МІНІСТЕРСТВО ОСВІТИ І НАУКИ, МОЛОДІ ТА СПОРТУ УКРАЇНИ
ХАРКІВСЬКА НАЦІОНАЛЬНА АКАДЕМІЯ МІСЬКОГО ГОСПОДАРСТВА

МЕТОДИЧНІ ВКАЗІВКИ
ДЛЯ ОРГАНІЗАЦІЇ САМОСТІЙНОЇ РОБОТИ
З ДИСЦИПЛІНИ

«ІНОЗЕМНА МОВА (ЗА ПРОФЕСІЙНИМ СПРЯМУВАННЯМ)»

(АНГЛІЙСЬКА МОВА)

(для студентів 1-2 курсів заочної форми навчання
напряму підготовки 6.050701 «Електротехніка та електротехнології»)

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INTRODUCTION

These educational materials are designed for the ESP students of Power Supply and City Lighting department of the first and second year of studies to develop their knowledge and skills in the English language.

This manual is based on the authentic texts from different sources concerning cross-cultural issues. It contains the tasks for reading and translation, vocabulary tasks and grammar exercises.

Each unit contains:

- An authentic text for reading and translation;
- Comprehension exercises;
- Exercises for memorization and mastering new vocabulary;
- Grammar exercises;
- Supplementary reading

The manual is recommended for practical lessons

UNIT 1. ROLE OF FOREIGN LANGUAGES IN OUR LIFE.

Task 1.1. Read the text and answer the questions.

Education and Role of Foreign Languages.

Education is very important in our life. A pupil gets knowledge at school, higher educational establishments, from books, magazines, from TV educational programs. The pupils can get deeper knowledge in different optional courses in different subjects and school offers these opportunities. They can improve their knowledge by attending different optional courses in different subjects. The result of the educative process is the capacity for Further education. Nowadays the students of secondary schools have opportunities to continue their education by entering gymnasiums, lyceums, colleges, institutes, universities. But the road to learning is not easy. To be successful in studies one must work hard. It's for you to decide to learn and make progress or not to learn wasting your time. The role of foreign languages is also increasing today. Thanks to the knowledge of foreign languages one can read books, magazines in the original, talk to foreigners, translate various technical articles. Moreover, joint ventures which have recently appeared in our country need specialists with profound knowledge of foreign languages like English, German or French. To know foreign languages is absolute necessary for every educated person, for good specialists. Our country is transferring to a market economy. Research and innovations should improve living, working conditions of our people. That is why it is so important to be persistent in students. The movement of English around the world began with the pioneering voyages to the Americas and Asia, continued with the 19th century colonial developments in Africa and the South Pacific, and took a significant further step when it was adopted in the 20th century as a official or semiofficial language by many newly-independent states. English is now the dominant or official language by many newly-independent states. English is now the dominant or official language in over 60 countries, and is represented in every continent and in the three major oceans - Atlantic, Indian, and Pacific. It is this spread of representation which makes the application of the term "world language" a reality. The present-day world status of English is the result of two factors: the expansion of British colonial power, which peaked towards the end of the 19th century, and the emergence of the United States as the leading economic power of the 20th century. There are many different reasons why people study foreign languages, English in particular. Here are some of them:· to travel abroad;· to get good job to have something to do in your spare time;· to be better educated;· to be familiar with social and cultural life in other countries; to be able to participate in conversations with people from English-speaking countries. English is the language of international air traffic control, and is currently developing its role in international maritime, policing, and emergency services. English is the chief language of international business and academic conferences, and the leading language of

international tourism. English is the main language of popular music, advertising, satellite broadcasting, home computers, and video games. A foreign language is not just a subject learnt in the classrooms. It's something which is used in real life situations. There are many reasons why we begin to study foreign languages. First of all it's an effective medium of international communication. Learning foreign languages opens up opportunities and careers that didn't even exits some years ago. Knowing foreign languages can help us to find a job in such fields as science and technology, foreign trade and banking, international transportation communication, teaching librarian science and others. A more general aim is to make us intellectually developed. Learning a foreign language also includes learning culture, traditions and mode of thought of different people.

1. Where can an educated person get knowledge?
2. What is important to be successful?
3. Why is the role of foreign languages increasing today?
4. What did the movement of English around the world begin with?
5. What are the reasons why people study foreign languages?
6. Is it important to know foreign languages if you want to find a good job? Why?

Task 1.2. Put verbs into the correct form (Present Simple or Present Continuous)

a. An educated person always … (try) to learn, find out, discover more about the world around him.
b. To be successful in studies one must … (work) hard.
c. The role of foreign languages … also … (increase) today.
d. Our country … (transfer) to a market economy.
e. It … (be) this spread of representation which … (make) the application of the term "world language" a reality.
f. There …. (be) many different reasons why people …. (study) foreign languages, English in particular.
g. Learning foreign languages … (open) up opportunities and careers that didn't even exits some years ago.

Task 1.3. Read the text and answer the questions

Great Britain

Learning English naturally leads to learning facts about the country it is spoken in. Lots of people are greatly interested in everything connected with Great Britain. So here are some basic facts about this country.

The United Kingdom of Great Britain and Northern Ireland is situated on the British Isles. The British Isles consist of two large islands, Great Britain and Ireland, and about five thousand small islands. The total area of the islands is over 224’000 square kilometers.

The UK is made up of four countries: England, Wales, Scotland and Northern Ireland. Their capitals are London, Cardiff, Edinburgh and Belfast respectively. Great Britain consists of England, Scotland and Wales and doesn’t include Northern Ireland. But in everyday speech “Great Britain” is used to mean the UK.

The capital of the UK is London. It stands on the River Thames. The British Isles are separated from the European Continent by the North Sea and the English Channel. The western coast of Great Britain is washed by the Atlantic Ocean and the Irish Sea. The surface of the British Isles varies very much. The north of Scotland is mountainous and is called the Highlands; while the south, which has beautiful valleys and plains, is called the Lowlands. The north and the west of England are mountainous, but all the rest-east, center and southeast - is a vast plain. Mountains are not very high. Ben Nevis in Scotland is the highest mountain (1343 meters over the sea level).

There are a lot of rivers in Great Britain, but they are not long. The Severn is the longest river, while the Thames is the deepest and the most important one.

The mountains, the Atlantic Ocean and the warm waters of Gulf Stream influenced the climate of the British Isles. It is mild all over the year round.

