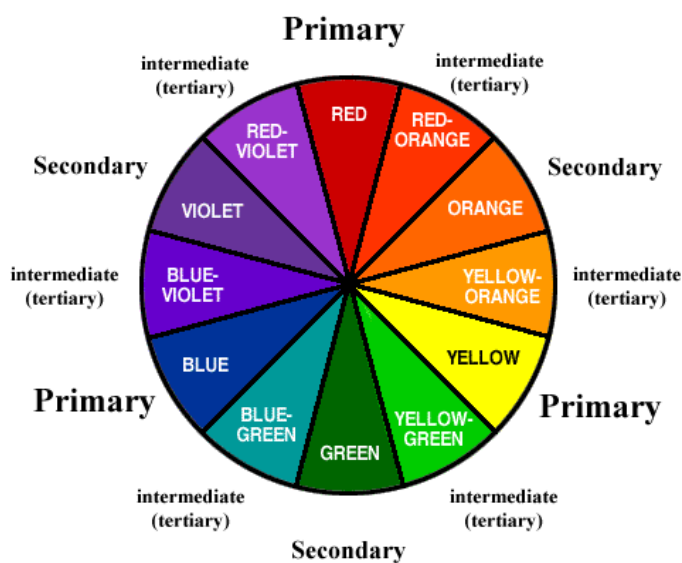
The Elements of Design

The elements of design are the things that make up a design. Design elements are the basic units of a visual image. These elements include:

Line. Line is the basic element that refers to the continuous movement of a point along a surface, such as by a pencil or brush. Lines and curves are the basic building blocks of two dimensional shapes like a house's plan. Every line has length, thickness, and direction. There are curve, horizontal, vertical, diagonal, zigzag, wavy, parallel, dash, and dotted lines.

Space. Space is the area provided for a particular purpose. It may have two dimensions (length and width), such as a floor, or it may have three dimensions (length, width, and height). Space includes the background, foreground and middle ground. Space refers to the distances or areas around, between or within components of a piece. There are two types of space: positive and negative space. Positive space refers to the space of a shape representing the subject matter. Negative space refers to the space around and between the subject matter.

Colour. Colour is light reflected off of objects. Colour has three main characteristics: hue (the name of the colour, such as red, green, blue, etc.), value (how light or dark it is), and intensity (how bright or dull it is). White is pure light;

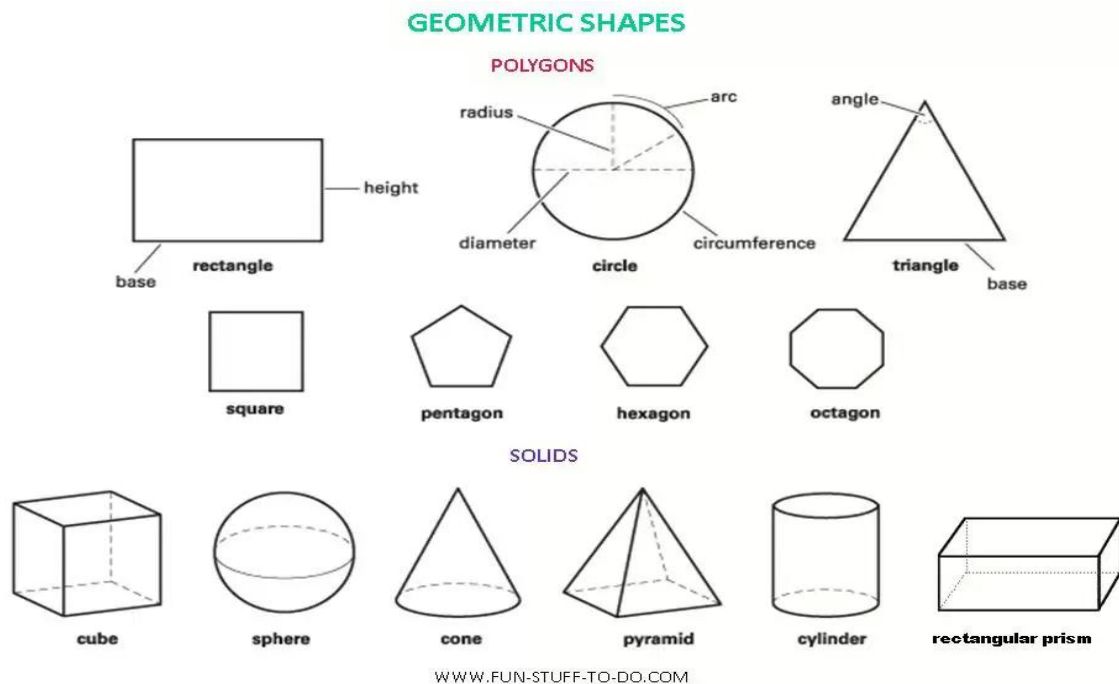


black is the absence of light. Primary colours are the only true colors (red, blue, and yellow). All other colours are mixes of primary colors. Secondary colors are two primary colors mixed together (green, orange, violet). Intermediate colors, sometimes called tertiary colors, are made by mixing a primary and secondary color together. Some examples of intermediate colors are yellow

green, blue green, and blue violet. Complementary colors are located directly across from each other on the color wheel (an arrangement of colors along a circular diagram to show how they are related to one another). Complementary pairs contrast because they share no common colors. For example, red and green are complements, because green is made of blue and yellow. When complementary colors are mixed together, they neutralize each other to make brown.

Shape. A shape is defined as an area that stands out from the space next to or around it due to a defined or implied boundary, or because of differences of value, color, or texture. Shapes can also show perspective by overlapping. They can be geometric or organic. Shapes in house decor and interior design can be used to add

interest, style, theme to a design like a door. Shape in interior design depends on the function of the object like a kitchen cabinet door. Natural shapes forming patterns on wood or stone may help increase visual appeal in interior design. In a landscape, natural shapes, such as trees contrast with geometric such as houses.



Texture. Texture is perceived surface quality. There are two types of texture: tactile and implied (visual). Tactile texture (real texture) is the way the surface of an object actual feels. Examples of this include sandpaper, cotton balls, tree bark, puppy fur, etc. Implied texture is the way the surface on an object looks like it feels. The texture may look rough, fizzy, gritty, but cannot actually be felt. This type of texture is used by artist when drawing or painting.

Form. Form is any three dimensional object. Form can be measured, from top to bottom (height), side to side (width), and from back to front (depth). Form is also defined by light and dark. There are two types of form, geometric (man-made) and natural (organic form). Form may be created by the combining of two or more shapes. It may be enhanced by tone, texture and colour. It can be illustrated or constructed.

Task 2. Give answers to the following questions:

1. What are the elements of design?
2. What do the elements of design include?
3. What kinds of lines are there?
4. What is the difference between the positive and negative space?
5. Can you give the examples of tertiary colours?
6. What are the main characteristics of colours?
7. What is a shape? What 2D and 3D shapes do you know?

8. What type of texture is the implied texture?
9. What is a form?
10. How can form be measured?

ACTIVITY

Choose one of design styles and make a presentation of a living room in this style. You should emphasise on the colours and forms of this style, texture of materials used in this room and lines of furniture.

DID YOU KNOW?

Tactile texture

Tactile means touch. Tactile texture is the actual (3D) feel of a surface. This is of paramount importance to three-dimensional design but of only moderate interest in two-dimensional design.

The actual surface texture needs to either be felt, or seen with light raking across its surface to make the texture visible.

Visual texture

Visual texture refers to the illusion of the surface's texture. It is what tactile texture looks like (on a 2D surface). The textures you see in a photograph are visual textures. No matter how rough objects in the photograph look, the surface of the photograph is smooth and flat.

Both types are important to the designer, but in 2D art, the illusion of texture is used more than tactile texture.

Practicing.....

Word-building

Clipping

Clipping is a part of a word which serves for the whole.

Names: Liz, Ron, Rob, Sue, Betty (from Elizabeth).

In students' speech: **prof** for professor, **phys-ed** for physical education, **poli-sci** for political science, **burger** for hamburger, **fries** (from French fried potatoes),

Clipped forms in general usage: **doc, ad, auto, lab, sub, deli, demo, condo, fax.**

Ex. 1. Try to find the word from which clipping was made: biz, caps, celebs, cello, deli, exam, fridge, flu, gator, hippo, hood, info, intro, lab, limo, mayo, maths, max, perm, photo, ref, reps, rhino, sax, stats, temp, thru, tux, ump, veep, vet.

VOCABULARY EXERCISES

Ex. 1. Find in the text English equivalents of the following: співвідношення тонів, довжина, товщина, певна ціль, передній план, двомірні форми, наждачний папір ("шкурка"), колірне колесо, зверху до низу, зі сторони в сторону, ошатний стиль, симетричний, асиметричний, задній план/тло, додаткові кольори, наближення, гладкий та плоский, видимий (предмет), відчутний/тактильний, прямокутна призма, першорядний, помірна/стримана зацікавленість, багатокутники, конус, п'ятикутник, шестикутник, восьмикутник

Ex.2. Give Ukrainian equivalents of the following: different layouts, inherent part of an object, the rules of proportion, an idealized human figure, a Golden rectangle, pack things tightly together, to create a sense of eurhythmia, foot to navel, the fixed and faultless laws, universal laws of proportion and symmetry, to fit precisely into both a circle and a square, a living rulebook, can be applied to all people.

Ex.3. Match each word in the left-hand column with the best in the right-hand column.

THE ELEMENTS AND PRINCIPLES OF DESIGN

1	Space	a	is achieved by the use of balance, repetition and/or design harmony.
2	Colour	b	overall outline of an item
3	Texture	c	an element of design consisting of a continuous expanse of distance without forms, which is divided with walls, partitions, and furnishings.
4	Proportion	d	can be either cool and warm
5	Intensity	e	helps to separate one colour from another
6	Shape or Form	f	a harmonious sequence or correlation of colours or elements
7	Hue	g	lightness or darkness of a colour
8	Line	h	can be straight or curved
9	Harmony	i	can be either symmetrical or asymmetrical.
10	Balance	j	is the occurrence of differing elements, such as colour, value, size, etc.
11	Unity	k	a surface quality
12	Contrast	l	the brightness or dullness of a colour
13	Rhythm	m	is similarity of components or objects looking like these belong together.

Ex.4. Complete the sentences with appropriate words from the list below:

THE ELEMENTS OF DESIGN

In some books we can find the explanations of elements of design that are:

Line. Line can be considered in two ways. The linear marks made with a or brush or the edge created when two shapes meet.

Shape A shape is a self-contained defined area of or organic form. A positive shape in a painting automatically creates a shape.

Direction All lines have direction -....., Vertical or Oblique. Horizontal suggests calmness, stability and tranquillity. Vertical gives a feeling of balance, formality and alertness. suggests movement and action.

Size Size is simply the relationship of the area occupied by one shape to that of another.

Texture Texture is the surface..... of a shape - rough, smooth, soft, hard, glossy etc. Texture can be physical (tactile) or..... .

Colour Also called Hue.

Value Value is the lightness or of a colour. Value is also called Tone.

Words: quality, negative, darkness, pen, horizontal, visual, geometric, oblique

Ex.4. Translate the text into English. Use the information from the basic text and from the supplementary reading. Reproduce this text.

Елементи та принципи дизайну

Якщо ми говоримо про елементи дизайну, то ними є речі, які створюють дизайн. Принципами дизайну є те, що ми робимо з цими елементами. Коли ми будемо говорити про будь-якого дизайнера, то він використовуватиме такі елементи: лінія, простір, обриси та форма, текстура, колір. Деякі інші елементи як от маса, світло та шаблон/зразок (pattern) стосуються дизайну інтер'єру. Кожен об'єкт, якщо він є трьохвимірний, має масу та форму. Співвідношення тонів (value) – це ахроматична шкала від білого через сірий до чорного у 9-12 кроків. Відтінки (tints) утворюються додаванням білого, щоб отримати світлі тони (tones) кольору. Тон - це кількість чи міра світлого у кольорі. Він використовується, щоб виразити форму, об'єм, текстуру. Тіні (shades) утворюються додованням чорного, щоб отримати темні тони кольору.

Принципи організовують елементи і структурують композицію. Слід назвати такі принципи: гармонія, єдність, баланс (симетрія-асиметрія), повторення, ритм/рух, акцент (emphasis), контраст, пропорція,

функціональність, наближення, розмаїтість. Ритм – це гармонійна послідовність кольорів та елементів, постійне повторювання мотиву.

Якби ми знали елементи та принципи дизайну раніше, ми б краще виконували практичні завдання. Шкода, що цьому не приділялось достатньо уваги. Було б добре застосовувати ці знання у майбутній професійній діяльності будівельника.

Miscellaneous

Ex. 7. Choose and use: write (put pen to paper); **write sth down** (write sth on paper in order to remember it); **write sth up** (record sth (usually notes) in neat and complete form).

1. You don't have to write everything that the lecturer says. 2.I'm going to write my lecture notes this evening. 3.I'm planning to write my essay on Molière's comedies next week. 4. I wrote your number. y little brother is just learning to read and write. 5. Molière wrote his last play, The Imaginary Invalid, in 1673.

GRAMMAR EXERCISES

Ex. 1. Translate the sentences: 1. I wish I lived in the country. 2 .I wish I told him the whole truth. 3. I wish it weren't so cold. 4. I wish I hadn't eaten this salad. 5. He wishes he had written a letter to Kate. 6. I wish you would help me. 7. I wish you wouldn't play computer games any more.

Ex. 2. Change the sentences using “I wish + Past Subjunctive” Translate them into Ukrainian: 1. I'd like to know principles of interior design. 2. Why don't we use the the principles and elements to serve the designer's purpose and visual goals? 3. She hates painting walls with this motif. 4. I'd like to live in a palace. 5. We hate doing English exercices every day. 6. Why don't we have enough time to communicate?

Ex. 3. Change the sentences using “I wish + Past Perfect Subjunctive” Translate them into Ukrainian: 1. I decided to study in Lutsk. 2. They didn't go to the Art exhibition. 3. She decided to stop working as a designer. 4. He lost all his money. 5. It was his mistake to use those colours. 6. She didn't realize that the time passed. 7. He went to work in a designing firm. 8. The students decided not to choose Human Anatomy as the elective.

Ex. 4. Open the brackets using the necessary form of Subjunctive after “wish”:

1. I wish (to know) Polish. 2. She fell and broke her leg. I wish she (to be) more careful. 3. I wish you (to read) more Design books in future. 4. They need a designer for the firm. I wish I (can) draw. 5. I wish I (not to lend) him my car: he has broken it. 6. I feel tired. I wish I (not to work) so late last night. 7. My apartment is rather small. I wish I (to have) a bigger one. 8. I wish I (not to spend) all my money last night. 9. I wish you (to know) the answer to this question. 10. I wish you (to phone) me yesterday. 11. I wish (to know) then what I know now.

Ex. 5. Translate the sentences into English: 1. Якби я мав вільний час зараз! 2. Шкода, що я запізнився на зустріч. 3. Якби я вмів малювати! 4. Якби я знав елементи та принципи дизайну! 5. Шкода, що вона не знає додаткові кольори. 6. Добре було б, як би у мене була книга «Основи дизайну інтер'єру». 7. Шкода, що я послухав їхньої поради. 8. Жаль, що вони не змінили свої думки. 9. Добре було б, якби ти знав правду. 10. Добре було б, якби ми уміли застосовувати усі знання на практиці.

SUPPLEMENTARY READING

Principles of Design

The principles of design are what we do to the elements of design. How we apply the principles of design determines how successful the design is. The principles of design govern the relationships of the elements used and organize the composition as a whole. Successful design incorporates the use of the principles and elements to serve the designer's purpose and visual goals. There are no rules for their use. The designer's purpose and intent drives the decisions made to achieve harmony between the elements. The principles of design consist of:

Balance. Artists/designers use the elements of art — colour, line, shape, tone and form — to create balance in artworks. Balance can be either symmetrical or asymmetrical. Balance can be achieved by the location of objects, volume or sizes of objects, and by colour. It can also be achieved by balancing lighter colors with darker colors, or bold colors with light neutral colors.

Unity. Unity refers to a sense that everything in a piece of work belongs there, and makes a whole piece. It is achieved by the use of balance, repetition and/or design harmony.

Harmony. Harmony is achieved through the sensitive balance of variety and unity. Color harmony may be achieved using complementary or analogous colors. Harmony in design is similarity of components or objects looking like these belong

together. Harmony may be visually pleasing and harmony is when some of the objects like drapes and couches share a common trait. A common trait between objects could be: color(s), shape(s), texture, pattern(s), material, theme, style, size, or functionality.

Contrast. Contrast is the occurrence of differing elements, such as colour, value, size, etc. It creates interest and pulls the attention toward the focal point.

Repetition (rhythm, pattern). The recurrence of elements within a piece: colors, lines, shapes, values, etc. Any element that occurs is generally echoed, often with some variation to maintain interest. Rhythm in interior design also may be used to reduce randomness.

Variety (alternation). The use of dissimilar elements which creates interest and uniqueness. Variety like a painting or some reflective wood panels added on a plain wall may be used to reduce monotony. Helps infuse color to a house decor to attempt to increase design beauty.

Emphasis (dominance or focal point). Emphasis refers to areas of interest that guides the eye into and out of the image through the use of sequence of various levels of focal points, primary focal point, secondary, tertiary, etc. Emphasis hierarchy may give direction and organization to a design, and avoid subconscious confusion to sometimes improve the design's visual appeal and style. Emphasis hierarchy or focus is not giving each object in a project equal dominance within a piece of work. Emphasis or dominance of an object can be increased by making the object larger, more sophisticated, more ornate, by placing it in the foreground, or standout visually more than other objects in a project. The primary focus point or area receives the largest emphasis in a room.

Proportion (scale).Proportion involves the relationship of size between objects. Proportion is also relative sizes of surface areas of different colors. Proportion also depends on functionality of object.

Functionality. A design must have good functionality. Proper functionality is simply the best possible design and best possible location of this design that the occupant(s) requires. Such designs are clean, nearly sterile, tidy, brightly lit, warm, visually appealing. Great functionality and best possible materials for the function usually also increases visual appeal.

Proximity. Proximity is the placing of similar objects closer together physically, and unlike objects further apart. This aids in creating unity. For example, different furniture styles with different colors compressed in a small bedroom does not look as nice as the same furniture placed further apart in a very large living room.

Answer the questions:

1. How many design principles do you know?
2. What principle should be used to reduce monotony?
3. How do we call the process of placing unlike objects apart?
4. What is harmony?
5. What does the success of design depend on?

FOR PLEASURE.....

Colors speak all languages. (Joseph Addison)

Color is all. When color is right, form is right. Color is everything, color is vibration like music; everything is vibration. (Marc Chagall)

Color affects our life. Color is physical... we see it. Color communicates... we receive information from the language of color. Color is emotional... it evokes our feelings. (Bride M. Whelan)



Gunston Hall is an example of the classical architects use of repeating proportions. Here the proportions 1:2 and 3:5 are used in the prominent shapes of the house.