The UK is a highly developed industrial country. It’s known as one of the world’s largest producers and exporters of machinery, electronics, textile, aircraft and navigation equipment. One of the chief industries of the country is shipbuilding. The main industrial centers and at the same time the largest cities of the country are London, Manchester, Liverpool, Birmingham, Glasgow.

Two characteristic of the British Constitution confuse most foreigners: there is no written constitution; it is not contained in any single document. There are two kinds of rules by which GB is governed: Rules of Law and Rules of Custom. The Rules of Law are those set out in such historical declarations as Magna Charta (1215)? The Bill of Rights of 1689 and the Act of Settlement of 1701. Many principles of the British Constitution by which Britain is governed are principles of Common Law. There are principles, which are not established by any law passed by Parliament but established in the courts.

The British developed their own character and way of life. They came to respect privacy and to value old traditions. They developed a dry wit, a love for personal freedom and a high degree of self-criticism. They have produced some of the world’s greatest writers, scientists, explorers, artists and political figures. The undying genius of William Shakespeare determined the development of the whole world’s literature, influenced the minds of many generations, became their moral compass.

Some of the British national traits are resulting from the British way of life. The British are known as a people self-assured, absolutely confident in their national sense of superiority.

The British display a very wide toleration of individual differences among themselves, and even among others.

The history of the UK is the story of how a small island country became the world's most powerful nation and then declined. Though it is no longer the world's power, the UK is still a leading industrial and trading nation. The UK of today is in a state of change and is seeking its new role in the world.

1. What does Great Britain consist of?
2. Where is it situated?
3. What is the name of the longest river?
4. Why is the UK a highly developed industrial country?
5. What characteristic of the British Constitution confuse most foreigners?
6. What can you tell about the British?

Task 1.4 Read the text again and complete the gaps

1. The British Isles consist of …….
2. The UK is made up of……
3. The western coast of Great Britain is washed by……..
4. Ben Nevis in Scotland is……
5. One of the chief industries of the country is……..
6. The British developed their own……
7. The British are known as……

Task 1.5. Fill in the appropriate words from the list. Use the words only once.

Greatly basic beautiful the surface of the longest a highly developed aircraft and navigation to value a very wide

……..interested in
……..toleration
……..valleys and plains
……..equipment
……..river
…….facts
…….the British Isles
…….old traditions
……..industrial country

Task 1.6. Find the word out

Sea - river - lake - mountain
Country – city - population - region
North - forth – west - east
Valleys - ships - hills – plains
Population – people – persons – males
Literature – writers - scientists - explorers
Leading - ruling – governing – stimulating
The young - the Swedish – the British – the Italian
Seeking – hiding – looking for – searching

Task 1.7. Complete the sentences with the following verbs in the correct form (Present Simple)

Be include consist of display want confuse

1. The British Isles ……. two large islands, Great Britain and Ireland, and about five thousand small islands.
2. Great Britain …….. Northern Ireland.
3. Ben Nevis in Scotland …… the highest mountain.
4. Two characteristic of the British Constitution …… most foreigners.
5. The British ……. a very wide toleration of individual differences among themselves, and even among others.
6. Lot of people ……. to visit the UK.

Task 1.8. Read the text and answer the questions

Australia

The Great Barrier Reef on the coast of Queensland is a *garden* under the sea. There are 1,400 different kinds of fish, and more than 300 kinds of coral. Tropical fruit and flowers grow on the beautiful islands. It's not surprising that more *holiday-makers* come to Queensland every year.

Tasmania, the island south of Australia, is small. It's the same size as England. It is also very different from the other *states*. There are no deserts in Tasmania. It often rains, both in winter and summer. Only a half of million people live in Tasmania, and a large part of the island is still covered with wild, beautiful wild forests. These forests are full of wonderful flowers and interesting animals.

In the Northern Territory you will find the red heart of Australia. And it is really red, with red rocks, red sand, and red skies in the evening. Every year, thousands of *tourists* visit Ayers Rock and a strange group of huge red stones called "the Olgas". But these places are also holy to the Aboriginals. They believe that the land itself has life.

Sydney is the best known place in New South Wales. In fact, it's the best known place in Australia. But New South Wales has more than cities. There are, for example, the Blue Mountains. They are covered with forests of blue colored eucalyptus trees. The air above the forest contains millions of microscopic drops of eucalyptus oil. When the sun shines, the air of the Blue Mountains is a real, beautiful blue.

Less than a hundred years ago, there was nothing except sheep in Canberra. But then Australians decided to build a capital city.. The work began in 1913. Now, Canberra is an international city, full of diplomats and government offices. It's beautiful place, with parks, lakes, big open streets and fine buildings.

Australia is sometimes called "the lucky country". One reason is the wonderful *riches* under the earth: gold, silver, iron, coal and many precious metals. The Bass Strait, of the coast of Victoria, has been one of the country's biggest oil fields for many years.

South Australia is the driest of all the states, but it does have the Murrey River. The river brings greenness and life to the south-east corner. In the early of the Australian history, the Murrey River was South Australia's main road. Before real roads and railways came, the river carried people and *goods* from the east up into the country. Some towns on the Murrey still keep the old river boats, and visitors can ride on them.

There are two kinds of gold in Western Australia. First, there's real kind – the kind that comes out of the ground. Gold was found in Kalgoorlie in1893, and the "Golden Mile" was for a time the most expensive piece of land in the world. Kalgorlie still exports some gold, but new gold of Western Australia is *wheat*. Big farms grow millions of tones of wheat every year, and wheat has become Australia's second biggest export.

1. What is Australia famous for?
2. What is Northern Territory famous for?
3. What Blue Mountains are covered with?
4. What is the best known place in Australia?
5. Why is Australia sometimes called "the lucky country"?
6. Would you like to visit Australia?

Task 1.9. Look at the following words in italic and try to explain them

Task 1.10. Some sentences are correct, but some need **the** (perhaps more than one). Correct the sentences there necessary. Put ' *right*' if the sentence is correct.

1. Milan is in north of Italy.
2. Ben Nevis in Scotland is the highest mountain (1343 meters over the sea level).
3. Tasmania is the southern island of Australia.
4. Every year thousands of *tourists* visit Ayers Rock.
5. Sydney is best known place in New South Wales.
6. But New South Wales has more than cities.
7. When sun shines, the air of Blue Mountains is a real, beautiful blue.
8. South Australia is the driest of all the states, but it does have the Murrey River.
9. In the early of the Australian history, Murrey River was South Australia's main road.

Task 1.11. Put the verb into correct form. (Present Continuous). Sometimes you need the negative.

1. Please don't bother me, I …….(.try) to concentrate.
2. Michael …….(travel) in Australia at the moment.
3. Let's go out. It ……..(rain) any more.
4. Henry …… (work) this week. He is on holiday. He ……..(visit) his relatives in Sydney.

5. Australia ……(seek) its new role in the world today.

Task 1.12. Read the text and answer the questions

From the history of Kharkiv.

The city of Kharkiv is one of the major industrial, commercial, scientific and cultural centres of Ukraine. Its architecture has been influenced by varying conditions of life, habits and traditions of the Ukrainian people.

The river Dnieper has always played the most important role in life and economic activities of the Ukrainian people. The river divides the country into two halves called Left-Bank and the Right-Bank Ukraine.

In the 14th century the right-Bank Ukraine and small regions on the left bank of the Dnieper were occupied by Poland and Lithuania, later united into Rzecz Pospolita/

Many Ukrainian peasants and Cossacs often rebelled against the power of Polish Roman Catholic nobility and began to flee to desolate parts of the Left-Bank Ukraine. They began growing crops, building villages, townships and fortresses. There were no big landlords on that territory then. Therefore this land was called Slobodskaya Ukraina, i.e. “free Ukrainian Land”.

In the 1650’s a fortress was built on the bank of the river Kharkiv and a small township of the same name grew around it. During the first 12 decades of its existence the town was self-governed. Its administration was elected by the Cossacs and headed by the Cossac Colonel, also an elected official. The Voyevoda controlled only military affairs.

The population was almost Ukrainian and it was only in the second quarter of the 19th century that it became multinational. In the 1770’s Catherine II abolished the autonomy of the Cossacs and divided Ukraine into a number of provinces (governorates) headed by Governors appointed by Monarch.

Since then the city has been developing rapidly. Its squares were surrounded with wooden or brick houses of one or two or even three storeys.

In 1805 the University of Kharkov was founded. The Assumption Cathedral, the oldest in city, was built in 1778. And in 1821-1844 its magnificent belfry was erected to mark the victory of the Russian Army over Emperor Napoleon of France.

Kharkovites have always loved theatre. They first saw theatre performances in the end of 18th century. In 1841 a building was erected for the permanent Drama Theatre.

The architecture of Kharkiv reflected variety of styles. There worked lots of famous architects.

After 1934 Kharkiv remained one of the most important and beautiful cities of Ukraine.

1. What is Kharkiv famous for?
2. Who occupied the right-Bank Ukraine and small regions on the left bank of the Dnieper in the 14th century?

3. Why did many Ukrainian peasants and Cossacs begin to flee to desolate parts of the Left-Bank Ukraine?
4. What did they begin doing?
5. What did Catherine II do in the 1770's?
6. What was founded in 1805?
7. What architects worked in Kharkiv?

Task 1.13. Match the sentences halves.

1 The river Dnieper has always played	a)only military affairs.
2 They began growing crops, building	b)the autonomy of the Cossacs
3 The Voyevoda controlled	c)in city, was built in 1778.
4 In the 1770's Catherine II abolished	d)villages, townships and fortresses.
5 The Assumption Cathedral, the oldest	e)the most important role in life and economic activities of the Ukrainian people.
6 Kharkovites have always	f)loved theatre.

Task 1.14. Read these statements. Decide whether you think they are true or false.

1. The river divides the country into two halves called Left-Bank and the Right-Bank Ukraine.
2. Ukrainian peasants and Cossacs were always satisfied with their conditions of life.
3. In the second quarter of the 19th century the population of Ukraine became almost Ukrainian.
4. In the 1650's a fortress was built on the bank of the river Kharkiv and a small township of the same name grew around it.
5. Kharkovites first saw theatre performances in the end of 17th century.

Task 1.15. Complete the sentences with the correct form of the passive

1. Architecture of Kharkiv (influence) …… by varying conditions of life, habits and traditions of the Ukrainian people for many years.
2. In the 14th century the right-Bank Ukraine and small regions on the left bank of the Dnieper (occupy) ……. by Poland and Lithuania.
3. In the 1650's a fortress (build)…… on the bank of the river Kharkiv.
4. Squares of Kharkiv (surround)……. with wooden or brick houses of one or two or even three storeys at that time.
5. And in 1821-1844 its magnificent belfry (erect)…….. to mark the victory of the Russian Army over Emperor Napoleon of France.
6. Today Kharkiv (visit) …… by lots of tourists.

UNIT 2. PROFESSION OF ENGINEER

Task 2.1. Read the text and answer the questions.

An **engineer** is a professional practitioner of engineering, concerned with applying scientific knowledge, mathematics and ingenuity to develop solutions for technical, social and economic problems. Engineers design materials, structures and systems while considering the limitations imposed by practicality, safety and cost. The word *engineer* is derived from the Latin roots *ingeniare* ("to contrive, devise") and *ingenium* ("cleverness").Engineers are grounded in applied sciences, and their work in research and development is distinct from the basic research focus of scientists.[2] The work of engineers forms the link between scientific discoveries and their subsequent applications to human needs and quality of life.[1]Engineers develop new technological solutions. During the engineering design process, the responsibilities of the engineer may include defining problems, conducting and narrowing research, analyzing criteria, finding and analyzing solutions, and making decisions. Much of an engineer's time is spent on researching, locating, applying, and transferring information.[1] Indeed, research suggests engineers spend 56% of their time engaged in various different information behaviours, including 14% actively searching for information. Engineers must weigh different design choices on their merits and choose the solution that best matches the requirements. Their crucial and unique task is to identify, understand, and interpret the constraints on a design in order to produce a successful result. Engineers apply techniques of engineering analysis in testing, production, or maintenance. Analytical engineers may supervise production in factories and elsewhere, determine the causes of a process failure, and test output to maintain quality. They also estimate the time and cost required to complete projects. Supervisory engineers are responsible for major components or entire projects. Engineering analysis involves the application of scientific analytic principles and processes to reveal the properties and state of the system, device or mechanism under study. Engineering analysis proceeds by separating the engineering design into the mechanisms of operation or failure, analyzing or estimating each component of the operation or failure mechanism in isolation, and re-combining the components. They may analyse risk.