Module six

ARCHITECTURE

UNIT ONE

Reading: Architecture, its Forms and Functions

Word building: Acronyms

Grammar: Non-verbal forms: Infinitive; Complex Object, Complex Subject

Supplementary reading: Architectural Planning



Phonetic Drills

*I wish to wish the wish you wish to wish,
But if you wish the wish, the witch wishes,
I won't wish the wish you wish to wish.*

Words you will need.....

permanence, *n.*

suitability, *n.* [s(j)u:tə'biliti]

adaptability, *n.*

adapt, *v* *Syn. adjust, conform*

benefit *n.* *Syn. profit, gain, income*

settled *adj.*

prerequisite *n.* [pri'rekwizit]

Syn. requirement

experience *n.* *Syn. knowledge*

to experience *v.* *Syn. to live through*

particular *adj.* (also: special, specific, especial, individual)

constant, *n*

vary, *v* ['ve(ə)rɪ]

utility *n.*

utilitarian, *adj* [ju:,tili'te(ə)rɪən]

relative *adj.* *Syn. comparative, proportional*

e.g. *But you know, everything is relative.*

concern, *n* [kən'sɜ:n]

незмінність, сталість, довговічність

відповідність, придатність, наявність, адаптованість, пристосовність

адаптувати, узгоджувати

прибуток, користь, вигода

заселений, осілий, сталий

передумова, вищевикладене, вимога, потреба

досвід, знання, досвідченість

знати з досвіду, переживати, відчувати

окремий, особливий, винятковий, індивідуальний, спеціальний

постійна (величина), константа

змінювати, (часто from) різнитися

корисність, рентабельність

утилітарний; практичний

відносний, умовний, відповідний,

порівняльний, пропорційний

зацікавленість, відношення, стосунок

defense, n. equal adj <i>Syn. the same</i> expose, v [ik'spəʊz] generic tomb, n [tu:m] domestic architecture confine, v [kən'fain] confine, n ['kɒnfain] welfare and educational extend, v [ik'stend] expand, v [ik'spænd] supervision, [s(j)u:pə'viʒ(ə)n] by-gone= bygone solidly, adj triple, n ['trip(ə)l] requisite, n ['rekwizit] simultaneously, adv [sim(ə)'teiniəsli] cumulative, adj ['kju:mjʊlətiv] aesthetical, adj [i:s'θetik(ə)l] minor, adj ['maɪnə] landmark, n ['lændmɑ:k]	захист; оборона; виправдання однаковий, рівний, рівноправний показувати, виставляти напоказ, стандартний, загальний надгробний пам'ятник; гробниця; архітектура житла, місцева архітект. обмежувати, рубіж, межа культурно-побутовий та освітній простягати, витягувати; натягати розширювати, розвивати, інспектування, контроль пережитий; минулий, міцно потрійна кількість потрібне, необхідне; те, що вимагається; необхідна річ одночасно накопичений, сукупний естетичний другорядний, незначний, несуттєвий, споруда історичного значення; віха
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Pre-reading.....

Task 1. a) While reading the text, you will come across a number of international words:

Architecture, design, structure, ensemble, aesthetic, function, criteria, principle, practical, civilized, technique, culture, primitive, element, natural, human, symbol, institution, characteristics, activity, stability, construction, communication, form, idea, constant, active, build, integrate.

b) Find English equivalents (B) to the following words (A):

A. обмежувати; передумова; розрізняти; сталий; відповідність; змінюватися; захист; розвивати; корисність; пристосовність; володіти; умова; виразний; рівний

B. to vary; adaptability; equal; to confine; utility; to possess; prerequisite; condition; to distinguish; expressive; suitability; settled; to develop; defense

Task 2. Answer the questions:

1. What do you think the word "architecture" means?
2. What do you think about your city/town architecture?
3. What can you say about the role of an architect in civilized society?

Reading.....

Task 1. Read and translate the text.

Architecture, Its Forms and Functions

A. Architecture is the art and science of designing and building structures, or ensembles, according to aesthetic and functional criteria. Structures built in accordance with such principles are also architecture. Architecture is employed to fulfil the practical and expressive requirements of civilized people. Almost every settled society that possesses techniques for building produces architecture. It is necessary in all but the simplest cultures. With architecture, a man has not only a defence against the natural environment but also the benefits of a human environment, a prerequisite for and a symbol of the development of civilised institutions.

The characteristics that distinguish a work of architecture from other human-made structures are (1) the suitability of the work for use by human beings in general and its adaptability to particular human activities; (2) the stability and permanence of the work's construction; and (3) the communication of experience and ideas through its forms. All these conditions must be met in architecture. The second is a constant, while the first and the third vary in relative importance according to the social function of buildings. If the function is chiefly utilitarian, as in a factory, communication is of less importance. If the function is chiefly expressive, as in a monumental tomb, utility is a minor concern. In some buildings, such as churches and city halls, utility and communication may be of equal importance.

A historical approach exposes key relationships between architecture and other disciplines – sculpture, drawing, engineering, and town planning, to name a few. Most of us, however, experience architecture in relation to certain generic building types. We live in a house, worship in a religious building, go to work in skyscrapers, spend our money in shopping centres, fill our cars with gasoline at gasoline stations, stay overnight in a hotel, and go to hospitals when we are sick.

The types of architecture are established not by architects but by society, according to the needs of its different institutions. So the types of architecture depend upon social formations and the simplest classification represents the

following groups: domestic, religious, governmental, recreational, welfare and educational, commercial and industrial (architecture).

B. An architect is a person trained and experienced in the design of buildings and the coordination and supervision of all aspects of the construction of buildings.

When the architect designs a structure, he uses the cumulative knowledge of centuries. Apart from the architect, many consulting experts such as structural engineers, service engineers and other subcontracted specialists work on the design of the structure.



The architect's function now extends into town planning and work activities that need buildings. Town planning is a cooperative process in which architects, economists, engineers, lawyers, landscape architects, doctors, sociologists, surveyors or topographers and other specialists take part.

The architect's sphere of knowledge is constantly expanding. An architect is to combine art, advanced technology, science and economics in his work. The structure created by an architect should give us pleasure and a sense of beauty. The main problem facing the architect today is to avoid any conflict with nature and landmarks of bygone days.

C The sequence of the three basic aims – “convenience, strength and beauty” – has its own significance.

Firstly, any building exists for some particular purpose; it is built because of some definite human need, either practical or expressive, or both. Therefore, “convenience” is the primary of all basic aims.

Secondly, the construction of any object or shelter for human use must be a true construction; that is, it must stand up solidly for the duration for which it is designed.

Finally, mankind has always realized that buildings to be complete must have not only “convenience” and “strength” but also “beauty”.

The value of true architecture lies in the direct effect of the structure itself on the viewer and of the actual elements it is constructed of.

Such elements as walls and openings, supports, floors and ceilings, enclosed areas or rooms are considered the letters of the architect's alphabet. No building can exist without some of them since both practical and aesthetical success of the building is almost entirely founded upon their correct arrangement and design. The architect must always study each detail from the viewpoints of both use and

appearance as well as from that of construction, and he must continuously see it not as an isolated detail but as an individual note in a great composition.

The architect has the task of being an artist as well as an inventive engineer. The triple nature of architectural design (convenience, strength, beauty) is one of the reasons why architecture is a difficult art; for it takes a special type of imagination as well as long years of training and experience to produce a designer capable of making the requisite judgment in the light of these three factors – use, construction, and aesthetic effect simultaneously. A designer/architect must have sufficient knowledge of engineering and of building materials to enable them to create economically strong as well as practical structures, and, in addition, must possess the creative imagination which will enable them to integrate the plan and the construction into one harmonious whole.

The architect's feeling of satisfaction in achieving such integration is one of their greatest rewards.

Task 2. Answer the questions on the text:

1. What is architecture?
2. What is architecture employed for?
3. Is architecture necessary in all settled societies? What does it give to a man?
4. What are the main features that distinguish a work of architecture from other man-made structures? What features are not constant ones?
5. What are the basic types of architecture? How are they established?
6. What is the definition of an architect?
7. What are the architect's functions and tasks?
8. What specialists help an architect in his/her work?
9. What are the three basic aims of architecture?
10. What is considered to be the letters of the architect's alphabet?
11. Why architecture is a difficult art? What are the reasons?

ACTIVITY

"I've chosen architecture as a career / the elective because..." Highlight at least 5 points which make this profession / discipline so attractive. Summarize your knowledge of the question under consideration. Discuss it with your partner. Use the following plan:

- 1) Architecture as an art and science.
- 2) The main aim of architecture.
- 3) The life of a man with and without architecture.
- 4) The main characteristics of a work of architecture.

DID YOU KNOW?

- In many ancient civilizations, such as those of Egypt and Mesopotamia, architecture and urbanism reflected the constant engagement with the divine and the supernatural, and many ancient cultures resorted to monumentality in architecture to represent symbolically the political power of the ruler, the ruling elite /i'li:t/, or the state itself.
- There are 10 Million bricks in the Empire State Building.
- The Escorial [ˌɛskərɪ'ɑ:l], the famous palace located outside Madrid, was built in the shape of a gridiron ['grɪdaɪən] because Saint Lawrence, to whom the palace was dedicated, was roasted on one.
- The only manmade structure visible from space is the Great Wall of China.
- The base of the Great Pyramid in Egypt is large enough to cover ten football fields.

Practicing.....

Word-building

Acronyms

Acronyms [ˈækrə(u)nɪm] are formed by taking the initial letters of a phrase and making a word out of it or by taking a whole or part syllable. The classical acronym is also pronounced as a word. The acronyms of a special case are pronounced as letters rather than according to the rules of English spelling.

Ex.1. a) Learn some examples of acronyms in English: **Scuba** - self-contained underwater breathing apparatus. **Radar** - RAdio Detection And Ranging. **NB** - Nota bene, literally 'note well'. **BRB** - be right back (from 1980s, 90s). **FYI** - for your information (from mid 20th century). **LOL** - laughing out loud (early 21st century). **ROFL** - rolling on the floor laughing

b) Explain the acronyms. Try to find more examples: UN, IMF, NATO, UFO, NASA, UNESCO, BASIC, VIP, FBI, DJ, LNTU.

VOCABULARY EXERCISES

Ex.1. Give Ukrainian equivalents of the following: structural principles, ensembles, aesthetic, functional criteria, practical and expressive requirements, civilized people, gasoline stations, natural environment, symbol, suitability of the work, stability and permanence of the work's construction, conditions, constant, social function of buildings, monumental tomb, a work of architecture, the architect's alphabet, architectural skills, creative imagination, to integrate the plan.

Ex.2. Give English equivalents of the following: архітектор, підготовка та досвід у проектуванні будинків, координація і контроль усіх аспектів будівництва будівель, експерт, земельні ділянки та будівлі, спільний процес, ландшафтні архітектори, інспектори, топографи, сфера знань архітектора, молитися, передові технології, задоволення, почуття прекрасного, відповідно до, побутовий та освітній, винахідливий інженер, стіни та отвори, хмарочос.

Ex 3. Read the text again and find out if the following statements are true or false:

- 1) Architecture should fulfil the requirements of primitive people.
- 2) Structures should be built according to aesthetic and functional criteria.
- 3) There are no differences between a work of architecture and other man-made structures.
- 4) The stability and permanence of the work's construction are constant for all types of buildings.
- 5) In a factory, utility and communication are of equal importance.
- 6) The architect has the task of being an artist as well as an inventive engineer.

Ex.4. Complete the sentences:

- 1) Almost every settled society that possesses the technique for building produces...
a) nature b) architecture c) struggle
- 2) Architecture is necessary in all but the simplest...
a) techniques b) theories c) cultures
- 3) With architecture, man has a prerequisite for the development of civilized...
a) importance b) institutions c) symbols
- 4) The stability and permanence of the work's construction is a...
a) form b) function c) constant
- 5) If the function is chiefly utilitarian, communication is of less...

- | | | |
|--|---------------|---------------|
| a) importance | b) condition | c) benefit |
| 6) In a monumental tomb, utility is a minor... | | |
| a) feature | b) experience | c) concern |
| 7) Utility and communication are equally important in churches and | | |
| a) markets | b) plants | c) city halls |

Ex.5. There are some types of architecture. Give examples of each type. Use the words and word combinations given below:

1) Domestic Architecture 2) Religious Architecture 3) Governmental Architecture
4) Recreational Architecture 5) Architecture of Welfare and Education 6) Commercial and Industrial Architecture

theatres; hospitals; guardhouses; capitols; schools; stores; prisons; parliament buildings; museums; court houses; villas; circuses; huts; banks; exhibition halls; sport facilities; factories; mines; churches; libraries; hotels; markets; publishing houses; post-offices; palaces; laboratories; cathedrals; restaurants; plants; temples

Ex.6. Replace the words and word combinations in italics (A) by their contextual synonyms (B):

- A 1) The architect is *a person* who designs *buildings*.
2) *Town planning* is *the preparation* of *plans* for the regulated *growth* and *improvement* of towns.
3) *City design* is the organization of *land* and *buildings* for *group* living.
4) The *main problem* for the architect *today* is to avoid any conflict with *nature* and *the landmarks* of *by-gone days*.
5) The architect uses *the cumulative* knowledge of centuries.

B man; schemes; nowadays; structures; environment; collective; urbanism; city; territory; design; development; basic; elaboration; modernization; old centuries; concern; architectural monuments

Ex.7. Translate sentences into English using words and word combinations from the Vocabulary.

Архітектура

Архітектура – це мистецтво і наука проектування та будівництва конструкцій чи ансамблів конструкцій. Витвір архітектури відрізняється від інших структур придатністю та адаптивністю, стабільністю та незмінністю, передачею досвіду та ідей через її форму. Стабільність та незмінність –

постійна вимога, інші ж змінюються у відповідності з соціальною функцією будівлі.

Архітектура тісно пов'язана зі скульптурою, кресленням та малюванням, інженерією, містоплануванням. Тип архітектури залежить від потреб суспільства. На сьогодні розрізняють архітектуру помешкання, урядову, релігійну, архітектуру місць відпочинку, культурно-побутову та освітню, торгово-промислову архітектуру.

Майбутній архітектор навчається проектувати будівлі, координувати та контролювати їх спорудження. Сфера знань архітектора розширюється. Він мусить поєднати мистецтво, передові технології, науку та економіку у своїй роботі та не конфліктувати з природою та спорудами історичного значення.

Головною метою архітектора є звести будівлю, котра буде зручною, міцною та красивою одночасно.

Miscellaneous

Ex. 8. Choose and use.

keep at sth: continue working on sth; **keep away (from):** stay away **keep back:**

1) stay back, 2) conceal **keep behind:** make smb remain after others have left

keep sb/sth down: control **keep (oneself) from:** 1) prevent from 2) avoid

keep in with: remain friendly with **keep sb/sth:** (cause) to stay at a distance

keep on: continue **keep up with:** stay level with (sb/sth)

1. She hired an assistant because she couldn't keep the work. 2. The firefighter told us to keep from the burning building. 3. It's a good idea to keep Mykola as he might be helpful to you later. 4. He is going to keep taking his driving test until he passes. 5. He put up a "No Trespassing" sign to keep walkers his land. 6. Tell me the whole story; don't keep anything 7. You should keep your studies. 8. He couldn't down his anger.

Ex. 10. Look through the text (Part C) and find two facts which are new to you and two facts which are already known to you.

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Task 11. There are some notes the student made after reading the text (Part C). Did s/he remember everything right? Read her/his notes and correct them if necessary.

1. They say the building is complete when it has "convenience", "strength" and "beauty". 2. The construction of any object or shelter for human use must be a true construction; that is, it must stand up solidly for the duration for which it is

designed, and that's why such a factor in architecture as strength is primary. 3. Architects must study each detail in their work only from one viewpoint, that is, of use. 4. To create a work of architecture, the designer must project an integration of the whole with the help of such elements as walls and openings, supports, floors and ceilings, and rooms. 5. The architect must possess knowledge of different sciences, but the creative imagination isn't necessary for him.

GRAMMAR EXERCISES

Ex.1. Translate the sentences into Ukrainian and comment on the different forms of the infinitive.

1. He has a great desire *to be invited* to the conference of architects. 2. Paul seems *to have finished* his town planning project. 3. They are glad *to have been helped*. 4. I am glad *to have been discussing* with you the types of architecture. 5. The question about the main problem facing the architect today is not difficult *to answer*. 6. I am glad *to be working* with this engineer now.

Ex.2. Fill in the correct form of the infinitives (pay attention to the use of Active and Passive Voice).

1. His greatest ambition is ... (choose) to take part in the street planning project. 2. We're waiting for his first house ... (build). 3. I don't like ... (interrupt). 4. Listen carefully, I don't want ... (misunderstand). 5. She has nobody ... (speak). 6. He is pleased ... (appoint) to the position of a landscape architect. 7. ... (instruct) by an excellent specialist was a great advantage. 8. I hate ... (bother) you, but the students are still waiting ... (give) books for their work.

Ex. 3. Define the functions of the infinitives.

1. He ought *to have supported* her. 2. It was impossible *to dissuade* him! 3. *To expect* too much is a dangerous thing. 4. *To occupy* her mind she took the job offered. 5. I'm glad *to be invited* to the industrial site *to lay* the foundation stone. 7. He was determined *to sort out* the problem. 8. *To give* is more blessed than *to receive*. 9. Your duty will be *to send* and *receive* messages.

Ex.4. There is at least one mistake in each sentence. Suggest appropriate corrections:

1. Very reluctantly, he consented her to lend some money to Janet. 2. My parents always encouraged work hard at the building site. 3. I think we should let them to stay until the weekend. 4. They allowed leave their luggage in the lounge. 5.

Hospital workers had to make to do with a 1.5% pay increase this year. 6. They let me to borrow their car while they were on holiday. 7. I'd rather to stay in tonight.

Ex. 5. Open the brackets using the Complex Object or Complex Subject

A. 1. I want you (determine) what man-made structure is visible from space. 2. The architect knows not only "convenience", "strength" but also "beauty" (be) important for the building. 3. This project made us (learn) more about the architecture of our native town. 4. I heard him (combine) art, advanced technology, science and economics in his work. 5. Citizens asked this young architect (erect) the monument to T. Shevchenko in the centre of the city. 6. We noticed the team "Architects from Lutsk" (solve) the problem the first. 7. I felt the clients (be) pleased with the result.

B. 8. Yesterday's meeting appears ... (hold) in a friendly atmosphere. 9. The new safety procedures have so far proved ... (be) satisfactory. 10. Our competitors still seem (keep) the details of their new project a secret. 11. His affairs turned out ... (be) in perfect order. 12. She is certain ... (not/ give) you any further information.

Ex.6. Paraphrase the sentences using Complex Subject.

1. The heads of these states will no doubt discuss the burning issues again at the next conference. 2. We know that the goods sold under Contract № 20 were shipped on the 10th of June. 3. They heard the judge announce the verdict. 4. It appears that the performance has made a great impression on the audience. 5. Probably this feature won't be published in the local newspaper. 6. It seemed that Jack knew the subject inside out. 7. The government states that the price of building materials has risen by 7.8 per cent. 8. The organizers expect many people to attend the seminar for civil engineers.

Ex. 7. Translate the sentences into English using Infinitive, Complex Object or Complex Subject where it is necessary.

1. Мої студенти відмовилися брати участь у конкурсі студентських наукових робіт. 2. Вам краще пройти курси дизайнера за кордоном. 3. Не можу не погодитися з вами. 4. Мене змусили підписати цей договір про будівництво автозаправки у цьому місці. 5. Чому б не відкласти розробку проекту басейну до кінця місяця? 6. Вона збирається переїхати в нову квартиру. 7. Їй немає часу ходити на будівництво. 8. Не змушуй мене повторювати, що технологія будівельного виробництва постійно ускладнюється. 9. Ми знаємо, що сучасний архітектор розробляє архітектурний розділ проектної документації.

10 Я помітив, що чим складніший об'єкт, тим більше знань потрібно архітекторові. 11. Здається, проектна документація розробляється за допомогою комп'ютера та спеціальних комп'ютерних програм. 12. Відомо, що архітектурний стиль визначається як сукупність основних рис і ознак архітектури певного часу і місця. 13. Допитливість змусила мене знайти інформацію про цього сучасного архітектора.

SUPPLEMENTARY READING

Architectural Planning

The architect usually begins to work when the site type and cost of a building have been determined.

Planning the environment. The natural environment is at once hindrance and a help, and the architect seeks both to invite its aid and to repel its attacks. To make building habitable and comfortable, he must control the effects of heat, cold, light, air, moisture, and dryness and foresee destructive potentialities such as fire, earthquake, flood, and disease.

The placement and form of buildings in relation to their sites, the distribution of spaces within buildings, and other planning devices discussed below are fundamental elements in the aesthetics of architecture.

Orientation. The arrangement of the axes of buildings and their parts is a device for controlling the effects of sun, wind, and rainfall. Within buildings, the axis and placement of each space determine the amount of sun it receives. Orientation may control air for circulation and reduce the disadvantages of wind, rain, and snow. The characteristics of the immediate environment also influence orientation: trees, land formation, and other buildings create shade and reduce or intensify wind, while bodies of water produce moisture and reflect the sun.

Colour. Colour has a practical planning function as well as expressive quality because of the range of its reflection and its absorption of solar rays. Since light colour reflects heat and dark colours adsorb it, the choice of materials and is a pigment is an effective tool of environmental control.

Materials and techniques. The choice of materials is conditioned by their own ability to withstand the environment as well as by properties that make them useful to human being. One of the architect's jobs is to find a successful solution to both conditions; to balance the physical and economic advantages of wood against the possibility of fire, termites, and mold, the weather resistance of glass and light metals against their high thermal conductivity, and many similar conflicts.

Interior control. The control of the environment through the design of the plan and the outer shell of a building cannot be complete since extremes of heat and cold, light, and sounds penetrate into the interior, where they can be further modified by the planning of spaces and by conditioning devices. Temperature, light and sound are all subject to control by the size and shape of interior spaces, the way in which the spaces are connected, and the materials employed for floors, walls, ceilings, and furnishings. Today, heating, insulation, air conditioning, lighting, and acoustical methods have become basic parts of the architectural program.

Planning for use. While environmental planning producer comfort for the senses (sight, feeling, hearing) and reflexes (respiration), planning for use or function is concerned with convenience of movement and rest.

Differentiation. The number of functions requiring distinct kinds of space within a building depends not only upon the type of building but also upon the requirements of the culture and the habits and activities of the individual patrons. A primitive house has a single room with a hearth area, and a modern one has separate areas for cooking, eating, sleeping, washing, storage, and recreation.

Economic planning. Major expenses in buildings are for land, materials, and labour. In each case they are high when the commodity is scarce and low when it is abundant, and they influence planning more directly when they become restrictive.

When land coverage is limited, it is usually necessary to design in height the space that otherwise would be planned in breadth and depth, as in the ancient Roman Insula (apartment houses) or the modern skyscraper. When the choice of materials is influenced by cost, all phases of architectural design are affected. High labour cost influence the choice of techniques and, consequently, of materials.

Answer the questions: 1. When does the architect begin to work on the project? 2. What are the main aspects of architectural planning? 3. What are the fundamental elements in the aesthetics of architecture? 4. What must the architect control to make buildings habitable and comfortable? 5. What is the planning for use concerned with? 6. What are the major expenses in building? 7. What skills must an architect have? 8. How can architects change the future?

FOR PLEASURE.....

The architect creates order in the picturesque variety of nature.

August Perret

Home is where the heart is. (English proverb)

UNIT TWO

Reading: Bioclimatic Architecture

Word building: Conversion

Grammar: Non-verbal forms. **Gerund**

Supplementary reading: What is bioclimatic architecture and what does bioclimatic design include?



Phonetic Drills

Not these things here, but those things there.

Sounding by sound is a sound method of sounding sounds.

Words you will need.....

bioclimatic architecture	біокліматична архітектура
force <i>n.</i> Syn. strength	сила
e.g. <i>with all one's force</i> — щосили;	
<i>in force</i> — діючий, чинний	
natural forces	природні сили
generator <i>n.</i> Syn. producer	генератор, виробник
contextual generator	контекстуальний генератор
benign , <i>adj</i> [bi'nain]	сприятливий, благодатний
target , <i>n.</i> Syn. aim, goal	мета, ціль, об'єкт
protect <i>v.</i> Syn. to defend	захищати, охороняти, оберігати
enhance <i>v.</i> Syn. to increase, to raise, to improve	підвищувати, збільшувати
concept <i>n.</i> Syn. idea, conception	концепція, поняття, ідея
rethinking basic concepts	переосмислення основних понять
recycled <i>adj.</i>	утилізований, перероблений
material <i>n.</i> Syn. fabric	матеріал, матерія
enormous <i>adj.</i> Syn. huge, tremendous	величезний, значний, безмірний
consumption <i>n.</i>	споживання, затрата
e.g. The consumption of electricity and gas rose to a record level.	
awareness <i>n.</i> Syn. realization	усвідомлення, обізнаність
jeopardize <i>v.</i> Syn. take the risk	наражати на небезпеку, ризикувати
conservation <i>n.</i> Syn. storage, preservation, keeping, saving	збереження, консервування, охорона природи
impact <i>n.</i> Syn. influence, effect, action,	вплив, удар, поштовх, імпульс

have an impact on cost <i>n.</i> maintenance costs issue, <i>n</i> ['ɪʃuː, 'ɪsjuː] address issues access <i>n.</i> <i>Syn.</i> approach access to public transportation community, <i>n.</i> community infrastructure systems profitable <i>adj.</i> <i>Syn.</i> beneficial selling point profess, <i>v.</i> <i>Syn.</i> to teach comply, <i>v.</i> (<i>with</i>) conviction, <i>n.</i> <i>Syn.</i> belief, opinion ignore, <i>v.</i> <i>Syn.</i> to disregard, to dismiss enhance, <i>v</i> widespread, <i>adj</i> market surveys environmentally friendly sustainable sustainable architecture sustainable materials responsible , <i>ad.</i> <i>Ant.</i> irresponsible life cycle renewable energy practitioner <i>n.</i> <i>Syn.</i> professional imaginative practitioners encompass, <i>v.</i> <i>Syn.</i> circumscribe incentive <i>Syn.</i> motive promote <i>v.</i> <i>Syn.</i> to assist, to support e.g. This large-scale event is designed to promote bioclimatic architecture. restrict, <i>v.</i> <i>Syn.</i> to limit restrictive, <i>adj</i> [rɪ'strɪktɪv] stucco, <i>n</i> ['stekəʊ]	здійснювати вплив на ціна; вартість експлуатаційні витрати; випуск; питання, проблема вирішувати питання доступ, підхід; підступ доступ до громадського транспорту група, громада, община; системи комунальної інфраструктури корисний, прибутковий, вигідний виграшний момент відкрито визнавати, заявляти виконувати (бажання) ; підкорятися; поступатися, погоджуватися переконання, упевненість; не брати до уваги, ігнорувати; збільшувати, підсилювати (широко) розповсюджений; дуже поширений дослідження, вивчення ринку; такий, що не забруднює середовище стійкий, життєздатний, екологічний (екологічно) стійка архітектура екологічні матеріали відповідальний життєвий цикл енергія, що відновлюється виконавець, діяч творчі виконавці оточувати стимул, спонукальна причина просувати, сприяти обмежувати; (to) тримати в певних обмежувальний; обмежений штукатурка (для зовнішніх робіт)
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vernacular <i>adj.</i> Syn. national, native	місцева, національна архітектура
inspiration <i>n.</i> [ˌɪnsp(ə)'reɪʃ(ə)n] Syn.	натхнення; стимулювання,
site <i>n.</i> Syn. position, station, place, location	будівельний майданчик
awareness, n [ə'weənɪs]	обізнаність, інформованість
fairly, adv ['feəli]	чесно; справедливо, неупереджено

Pre-reading.....

Task 1. a) While reading the text you will come across a number of international words:

Bio-architecture, conservation, harmony, nature, resource, tradition, consider, regulate, health, contextual generator, transportation, infrastructure systems, comfortable, ignore, orientation, construction, promote, inspiration, site.

b) Find Ukrainian equivalents to the following words or word combinations:

Environmental impact, natural forces, more efficient energy consumption, an irresponsible view, to exist in harmony with the site or nature, public awareness of environmental issues, resource efficient buildings, the environmental impact of the building, sustainable materials, take into consideration, visual pollution, vernacular architecture, mimetic architecture, maintenance costs address issues, access to public transportation community, imaginative practitioners.

Task 2. Think of the answers:

1. What does bioclimatic architecture deal with?
2. What is a "green" building?
3. What is a sustainable architecture?

Reading.....

Task 1. Read and translate the text.

Bioclimatic Architecture

Bioclimatic architecture is a way of designing buildings and manipulating the environment within buildings by working with natural forces around the building rather than against them. Thus it concerns itself with climate as a major contextual generator, and with benign environments using minimal energy as its target.

Bioclimatic architecture aims to protect and enhance the environment and life. It is developing on many different levels from rethinking basic concepts about

our need for shelter and the function of the "city" in our lives to developing recycled or sustainable building materials.

The impact of traditional building on the environment and natural resources is enormous. However, the ideal of designing and building structures that are environmentally friendly has become fairly widespread throughout the community of architects and builders in developed nations. In addition, there are an increasing number of incentives for putting up buildings with more efficient energy consumption and that reduces the negative impacts on natural resources by using recycled or sustainable materials. While these vary around the world, there is awareness that our need for shelter must not jeopardize the environment.



There is growing interest in "green" building practices, which offer an opportunity to create environmentally sound and resource-efficient buildings by using an integrated approach to design.

"Green" buildings promote resource conservation through energy efficiency, renewable energy, and water conservation features. They take into consideration the environmental impact of the building and minimize waste. Other goals are to create a healthy and comfortable environment, reduce operation and maintenance costs, and address issues such as historical preservation, access to public transportation and other community infrastructure systems. The entire life cycle of the building and its components is considered, as well as the economic and environmental impact and performance.

As public awareness of environmental issues increases, the construction developers are also beginning to see that "green building" can be profitable and a selling point. Market surveys are showing that a surprising number of potential buyers are interested and will pay the higher prices for a home that is environmentally friendly. In the last few years there has been much talk concerning environmentally responsible architecture, that is, architecture respectful of the earth's resources and its natural beauty.

Unfortunately, many of the architects and designers who profess interest in the concept of sustainable architecture do not practice it in their own work for whatever reason. In fact, most architects ignore the issue altogether, preferring to regard architecture as fashion. This is a terribly



irresponsible view, because in terms of energy use and visual pollution, buildings have had an increasingly severe and damaging impact on the environment, this makes the issue of sustainable architecture not only an important consideration but also a necessary one.

As for a building philosophy for national parks, which were created to conserve nature for future generations, it seems that sustainable architecture, or "integrated bioclimatic architecture", is the only logical and responsible approach.

What is integrated bioclimatic architecture? It is the architecture that arises out of the landscape, with the site determining the orientation and construction of a building, not just aesthetically, but also mechanically, determining its heating, cooling, and lighting too. Thus, it is an architecture that respects nature and its resources and provides its occupants with the most comfortable and pleasing environment possible. However, this architectural approach need not be a restrictive one for imaginative practitioners. As integrated bioclimatic architecture encompasses examples of vernacular architecture, like the typical "white stucco Mediterranean fishing village", as well as mimetic architecture, which draws on the materials, textures, even the plants of the surrounding landscape for its inspiration. Indeed, good integrated bioclimatic architecture should exist in harmony with the site.

Task 2. Give answers to the following questions and discuss them with your partners:

- 1.What is bioclimatic architecture?
- 2.What is the aim of bioclimatic architecture?
- 3.What does bioclimatic design include?
- 4.What does bioclimatic architecture deal with?
- 5.Why have buildings had an increasingly severe and damaging impact on the environment?
- 6.Why is there growing interest in "Green" building practices?
- 7.What makes the construction developers see that "green" building can be profitable?
- 8.Do most architects regard architecture as fashion?
- 9.What is integrated bioclimatic architecture?
- 10.How can you explain the words "vernacular architecture"?

ACTIVITY Prepare a presentation about bioclimatic architecture, its function and styles.

DID YOU KNOW?

- Did you know that the multifunctional thermal walls that PolygHome offers, allows for various finishing panels?
- Did you know that PolygHomes concept designs BioClimatic homes?
- Did you know that PolygHomes structure is mainly composed with engineered wood that is approved FSC?
- Did you know that PolygHome offers a tempered and controlled atmosphere under its first level?
- Did you know that PolygHome offers a superior thermal envelope if compared to a traditional construction?
- Did you know that PolygHomes structure benefits from its ventilation ducts and diffusers to air condition the home?

Practicing.....

Word-building

Conversion

Conversion is the process by which new words are created by using a word in new functions (i.e., by shifting, changing or converting its original grammatical class to another class), without any change in its form.

e.g. a. If the shop isn't too far away, we can **walk** over there.

b. I take **a walk** around the block every evening.

Ex.1. Read and translate the words: water – to water, plan – to plan, design – to design, structure – to structure, form – to form, experience – to experience, use – to use, clean – to clean, complete – to complete, live – to live, correct – to correct; address /'xdrqs/ – to address /q'drqs/, decrease – to decrease, import – to import, impress – to impress, record – to record, survey – to survey, house – to house /z/.

VOCABULARY EXERCISES

Ex. 1. Find in the text:

a) antonyms to the following words and translate them into Ukrainian: to decay, not common, positive, to decrease, the most uncomfortable, low, not manifest, end, to take into account the, not prefer, to restore, to deny, unimportant.

b) synonyms to the following words and word combinations and translate them into Ukrainian: to relate, vitality, to prevent, to increase, purpose, to affect, residential area, damaging, to raise, proposal, project, view, convenient, consonance, benefit, trade, polite, to say, occasion, to disregard, to choose, style, loss, to suffer.

Ex. 2. Give English equivalents of the following.

Арка, підтримувана колонами; створення здорового навколишнього середовища; плодоносний ґрунт; руйнівний вплив; будівництво, заплановане в цьому районі; повторне використання матеріалів; поновлювані ресурси; відсутність переконаності; мінімальна енергія; природні ресурси; негативний вплив; майбутні покоління; потенційні покупці; навколишній ландшафт.

Ex.3. Find in the text all synonyms to the phrase "green building".

Ex.4. Read a few explanations to the text.

1. As public awareness of environmental issues increases ... – У міру того, як росте обізнаність громадськості з питань навколишнього середовища... .
2. ... who profess interest in the concept of sustainable architecture – які відкрито цікавляться концепцією стійкої архітектури.
3. ... buildings have had an increasingly severe and damaging impact on the environment – будівлі роблять усе більш руйнівний вплив на середовище.

Ex. 5. Complete the sentences with the appropriate words from the list below and translate them into Ukrainian:

partitions, interior, weight, exterior, load-bearing, studs, lumber

Buildings must be protected from the weather. For this purpose, (1) ... walls are made. (1) walls are usually (2) ... walls. This means they help support the (3) ... of the structure. (4) walls divide the building into different rooms. Some (4) ... walls help bear the load. Others do not. Those that do not bear any load are called (5)... . Framing of both (4) ... and (1) ... walls is usually done with 2" x 4" (6) ..., called (7) Sometimes 2" x 6" (6) ... is used for (1) ... walls if thicker insulation will be installed later. Because (6)... is becoming more costly, some homes are built with metal framing. Walls in commercial and industrial buildings are made using many different materials and methods. Concrete and concrete block are often used for (2) ... walls. Concrete, glass, steel, brick, or wood can be used for (1) ... walls of framed structures. Metal frames are used for (4)... (5)... .

Note : *studs* – розпори, підпори; *lumber* – порізане дерево.

Ex. 6. Match each word in the left-hand column with the best in the right-hand column.

BIOCLIMATIC DESIGN

1.	Building sector	a.	the sun, with parameters of solar geometry and sunshine, air temperature, wind with parameters the direction and intensity, moisture with parameters the humidity of air and the environment.
2.	Bioclimatic design	b.	is architecture that utilizes environmentally conscious design techniques.
3.	Objectives of bioclimatic design	c.	combines a variety of techniques and technologies to achieve ultra-low energy use.
4.	Basis of bioclimatic design	d.	is the single most important goal of sustainable architecture.
5.	Climatic elements	e.	allows buildings to harness the energy of the sun efficiently without the use of any active solar mechanisms such as photovoltaic cells or solar hot water panels.
6.	Energy design		plays an important role in emissions and energy consumption.
7.	Sustainable architecture	f.	to save and to replace some or all the fuel consumption for heating, cooling and other needs of habitable space; ensure internal conditions within the comfort zone; ensure a short-term depreciation of its additional initial costs compared to a conventional building.
8.	Sustainable energy	g.	is a complex process, which must consider issues of energy interaction between a building and its environment.
9.	Passive house standard	h.	is climate.
10.	Energy efficiency	i.	which can drastically reduce the energy consumption of a building and its negative environmental impact.
11.	Well insulated building	j.	use heating, ventilation and cooling system efficiency; renewable energy generation; solar panels; wind turbines; solar water heating; heat pumps.

12.	Passive solar building design	k.	the most important and cost effective element of an efficient heating, ventilating, and air conditioning (HVAC) system.
13.	Photovoltaic solar panels	l.	help to provide sustainable electricity for any use.
14.	Roofs	m.	are often angled toward the sun to allow photovoltaic panels to collect at maximum efficiency.

Ex.7. Translate sentences into English and reproduce them.

Біокліматична архітектура

Провідною ідеєю біокліматичної архітектури є створення комфортного середовища для людської діяльності в будинках. Біокліматична архітектура поєднує досвід традиційної архітектури та досягнення сучасних енергоефективних технологій проектування. Особлива увага приділяється послідовному дотриманню принципу енергетичної раціоналізації.

Ідея “будинку природного організму”, форма якого відповідає конкретним умовам функціонування, дала поштовх для розвитку органічної архітектури.

У напрямку біонічної архітектури на основі методу функціональних аналогій були запропоновані будинки, структура, конструктивна система та спосіб функціонування, які наближені до природних аналогів. Було розвинуто принцип мінімізації енергетичних та матеріальних ресурсів при створенні будинку та раціоналізації його експлуатації.

Miscellaneous

Ex. 8. Choose and use.

let sth down: *lengthen a garment* **let sb down:** *disappoint* **let sb off:** *not to punish* **let on:** *reveal a secret* **let out:** *make (a garment) looser, larger etc.*

let up: *lessen, stop gradually*

1. The judge let the boys with a warning. 2. When she put on weight she had to let all her clothes. 3. It was raining hard earlier but it's letting now. 4. John didn't let that Jim had broken the window. 5. This skirt is rather short. You'd better let it 6. I thought I could trust Sam, but he let me

GRAMMAR EXERCISES

Ex. 1. Open the brackets using the gerund either in the active or passive voice form.

1. The decorator insists on (pay) for his work done. 2. Henry is looking forward to (give) the leading role in the project. 3. Joan is very secretive. She avoids (ask) any personal questions or (ask) any even by her closest friends. 4. Why do celebrities avoid (meet) journalists? 5. The tutor was annoyed at (interrupt) every other moment. 6. We did not want to speak to the correspondent and tried to avoid (interview) by him. 7. Specialists organized their considerable resources in an effort to prevent data from (take) from International Financial Statistics.

Ex. 2. Combine the sentences using the gerund.