Many engineers use computers to produce and analyze designs, to simulate and test how a machine, structure, or system operates, to generate specifications for parts, to monitor the quality of products, and to control the efficiency of processes.

Most engineers specialize in one or more engineering disciplines. Numerous specialties are recognized by professional societies, and each of the major branches of engineering has numerous subdivisions. Civil engineering, for example, includes structural and transportation engineering, and materials engineering includes ceramic, metallurgical, and polymer engineering. Engineers also may specialize in one industry, such as motor vehicles, or in one type of technology, such as turbines or semiconductor materials.

Several recent studies have investigated how engineers spend their time; that is, the work tasks they perform and how their time is distributed among these. Research suggests that there are several key themes present in engineers' work: (1) technical work (i.e., the application of science to product development); (2) social work (i.e., interactive communication between people); (3) computer-based work; (4) information behaviours. Amongst other more detailed findings, a recent work sampling study found that engineers spend 62.92% of their time engaged in technical work, 40.37% in social work, and 49.66% in computer-based work. Furthermore, there was considerable overlap between these different types of work, with engineers spending 24.96% of their time engaged in technical and social work, 37.97% in technical and non-social, 15.42% in non-technical and social, and 21.66% in non-technical and non-social.

Engineering is also an information intensive field, with research finding that engineers spend 55.8% of their time engaged in various different information behaviours, including 14.2% actively seeking information from other people (7.8%) and information repositories such as documents and databases (6.4%).

The time engineers spend engaged in such activities is also reflected in the competencies required in engineering roles. In addition to engineers' core technical competence, research has also demonstrated the critical nature of their personal attributes, project management skills, and cognitive abilities to success in the role.

1. What is the definition of the profession engineer?
2. What may the responsibilities of the engineer include?
3. What disciplines do most engineers specialize in?
4. What types of work are engineers engaged in?

Task 2.2. Match the sentences halves.

to develop solutions for	focus of scientists
the basic research	and state of the system
Several recent	technical, social and economic problems.
and choose the solution	studies
to reveal the properties	that best matches the requirements.
information intensive	field

Task 2.3. Read the text and answer the questions.

Engineering education

Most engineering programs involve a concentration of study in an engineering specialty, along with courses in both mathematics and the physical and life sciences. Many programs also include courses in general engineering. A design course, sometimes accompanied by a computer or laboratory class or both, is part of the curriculum of most programs. Often, general courses not directly related to engineering, such as those in the social sciences or humanities, also are required.

Accreditation is the process by which engineering program are evaluated by an external body to determine if applicable standards are met. The Washington Accord serves as an international accreditation agreement for academic engineering degrees, recognizing the substantial equivalency in the standards set by many major national engineering bodies. In the United States, post-secondary degree programs in engineering are accredited by the Accreditation Board for Engineering and Technology.

The definition of what engineering is varies across countries. In the UK "engineering" is defined as an industry sector consisting of employers and employees loosely termed as "engineers" who range from semi skilled trades up to Chartered Engineers. In the US and Canada, engineering is defined as a regulated profession whose practice and practitioners are licensed and governed by law. In some English speaking countries engineering has been seen as a somewhat dry, uninteresting field in popular culture and has also been thought to be the domain of nerds. For example, the cartoon character Dilbert is an engineer. In science fiction, engineers are often portrayed as highly knowledgeable and respectable individuals who understand the overwhelming future technologies often portrayed in the genre. Several *Star Trek* characters are engineers. One difficulty in increasing public awareness of the profession is that average people, in the typical run of ordinary life, do not ever have any personal dealings with engineers, even though they benefit from their work every day. By contrast, it is common to visit a doctor at least once a year, the accountant at tax time, the pharmacist for drugs, and, occasionally, even a lawyer.

In companies and other organizations in the UK there is a tendency to undervalue people with advanced technological and scientific skills compared to celebrities, fashion practitioners, entertainers and managers. In his book *The Mythical Man-Month*,*- Fred Brooks Jr says that managers think of senior people as "too valuable" for technical tasks, and that management jobs carry higher prestige. He tells how some laboratories, such as Bell Labs, abolish all job titles to overcome this problem: a professional employee is a "member of the technical staff." IBM maintain a dual ladder of advancement; the corresponding managerial and engineering / scientific rungs are equivalent. Brooks recommends that structures need to be

changed; the boss must give a great deal of attention to keeping his managers and his technical people as interchangeable as their talents allow.

What do most engineering programs involve?

What is important part of the curriculum of most programs?

What is Accreditation?

What are some definitions of engineering ?

What did [21] Fred Brooks Jr say in his book *The Mythical Man-Month*?

Task 2.4 Put the verbs into correct form of Passive Voice

Often, general courses not directly related to engineering, such as those in the social sciences or humanities, also … (require).

Accreditation is the process by which engineering program … (evaluate) by an external body to determine if applicable standards … (meet).

In the United States, post-secondary degree programs in engineering … (accredit) by the Accreditation Board for Engineering and Technology.

In the UK "engineering" … (define) as an industry sector consisting of employers and employees loosely termed as "engineers" who range from semi skilled trades up to Chartered Engineers.

In some English speaking countries engineering … (see) as a somewhat dry, uninteresting field in popular culture and … (think) to be the domain of nerds. .

In science fiction, engineers … (portray) as highly knowledgeable and respectable individuals who understand the overwhelming future technologies often portrayed in the genre.

Brooks recommends that structures need … (change).

Task 2.5. Read the text and answer the questions.

Kharkiv National Academy of Municipal Economy

Kharkiv National Municipal Academy is a modern scientific and educational complex, that trains specialists in all fields of educational and specialization standards: from junior specialist, Bachelor and Master to Candidates and Doctors of Sciences on the basis of higher education.

Academy trains specialists for municipal construction management, transport, electric and energy supply, water and gas supply industries; urban economics; hotel management and tourism; improvement of urban ecology and population areas ecology.

Academy trains more than 16000 students, 300 students are citizens of 30 countries of the world. The branches of Academy successfully work in Greece and Israel. Academy has close scientific and business contacts with higher educational establishments, scientific and research institutions from 11 countries of the world, among them are France, Germany, Finland, the USA, Great Britain, Sweden, Netherlands, Israel, etc.

Our Academy has 11 branch scientific and research laboratories, namely "Megapolis Centre", engineering centre of phyto-technologies, inter-faculty laboratory of Academic scientific and research complex (ASRC), which have the international recognition.