1. Send your application today. Don't delay! 2. I have to pay an enormous income tax. I resent this. 3. His assistant always buys a thing or two in a dutyfree shop. She can't resist this. 4. You shouldn't take advantage of people's weakness. It's no good. 5. I posted your letters. I clearly remember that. 6. Both companies had discharged a lot of toxic waste. They denied that.

Ex. 3. Fill in the gaps with prepositions.

1. The media can be blamed ... imposing lots of negative views on gullible young people. 2. She often complains ... not feeling appreciated at work. 3. If you persist ... causing the trouble, the company may be forced to dismiss you. 4. He was absorbed ... studying the manuscript. 5. The principal got tired ... making reprimands. 6. We have difficulty ... installing the new equipment. 7. The loader agreed to assist us ... shifting the furniture. 8. The workers threatened the boss ... going on strike. 9. ... choosing her coronation stamp Queen Elizabeth examined sixty-three designs.

Ex. 4. Open the brackets using either the gerund or the infinitive.

1. My tutor has always encouraged me (have) confidence in myself. 2. If you delay (pay) your rent any longer, you'll be evicted. 3. She demanded (speak) to the manager who refused (give) her six percent pay rise. 4. The teachers of this primary school encourage (develop) individual interests. 5. (Be) honest, there is little chance of the scheme (approve). 6. I don't see why we should postpone (talk) it out. 7. Don't hesitate (call) us if you need help or a good piece of advice. 8.

Whenever we met, she avoided (look) at me. 9. City life is too hectic for me. I really miss (live) in the country.

Ex.5 Translate the sentences into English:

1. Є лише один шлях вирішити це питання. 2. Я не бачу причини переробляти запропонований проект. 3. Я не мав можливості застосувати сучасні енергоефективні технології у будівництві свого маєтку. 4. Отримавши запрошення взяти участь в конференції, він почав готуватися до неї. 5. Дізнавшись, що компанія продала його винахід не порадившись з ним, вчений розсердився. 6. Я не знаю, чому вони вирішили відкласти це питання до наступного тижня, замість того, щоб обговорити його відразу. 7. Я нічого не можу сказати про переваги біонічної архітектури, не побачивши її в дії.

SUPPLEMENTARY READING

What is bioclimatic architecture and what does bioclimatic design include?

Bioclimatic architecture refers to the design of buildings and spaces (interior – exterior – outdoor) based on local climate, aimed at providing thermal and visual comfort, making use of solar energy and other environmental sources. Basic elements of bioclimatic design are passive solar systems, which are incorporated into buildings and utilise environmental sources (for example, sun, air, wind, vegetation, water, soil, sky) for heating, cooling and lighting the buildings.

Bioclimatic design takes into account the local climate and includes the following principles:

Heat protection of the buildings in winter as well as in summer, using appropriate techniques which are applied to the external envelope of the building, especially by adequate insulation and air tightness of the building and its openings.

Use of solar energy for heating buildings in the winter season and for daylighting all year round. This is achieved by the appropriate orientation of the buildings and especially their openings (preferably towards the south), by the layout of interior spaces according to their heating requirements, and by passive solar systems which collect solar radiation and act as “natural” heating as well as lighting systems.



Protection of the buildings from the summer sun, primarily by shading but also by the appropriate treatment of the building envelope (i.e. use of reflective colours and surfaces).

Removal of the heat which accumulates in summer in the building to the surrounding environment using by natural means (passive cooling systems and techniques), such as natural ventilation, mostly during nighttime.

Improvement – adjustment of environmental conditions in the interiors of buildings so that their inhabitants find them comfortable and pleasant (i.e. increasing the air movement inside spaces, heat storage, or cool storage in walls).

Ensuring insolation combined with solar control for daylighting of buildings, in order to provide sufficient and evenly distributed light in interior spaces.

Improvement of the microclimate around buildings, through the bioclimatic design of exterior spaces and in general, of the built environment, adhering to all of the above principles.

The bioclimatic design of a building requires the simultaneous and coordinated operation of all the systems so that thermal and visual benefits can be combined throughout the year.

Answer the questions:

1. What is meant by “Bioclimatic architecture” in your opinion?
2. What is sustainable architecture?
3. What do you think the Green house is?
4. What are the main principles of bioclimatic architecture?
5. What principles does bioclimatic design take into account?
6. What does bioclimatic design include?
7. What energy can be used for heating buildings in the winter season and for daylighting all year round?
8. What is used for protection of the buildings from the summer sun?
9. What can sufficient light in interior spaces provide?
10. What does bioclimatic design require?

FOR PLEASURE.....

*“Good architecture is green architecture, but it doesn’t mean that all green architecture is good architecture”. Ken Yeang
Everything will be okay in the end. If it’s not okay, it’s not the end.*

UNIT THREE

Reading: Landscape Architecture

Word building: Blending

Grammar: Non-verbal forms. Participle I, II

Supplementary reading: Definitions of landscape, landscape design, landscape architecture, landscape planning and EID. Design approach.



Phonetic Drill

*For the world you may be just one person,
but for one person you may be the whole world!*

Words you will need.....

landscape *n.* Syn. scenery

preservation *n.* Syn. protection

landscape preservation

rehabilitation *n.* Syn. reconstruction, rebuilding, renewal

scope *n.* Syn. dimension, spread

estate *n.* Syn. property

spatial *adj.* Syn. dimensional

spatial planning ['speɪʃ(ə)l]

licensure *n.*

infrastructure *n.*

civil, public infrastructure

embodied, *adj* [ɪm'bɒdɪd], [em-]

remit, *n*

species, *n* ['spi:ʃi:z], *pl.* без змін

hydrology, *n.* [haɪ'drɒlədʒɪ]

regeneration, *n.* Syn. revival

urban regeneration

appraisal, *n* [ə'preɪz(ə)l] Syn.

estimate, valuation, mark

landscape appraisal

fold, *n*

пейзаж, краєвид, ландшафт

збереження, запобігання, охорона

збереження природних ландшафтів

реабілітація, відбудова

сфера, масштаб, обсяг, розмах

майно, нерухомість

просторовий

просторове планування

видача дозволів, ліцензування

інфраструктура

цивільна, суспільна інфраструктура

втілений, уособлений

сфера компетенції, коло обов'язків

рід, порода, вид, різновид

гідрологія

регенерація, відродження,

переродження

регенерація міст

оцінка

оцінка краєвиду, ландшафту

товариство односторонніх

on par with (somebody/something)

reservoir, *n.* ['rezəvwa:] *Syn.* tank, container, basin

extract *v.*

extractive industry applications

contribution *n.* *Syn.* fee, deposit, cooperation, collaboration

restoration, *n.* [ˌrest(ə)'reɪʃ(ə)n]

wilderness [ˈwɪldənɪs]

wilderness area

assessment *n.* *Syn.* opinion, thought, idea, mind, think

forestry, *n.* ['fɒrɪstrɪ]

horticulture, *n.* ['hɔːti,kelʃə]

technical limitations

soil science

serviceability *n.* [ˌsɜːvɪsəˈbɪlɪtɪ]

explore *v.* *Syn.* investigate, research, examine

interpret *v.* *Syn.* to explain

biodiversity, *n.* [ˌbaɪəʊdaɪˈvɜːsɪtɪ]

Syn. originality, peculiarity, variety

range, *v.*

reclamation, *n.* [ˌreklə'meɪʃ(ə)n]

offshore, *adj.*

Pre-reading.....

Task 1. a) While reading the text you will come across a number of international words:

Preservation, profession, urban and regional planning, art, technology, social science, politics, philosophy, materials, hydrology, ecological, infrastructure and building design, universities, hospitals, hotels, commercial, squares, scheme, offshore, contract, consultant, geomorphology, strategy, resources, limitation, factors, specific.

на тому самому рівні з

водосховище, резервуар, скарбниця

видобувати, вибирати

видобувні промислові застосування

внесок, співробітництво, взаємодія

відновлення, ремонт; обладнання

(приміщення) ; реставрація,

дика місцевість; незаймана природа

державний природний заповідник

оцінка, думка, судження

лісове господарство

садівництво

технічні обмеження, недоліки,

грунтознавство

справність, експлуатаційна надійність

досліджувати, зонувати, розвідувати

інтерпретувати, розтлумачувати,

тракувати, розцінювати

біорізноманітність, різновидність,

різноманітність, своєрідність,

відмінність

(from, between) коливатися в певних

межах; вишиковувати в ряд

освоєння, рекультивация (земель),

меліорація, виправлення, поліпшення

який рухається в напрямку від берега

b) Find Ukrainian equivalents to the following words or word-combinations:

Landscape architecture, architectural design, site planning, estate development, environmental restoration, multi-disciplinary field, public parks and parkways, corporate office buildings, external space, valuable contribution, support or prepare applications, outdoor green spaces, private practice, planning or management purposes, serviceability.

Task 2 Think of the answers:

1. What is landscape architecture?
2. Where do landscape architects work?
3. What are the abilities of landscape architects?
4. What do landscape designers do?
5. What do landscape managers do?
6. What do landscape scientists do?

Reading.....

Task 1. Read and translate the text.

Landscape architecture

Landscape architecture is the art, planning, design, management, preservation, and rehabilitation of land, as well as the design of large-scale man-made constructs. The scope of the profession includes architectural design, site planning, estate development, environmental restoration, town or urban planning, park and recreation planning, regional planning, spatial planning, and historic preservation.

Landscape architects are considered professionals on par with doctors and lawyers, because they are often required to obtain specialized education and professional licensure, similar to the requirements for those other professional occupations.



Landscape architecture is a multi-disciplinary field, including within its fold mathematics, science, engineering, art, technology, social sciences, politics, history, philosophy, the activities of a landscape architect can range from the creation of public parks and parkways to the site planning for corporate office

buildings, from the design of residential estates to the design of civil infrastructure and the management of large wilderness areas or reclamation of degraded landscapes such as mines or landfills.

Landscape architects work on all types of external space – large or small, urban or rural, and with 'hard'/'soft' materials, hydrology and ecological issues. They work on:

- The form, scale and siting of new developments
- Private estates and public infrastructure, and building design
- The site design for schools, universities, hospitals and hotels
- Public parks, golf courses, theme parks and sports facilities
- Housing areas, industrial parks and commercial developments
- Highways, transportation structures, bridges and corridors
- Town and city squares and pedestrian schemes
- Large or small urban regeneration schemes
- Reservoirs, dams, power stations, extractive industry applications or major industrial projects
- Environmental assessment, planning advice and land management proposals.
- Coastal and offshore developments

The most valuable contribution is often made at the earliest stage of a project in generating ideas and bringing flair and creativity to the use of space. The landscape architect can:

- contribute to the overall concept
- prepare an initial master plan, from which detailed designs can subsequently be prepared
- let and supervise contracts for construction work
- prepare design impact assessments
- conduct environmental assessments or audits
- act as an expert witness at enquiries on land use
- support or prepare applications for capital or revenue funding grants

Persons who may work for or with Landscape Architects:



Landscape designers are involved in garden, landscape design and creation of all types of outdoor green spaces. Many work in public offices in central and local government. Others work in private practice and act as consultants to public authorities, industry and commerce, and to private individuals.

Landscape managers use their knowledge of plants and the natural environment to advise on the long-term care and development of the landscape. They work in horticulture, estate management, forestry, nature conservation and agriculture.

Landscape scientists have specialist skills such as soil science, hydrology, geomorphology or botany that they relate to the practical problems of landscape work. Their projects can range from site surveys to the ecological assessment of broad areas for planning or management purposes. They may also report on the impact of development or the importance of particular species in a given area.

Landscape planners are concerned with the location, scenic, ecological and recreational aspects of urban, rural and coastal land use. Their work is embodied in written statements of policy and strategy, and their remit includes master planning for new developments, landscape evaluations and assessments, and preparing countryside management or policy plans. Some may also apply additional specialisms such as landscape archaeology or law to the process of landscape planning.



Landscape engineers/surveyors, as engineers or surveyors, must identify and understand the relevant conditions in order to produce a successful result. Other issues include available resources, physical or technical limitations, and factors such as cost, and serviceability. By understanding these constraints, engineers provide recommendations for which a landscape or system may be developed.

Landscape artists (Land artists) use the landscape itself, or elements thereof, to explore relationships between nature and culture. Landscape artworks can be monumental and permanent or temporary and are usually site-specific. Landscape artists historically reflect social perceptions of the environment, and thereby explore, interpret, and re-envision the anthropologic role in the natural world. Issues such as sustainability, adaptability, biodiversity, and renewable resources are major themes of contemporary land art.

Task 2. Give answers to the following questions:

1. What is landscape design?
2. What does the landscape architecture include?
3. What does a landscape architect consider?

4. How is a landscape designer defined?
5. What is the definition of a landscape planner?
6. What can you say about a landscape engineer?
7. How is a landscape artist defined?
8. What is traditional planning?
9. What must landscape architects take into account?
10. What difficulties must landscape architects face?

Task 3. Define whether the following statements are True (T) or False (F):

1. The landscape architect can act as an expert witness at enquiries on land use;
2. Landscape architects do not work on coastal and offshore developments;
3. Landscape scientists do not need to have such skill as soil science;
4. Landscape planners are concerned with the location;
5. Landscape managers do not use their knowledge to advise on the long-term care and development of the landscape.

Task 4. Fill in the gaps, using suitable words and word combinations:

1. ... are specialists, who work on all types of external space.
2. ... are involved in landscape design.
3. ... use their knowledge to advise on the long-term care and development of the landscape.
4. ... should have soil science.
- 5... are concerned with the location and land use.
6. ... must understand the relevant conditions to produce a successful result.

ACTIVITY

Create the following computer design development such as:

- fold range of plants for winter gardens;
- fold range of plants for stylized gardens;
- select common materials for making small architectural forms;
- develop a light-colored design of facades of public, residential and industrial buildings;
- develop a light color space architectural complex (hotel, commercial, recreational);
- analyze light-colored fragment of Landscape Design

DID YOU KNOW?

- The ancient Greeks identified four 'elements': Earth Fire Water and Air. Their concern was with science – not with landscape design.
- Pavements could be included within 'structures', giving us only 4 elements, but they deserve separate identification as the 'connective tissue' in the man-made landscape.
- Garden Design is an ancient art for which we have records reaching back for more than 4,000 years.
- Landscape Architecture came into being as an art concerned with designing a particular type of building.
- Environmental Impact Design is a development from America's National Environmental Policy Act (NEPA) of 1969. An Environmental Impact Survey is followed by an Environmental Impact Assessment and an Environmental Impact Design (EID).
- An Environmental Impact Survey is followed by an Environmental Impact Assessment and an Environmental Impact Design (EID).

Practicing.....

Word-building

Blending

Blending is the process whereby new words are formed by combining parts of two words, usually the beginning of one word and the end of another. Notice that enough of each word is normally retained so that the complex whole remains fairly readily analyzable. **e.g.** Smog (smoke + fog), brunch (breakfast + lunch) etc.

Ex.1. Read a partial list of common blends. Try to find some more:

Heliport (helicopter + airport), motel (motor + hotel), FORTRAN(formula translation), breathalyzer(breath + analyzer), electrocute(electro + execute), Eurovision(European + television), multiversity (multiple + university), newscast(news + broadcast), paratroops(parachute + troops), telecast (television + broadcast), travelogue(travel + catalogue), telex(teleprinter + exchange).

VOCABULARY EXERCISES

Ex. 1. Give Ukrainian equivalents of the following: preservation, rehabilitation, issues, conservation, application, interpret, hydrology, outdoor green space, planning or management purposes, cost, serviceability, flair, landfill, the overall concept, conduct environmental assessments, additional specials, constraints

Ex.2. Give English equivalents of the following: збереження, охорона, реабілітація, сфера, обсяг, розвиток нерухомості, просторове планування, професійний, ліцензування, цивільна інфраструктура, гідрологія, дослідження, водосховище, резервуар, видобувні промислові застосування, офшорні розробки, внесок, співробітництво, управління нерухомістю, лісове господарство, технічні обмеження, експлуатаційна надійність.

Ex.3. Arrange the words into pairs of synonyms and translate them into Ukrainian: preservation, explain, saving, diversity, rebuilding, corporate, planning, designing, bound issues, conservation, opinion, interpret, variety, offshore, restoration, outside, reconstruction, combined, rehabilitation, problem, assessment, limit.

Ex.4. Arrange the words into pairs of antonyms and translate them into Ukrainian: spatial, inaction, development, inside, limitation, serviceability, external, public, disadvantage, outdoor, private, unemployment, conduct, inapplicability; similar, regress, different, occupation, close, internal.

Ex.5. Complete the sentences with the appropriate words from the list below and translate them into Ukrainian:

management, species, preservation, rehabilitation, impact, recommendation, space, planning, design, art, prepare

1. Landscape architecture is the ... of the land and the design of large-scale man-made constructs. 2. Landscape architects work on all types of external ... – large or small, urban or rural. 3. The landscape architect can ... an initial master plan, from which detailed designs can subsequently be prepared. 4. Landscape scientists may also report on the ... of development or the importance of particular ... in a given area. 5. Engineers provide ... for which a landscape or system may be developed.

Ex.6. Translate the sentences into English.

1. Відносини між ландшафтним дизайном та ландшафтною архітектурою є еквівалентом відносин між законом і юристами. 2. Відкритий простір, який є "хорошим" з однієї точки зору (наприклад, соціальної) може бути непривабливим з іншої точки зору (наприклад, естетичний чи природний процес). 3. Термін ландшафтна архітектура був винайдений Gilbert Laing Meason в 1828 році. 4. Більшість країн мають професійні асоціації, пов'язані з ландшафтною архітектурою. 5. Фактори проектування включають об'єктивні якості, такі як клімат і мікроклімат. 6. Це є відмінною рисою ландшафтного планування.

Ex.7. Translate the following abstract and reproduce it.

Ландшафтний дизайн

Ландшафтний дизайн – це мистецтво, що знаходиться на стику трьох напрямків: з одного боку: архітектури, будівництва та проектування (інженерний аспект), з іншого боку: ботаніки та рослинництва (біологічний аспект), і, з третього боку: в ландшафтному дизайні використовуються відомості з історії (особливо з історії культури) і філософії. Крім того, ландшафтним дизайном називають практичні дії з озеленення та благоустрою територій.

На відміну від садівництва і городництва, основне завдання яких має сільськогосподарську спрямованість (підвищення врожайності садово-городніх культур), ландшафтний дизайн є більш загальною й універсальною дисципліною. Головне завдання ландшафтного дизайну – створення гармонії, краси в поєднанні з вигодами використання інфраструктури будівель, згладжування конфліктності між урбанізаційними формами і природою, яка часто від них страждає.

Ландшафтний дизайн може бути окремим випадком більш загального поняття – ландшафтного проектування.

Ex.7. Describe the work of landscape artists.

Miscellaneous

Ex. 8. Choose and use: look after (take care of); look for (search for); look out (for)(watch out); look into(investigate);look over(inspect carefully); look through (study carefully sth written)

1. I've been looking my glasses to read the article about this famous builder. 2. The hotel manager will look your complaint. 3. I must look my essay before I hand it in tomorrow. 4. Look for sharks when you go swimming. 5. Oksana looks the children while Mariia goes to the university.

GRAMMAR EXERCISES

Ex.1. Paraphrase the following sentences using Participle I where it is possible. Define the syntactic function of participles.

Model: The girl who is looking through the window is my sister. → The girl looking through the window is my sister.