Academy has 6 educational corps, a library with the stock of 882000 volumes, a student campus with 6 hostels, a sport centre with many large and small game halls, halls for track and fields athletics, gymnastics, bodybuilding, boxing, martial arts and simulators.

There is a student sanatorium, dining halls and numerous cafes.

Kharkiv National Municipal Academy trains students at 11 departments:
- Town Planning and Development
- Economics and Entrepreneurship
- Management
- Urban Engineering Ecology
- Power Supply and City Lighting
- City Electric Transport
- Correspondence department
- Foreign Students department
- Postgraduate and Distant Learning department
- Upgrading Skills and Retraining department
- Preparatory department

According to the level of training the Academy graduates get the diplomas of Bachelor Degree, Specialist Degree and Master Degree in the different specialties and departments.

1. What does Academy train specialists for?
2. How many students does Academy trains?
3. What countries does Academy have close scientific and business contacts with higher educational establishments in?
4. What are the names of 11 departments of Academy?
5. What diplomas do the Academy graduates get?

Task 2.6 . Put the verb into correct form. (Present Simple).

Kharkiv National Municipal Academy … (be) a modern scientific and educational complex, that … (train) specialists in all fields of educational and specialization standards.

The branches of Academy successfully … (work) in Greece and Israel.

Academy … (have) close scientific and business contacts with higher educational establishments, scientific and research institutions from 11 countries of the world.

There … (be) a student sanatorium, dining halls and numerous cafes.

According to the level of training the Academy graduates … (get) the diplomas of Bachelor Degree, Specialist Degree and Master Degree in the following specialties and departments.

Unit 3. HISTORY OF CREATING LAMPS. TYPES OF LAMPS.

Task 3.1. Read the text and answer the questions.

Early History of creating lamps

The first lamp was invented around 70,000 BC. A hollow rock, shell or other natural found object was filled with moss or a similar material that was soaked with animal fat and ignited. Humans began imitating the natural shapes with manmade pottery, alabaster, and metal lamps. Wicks were later added to control the rate of burning. Around the 7th century BC, the Greeks began making terra cotta lamps to replace handheld torches. The word lamp is derived from the Greek word lampas, meaning torch.

In the 18th century, the central burner was invented, a major improvement in lamp design. The fuel source was now tightly enclosed in metal, and a adjustable metal tube was used to control the intensity of the fuel burning and intensity of the light. Around the same time, small glass chimneys were added to lamps to both protect the flame and control the flow of air to the flame. Ami Argand, a Swiss chemist is credited with first developing the principal of using an oil lamp with a hollow circular wick surrounded by a glass chimney in 1783.

In 1806, Humphrey Davy demonstrated a powerful electric lamp, called an "arc lamp." However, it required so much energy that it was impractical for use. By 1817, candles, oil lanterns and gas lamps were utilized as the main source of light during nighttime hours. Electric generators were developed to provide the energy for light sources used in public buildings and lighthouses. It wasn't until Thomas Edison created the first practical electrical light bulb as well as an electrical system to support it that electric light became available in home and office settings.

1. When was the first lamp invented? What did it look like?

2. What is a Swiss chemist, Ami Argand, famous for?

3. Who demonstrated a first powerful electric lamp?

4. Who created the first practical electrical light bulb as well as an electrical system to support it?

Task 3.2 Put the verbs into Passive voice.

1. The first lamp … (invent) around 70,000 BC.

2. A hollow rock, shell or other natural found object … (fill) with moss or a similar material that … (soak) with animal fat and ignited.

3. Wicks … later (add) to control the rate of burning.

4. The word lamp … (derive) from the Greek word lampas, meaning torch.

5. In the 18th century, the central burner … (invent), a major improvement in lamp design.

6. The fuel source … now tightly (enclose) in metal, and a adjustable metal tube … (use) to control the intensity of the fuel burning and intensity of the light.

7. Around the same time, small glass chimneys … (add) to lamps to both protect the flame and control the flow of air to the flame.

8. Ami Argand, a Swiss chemist … (credit) with first developing the principal of using an oil lamp with a hollow circular wick surrounded by a glass chimney in 1783.

Task 3.3. Read the texts and answer the questions.

Lighting Fuels

Early lighting fuels consisted of olive oil, beeswax, fish oil, whale oil, sesame oil, nut oil, and similar substances. These were the most commonly used fuels until the late 18th century. However, the ancient Chinese collected natural gas in skins that was used for illumination.

In 1859, drilling for petroleum oil began and the kerosene (a petroleum derivative) lamp grew popular, first introduced in 1853 in Germany. Coal and natural gas lamps were also becoming wide-spread. Coal gas was first used as a lighting fuel as early as 1784.

What do early lighting fuels consist of?
What happened in 1859?
When was coal first used?

Gas Lights

In 1792, the first commercial use of gas lighting began when William Murdoch used coal gas for lighting his house in Redruth, Cornwall. German inventor Freidrich Winzer (Winsor) was the first person to patent coal gas lighting in 1804 and a "thermolampe" using gas distilled from wood was patented in 1799. David Melville received the first U.S. gas light patent in 1810.

Early in the 19th century, most cities in the United States and Europe had streets that were gaslight. Gas lighting for streets gave way to low pressure sodium and high pressure mercury lighting in the 1930s and the development of the electric lighting at the turn of the 19th century replaced gas lighting in homes.

1. When and where did William Murdoch use coal gas for lighting?

2. What did David Melville receive in 1810?

3. What replaced gas lighting in homes in 19th century?

UNIT 4. MODERN LIGHTING

Task 4.1 Read and translate he texts.

Modern Lighting

Debate has arisen over who first invented the light-emitting diode (LED). Four independent American research groups are generally credited with its invention in 1962. However, new information has come to light on the work by a Russian radio technician named Oleg Vladimirovich Losev, who published details of the first ever LED in 1927. LED lights are longer-lasting and more energy-efficient than compact fluorescent and incandescent lights.

Types of Industrial Light Bulbs

Because they're designed for highly specialized applications, industrial light bulbs come in all shapes and sizes, including:

- **Industrial and commercial light bulbs.** This family of lighting products includes both mounts and bulbs for warehouses, retail outlets and manufacturing facilities. Generally, they are designed to provide high-wattage lighting to large areas in the most economical manner possible.