1. The conference, which is being held at the University, is devoted to Landscape architecture. 2. I couldn't ring them up as I hadn't found their telephone number. 3. We went to see our friends who had just returned from a voyage. 4. The man who made a report yesterday came back from Austria. 5. Unable to attend the conference that took place a month ago, we asked for the typewritten reports. 6. He stood at the counter and hesitated, he did not know what to choose. 7. As we were very tired, we refused to get on with the discussion. 8. When he crossed the bridge, he saw a small village which was situated at the foot of a hill. 9. The glass roof collapsed onto the crowd and caused horrific injuries.

Ex.2. Open the brackets using the correct perfect form of Participle I.

1. (complete) all our preparations we hired a taxi and hurried off. 2. By this time (get used) to the atmosphere of the big city, he no longer felt a stranger. 3. (see) so little of the country, I am afraid I cannot answer all your questions. 4. Never (experience) such difficulties before she was at a loss. 5. (arrive) two days before the conference he had a lot of time to explore the surroundings. 6. She left (tell) us all she had found out. 7. A person (bring) good news is always welcome.

Ex.3. Paraphrase the following sentences according to the model.

Model: *The new job, which has been offered to me lately, seems to be very demanding. - The new job offered to me lately seems to be very demanding.*

1. The answer, which had been so long expected, came at last. 2. These are only a few of the attempts which were made to improve the situation. 3. The things that are left behind by passengers are usually taken to the Lost Property Office. 4. Here is the memo I received yesterday. 5. It was not easy to find the file which I had

deleted. 6. The castle, which was built many years ago, still looks magnificent. 7. Name some places abroad you have visited so far.

Ex.4.Combine the following pairs of sentences by using participles.

1. We met a boy. He was carrying a heavy bag. 2. The house was decorated with lights. It looked beautiful. 3. I found the door open. I went inside. 4. We had worked for several hours. We came out of the office. 5. His handwriting was illegible. I couldn't figure out what he had written. 6. We make some friendships in childhood. They last forever. 7. The sun had risen. We set out on our journey. 8. I walked along the road. I saw a snake. 9. He lost all his money in gambling. He became a pauper. 10. I took a cue from his words. I solved the riddle. 11. He didn't realize the implication of his words. He went on speaking. 12. The enemy forces had been defeated by our army. They retreated fast into their own territory. 13. It was a fine day. Everybody was out on the roads.

Ex 5. Translate the sentences into English using different types of participles.

1.Читаючи статтю в журналі про ландшафтний дизайн, я виписав основні тенденції. 2. Читаючи статтю у журналі про ландшафтний дизайн, я виписував основні тенденції. 3. Читаючи статтю у журналі про ландшафтний дизайн, я виписуватиму основні тенденції. 4. Будинок, що будують у нашому районі, буде будівлею лісового господарства. 5. Мій товариш посадив дерева, які зараз поливають. 6. Коли його запитали про дизайн саду, він відповів, що уже розробив його. 7. Вам подобається ландшафтний дизайн цієї частини міста, який зараз обговорюється? 8. Знання, отримані ландшафтними менеджерами у вищій школі дизайну, дуже важливі для подальшої роботи. 9. Зламана квітка лежала на траві. 10. Викладач уважно переглянув презентації, підготовлені студентами. 11. Загубивши телефон дизайнерської фірми, я не міг зателефонувати їм. 12. Отримавши запрошення, я негайно виїхав на конференцію. 13. Ось теми, які зазвичай обговорюють на семінарах.

Ex.10. Translate the sentences into Ukrainian, paying attention to the usage of verbals.

1. Hearing the sounds of music, we stopped talking. 2. The perspective of underdeveloped nations forming an economic alliance is unbelievable. 3. Having been shown the wrong direction, the hikers soon lost their way. 4. The rush hour in Tokyo – it's something to be seen to be believed. 5. The room facing the garden is much cozier than this one. 6. Running into the road, the young man caught a taxi.

SUPPLEMENTARY READING

Definitions of landscape, landscape design, landscape architecture, landscape planning and EID. Design approach

Landscape has six main compositional elements: Landform, Vertical Structures, Horizontal Structures, Vegetation, Water, and Climate. Landscape Design is the art of arranging these elements to make good outdoor space.

Garden Design is a specialized branch of Landscape Design, concerned with private space and private goods. The difference between the two arts is that one is concerned with private space and one with public space. The public park is an area of overlap - and the origin of the landscape architecture profession.

Landscape Designers influence Natural Processes, Social Processes and Aesthetic Processes. Their aims and objectives can also be placed in these three groups. Outdoor space which is 'good' from one point of view (eg social) may be bad from another point of view (eg aesthetic or natural process). A space can also be good for humans but bad for other species (eg a swimming pool with treated water).

Landscape Architecture is an organized profession. Its members have approved qualifications and work on Garden Design, Landscape Design, Landscape Planning and other specialized activities. The relationship between Landscape Design and Landscape Architecture is equivalent to the relationship



between the law and lawyers. The term landscape architecture was invented by Gilbert Laing Meason in 1828. 'Landscape architecture' is now recognized by the International Labour Organization and represented by the International Federation of Landscape Architects (IFLA). Most countries have professional associations concerned with landscape architecture. Planning

the landscape is an old idea. Around 1800 John Claudius Loudon (1783-1843) worked as 'a planner (as the Scotch call a landscape-gardener)'.

Patrick Abercrombie gave a lecture on Country planning and landscape design in 1934 and wrote that 'the English countryside has been wrought upon by man in the past in such a way that he has created out of nature's raw materials a work of human art, a composition or a picture as we should say of music or painting'. When Brian Hackett used Landscape Planning as the title of a book in 1971, he used it in its modern sense. *The objectives* of Landscape Planning are similar to those of Landscape Design but planning projects tend to be 1) more

concerned with public goods than private goods; 2) larger in scale; 3) longer in duration; 4) implemented by many contracts, rather than one contract

Environmental Impact Design (EID) may be defined as 'the adaptation of a project design with regard to the supply of public goods (social, natural and aesthetic) and the development of multi-objective landscapes'.

Factors in designing include objective qualities such as the climate and microclimates; topography and orientation, site drainage and groundwater recharge; municipal and resource building codes, soils and irrigation, human and vehicular access and circulation, recreational amenities (i.e.: sports and water), furnishings and lighting, native plant habitat botany when present, property safety and security, construction detailing, and other measurable considerations.

Factors in designing also include subjective qualities such as: genius loci (the special site qualities to emphasize); client's needs and preferences; desirable plants and elements to retain on site, modify, or replace, and available to use as borrowed scenery from beyond; artistic composition from perspectives of both looking upon and being in the gardens; spatial development and definition; plant palettes in designed layouts, and artistic focal points for enjoyment.

There are innumerable other design factors and considerations brought to the complex process of designing a garden that is beautiful, well functioning, and thrives over time.

The up-and-coming practice of online landscape design allows professional landscapers to remotely design and plan sites through manipulation of two-dimensional images without ever physically visiting the location. Due to the frequent lack of non-visual, supplementary data such as soil assessments and pH tests, online landscaping necessarily must focus on incorporating only plants which are tolerant across many diverse soil conditions.

Answer the questions: 1. What are the main compositional elements of landscape? 2. What is Garden Design? 3. How can aims and objectives of Landscape Designers be placed? 4. Who invented the term "Landscape Architecture"? 5. Do you know the objectives of Landscape Planning? 6. What allows professional landscapers to design and plan sites remotely?

FOR PLEASURE.....

The only thing in life achieved without effort is failure...

I call architecture frozen music.

– Johann von Goethe

PROGRESS CHECK

Module I

THE ENGINEERING PROFESSION

UNIT ONE

Lutsk National Technical University

1. Lexical Progress Check

- 1) In 2008, LNTU got the status of a... University.
a) National; b) State; c) Private d) Common;
- 2) Structurally, the university consists of:
a) a college, 24 departments, 8 faculties; b) 3 colleges, 34 departments, 8 faculties; c) 3 colleges, 35 departments, 7 faculties; d) 2 colleges, 35 departments, 8 faculties;
- 3) The largest university in the world is
a) University of Karueein; b) University of Bologna; c) Indira Gandhi National Open University; d) Lutsk National Technical University; e) Oxford University.
- 4) The first director of the branch of the Ukrainian Institute of Water Transport Engineers was ...
a) I.M.Khorolsky; b) V.V.Bozhydarnik; c) Z.V. Herasymchuk; d) L.M. Kravchuk;
- 5) A person who has completed a university degree course is called - ...
a) a postgraduate; b) a graduate; c) tuition; d) a teacher; e) a student
- 6) ...is used with reference to bridges, roads, harbours, water supply and hydroelectric schemes.
a) "construction"; b) "building"; c) "civil engineering"; d) "condition"; e) "structural engineering".
- 7) State your name, age, and ____ in the box below.
a) work; b) post; c) position; d) profession; e) occupation
- 8) ... is dealing with the flow of water and other fluids.
a) Electrical and Electronic Engineering; b) Mechanical Engineering; c) Chemical Engineering; d) Environmental/Sanitary Engineering; e) Hydraulic Engineering.
- 9) In big cities where there is not enough space, people often live in
a) cabins; b) apartments; c) mansions; d) cottages; e) huts
- 10) Most houses have ... frames.
a) stone; b) lime; c) wood; d) steel, e) concrete

2. Grammar Progress Check

- 1) "Be careful with that suitcase, porter. It contains a ten-foot snake." – Porter: "You can't kid me – snakes don't have any
a) feet; b) foot; c) foots; d) feets; e) fits
- 2) Every year over 2000 students take an active part ... sport competitions.
a) at; b) on; c) in; d) for; e) by
- 3) They have got ... first prizes in ... world Engineering Contest.

- a) a; b) the; c) an; d) some; e) -.
- 4) The work of ... engineers is very important.
a) these; b) thesis; c) this; d) that; e) thats
- 5) The building profession ... many numbers of young men and women nowadays.
a) is attracting; b) is being attracted; c) attract; d) attracts; e) are attracted
- 6) They ... of different materials that depend on the climate of the area you live in.
a) are built; b) is building; c) was building; d) was built; e) shall be built
- 7) This material ... an extremely high rate of strength increase.
a) to have; b) have; c) is having; d) has; e) shall have
- 8) A great variety of materials are nowadays ... by builders.
a) used; b) use; c) uses; d) using
- 9) Though today Ukrainian industry _____ materials all over the world,
a) transport; b) transports c) transporting d) are transporting; e) is transported
- 10) Marble is much ... than stone.
a) stronger; b) strong; c) more strong; d) most strong; e) strongest

3. Reading

Language in the Life of Man and Human Society

1. to make use of	вживати, користуватися
2. as recent as	такий давній, як
3. human being	людина
4. at the most	найбільше, не менше, ніж
5. the remote past	далеке минуле
6. spoken language	усна мова
7. native speaker	носій рідної мови
8. mother tongue	рідна мова
9. to have (a practical) command (of)	володіти практично
10. to have a much better grasp of the subject	краще володіти предметом

Human language is the most astonishing creation of man. It helps us to think, to express our thoughts and to understand each other. We make use of it in practically everything we do.

Language is a means of communication in human society. People can use other means of communication, such as red lights or flags, but these signs are interpreted into human language. So language is the normal form and the main means of communication in human society.

Human speech differs greatly from the signal like actions of animals, even of those, which use the voice. Dogs, for instance, make only two or three kinds of noise – say barking, growling and whining. In human speech different sound combinations have different meanings.

Mankind speaks many languages. A group of people who use the same system of speech signals is a speech community. Speech-communities differ greatly in size. An American Indian tribe of only a few hundred persons speaks language of its own. On the other hand, some speech communities are very large.

English has several hundred million native speakers. For them, English is their mother tongue. Millions of people who speak other native languages learn English for business, professional, or political purposes. For them, English is not their mother tongue but a foreign language. Ukrainian, French, German, Chinese, and other languages also have large numbers of speakers.

There are people who know three, four, five or six languages. They are polyglots. They study languages because they are their speciality or hobby. For a modern engineer and research worker, it is absolutely necessary to have a practical command of foreign languages. A scientist who can read the literature of his field in several languages has a much better grasp of the subject.

Learning foreign languages enriches the native language, making it clearer, more flexible and expressive.

1. Find out if the following statements are true or false according to the text.

1. There are other living beings with the power of speech.
2. Polyglots are people who know three, four, five or six languages.
3. Language is a means of communication not only for human beings but also for animals.

2. Answer the following questions:

1. Why is human language the most astonishing creation of man?
2. What is the essential difference between human language and other types of languages?

3. Find the correct endings for the sentences below.

- | | |
|---|--|
| 1. English is | A. a perfect means of expression and communication. |
| 2. It has | B. a long and complicated history. |
| 3. English has | C. a Germanic language. |
| 4. Language is | D. has a problem of using foreign scientific and technical literature. |
| 5. A specialist who does not know foreign languages | E. millions of native speakers. |

UNIT TWO

Future Speciality

1. Lexical Progress Check

- 1) A person doing studies that are done at a university is called - ...
a) a postgraduate; b) graduate; c) tuition; d) a teacher; e) student
- 2) The word ... is mainly used in the sense of domestic dwellings, including houses and multi-storey flats, schools, hospitals and office blocks.
a) "construction"; b) "building"; c) "civil engineering"; d) "condition"; e) "structural engineering".
- 3) ... is the branch of engineering that deals with the effects and processes that

result from the behaviour of tiny particles of matter called electrons.

- a) Electrical and Electronic Engineering; b) Mechanical Engineering; c) Hydraulic Engineering; d) Environmental/Sanitary Engineering; e) Chemical Engineering;
- 4) Many suburban residents live in ... with their own yards and gardens.
 - a) single-family houses; b) apartments; c) penthouses; d) cabins; e) huts
- 5) In Central Asia, nomads live in ... which they carry with them.
 - a) tents; b) apartments; c) mansions; d) cottages; e) huts
- 6) The students are given the opportunity to choose ... and subject courses by themselves.
 - a) books and equipment; b) teachers; c) the curricula; d) groupmates; e) scientific supervisor
- 7) The oldest existing and continually operating educational institution in the world is
 - a) the University of Karueein; b) University of Bologna; c) Oxford University; d) Lutsk National Technical University; e) Indira Gandhi National Open University.
- 8) The ... were the first to develop central heating.
 - a) Ukrainians; b) Egyptians; c) old Slavs; d) ancient Greeks; e) ancient Romans
- 9) In Tibet, many people live in tent-like ...
 - a) cabins; b) yurts; c) mansions; d) cottages; e) huts
- 10) The... is part of the building above the foundation.
 - a) structure; b) picture; c) window; d) door; e) column

2. Grammar Progress Check.

- 1) Organic glass consists of ___ one synthetic resin
 - a) a; b) the; c) an; d) some; e) -.
- 2) Most early engineers ... in the construction of fortification
 - a) were engaged; b) is engaged; c) are being engaged; d) to be engaged; e) were being engaged
- 3) The English Channel is ... than the Strait of Gibraltar.
 - a) wide; b) wider; c) widest; d) more wide; e) the most wide
- 4) A qualified building worker now ... able to read a technical drawing.
 - a) is; b) are; c) have; d) had; e) was
- 5) Students of building institutes.... the existing materials.
 - a) studies; b) study; c) studyes; d) is studying; e) are being studied
- 6) The distribution of water in irrigated areas ... on annual plans.
 - a) is based; b) are based; c) is being based; d) are being based; e) base
- 7) Young architect is dreaming up tomorrow's house today: "The walls ... giant curved sandwiches".
 - a) shall be; b) will be; c) is being; d) are being; e) to be
- 8) What is the name of the ... port in the United States?
 - a) bigger; b) biger; c) biggest; d) big; e) biggist
- 9) ... we study, ... we know.

- a) as ... as; b) so ... as; c) than; d) like ... as; e) the more... the more
 10) My train starts in a minute. I can't wait for him any ...
 a) longer; b) long; c) longest; d) more long; e) much long

3. Reading

Honorable Profession

1. housing construction	житлове будівництво
2. large scale	великий масштаб
3. prefab ferroconcrete panels	збірні залізобетонні панелі
4. honourable	благородний
5. pumping station	насосна станція
6. to treat	оброблювати
7. to purify	очишувати
8. domestic	домашній, внутрішній

In Ukraine, housing construction is underway on a large scale. Hundreds of factories producing prefab ferroconcrete panels are being built. The work of a builder is no longer backbreaking and complicated.

The building profession attracts a large number of young men and women nowadays. It is an honourable profession.

Builders construct and reconstruct residential and industrial buildings, bridges, schools, palaces of culture, museums, theatres, kindergartens and hospitals. They build tunnels, canals, power stations, dams and reservoirs. They also construct aqueducts to store and transport water for populated areas and to irrigate desert lands. The distribution of water in irrigated areas is based on annual plans.

The person entering this honourable profession must have a scientific attitude, imagination, initiative and good judgement, obtained experience and serious work.

Civil engineers and architects have a common aim – to provide people with all modern conveniences, such as running water, gas, electricity, and central heating. While a sanitary engineer protects water quality by treating and purifying it for domestic use, an architect designs buildings. An architect must receive a great deal of scientific training connected with this profession. He must know mathematics, as well as many facts concerning materials – for example what loads different materials may safely carry – so that there will be no danger of the building falling down. Architects must need some knowledge of sculpture, painting, design, mechanical engineering, geography, city planning, etc. The structure an architect creates should give us pleasure, a sense of beauty.

1. Read the text carefully and then make up four questions. All the questions should be answered.

2. Find out if the following statements are true or false.

1. The distribution of water in irrigated areas is based on annual plans.
2. Very many irrigated systems are being built and modernized.
3. Civil engineers and architects have a common aim.

3. Read the text again and write down the correct endings of the sentences below.

1. The building profession attracts so many numbers of young men and women nowadays because
2. At present civil engineers construct and reconstruct
3. An architect must receive

UNIT THREE

Buildings

1. Lexical Progress Check

- 1). The term ... is used to denote the erection and repair of all types of buildings, roads, bridges, and other structures.
a) "construction"; b) "building"; c) "civil engineering"; d) "condition"; e) "structural engineering".
- 2) Jonson was a Mechanical Engineer by ____ .
a) work; b) post; c) position; d) profession; e) occupation
- 3) The history of Lutsk National Technical University goes back as far as ...
a) 1991; b) 1978; c) 1996; d) 1969; e) 1966.
- 4) Part time training at the University is organised for those who want ...
a) to have a lot of rest; b) to attend periods every day; c) to combine their work and study; d) to miss classes; e) to entertain.
- 5) The term ... means particularly the calculation and design of all kinds of structures whose strength is mostly provided by steel, reinforced, prestressed, or precast concrete, or other alloys.
a) "construction"; b) "building"; c) "civil engineering"; d) "condition"; e) "structural engineering".
- 6) ... is dealing with water supply, water purification, and sewer systems, as well as urban planning and design.
a) Electrical and Electronic Engineering; b) Mechanical Engineering; c) Chemical Engineering; d) Environmental/Sanitary Engineering; e) Hydraulic Engineering.
- 7) Those aeroplanes have a very large passenger ...
a) cabins; b) apartments; c) mansions; d) farmhouses; e) huts
- 8) They are expecting a baby and want to move to a bigger ...
a) cabin; b) house; c) tent; d) hut
- 9) The family likes to stay in a ... in the mountains in the summer.
a) cabin; b) apartment; c) mansion; d) yurt; e) hut
- 10) In some counties people live in ... on rivers.
a) houseboats; b) apartments; c) mansions; d) cottages; e) huts

2. Grammar Progress Check

- 1) How many ... have you got? – I don't know. Every time I count them I fall asleep.
a) ships; b) sheeps; c) sheepes d) sheep; e) ship
- 2) The Specialised Academic Councils in the defence of doctoral theses in 5 specialities work in ... University.
a) we; b) us; c) our; d) ours; e) hour
- 3) Education process is carried out according to the multilevel system: ... Bachelor - ... Master...-... PhD
a) a; b) the; c) an; d) some; e) -
- 4) The lecturer gave ___ the names of all building materials.
a) they; b) us; c) our; d) ours; e) their.
- 5) We are ... proud of our district ... you are of yours.
a) as ... as; b) so ... as; c) than; d) like ...as; e) the more....the more
- 6) The academy trains foreign students ... all specialties and ... all departments and institutes of the Academy.
a) at; b) on; c) in; d) for; e) by
- 7) Hundreds of factories producing prefab panels
a) is being built; b) is building; c) built; d) are building; e) are being built
- 8) Paris is one of the ... cities in the world.
a) beautifuler; b) beautifulest; c) more beautiful; d) most beautiful; e) beautiful
- 9) Homes and houses ... different shapes and sizes
a) are having; b) has; c) is having; d) have; e) has got
- 10) The more one has, the more one
a) wants; b) want; c) wanted; d) shall want; e) is wanting

Module II

THE CONSTRUCTIONS

UNIT ONE

Building Construction

1. Lexical Progress Check

- 1) Early building materials were perishable, such as ... (find the odd one)
a) leaves; b) branches; c) animal hides; d) rock; e) grass
- 2) Straw, reeds, leaves etc. used to make a ..., or the ... made of them.
a) roof; b) window; c) door; d) floor;
- 3) Building materials such as rock, brick, or tile, often bound together by ... or cement.
a) stone; b) glass; c) mortar d) concrete; e) wood
- 4) In comparison with steel ... is lighter, cheaper, easier to work with and its mechanical properties are good.