- **Stage and studio light bulbs.** Movie and television shoots, as well as live dramatic and musical performances, rely on specific lights to create mood and special effects. Delicate and expensive bulbs are designed solely for use in these lights.
- **Medical light bulbs.** Diagnostic instruments are, like studio lights, often powered by uniquely designed light bulbs. Everything from X-ray machines and laryngoscopes to endoscopes and dental instruments rely on very specific light bulbs to work.
- **Scientific light bulbs.** Research and development labs as well as educational institutions need light bulbs and lamps for spectroscopy, chromatography and microscopy. Tungsten halogen, xenon, mercury arc and hollow cathode are but a few of the light bulb types used in scientific applications. Microscope bulbs in particular can be tricky to shop for, since there are thousands of products available and it's not always easy to tell whether or not a given bulb is indicated for use in a particular microscope. Contact the manufacturer if you have any questions.

Well-Known Manufacturers of Specialty Light Bulbs

GE industrial light bulbs are trusted around the world, delivering energy savings, long life and excellent reliability. After more than 100 years in business, General Electric continues to innovate; they've recently developed an award-winning line of light-emitting diode (LED) products to address the needs of industry's new generation. General Electric has also partnered up with EMCORE Corporation to produce the GELcore series of high-brightness LEDs.

Philips Lighting specializes in producing incandescent and halogen lamps in addition to a wide variety of ballasts, fixtures, stainless steel tubing and lighting electronics. Ushio America, Osram Sylvania and Radium Lampenwerk are but a few of the more prominent lighting companies with a global presence.

UNIT 5. NUCLEAR POWER IN UKRAINE.ECOLOGICAL CONSEQUENCES OF ARTIFICIAL NIGHT LIGHTING.

Task 5.1. Read the text and answer the questions.

Nuclear Power in Ukraine

- **Ukraine is heavily dependent on nuclear energy - it has 15 reactors generating about half of its electricity.**
- **Ukraine receives most of its nuclear services and nuclear fuel from Russia.**
- **In 2004 Ukraine commissioned two large new reactors. The government plans to maintain nuclear share in electricity production to 2030, which will involve substantial new build.**

A large share of primary energy supply in Ukraine comes from the country's uranium and substantial coal resources. The remainder is oil and gas, mostly imported from Russia. In 1991, due to breakdown of the Soviet Union, the country's economy collapsed and its electricity consumption declined dramatically from 296 billion kWh in 1990 to 170 in 2000, all the decrease being from coal and gas plants. Today Ukraine is developing shale gas deposits and hoping to export this to western Europe by 2020 through the established pipeline infrastructure crossing its territory from the east.

Total **electricity production** in 2009 amounted to 173 billion kWh, with 4 billion kWh net exports, and total capacity is over 52 GWe. In 2009, 41% of power came from coal and gas (approx 20% gas), 48% from nuclear (82.9 TWh) and 7% from hydro, according to the Ministry of Fuel and Energy. In 2009, 77.9 billion kWh net came from nuclear, according to IAEA. Nuclear plant comprises 26.6% of capacity, hydro 9.3%.

A major increase in electricity demand to 307 billion kWh per year by 2020 and 420 billion kWh by 2030 is envisaged, and government policy was to continue supplying half of this from nuclear power. This would have required 29.5 GWe of nuclear capacity in 2030, up from 13.9 GWe (13.2 GWe net) now.

In mid 2011 the Ukraine energy strategy to 2030 was updated, and in the electricity sector nuclear power's role was emphasized, with improved safety and increased domestic fuel fabrication. In mid 2012 the policy was gain updated, and 5000 to 7000 MWe of new nuclear capacity was proposed by 2030, costing some $25 billion.

1. What does Ukraine heavily depend on?
2. What country does Ukraine receive most of its nuclear services and nuclear fuel from?
3. Why did the country's economy collapse in 1991?
4. What can you tell about the Ukraine energy strategy?

Task 5.2 What do these numbers refer to?

1990, 1991, 2000, 2009, 2011, 2020, 2030

Task 5.3 . Put the verb into correct form. (Present Simple, Present Continuous, Past Simple). Sometimes you need the negative.

1. Ukraine … (receive) most of its nuclear services and nuclear fuel from Russia.

2. A large share of primary energy supply in Ukraine (come) from the country's uranium and substantial coal resources.
3. In 1991, due to breakdown of the Soviet Union, the country's economy … (collapse) and its electricity consumption …. (decline) dramatically from 296 billion kWh in 1990 to 170 in 2000.
4. Today Ukraine … (develop) shale gas deposits and hoping to export this to western Europe by 2020 through the established pipeline infrastructure crossing its territory from the east.
5. In 2009, 77.9 billion kWh net … (come) from nuclear, according to IAEA.
6. In mid 2011 the Ukraine energy strategy to 2030 … (be) updated, and in the electricity sector nuclear power's role … (be) emphasized, with improved safety and increased domestic fuel fabrication.

Task 5.4. Read the text and answer the questions.

Ecological Consequences of Artificial Night Lighting

While certain ecological problems associated with artificial night lighting are widely known-for instance, the disorientation of sea turtle hatchlings by beachfront lighting-the vast range of influences on all types of animals and plants is only beginning to be recognized. From nest choice and breeding success of birds to behavioral and physiological changes in salamanders, many organisms are seriously affected by human alterations in natural patterns of light and dark.

Ecological Consequences of Artificial Night Lighting is the first book to consider the environmental effects of the intentional illumination of the night. It brings together leading scientists from around the world to review the state of knowledge on the subject and to describe specific effects that have been observed across a full range of taxonomic groups, including mammals, birds, reptiles and amphibians, fishes, invertebrates, and plants.

Ecological Consequences of Artificial Night Lighting provides a scientific basis to begin addressing the challenge of conserving the nighttime environment. It cogently demonstrates the vital importance of this until-now neglected topic and is an essential new work for conservation planners, researchers, and anyone concerned with human impacts on the natural world.

1. Could you give examples of ecological Consequences of Artificial Night Lighting?
2. Why is it a real problem nowadays?
3. What does Ecological Consequences of Artificial Night Lighting provide?

Task 5.5 Match the left column with the right one

Are widely	affected by
Physiological changes	known
To be seriously	the vital importance
Pattern of	of the night
Intentional illumination	in salamanders
To review the state	light and dark
It demonstrates	of knowledge

UNIT 6. ALTERNATIVE ENERGY. THERMAL CONVERSION

Task 6.1. Read the text and answer the questions.

A few thoughts about alternative energy!

We focus on **alternative energy** because it is now being looked at as a means of fueling our economy as we move away from oil dependence. If there comes the next oil crisis and people are starting to look at *alternative energy* such as solar, nuclear, ethanol, and biodiesel energies.

Let's face it, there is not enough oil in this world to continue at our current consumption rate...eventually, our supply will stop and the world's economy with it. Filling up at the pump is becoming costly. **Solar energy** is becoming more and more common as a means to power things that normally run off of electricity. **Ethanol** is starting to creep into the gas tanks of more and more Americans as we see countries like Brazil in South America running on ethanol, and depending less on gas. **Wind energy** farms are starting to dot the countryside in countries all over the world. **Alternative energy** is becoming more prominent now, and environmental concern is no longer for the "tree big". People are starting to wake up and see that our planet is slowly being destroyed by pollution and lack of responsibility. This is the point where we come in - to bring understanding about **alternatives in energy**, and environmental responsibility.

Do you have **alternative energy** working for you? Are you concerned about the environment and how it is being destroyed? Are you exploring **energy alternatives** yet? Please read the different **alternative energy articles**, check out the recommended products here, and most importantly visit also this links in the sidebar for more informations to compare between products.. We all have a duty to protect,

care for, and conserve this precious planet that we have been given! And the way is **alternative energy**.

1. Why do we focus on alternative energy?
2. What are the types of alternative energy?
3. How do you understand the phrase “People are starting to wake up”?
4. Why is solar energy becoming more and more common as a means to power things?

Task 6.2. Put the verbs into appropriate tense (Present Simple or Present Continuous)

1. We … (focus) on **alternative energy** because it is now being looked at as a means of fueling our economy as we move away from oil dependence.
2. People … (start) to look at *alternative energy* such as solar, nuclear, ethanol, and biodiesel energies.
3. **Solar energy** … (become) more and more common as a means to power things that normally run off of electricity.
4. … you (have) **alternative energy** working for you?
5. … you (explore) **energy alternatives?**

Task 6.3. Read the text and answer the questions.

The way of how to get solar energy

The Sun produces radiant energy by consuming hydrogen through a process of nuclear fusion reactions. A portion of this solar energy consists of photons and it is this portion that eventually travels on to Earth, taking approximately 8 minutes and 20 seconds to complete the journey.

The Earth receives and collects solar energy through its atmosphere, as well as through its oceans and plant life. Solar energy then interacts with oceans on Earth and atmosphere resulting in the creation of winds which can in turn produce electricity when directed through aerodynamically designed wind machines.

Solar photovoltaic cells convert solar rays into electricity. (Photovoltaic literally means "light energy".) Individual cells are packaged into modules called arrays that act similarly to batteries when the sun is shining, producing a stream of direct current (DC) electricity that is then channeled into buildings or shared with power grids.

The inverter then convert DC electricity generated by the arrays into alternating current (AC) electricity. This AC electricity is then able to be used in

buildings, schools, homes and businesses to power electrical devices like lights, computers, and appliances. In this way, solar energy is able to effectively meet all our electrical needs in a clean, convenient, and environmentally-friendly way

Task 6.4. Read the text and answer the questions

How does wind power work

The wind power is actually a form of solar power because the wind is generated due to the heating effect from the sun.

When the sun heats the earth's surfaces at different speed on sand, water, stone and various types of soil, these surfaces absorb and release heat at different rates, creating different temperatures.

The physic theory says, when the air moves, it generates kinetic energy, a type of energy created with the motion of mass. With modern technology, we can capture and convert the kinetic energy into other forms of energy such as electricity. Energy from wind is a renewable alternative energy that can be generated endlessly, as long as there is wind.

The cost of generating electricity from wind power has been greatly reduced, making it a feasible renewable alternative energy solution to be used as the major source of electricity for future. Now a days there are many d-i-y- wind power system building guides available that give guidance to people who are interested in implementing renewable energy system at home.

1. How does the Sun produce radiant energy?
2. What does a portion of this solar energy consist of?
3. What does the Earth receives and collects solar energy through?
4. What does solar energy then interacts with?
5. What does Solar photovoltaic cells convert?
6. What does The inverter convert DC electricity into?
7. In what way solar energy is able to effectively meet all our electrical needs in?

Task 6.5 Fill in the appropriate word(s) from the list. Use the words only once.

Radiant plant interact with individual power electrical environmentally-friendly the wind the earth’s release

……..cells

……..way
……..energy
……..…oceans
……..heat
……...surfaces
……..life
……grids
……needs
……power

Task 6.6. Read the text and answer the questions.

The Pros and the Cons of DIY WindPower

The PROS: Supply and Maintenance

The good thing about DoItYourSelf wind power is, that it is not "toooo" expensive.. The fuel consumption is still tolerable and the maintenance cost is also not too high. According to scientists, the energy that we can harness from the atmosphere is a lot greater than what the world can consume. Think about this! Accordingly, the wind power available is **five times** more than the world consumption. However, there has to be a practical limit as to the amount to be used. For now, studies are being done how it will impact the atmosphere if we harness it in global scale.

The CONS: Battery Rewiring

Harnessing the energy does not mean it's all just good times since you have free electricity. A great deal of effort is needed in the maintenance of your tools. Many of the materials sold in the market now are mostly do-it-yourself, means DIY. DoItYourSelf wind power means you have to install the wind turbines and allthe technical skills; you will also need to maintain the batteries and all that, making controls and Checks, so that everything works well. The most common problem that users encounter is rewiring the batteries. At the beginning may be it is a hassle if you are unsure what to do, but it is just a breeze if you know the steps to take. See all the videos out there, wich expalins nealry every thing.

A battery that can produce 0-300 volts normally has 42 coils around the edge of the stator. There are two ends to this wiring system and DIY wind power enthusiasts like you will observe that at one end, there are three wires joined together whereas for the other end, the three wires are separate. Each wire is connected to 14 coils and these 14 coils send different current flows in different intervals. A majority of DIY wind power users prefer 23 or 24 volts. In this case, you will have 3 sets of 14 coils. Each coil will be able to produce about 212 volts of power. At full speed, you should be able to have 300 volts maximum with a 12 volt system.