- a) stone; b) glass; c) brick; d) concrete; e) wood
- 5) Your answer will have no ... on your grade on the test.
 - a) to affect; b) to effect; c) affect; d) effect; e) effecting
- 6) What he said to her ... her deeply.
 - a) affected; b) effected; c) affect; d) effect; e) effecting
- 7) Poured concrete is generally required to stay in the concrete forms for about
 - a) 2 days; b) 7 days; c) 25 days ; d) 17 days; e) a day
- 8) In laying out a site for construction ... is used by surveyors to measure vertical and horizontal angles.
 - a) rule; b) saw; c) level; d) transit; e) jackhammer
- 9) The primary functions of a ... are to admit light and fresh air into a building.
 - a) floor; b) ceiling; c) window; d) door; e) roof
- 10) Concrete and concrete block are often used for walls.
 - a) exterior; b) partitions; c) interior; d) studs; e) load-bearing,

2. Grammar Progress Check

- 1) The Nobel Prize ... to British scientists for this outstanding discovery
 - a) is awarded ; b) awarded; c) awards ; d) has awarded ; e) is being awarded
- 2) When I am sixty, I ... more than fifty houses.
 - a) built; b) am building; c) have built ; d) shall have built ; e) build
- 3) A great number of experiments ... at the research institute before the flood defence system was worked out.
 - a) made; b) have been made; c) have made; d) had been made ; e) make
- 4) Lasers ... by construction and building workers, drillers etc.
 - a) uses; b) are used; c) is used ; d) used; e) are using
- 5). By the time we finish, we ... for 4 hours.
 - a) are painting; b) were painting; c) are being painted; d) will have been painting; e) had been painting
- 6) The construction of the road ... when the commission arrived.
 - a) had completed ; b) had been completed; c) have been completed ; d) have completed ; e) is completed
- 7) The general problem of maintaining comfortable conditions in an occupied room the ... subject of study for many years
 - a) has been; b) is; c) was ; d) are ; e) have been
- 8) There's _____ I can do about this. It's outside my control.
 - a) few; b) little; c) a few ; d) a little
- 9) Could you spare me ... minutes?
 - a) few; b) little; c) a few ; d) a little
- 10) Our new construction business is going very... at the moment.
 - a) some; b) good; c) better ; d) best ; e) well

3. Reading

The Most Important and Widely Used Building Materials

1. lime	вапно
3. masonry	цегляна кладка
5. high rate of strength	висока міцність
6. resistance to	міцність на
7. crushed stone	щебінь
8. mortar	розчин
9. aggregate	заповнювач
10. fine aggregate	мілкий заповнювач

(1) 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 choosing materials for any construction work, the civil engineer must consider many factors. These factors include availability, cost, physical properties of materials and others.

(2) Timber, steel and concrete all vary, sometimes over considerable ranges in the properties desired by the engineer. Even steel, uniform as it appears to be, varies considerably in its microstructure. Concrete is even less uniform than other materials.

(3) Lime, gypsum and cement are the three materials widely used in building construction for the purpose of binding together masonry units, such as stone, brick and as constituents of wall plaster. Cement is furthermore the most important component of concrete.

(4) The most important building materials may be considered to be structural steel and concrete. Concrete may be considered an artificial conglomerate of crushed stone, gravel or similar inert material with a mortar. A mixture of sand, screenings, or similar inert particles with cement and water that hardens into a rocklike mass is called mortar. The fundamental object in proportioning concrete or mortar mixes is the production of a durable material of requisite strength, water tightness and other essential properties at minimum cost. To attain this end, careful attention must be given to the selection of cement, aggregate, and water.

1. Find the correct headings of the paragraphs.

1. Technology of concrete production.
2. Composition of cement.
3. Materials for binding masonry units.
4. The properties of major building materials.
5. The properties of Portland cement.

2. Read the following sentences and divide them into two groups: 'Cement' and 'Concrete'.

1. This material is most widely used for the purpose of binding together masonry units such as stone and brick.
2. This material is also known to be the most important component of concrete.
3. This kind of material may be considered an artificial conglomerate of crushed stone, gravel or similar inert material with a mortar.
4. The material which contains alumina has an extremely high rate of strength increase.
5. The fundamental object in proportioning this material is the production of a durable material of requisite strength, water-tightness and essential properties.
6. The most accurate method of measuring proportions is to weigh the required quantities of each material.

3. Choose the best answer A, B, or C to the questions.

1. What influences the choice of building materials?
 - a) The choice of building materials is governed by the type and the function of a building.
 - b) Availability, cost and physical properties are the main considerations for an engineer in selecting materials for construction.
 - c) The techniques and methods of construction are the main factors influencing the choice of building materials.
2. What are lime, gypsum and cement most widely used for?
 - a) These three materials are not widely used for the purpose of binding together masonry units.
 - b) They are used as components to produce concrete.
 - c) With the large-scale construction, lime, gypsum and cement may be considered to be the most important binding materials.

UNIT TWO
Elements of a Building

1. Lexical Progress Check

- 1) Mixture of sand and silicates, generally is made in a very hot fire stove called a ... , and is very brittle.
 - a) oven; b) fire-place; c) kiln; d) cooker; e) stove
- 2) Joe talked with Janis, but his words had almost no ... on his friend's actions.
 - a) affected; b) effected; c) affect; d) effect; e) effecting
- 3) During recent years the value of ... as an architectural metal has been increasingly recognised.
 - a) aluminium; ; b) lime; c) rubber; d) alloy; e) ore
- 4) ... loads include wind pressure, seismic forces, vibrations caused by

machinery, movable furniture, stored goods and equipment, occupants, and forces caused by temperature changes.

a) Dead; b) Mixed; c) Live d) Easy; e) Heavy

5) ... loads always act directly downward, act constantly, and are additive from the top of the building down.

a) Dead; b) mixed; c) live d) easy; e) heavy

6) ... also *hatchet* is a hand tool with one side of its head forged and sharpened to a cutting edge, used for felling trees, splitting timber, etc

a) Pliers; b) Saw; c) Level; d) Axe; e) Jackhammer

7) ... of all foundations crack within the first year of being poured.

a) 66%; b) 6%; c) 16%; d) 26%; e) 36%

8)..... panes provided humans with the ability to both let light into rooms while at the same time keeping inclement weather outside.

a) Stone; b) Glass; c) Mortar d) Concrete; e) Wood

9).... is used to smooth and trim wood by shaving off thin pieces.

a) Wood float; b) Wood chisel; c) Smoothing planes; d) File; e) Hand power drill

10) The primary functions of the floor are to support the imposed loads and to provide a level surface for the activities that are carried out in the home.

a) floor; b) ceiling; c) window; d) door; e) roof

2. Grammar Progress Check

1) I ... for the mistakes.

a) is not blamed; b) does not blame; c) was not blamed; d) were not blamed; e) is not blaming

2) The papers ... through and corrected by the next lesson.

a) looked; b) had been looked; c) has been looked; d) was looked; e) is looking

3) They working by the evening.

a) will have finished; b) has finished; c) will finish; d) finished; e) finish

4) He ... all necessary instructions before he left for the airport.

a) is given; b) had been given; c) have been given; d) gives; e) gave

5) I need ... help. I'm a bit stuck.

a) few; b) little; c) a few ; d) a little

6) I didn't sleep very ... last night.

a) some; b) good; c) better ; d) best ; e) well

7) Michael Cane was born in South London, not the East End. ... people know that.

a) Few; b) Little; c) A few ; d) A little

8) This house ... last year.

a) built ; b) was built; c) is built; d) has built

9) The letter ... just... sent.

a) has ... been; b) had ... been; c) is ...being ; d) was... being

10) New methods of obtaining polymers ... lately.

a) was applied; b) is applied; c) apply; d) has been applied; e) had applied

3. Reading

The Choice of Material

1. mass production	масове виробництво
2. prefabricated concrete elements	залізобетонні елементи
3. reinforced concrete elements	збірні залізобетонні елементи
4. tensile stress	стискаюче навантаження
5. volume weight	об'ємна вага
6. thermal conductivity	теплопровідник
7. rigid	жорсткий
8. resin	смола
9. bending loads	вигинаюче навантаження
10. wide application	широке використання.

(1) Which material can be used to the best advantage for a particular part of the building depends on the kind of load to which it is subjected and on the shape of the part. The development of the metallurgical and machine-building industry enabled the mass production of prefabricated large-size concrete and reinforced concrete structural elements, a well-known factor influencing material choice.

(2) Reinforced concrete is a building material in which the joint functions of concrete and steel are advantageously utilised. Being brittle, concrete cannot withstand tensile stresses and therefore cannot be used in structures subjected to tensile loading. But if steel is introduced into concrete, it changes the properties of the monolith.

(3) In many cases, bricks, too, are very satisfactory for use in construction. Bricks generally have a pleasing appearance and are available in various qualities, colours, and textures. Being of a high volume weight and high thermal conductivity, ordinary brick is not always satisfactory in building practice.

(4) With respect to physical and mechanical properties at a normal temperature of 20°C, all plastics are divided into rigid, semi-rigid, soft and plastic. With respect to the number of constituents, plastics may be classified as simple and complex.

(5) Plastics consisting of one polymer are referred to as simple. Thus, organic glass 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.

1. Answer the following questions.

1. For what types of construction are reinforced concrete structures and elements used?
2. What new materials have come into use both in industry and building?
3. In what industrial fields are plastics used?

2. Read the following sentences and divide them into three groups 'Concrete', 'Brick' and 'Plastics'.

1. There are some kinds of structural materials that have appeared comparatively recently; sometimes they consist of one polymer. But in the building industry, some complex materials consisting of polymers and other components are used.
2. In many cases, bricks, too, are very satisfactory for use in construction.
3. There are some kinds of materials which are brittle and cannot withstand tensile stress.
4. If steel is introduced into some kind of material, it changes its properties.
5. Some building materials offer good resistance to compressive loads.
6. In respect of physical and mechanical properties, these materials are divided into rigid, semi-rigid and soft.

3. Choose the best answer A, B, C to the statements.

1. Using prefabricated or precast elements ...
 - a) depends only on the kind of load to which it is subjected.
 - b) builders perform a considerable amount of building work not on-site but at a factory.
 - c) made possible the mass production of large-sized structural elements.
2. Reinforced concrete is a building material in which ...
 - a) such properties as small volume weight and high thermal conductivity are combined.
 - b) physical and mechanical properties at a normal temperature of 20°C make it semi-rigid and soft.
 - c) the joint functions of concrete and steel are advantageously utilized.
3. Bricks generally present a pleasing appearance and ...
 - a) they are light-weight building materials.
 - b) cannot be used in structures subjected to tensile stresses.
 - c) can be obtained with various qualities, colors and textures.

UNIT THREE
Building a Structure

1. Lexical Progress Check

- 1) The volcanic eruption ... the entire country.
 - a) affected; b) effected; c) affect; d) effect; e) effecting
- 2) Bricks are hard and easily fastened together with the help of ...
 - a) mortar, b) send; c) lime; d) tile; e) water
- 3) The construction process is also highly organised; according to the...
 - a) national schedule; b) constructing plan; c) functional value; d) similar alterations; e) building. conditions.
- 4) help the project manager keep track of what must be done and when.
 - a) Schedules; b) Shelters; c) Instructions; d) Structures e) Words

- 5) However, ... gets stronger as it gets older it also becomes more brittle
a) concrete
- 6) ... loads include the weight of the building itself and all major items of fixed equipment
a) Dead; b) Mixed; c) Live d) Easy; e) Heavy
- 7) ... has rows of teeth cut into its metal surfaces
a) Pliers; b) Saw; c) Level; d) axe; e) Jackhammer
- 8) is used in construction to smooth out a concrete sidewalk.
a) Wood float; b) Wood chisel; c) Smoothing planes; d) File; e) Hand power drill
- 9) Most buildings have more than one... for safety reasons
a) ceiling; b) entrance c) window; d) door; e) roof
- 10) Concrete typically reaches 90% of its strength factor in ... days and takes years to fully cure
a) 7; b) 28; c) 90; d) 20; e) 8

2. Grammar Progress Check

- 1) Steel has come into general use nowadays in the construction of different buildings.
a) came; b) come; c) ia come; d) has come; e) had come
- 2) Will you have ... strawberries? They're very good
a) few; b) little; c) a few ; d) a little
- 3) We ... yet to this issue.
a) have not agreed; b) did not agree; c) has not agreed; d) do not agree; e) had not agreed.
- 4) All the ordered raw materials ... by the end of the year
a) are delivered; b) has been delivered; c) had been delivered; d) was delivered; e) delivered
- 5) ... learning is a dangerous thing.
a) few; b) little; c) a few ; d) a little
- 6) I've had ... drinks but I'm not drunk.
a) few; b) little; c) a few ; d) a little
- 7) The flexible line, that recently ... at our plant, has greatly improved the production process.
a) have developed; b) have been developed; c) have been developing; d) has been developed; e) shall have developed
- 8) My father ...just ... from a business trip.
a) is... returned; b) was...returned; c) has...returned; d) have... returned; e) had ... returned;
- 9) The weather was very ... while we were on holiday
a) some; b) good; c) better ; d) best ; e) well
- 10) "You ... a successful day today, ... you?"
a) have had, have not; b) are having, are not; c) have, do not; d) had, did not

3. Reading

Advanced Composite Materials

1. composite material	композитний матеріал
2. potentiality	потенційна можливість
3. plywood panel	фанерна плита
4. light-weight honeycomb structures	легкі пористі структури
5. consumption	витрати
6. emergence	поява
7. to outperform	перевершувати
8. conventional material	звичайний матеріал
9. sparingly	з розрахунком
10. exception	виключення

Composite materials are among the oldest and newest of structural materials. Men discovered early that when two or more materials are used together as one, the combination often behaves better than each of the materials alone. Following this principle they combined clay and straw to make bricks. Then with some notable exceptions, the further potentialities of composite materials remained virtually untapped for centuries while monolithic materials, such as iron and copper, served the major needs of an advancing technology. Even in the more recent times with the coming of reinforced concrete, linoleum, plasterboard and plywood panels were somewhat out of mainstream of materials development and technology.

During the 1930's and 1940's, however, light-weight honeycomb structures, machine parts made from compressed metal powders and plastic reinforced with glass fibres became commercial realities. These developments marked the beginning of the modern era of composite engineering materials. The use of composite materials has been steadily growing. The consumption of the fiber reinforced plastics, for example, has been increasing at a phenomenal rate of 25 per cent annually. Nevertheless, the emergence of a strict discipline and technology of composite materials is barely 20 years old.

There are two major reasons for the current interest in composite materials. The first is simply the demand for materials that will outperform the traditional monolithic materials. The second, and the more important in the long run, is that composites offer engineers the opportunity to design totally new materials with the precise combination of properties needed for a specific task. Although the new composites are usually more costly than conventional materials, they can be used more sparingly, because of their superior qualities.

1. Answer the following questions.

1. What is characteristic of composite materials?
2. What is the present tendency in the use of composite materials?
3. What are the main reasons for the interest in composite materials?
4. Why do engineers insist on using composite materials despite their high cost?

2. Complete the table.

Modern Materials	Characteristics	Where Is It Used?

3. Match the words in A with the corresponding definition in B.

A

1. brick
2. panel
3. plywood
4. linoleum
5. glass

B

- A. a floor covering made from a strong, shiny material
- B. a transparent solid substance used for making windows, bottles, etc.
- C. a material made of several thin layers of wood that are stuck together to form a strong board
- D. a flat piece of wood, glass etc, with straight sides, which forms part of a door, wall, fence
- E. a hard block of baked clay used for building walls, houses

Module III

PLANNING

UNIT ONE

City Planning

1. Translate the following words and word combinations into English.

виявляти значний інтерес до знань, громадські консультації, рекомендації з питань політики, вивіски, рекламні щити, місцева ідентичність, рух, особливість, концентрат, гармонійний ріст, депопуляція, безробіття, безправ'я, злочинність, пустельні міські пейзажі, урядові агентства, затори, забруднення навколишнього середовища, бюджет, процес.

2. Answer the following questions.

1. What forms of plans do you know?
2. What are the significant problems of city planning?
3. What is modern planning concentrated on?
4. Who is a city planner?
5. What is traditional planning?
6. What must city planners take into account?
7. What skills are required to become a successful urban planner?
8. What plans does an urban planner have?
9. What is the central aspect of the profession?

3. Give synonyms to the following words.

Public, recommendations, urban, character, local, identity, pedestrians, traffic, feature, term, concentrate, growth, population, unemployment, crime, desolate, landscapes, agency, congestion, pollution, budget, limitation, process.

4. Complete the sentences.

1. City planning (urban, city, and town planning) is
2. A plan can take a variety of forms including
3. Planners can help manage the growth of
4. Modern city planning is increasingly concerned with the
5. They must face the problems of
6. Today, urban planning can be described as

5. Change the following statements into the reported speech.

1. "I have something to show you", I said to her.
2. "I'm going away tomorrow", he said.
3. "I've been in London for a month but I haven't had time to visit the Tower", said Rupert.
4. "I'll come with you as soon as I'm ready", she replied.
5. "I'll see you tomorrow", she said.
6. "I really like this architecture style", she said.
7. "I don't like this project", she said.
8. "We visited the lecture from English" they said.

UNIT TWO

Surveying

1. Translate the following words and word combinations into English.

інспектування, геодезія, дозування, правильність, акуратність, новобудова, засіб, площа, земна поверхня, згинання, мірна стрічка, дуга, далекомірна лінійка, контурна лінія, тиснення, об'єктив камери, корінна порода, зона землетрусу, бурові роботи, вапняк, вибух динаміту.