Now Pay Close Attention Here –

Are you seriously looking for a proven way to save money on your electricity bills? There is a Guide which will help you to Build wind power at home. You will be surprised to know that how easy it is to Build a Windmill at Home, that will not only save your money but you will help in cleaning the environment. check the guide.

Task 6.7. Read the text and answer the questions.

Biomass

Biomass is biological material from living, or recently living organisms, most often referring to plants or plant-derived materials. As a renewable energy source, biomass can either be used directly, or indirectly – once or converted into another type of energy product such as biofuel. Biomass can be converted to energy in three ways: *thermal conversion*, *chemical conversion*, and *biochemical conversion*.

Historically, humans have harnessed biomass derived energy products since the time when people began burning wood to make fire. In modern times, the term can be referred to in two meanings. In the first sense, biomass is plant matter used either to generate electricity (via steam turbines or gasifiers), or to produce heat (via direct combustion). Wood remains the largest biomass energy source today; examples include forest residues (such as dead trees, branches and tree stumps), yard clippings, wood chips and even municipal solid waste. In the second sense, biomass includes plant or animal matter that can be converted into fibers or other industrial chemicals, including biofuels. Industrial biomass can be grown from numerous types of plants, including miscanthus, switchgrass, hemp, corn, poplar, willow, sorghum, sugarcane, bamboo, and a variety of tree species, ranging from eucalyptus to oil palm (palm oil).

The adoption of biomass-based energy plants has been a slow but steady process. Over the past decade, the production of these plants has increased 14%. In the United States, alternative electricity-production sources on the whole generate about 13% of power; of this fraction, biomass contributes approximately 11% of the alternative production. According to a study conducted in early 2012, of the 107 operating biomass plants in the United States, 85 have been cited by federal or state regulators for the violation of clean air or water standards laws over the past 5 years. This data also includes minor infractions.

Biomass-derived energy also holds the promise of reducing carbon dioxide emissions, a significant contributor to global warming, as carbon dioxide acts as a “greenhouse” gas by trapping heat absorbed by the earth from the sun. Although the burning of biomass energy releases as much carbon dioxide as fossil fuels, biomass burning does not release “new carbon” into the atmosphere while burning fossil fuels does. This is because carbon dioxide released from fossil fuels was carbon that was fixated via photosynthesis millions of years ago that had been locked in the hydrocarbons of fossil fuels.

Industry professionals claim that a range of issues can affect a plant's ability to comply with emissions standards. Some of these challenges, unique to biomass plants, include inconsistent fuel supplies and age. The type and amount of the fuel supply is completely reliant factors; the fuel can be in the form of building debris or agricultural waste (such as deforestation of invasive species or orchard trimmings). Furthermore, many of the biomass plants are old, use outdated technology and were not built to comply with today's stringent standards. In fact, many are based on technologies developed during the term of President Jimmy Carter, who created the Department of Energy in 1977.

The Energy Information Administration projected that by 2017, biomass is expected to be about twice as expensive as natural gas, slightly more expensive than nuclear power, and much less expensive than solar panels. In another EIA study released, concerning the government's plan to implement a 25% renewable energy standard by 2025, the agency assumed that 598 million tons of biomass would be available, accounting for 12% of the renewable energy in the plan.

There are a number of technological options available to make use of a wide variety of biomass types as a renewable energy source. Conversion technologies may release the energy directly, in the form of heat or electricity, or may convert it to another form, such as liquid biofuel or combustible biogas. While for some classes of biomass resource there may be a number of usage options, for others there may be only one appropriate technology.

Task 6.8. Read the text and answer the questions.

Thermal conversion

Biomass briquettes are an example fuel for production of dendrothermal energy

Thermal conversion processes use heat as the dominant mechanism to convert biomass into another chemical form. The basic alternatives of combustion, torrefaction, pyrolysis, and gasification are separated principally by the extent to

which the chemical reactions involved are allowed to proceed (mainly controlled by the availability of oxygen and conversion temperature).

Energy created by burning biomass (fuel wood), also known as dendrothermal energy, is particularly suited for countries where the fuel wood grow more rapidly, e.g. tropical countries. There are a number of other less common, more experimental or proprietary thermal processes that may offer benefits such as hydrothermal upgrading (HTU) and hydroprocessing. Some have been developed for use on high moisture content biomass, including aqueous slurries, and allow them to be converted into more convenient forms. Some of the applications of thermal conversion are combined heat and power (CHP) and co-firing. In a typical dedicated biomass power plant, efficiencies range from 7–27% (HHV basis).[23] Biomass cofiring with coal, by contrast, typically occurs at efficiencies near those of the coal combustor (30–40%, HHV basis).

1.What are Biomass briquettes?

2. What is dendrothermal energy?

Task 6.9. Read the text and answer the questions

Choosing a career is like any other activity; it is best to work to a plan. Too many people start looking for a specific job before thinking out their occupational aims. It is a good idea to begin by attempting to define in clear terms what your requirements are from a career. This involves taking a realistic view of your strengths and weaknesses. You may think for example, that you would like a job which involves organizing people, but liking such a job is not a sufficient justification if experience you already may have suggests that this is not your strong point. On the other hand, you should remember that training will help you to do new things. A further point to consider is how far you will be willing to do for a time things which you do not like to know that they are necessary to achieve your longer term objectives. Having thought carefully about the sort of person you are, try to work out a realistic set of occupational requirements. In particular, you can answer important questions. First: what sort of life do you want to lead? For example, do you want to live in the country or in the town? Is leisure time of great importance to you? Is the size of your salary important? Do you want to put down roots or travel widely? Second: what sort of work do you want to do? For example, do you like working alone or with others? Does teaching people appeal to you? Do you want to be an organizer of other people's activities? Do you want to develop new ideas and initiate changes.

As for me, I have made up my mind to be an engineer. As my parents are engineers they have made a great influence on my choice and I can say that this profession runs the family. My choice of this occupation didn't come as a sudden flash. I think that nowadays this profession is of great need and importance to our country. It is my aim to be a qualified specialist and to serve the interests of my

country. To be a well prepared engineer I should have some important qualities: great capability persistence, knowledge of science and, of course, knowledge of foreign languages. In spite of these arguments we mustn't forget about everybody's vacation. I think that my abilities combined with the knowledge would be quite enough to succeed in my work.

1. What is important when you choose a career?
2. Why is it important to work to a plan?
3. What are important questions you have to answer when you choose a career?
4. What is the most suitable profession for you?

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