2. Answer the following questions:

1. What is the difference between a horizontal plane and a vertical plane?
2. What device is used to determine the direction of gravity?
3. What is a chain?
4. What kind of survey takes into account the curvature of the Earth?
5. What is used in modern surveying instead of a chain?
6. What can be used to make contour maps in the field?
7. What is a bubble level? In what surveying instrument is it used?
8. What device can be used to determine approximate elevations?
9. How can distances be measured by means of light or sound waves?

3. Arrange the words into pairs of synonyms and translate them into Ukrainian.

examination, measure, unfilled, expansion, graph, next to, form, stroke, seismic activity, reduction, inspection, shape, discharge, investigate, district, together with, stripe, intension, short form, illustration, volcanic activity, region, empty, detonation.

4. Complete the sentences with appropriate words from the list below. Translate the sentences into Ukrainian.

Highways, distances, location, dams, sound waves, tunnels, characteristics, technology.

Some engineering projects - 1)__, 2)__, or 3)__, for example--may require extensive surveying in order to determine the best and most economical 4)__ or route. The different kinds of measurements in a survey include 5)__, elevations (heights of features within the area), boundaries (both man-made and natural), and other physical 6)__ of the site. Modern 7)__ has been used for surveying in instruments that measure distance by means of light or 8)__.

5. Translate the following sentences and explain the use of the Sequence of Tenses.

1. We asked our guests if they had had a good journey.
2. She said that she had not met him before.
3. I found out that they had gone to Lviv.
4. Tom said that he was staying in England for another year.
5. We said that we should finish the experiment as soon as possible.
6. If the payment is to be in dollars, the customer is not permitted to purchase a stronger currency.
7. The physiocrats argued that the products of agriculture and other natural resources were the true sources of wealth.
8. Although the book was written, it probably would have gone unnoticed were it not for the efforts made by General Motors to discredit its author.

UNIT THREE

Environmental/Sanitary Engineering

Translate the following words and word combinations into English.

Сантехніка, безпечні системи водопостачання, відходи, каналізаційні системи, фонтани, трубопроводи, шторм, громадські лазні, тверді відходи, струмки, колодязі, хвороба, шкідливі бактерії, стоки води, біологічні засоби, природні процеси очищення, нешкідливий, величезні печі, ясен, добрива, паливо, скло, газети, алюмінієві банки, еколог, розчин, метод утилізації сміття та побутових відходів переробки, очисні споруди, добриво, паливо, спалювання відходів своєї продукції, пар для вироблення електроенергії.

1. Answer the following questions.

1. What does environmental/sanitary engineering deal with?
2. What is a sewer? What is waste material known as?
3. What is a reservoir?
4. What is filtration?
5. What is chlorination?
6. What is an incinerator?

7. What is trash?
8. What is sanitary engineering?
9. Why do you study environmental and sanitary engineering?

3. Give synonyms to the following words.

disturb, trouble, supply, bring, link, appoint, remove, get, obtain, recent, place, secure, filtering, clearing, bad, strong, pointed, raise, individual, inoffensive, elimination, processing, individual.

4. Complete the sentences.

1. Many aspects of environmental/sanitary engineering are
2. In the Middle Ages in Europe, water came
3. Modern water supply systems also use
4. Part of providing a safe water supply is
5. A large number of modern drainage systems use
6. One modern method of disposing of trash and domestic wastes is
7. The magnetometer measures
8. Geological samples are most often obtained .

5. Translate into Ukrainian, paying attention to the use of time in Ukrainian and English.

1. When he learnt that his son always received excellent marks in all the subjects at school, he was very pleased.
2. When he learnt that his son had received an excellent mark at school, he was very pleased.
3. She said that her best friend was a doctor.
4. She said that her best friend had been a doctor.
5. I didn't know that you worked at the Korsaks` Museum of Modern Ukrainian Art.
6. I didn't know that you had worked at the Korsaks` Museum of Modern Ukrainian Art
7. We found that she left home at eight o'clock every morning.
8. We found that she had left home at eight o'clock that morning.

Module IV

TRANSPORTATION SYSTEMS

UNIT ONE

Roads

1. Lexical Progress Check

1. Transportation has always been one of the most important aspects of engineering.
a) electronic b) mechanical c). structural d) civil
2. The first modern roads that had a firm....., the surface on which the foundation rested.
a) bed b) footing c) ground d) earth
3. At the beginning of the twentieth century the broke up the smooth surfaces of the roads.
a. iron wheels b. rubber tires c. feet of people
4. is a slight convex curve in the surface of a road to permit drainage.
a. crown b. hill c. top d. footing
5. Without people would have to use boats to get across water.
a. cars b. crushed rock c. bridges d. foundation
6. The simplest type of span is a bridge, consisting of a rigid beam between two supports.
a. truss b. cable-stayed c. arch d. beam
7. The traffic-bearing surface of a bridge is a
a. deck b. truss c. span d. road
8. The Incas of pre-Columbian Peru built remarkable bridges, supported by cables of natural fibers, that crossed many of the deep gorges in their mountainous country.
a. viaduct b. swing c. lift d. suspension
9. Sir Marc Brunei designed a.....
a. suspension bridge b. tunneling shield c. pneumatic drill d. dynamite
10. One of the first major tunnels built through rock was the Mont Cenis Tunnel in the Alps between.....
a. Ukraine and Poland b. France and Italy c. America and Brazil

2. Grammar Progress Check

1. I think you_____wear that dress. It doesn't suit you.
a. don't have to b must c. shouldn't
2. We _____take our food to school. We went to the canteen
a. had to b. didn't have to c. didn't need to
3. All children_____fasten their seatbelts when travelling by car.
a. have to b. should c. must
4. Anna _____the piano when she was a young girl.
a. could play b. coulds play c. can play d. could plays
5. The little girl asked, "Mommy, _____ I have a cookie?" The mother said, "Yes, you _____."

- a) can / can b) may / might c) can / are able to
6. Shops _____ sell cigarettes to children.
a) mustn't b) don't have to
7. People who are sick _____ stay home from work.
a) must b) should
8. He seems _____ since morning about suspension bridges.
a) reads b) to have been reading c) to be reading d) to read
9. I want _____ by my friend.
a) to help b) to be helping c) to be helped d) to have been helped
10. I am sorry _____ a cup.
a) to break b) to be breaking c) to have broken d) to have been breaking

3. Reading

Bridge Construction for Hong Kong Airport

1. terminal	базовий аеродром, термінал
2. assemble	збирати
3. install	вмонтувати, вбудувати
4. pre-fabricated deck stations	збірні пролітні секції
5. weigh	мати вагу
6. coastline	берегова лінія; узбережжя
7. aggregate	заповнювач (бетону); суміш
8. dump	вигрузити навалом; насипати
9. extend	розширити
10. sq. ft	миль квадратних
11. 5' wall	стіна у 5 дюймів (дюйм=2,54 см)
12. mile	миля (1,609 км)

The building site was leveled and bridge construction started. Two bridges, whose towers rose to a height of 60 stories, were to be constructed. The strength and support to the bridge towers was provided by 3' diameter cable weighing up to 15000 tons. But all this could not be assembled on ground so they built it in the air. That was dangerous and difficult but done successfully. Then 1000 tons pre-fabricated deck stations were installed in the span and 5 years after the start of the whole project, bridge was completed.

The tunnel was made, bridge was ready, now both had to be connected together and for that purpose 2 new super highways were required. To build the highways, coastline had to be extended and 25 million tons of aggregate was dumped into the sea. The coastline was extended more than a half mile into the sea. This amount is so high that a 5' wall from Washington, D.C to San Francisco can be built using this amount. Terminal plans called for the largest enclosed space, more than a mile long. It covered an area of 6 million sq. ft. on land.

1. Answer the following questions

1. Where was the construction assembled?
2. How was the tunnel connected to the bridge?

3. Why was it necessary to extend the coastline?

2. **Find out if the following statements are true or false according to the text.**

1. According to the project the bridge was built in a year after the start of construction.

2. The coastline was extended more than 804.5 km into the sea.

3. **Write out from the text all sentences with modal verbs. Underline the modal verbs.**

UNIT TWO

Bridges

1. Lexical Progress Check

1. In the twentieth century in roadbuilding the first improvement involves the use of for the wearing surface.

a. clay b. polymers c. concrete d. wet ground

2. The top level of a road that receives the wear of traffic is called

a. wearing surface b. footing c. crown d. base course

3. is the paved strip on which airplanes land or take off at an airport.

a. airport strip b. highway c. freeway d. runway

4. The first bridges were made by

a. monkeys b. nature c. birds d. fish

5. Today most simple beam bridges are strengthened by a truss, which is based on...

a. the triangle b. the rectangle c. the cylinder d. the square

6. enabled bridge builders to span longer distances than truss bridges.

a. Logs b. Rubber tires c. Clovers d. Cantilevers

7. When holes have been bored in hard rock, they are filled with an which is then detonated.

a. air b. attribute c. explosive d. earth

8. It is common practice today to use soil techniques for tunneling through silt, sand, or gravel.

a. stabilization b. drill c. explosive d. compressed

9. Fresh air is pumped in through one, while polluted air is sucked out through another.

a. box b. tunnel c. duct d. line

10. A.....is a new type of machine that can bore through hard rock.

a. tail b. shield c. drill d. mole

2. Grammar Progress Check

1. You_____drink that. It's poison.

a. must b. should c. mustn't

2. ___I stay and help you or you can do it alone?

- a. Should b. Must c. Need
3. You _____ be very rich to go skiing nowadays.
a. mustn't b. needn't c. don't have to
4. Anna _____ to the movies after she finishes her homework.
a. can went b. could go c. can go d. can gone
5. You _____ live in Poland to study at the university. You can take a course by
the internet.
a) mustn't b) don't have to
6. You forget your sun cream. It's going to be very hot!
a) don't have to b) mustn't c.) needn't
7. Construction workers _____ wear hard hats.
a) must b) should
8. He seems _____ about suspension bridges now.
a) to have read b) to have been reading c) to be reading d) to read
9. The lecturer wants _____ if the students can't attend a lecture.
a) to tell b) to have been told c) to be told d) to have told
10. She was sorry _____ the show.
a)to miss b) to be missing c)to have missed d) to have been missing

3. Reading

Bridge

rough terrain	нерівна місцевість, важко прохідний
bodies of water	водойми
log	колода
structural integrity	структурна цілісність
mortar	розчин
dissolve	розчиняти, розмивати
sturdy	міцний, стійкий
accessible	доступний

Bridge is a structure that provides passage over obstacles such as valleys, rough terrain or bodies of water by spanning those obstacles with natural or manmade materials. They first began to be used in ancient times when the first modern civilizations started rising in Mesopotamia. From that point on, knowledge, engineering, and manufacture of new bridge building materials spread beyond their borders, enabling slow but steady adoption of bridges all across the world.

In the beginning bridges were very simple structures that were built from easily accessible natural resources - wooden logs, stone and dirt. Because of that, they had ability only to span very close distances, and their structural integrity was not high because mortar was not yet invented and rain slowly but constantly dissolved dirt fillings of the bridge. Revolution in the bridge construction came in Ancient Rome whose engineers found that grinded out volcanic rocks can serve as an excellent material for making mortar. This invention enabled them to build much more sturdier, powerful and larger structures than any civilization before them. Seeing the power of roads and connections to distant lands, Roman

architects soon spread across the Europe, Africa and Asia, building bridges and roads of very high quality.

1. Answer the following questions:

1. When did the first bridges start to be used?
2. What were the first bridges made of?
3. Why were the first bridges weak structures?
4. What helped to build powerful bridges?

2. Find out if the following statements are true or false according to the text.

1. Bridges were designed to walk or drive around the obstacles.
2. Roman architects spread across the Europe, Africa and Asia because they could build tunnels of very high quality.

3. Write out from the text sentences with the infinitive. Underline the infinitives.

UNIT THREE

Tunnels

1. Lexical Progress Check

1. A is a land area from which earth is being removed.
a. fill b. cut c. volcanic crater d. hill
2. A.....permits cars to change from one highway to another without interrupting the flow of traffic.
a. cloverleaf interchange b. bridge c. top level
3. Modern highways are still built according to the principles laid down in the eighteenth and early nineteenth centuries by specialists from and
a. France and Germany b. Germany and England c. England and France
4. span even longer distances than other types of bridges.
a. Cantilever bridges b. Suspension bridges c. Arch bridges d. Lift bridges
5. Several suspension bridges collapsed as a result of the movement created by the
a. influence of temperature b. rhythm of the loads moving across them
6. A bridge supported by hollow drums that can float is a.....
a. swing bridge b. bascule bridge c. steel arch bridge d. pontoon bridge
7. is a major problem in all automobile tunnels.
a. darkness b. wetness c. ventilation
8. Most automobile tunnels therefore have systems of ducts.
a. two b. three c. four d. five
9. A technique that is often used for subway construction is
a. the immersed-tube system b. the cut- and-cover method
10. The back part of a shield is a
a. tail. b. duct c. heading d. mole

2. Grammar Progress Check

1. We_____do so many things around the house, that we couldn't call you.
a. did have b. had to c. must
2. You_____use your flash inside the Museum, it's forbidden.

1. Answer the following questions

1. Who understood the potential of tunnels first of all?
2. What purpose were the tunnels initially used for?
3. Why were tunnels created between the mid-1600s and the 19th century?

2. Find out if the following statements are true or false according to the text.

1. With the help of the irrigation tunnels, water was delivered to deserts.
2. Tunnels appeared 2500 years ago.

3. Write out from the text all sentences with the infinitive. Underline the infinitive in the sentence.

Module V

DESIGN IN CONSTRUCTION

UNIT ONE

History of Interior Design

1. Lexical Progress Check

1. Physical attraction depends on..... ..
a. inner world b. the first opinion c. ratio
2. If a face is in proportion, we are more likely to notice it and find it
a. ugly b. average c. beautiful.
3. opened up interior design to the common man.
a. Books on design b. The industrial revolution c. Famous scientists
4. In a style red was very popular.
a. baroque b. international c. regency
5. The Golden Ratio is the ratio of the following distances:.....
a. (foot to navel):(navel to head) b. (head to below the belt):(below the belt to knee)
6. Phi (Φ) is like pi (π) in the sense that it is number.
a. an irrational b. rational c. coded d. two-figure
7. When people think of shapes with Golden section ratios they typically think of a where one side divided by the other is 1.618
a. Golden Ratio b. Golden Section c. Golden Mean d. Golden rectangle
8. Design elements are the basic units of a visual image and they include.....
a. balance b. space c. contrast
9. The principles of design are what we do to the elements of design and among them there is
a. colour b. harmony c. line d. size
10. The first shelters were.....
a. huts b. mines c. caves d. castles

2. Grammar Progress Check

1. If my brother _____ in trouble, I shall help him, of course.
a) was b) were c) is d) will be e) would be

2. If I don't manage to finish my report today, I (to stay) at home tomorrow.
a) stay b) shall stay c) would stay d) stayed e) would have stayed
3. If she were more careful about her diet, she _____ so stout.
a) doesn't be b) won't be c) wouldn't be d) isn't
4. You would not feel so bad if you _____ too much.
a) didn't smoke b) doesn't smoke c) wouldn't smoke d) would have smoked
5. If he _____ the poem, he would not have got a bad mark.
a) learnt b) had learnt c) learns d) learn
6. If you gave me your dictionary for a couple of days, I _____ this text.
a) will translate b) would translate c) would have translated d) translate
7. If I _____ a builder, I would be very happy.
a) am b) was c) were d) will be e) would have been
8. My friend says hello if he _____ my parents.
a) saw b) had seen c) will see d) sees
9. The dish would have been much more tasty if she _____ a better cook.
a) had been b) were c) is d) will be e) would be
10. I wish I _____ English better.
a) know b) knew c) will know

3. Reading

History of Art Deco

hub	центр уваги; епіцентр діяльності
to peak	досягнути вершини
elite	еліта
incorporate	об'єднати
intentions	прагнення, наміри
chrome hardware	хромовані вироби з металу
response	відповідь, реакція у відповідь на
female imagery	жіночі скульптури, зображення
Tiffany lamps	настільна лампа з абажуром зі скла
elaborate	складний, ретельно продуманий
flowing forms	обтічні форми

Art Deco was a popular design movement from the 1920's to 1930's, a movement between the two World Wars. This movement affected all forms of art from architecture, interior design, sculpture, furniture, industrial design and visual arts such as fashion, clothing, jewelry, paintings, graphic arts and film. This movement combined many different styles and movements such as neoclassical, constructivism, cubism, modernism, art nouveau and futurism.

Art Deco was very popular in Europe in the 1920's, in particular Paris represented the hub of Art Deco style, and its popularity peaked in America in the 1930s. It was not just for the elite. By the 1930's, mass production meant that everyone could live in the Art Deco style. Although Art Deco represented design movements that incorporated political and philosophical intentions, the art was very decorative.

Art Deco style represents a style that is elegant, functional and modern. The Art Deco interior style is a streamlined and geometrical which often includes furniture pieces with curved fronts, mirrors, clean lines, chrome hardware, and glass. The elegant style began as a Modernist response in opposition to Art Nouveau styling, which featured elaborate, flowing natural forms plus female imagery and Tiffany lamps.

1. Answer the following questions

1. When was this style popular?
2. Whom was this design style used by?
3. Does Art Deco include glass and mirrors?

2. Find out if the following statements are true or false according to the text.

1. Art Deco is a very decorative style.
2. Art Deco was very popular in Brazil.
3. Some of the main features of Art Deco are curved fronts and chrome hardware.

3. Read the text again and write down the correct endings of the sentences below.

1. Art Deco was movement between_____.
2. The peak of popularity of this style was in_____.
3. Art Deco combined many different styles such as_____.
4. Mass production meant that_____.

UNIT TWO

Beauty, Design, Building

1. Lexical Progress Check

1. The first lady of interior decoration is._____.
a) Lusie Jancen b) Elsie de Wolfe d) Franky Lloyd Wright
2. The Byzantine style was noted for _____.
a) ornamental domes and lavish decorations b) exaggerated details c) simple clean lines d) red colour for chairs and curtains
3. Vitruvius thought that a timeless notion of beauty could be learnt from _____.
a) the old books on architecture b) the “truth of nature” c) Ten Commandments
4. The principles of design are what we do to the elements of design and among principles there is
a. space b. shape c. size d. proportion
5. Primary colours are the only true colors.
a) red, blue, yellow b) green, orange, violet c) brown, white, black
6. An arrangement of colors along a circular diagram to show how they are related to one another is known as _____.
a) the elements of design b) the colour wheel c) primary colours
d) complementary colours e) secondary colours

7. Good design sends _____ message to everyone.
 a) different b) other c) the same d) unlike e) various
8. In 1919 in a little German town Weiniar, there was founded the “Bauhaus”– the first_____.
 a) shop of building materials b) school of designers c) hotel designed by Walter Gropius d) factory to produce construction materials
9. According to Vitruvius, a good building should satisfy such principles:_____.
 a) variety and proportion b) harmony, beauty and utility c) utility, beauty and durability d) durability, harmony and proportion
10. Residential interior designers, on the other hand, plan spaces for_____.
 a) government buildings b) living c) private business d) corporate entities

2. Grammar Progress Check

1. If he were not such an outstanding actor, he (not to have) so many admirers.
 a) doesn't have b) didn't have c) wouldn't have d) wouldn't have had
2. If you (to give) me your address, I shall write you a letter.
 a) give b) will give c) gave d) would give e) would have given
3. If she (not to be) so absent-minded, she would be a much better student.
 a) isn't b) wasn't c) weren't d) not been e) wouldn't be
4. If my sister does not go to the south, we (to spend) the summer in Lutsk together.
 a) spend b) will spend c) spent d) would spend e) would have spent
5. If they (not to go) to Paris last year, they would not have heard that famous musician.
 a) don't go b) didn't go c) hadn't gone d) not went
6. If you (not to get) tickets for the Philharmonic, we shall stay at home.
 a) don't get b) didn't get c) hadn't got d) wouldn't get
7. If you were not so careless about your health, you (to consult) the doctor.
 a) consult b) will consult c) consulted d) would consult
8. If he (to work) hard, he would have achieved great progress.
 a) works b) worked c) had worked d) has worked
- 9.. I (to write) the composition long ago if you had not disturbed me.
 a) write b) wrote c) had written d) would write e) would have written
10. My cat has died. I wish I (to look after) it better.
 a) look after b) looked after c) had looked after d) would look after

3. Reading

taxes
 escaping color
 ubiquitous
 weightlifters
 tranquil blue
 accurate

Color Psychology

податки
 зникаючий колір
 всюдисущий
 штангіст
 спокійний синій
 точний, правильний

cause	спонукати, бути причиною
loyalty	благонадійність, вірність
attention getter	засіб привертання уваги
enhance	збільшувати, підсилювати
overpowering	непереборний; всепоглинаючий
legal pad	блокнот лінійного паперу розміром 8

Like death and taxes, there is no escaping color. It is ubiquitous. Yet what does it all mean? Why are people more relaxed in green rooms? Why do weightlifters do their best in blue gyms?

Colors often have different meanings in various cultures. And even in Western societies, the meanings of various colors have changed over the years. But today in the U.S., researchers have generally found the following to be accurate.

Blue is the color of the sky and the ocean, blue is one of the most popular colors. It causes the opposite reaction as red. Peaceful, tranquil blue causes the body to produce calming chemicals, so it is often used in bedrooms. Blue can also be cold and depressing. Fashion consultants recommend wearing blue to job interviews because it symbolizes loyalty. People are more productive in blue rooms. Studies show weightlifters are able to handle heavier weights in blue gyms.

Cheerful sunny yellow is an attention getter. While it is considered an optimistic color, people lose their tempers more often in yellow rooms, and babies will cry more. It is the most difficult color for the eye to take in, so it can be overpowering if overused. Yellow enhances concentration, hence its use for legal pads. It also speeds metabolism.

1. Answer the following questions

1. What causes the opposite reaction as red?
2. Why is it better to wear blue to job interviews?
3. Where do babies cry more?

2. Find out if the following statements are true or false according to the text.

1. Yellow is depressing.
2. Weightlifters are able to handle lighter weights in blue gyms.
3. The meanings of various colors have changed over the years.

3. Read the text again and write down the correct endings of the sentences below.

1. The most difficult color for the eye to take in is _____.
2. Tranquil blue is often used in bedrooms because it causes the body _____.
3. Yellow is used for legal pads because it _____.
4. The researchers who have found accurate information about different colors were from _____.

UNIT THREE

The Elements of Design

1. Lexical Progress Check

1. Secondary colors are two primary colors mixed together. They are _____.
a) red, blue, yellow b) green, orange, violet c) brown, white, black
2. The 'ideal' human body fitted precisely into both _____.
a) a square and a pentagon b) a rectangle and a triangle c) a circle and a hexagon d) a circle and a square e) an octagon and a rectangle
3. During a very short period the "Bauhaus" managed to become a large _____.
a) design-training center b) factory to produce construction materials c) shop of building materials
4. Phi (Φ) is like pi (π) in the sense that it is number.
a. an irrational b. rational c. coded d. two-figure
5. If a face is in proportion, we are more likely to notice it and find it
a. beautiful b. average c. ugly
6. Glamour, elegance and modernity, simple clean lines, strikny colours and stylish patterns were represented by _____.
a) regency style b) international style c) art nouveau d) artdeco
7. Good art sends _____ message to everyone.
a) one b) different c) the same d) identical
8. . Primary colours are the only true colors.
a) red, blue, yellow b) green, orange, violet c) brown, white, black
9. opened up interior design to the common man.
a. Books on design b. The industrial revolution c. Famous scientists
10. The first shelters were.....
a. huts b. mines c. caves d. castles

2. Grammar Progress Check

1. If you _____ coffee, we shall drink tea.
a) don't buy b) didn't buy c) hadn't bought d) won't buy
2. If he is free tomorrow, he certainly _____ to our party.
a) comes b) come c) came d) will come e) would come
3. My brother would not have missed so many lessons if he (not to hurt) his leg.
a) doesn't hurt b) didn't hurt c) hadn't hurt d) hadn't hurted
4. If my friend _____ in my office, we would meet every day.
a) works b) worked c) will work d) had worked
5. If you spoke English every day, you _____ your language skills.
a) improved b) will improve c) would improve d) improve
6. If he gets a "five", his mother _____ happy.
a) were b) was c) has been d) is
7. If she _____ earlier, she would have been able to see him before he left.
a) returns b) returned c) has returned d) had returned

8. If I _____ a ticket yesterday, I would go to the concert today.
 a) get b) got c) has got d) had got e) had had got
9. If these shoes were not too big for me, I _____ them.
 a) buy b) bought c) will buy d) would buy
10. I am sorry. I wish I _____ your secret.
 a) didn't told b) not to tell c) hadn't told d) won't tell

3. Reading

Color Psychology

authority	влада
Bride	наречена; молода
Innocence;	невинність, чистота
to signify submission	виразити покірність
aloof	відчужений, холодний; замкнутий
villains	лиходій
negotiations	перемовини

Black is the color of authority and power. It is popular in fashion because it makes people appear thinner. It is also stylish and timeless. Black also implies submission. Priests wear black to signify submission to God. Some fashion experts say a woman wearing black implies submission to men. Black outfits can also be overpowering, or make the wearer seem aloof or evil. Villains, such as Dracula, often wear black.

Brides wear white to symbolize innocence and purity. White reflects light and is considered a summer color. White is popular in decorating and in fashion because it is light, neutral, and goes with everything. However, white shows dirt and is therefore more difficult to keep clean than other colors. Doctors and nurses wear white to imply sterility.

The most emotionally intense color, red stimulates a faster heartbeat and breathing. It is also the color of love. Red clothing gets noticed and makes the wearer appear heavier. Since it is an extreme color, red clothing might not help people in negotiations or confrontations. Red cars are popular targets for thieves. In decorating, red is usually used as an accent. Decorators say that red furniture should be perfect since it will attract attention.

1. Answer the following questions

1. Why is white popular in decorating?
2. What colour stimulates a faster heartbeat and breathing?
3. What woman implies submission to men, according to fashion experts?

2. Find out if the following statements are true or false according to the text.

1. Red cars are very often stolen.
2. Red is popular in fashion because it makes people appear thinner.
3. The color of love is white.

3. Read the text again and write down the correct endings of the sentences below.

1. Dracula wore black because_____.

2. The colour that can't help people in negotiations is _____.
3. Decorators say that red furniture should be perfect because_____.
4. If you wear red, you appear _____

Module VI

ARCHITECTURE

UNIT ONE

Architecture, its Forms and Functions

1. Translate the following words and word combinations into English.

архітектор, підготовка та досвід у проектуванні будинків, координація і контроль всіх аспектів будівництва будівель, проектувати структури, містобудівна і трудова діяльність, плани регульованого зростання та благоустрою міст, земельні ділянки та будівлі, ландшафтні архітектори, топографи, різні моделі вулиць, сфера знань архітектора, мистецтво, передові технології, задоволення, почуття прекрасного.

2. Answer the following questions.

1. What is architecture?
2. What does architecture give a man?
3. What are the main aspects of architectural planning?
4. What are the architect's functions?
5. What specialists help the architect to design structures?
6. What is town planning? What specialists take part in town design?
7. What is the main problem facing the architect today?
8. What are the basic types of architecture?
9. What are the fundamental elements in the aesthetics of architecture?

3. Find Ukrainian equivalents to the following words or word-combinations.

A. обмежувати; передумова; розрізняти; стійкий; відповідність; змінюватися; захист; розвивати; корисність; пристосовність; володіти; умова; виразний; рівний

B. to vary; adaptability; equal; to confine; utility; to possess; prerequisite; condition; to distinguish; expressive; suitability; settled; to develop; defense

4. Complete the sentences.

1. Architecture is 2. The characteristics that distinguish a work of architecture from other man-made structures are 3. The simplest classification of architectural types represents 4. The architect is 5. The architect has the task 6. The designer must have a sufficient knowledge of 7. The architect must always study

5. Define the functions of the Infinitives.

1. To create a work of architecture, the designer must project an integration of the whole with the help of such elements as walls and openings, supports, floors and ceilings, and rooms.
2. The architect must possess knowledge of different sciences.
3. The architect usually begins to work when the site type and cost of a building have been determined.
4. One of the architect's jobs is to find a successful solution to both conditions.
5. Temperature, light and sound are all subject to control by the size and shape of interior spaces.
6. The designer must have sufficient knowledge of engineering and of building materials.
7. The main problem for the architect today is to avoid any conflict with nature and the landmarks of bygone days.

UNIT TWO

Bioclimatic Architecture

1. Translate the following words and word combinations into English.

Арка, підтримувана колонами; створення здорового навколишнього середовища, плодоносний ґрунт, руйнівний вплив, будівництво, заплановане в цьому районі; повторне використання матеріалів, поновлювані ресурси, відсутність переконаності, мінімальна енергія, природні ресурси, негативний вплив, майбутні покоління, потенційні покупці, навколишній ландшафт.

2. Answer the following questions.

1. What does bioclimatic architecture deal with?
2. What is a "green" building?
3. What is sustainable architecture?
4. What is bioclimatic architecture?
5. What is the aim of bioclimatic architecture?
6. What does bioclimatic design include?
7. Why is there a growing interest in "Green" building practices?
8. What is integrated bioclimatic architecture?
9. Do most architects regard architecture as fashion?

3. Give antonyms to the following words.

to decay, not common, positive, to decrease, the most uncomfortable, low, not manifest, end, to take into account the, not prefer, to restore, to deny, unimportant.

4. Complete the sentences.

1. Bioclimatic architecture aims 2. "Green" buildings promote 3. Basic elements of bioclimatic design are 4. The bioclimatic design of a building requires 5. In fact, most architects ignore 6. Other goals are 7. Market surveys are 8. Ensuring insolation combined with

5. Define the functions of the Gerund in the sentences.

1. The planner begins by surveying sites and performing demographic, economic, and environmental studies.
2. Activated-sludge process involves using compressed air to increase and control the rate of biological reactions.
3. Financing is a delicate aspect of the profession, which requires that the planner unite social, budgetary, and developmental concerns.
4. Geodetic surveying involves measuring a network of triangles that are based on points on the Earth's surface.
5. Sea level, incidentally, can be determined only after averaging the tides in a given area over a definite period.
6. The main task of sanitary engineering is evolving industry.
7. Planning the landscape is an old idea.
8. Online landscaping necessarily must focus on incorporating only plants which are tolerant across many diverse soil conditions.
9. Stadia surveys are particularly useful in determining contour lines.

UNIT THREE

Landscape Architecture

1. Translate the following words and word combinations into English.

збереження, охорона, реабілітація, сфера, обсяг, розвиток нерухомості, просторове планування, професійний, ліцензування, цивільна інфраструктура, гідрологія, дослідження, водосховище, резервуар, видобувні промислові застосування, офшорні розробки, внесок, співробітництво, управління нерухомістю, лісове господарство, технічні обмеження, експлуатаційна надійність.

2. Answer the following questions.

1. What is landscape architecture? 3
2. Where do landscape architects work?
3. What are the abilities of landscape architects?
4. What do landscape designers do?
5. What is traditional planning?
6. What must landscape architects take into account?
7. What problems must landscape architects face?
8. What must focus online landscaping on?
9. What professional landscapers can design and plan sites?

3. Arrange the words into pairs of antonyms and translate them into Ukrainian.

spatial, inaction, development, inside, limitation, serviceability, external, public, disadvantage, outdoor, private, unemployment, conduct, inapplicability; similar, regress, different, occupation, close, internal.

4. Complete the sentences.

1. Landscape architecture is
2. The scope of the profession includes
3. Landscape architecture is a multi-disciplinary field, including
4. Landscape architects work
5. Landscape scientists have
6. Garden Design is
- 7.. Factors in designing include objective qualities such as
8. There are innumerable other design factors and considerations ...
9. Landscaping necessarily must focus on

5. Translate the sentences into English using different types of Participle.

1. Прочитавши статтю про ландшафтний дизайн, я зрозумів основні функції.
2. Ландшафтний комплекс, збудований у цьому районі, буде спорудою сучасного типу.
3. Розробляючи дизайн архітектурного комплексу, ми використаємо найновіші сучасні технології.
4. Обговоривши дизайн виробничого комплексу, ми приступили до виконання роботи.
5. Знання, отримані студентами у вузі, дуже важливі у їхній подальшій роботі.
6. Переглянувши усі презентації, викладач визначив найкращу.
7. Обговорюючи тему на занятті, студенти поставили безліч запитань до викладача, стосовно цієї важливої проблеми.
8. Теми, обговорені на конференції, були внесені до збірника статей.

GLOSSARY

- ✓ Aesthetics: The visual and artistic aspects of a design.
- ✓ Ambient Lighting: The use of light to set the mood and functionality of a space.
- ✓ Artificial Intelligence (AI): Using machine learning to optimize architectural designs.
- ✓ Atrium: A central open space often seen in large buildings.
- ✓ Augmented Reality (AR): Merging digital elements with real-world environments for design visualization.
- ✓ AutoCAD: A tool for creating precise 2D and 3D architectural drawings.
- ✓ Beam: A horizontal element that carries the weight of ceilings or walls.
- ✓ BIM (Building Information Modeling): Digital modeling of building components for efficient project management.
- ✓ Biophilic Design: Integrating natural elements into architecture for enhanced well-being.
- ✓ Brick: A common material for walls, often used for structural and aesthetic purposes.
- ✓ Building Envelope: The exterior shell of a building, including walls, roofs, and facades.
- ✓ Cantilever: A projecting structure supported only at one end.
- ✓ Carbon Footprint: The total greenhouse gases emitted during a building's lifecycle.
- ✓ Checklist: A tool to track progress and ensure all steps are completed.
- ✓ Circulation: The movement pattern of people within a space.
- ✓ Classical: Inspired by Greek and Roman architecture, featuring symmetry, columns, and decorative details.
- ✓ Color Palette: A selection of colors used in an interior or exterior design.
- ✓ Column: A vertical structural element that transmits loads
- ✓ Concept: The underlying idea and philosophy behind a design.
- ✓ Concrete: A durable building material made of cement, sand, and water.
- ✓ Contrast: The difference in colors, materials, or shapes to attract attention.
- ✓ Cost Estimation: Calculating expected expenses for a project.
- ✓ Ergonomics: Design principles that enhance human comfort and usability.
- ✓ Expansion Joint: A gap left in structures to prevent cracks due to expansion or contraction.
- ✓ Facade: The external appearance of a building.
- ✓ False Ceiling: A secondary ceiling used for aesthetics or acoustic improvement.
- ✓ Feedback: Constructive suggestions for improving designs.
- ✓ Form: The overall shape of a building or design.
- ✓ Foundation: The lower part of a building that supports its weight.

- ✓ Gantt Chart: A visual representation of project timelines and tasks.
- ✓ Glass: Used in windows, facades, and partitions to allow transparency and light penetration.
- ✓ Gothic: Recognized by pointed arches, stained-glass windows, and elaborate ornamentation.
- ✓ Harmony: A cohesive integration of various design elements.
- ✓ Minimalism: A design philosophy focusing on simplicity and removing unnecessary details.
- ✓ Modern: Emphasizes simplicity, functionality, and minimal ornamentation.
- ✓ Natural Ventilation: Using airflow to cool spaces without mechanical systems.
- ✓ Net-Zero Homes: Buildings that produce as much energy as they consume.
- ✓ Passive Design: Utilizing natural resources to regulate temperature and lighting.
- ✓ Pavilion: A freestanding structure used for exhibitions or relaxation.
- ✓ Plan: A 2D representation of a building displaying all rooms and spaces.
- ✓ Plinth: The base or platform on which a building or column stands.
- ✓ Project Scheduling: Organizing project phases with timeframes.
- ✓ Proposal: A document outlining project ideas, costs, and plans.
- ✓ Quality Control: Ensuring that construction meets the required standards
- ✓ Rainwater Harvesting: Collecting and using rainwater for non-potable needs.
- ✓ Recycling: The process of reusing materials to minimize waste.
- ✓ Revit: A software for Building Information Modelling (BIM) and team collaboration.
- ✓ Rhino: A tool for complex shape modelling and parametric design.
- ✓ Rhythm: The repetition of patterns or forms to create movement.
- ✓ Risk Management: Identifying and mitigating potential project risks.
- ✓ Scale: The ratio between the actual size of an element and its representation on a drawing.
- ✓ Sketch: A hand-drawn conceptual drawing representing an initial idea
- ✓ SketchUp: A simple yet powerful tool for 3D modeling and conceptual design.
- ✓ Solar Energy: Using solar power for electricity and heating.
- ✓ Space: A defined area within an environment intended for a specific function.
- ✓ Steel: A strong material used for structural frameworks.
- ✓ Sustainable Materials: Materials with minimal environmental impact.
- ✓ Symmetry: Balanced arrangement of elements for visual harmony.
- ✓ Terrace: An outdoor space connected to the main building structure.
- ✓ Thermal Insulation: Materials that reduce heat transfer in buildings.
- ✓ Virtual Reality (VR): Simulating spaces to allow clients and designers to experience them virtually.
- ✓ Wood: A natural building material used in floors, walls, and furniture.

REFERENCES

1. Building construction URL: <http://www.britannica.com/EBchecked/topic/83859/building-construction>.
2. Building material URL: http://en.wikipedia.org/wiki/Building_material
3. Elements of buildings URL: https://www.designingbuildings.co.uk/wiki/Elements_of_buildings
4. Evans V, Dooley J. Grammarway 4. Berkshire: Express Publishing, 2019. 276 p.
5. Evans V. FCE Use of English. Newbury: Express Publishing, 2000. 239 p.
6. <https://arch121.cankaya.edu.tr/uploads/files/Week%2013-lecture%20notes-07-jan-2014.pdf>
7. Glossary of architecture https://en.wikipedia.org/wiki/Glossary_of_architecture
8. Landscape architecture https://en.wikipedia.org/wiki/Landscape_architecture
9. Structural element URL: https://en.wikipedia.org/wiki/Structural_element
10. https://en.wikipedia.org/wiki/Structural_engineering#Structural_elements
11. <https://foter.com/decoraid/blog/interior-design-history/>
12. <https://styrodesign.eu/en/rechnik-na-arhitektorni-termini/>
13. Illustrated Architecture Dictionary URL: <https://buffaloah.com/a/DCTNRY/vocab.html>
14. Kulkarni L.G., Pawar A.D., Nitsure S.P. Basic Civil Engineering. Technical Publications, 2006, 462 p.
15. Lindeburg Michael R. Civil engineering reference manual. Professional Publications, 1992, 712 p.
16. Matthew Frederick. 101 Things I Learned in Architecture School, 2007, 214 p. URL: <https://www.jbe-platform.com/content/journals/10.1075/idj.18.2.12bau>
17. The ABCs of Visual Design URL: <http://tersiiska.com/design/principles>.
18. https://curriculumresources.edu.gh/wp-content/uploads/2025/01/Art-and-Design-Foundation_LM_Section-6_LV.pdf

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