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АНГЛИЙСКИЙ ЯЗЫК
БЕЗОПАСНОСТЬ ПРОИЗВОДСТВА

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Цель практикума – развитие коммуникативных компетенций в сфере профессионального общения на английском языке по тематике, общей для всех специальностей технического профиля. Практикум ориентирован на развитие навыков чтения, понимания и перевода профессиональной литературы, а также говорения по профессиональной тематике. Практикум предназначен для обучающихся по ФП "Профессионалитет", по Федеральным государственным стандартам по 50 наиболее востребованным на рынке труда, новым и перспективным профессиям и специальностям (ТОП -50), а также актуализированным ФГОС СПО.

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Содержание

ВВЕДЕНИЕ

Трудно представить себе успешное предприятие на рынке труда, где бы не уделялось внимание безопасности производственных процессов. Как известно, несчастные случаи на производстве часто надолго парализуют работу предприятия, не только создавая нервозную обстановку в коллективе, но и принося существенные финансовые потери. Таким образом, прочные знания правил техники безопасности становится жизненной составляющей делового и производственного процесса.

Исходя из того, что на многих современных предприятиях эксплуатируются импортные агрегаты и механизмы, специалистам придётся сталкиваться с инструкциями на иностранных языках, и чаще всего документация составлена на английском. Для продуктивной и безопасной работы современный специалист должен уметь прочитать, понять содержание руководств, условные обозначения и т.д.

Учебное пособие состоит из 5 разделов: 1. General Information, 2. Safety Rules and Safety Signs, 3. Instructions, 4. Tools and Equipment, 5. Environmental Safety, приложений и глоссария.

Первый раздел знакомит обучающихся с основными понятиями безопасного производства. Материал второго раздела посвящён основным правилам техники безопасности и условным обозначения на рабочих местах. Изучая третий и четвертый разделы, обучающиеся познакомятся с оборудованием, а также с инструкциями, направленными на обеспечение безопасности, сохранения здоровья и работоспособности работников в процессе труда. Материал пятого раздела посвящен вопросам экологической безопасности.

Тексты пособия составлены по статьям англоязычных аутентичных сайтов, специализирующихся на документации по технике безопасности и охране труда. К каждому тексту есть задания для понимания содержания прочитанного и использования изученного материала в различных речевых ситуациях, в том числе ситуационные задачи, что поможет научить студентов применять полученные знания в профессиональной деятельности и повышать уровень владения английским языком.

Для продуктивной работы с текстами в пособии предусмотрены приложения. В них студенты могут найти нужный справочный материал для успешного выполнения заданий. Приложение 1 «Grammar Review» позволяет повторить тему «Повелительное наклонение». Приложение 2 «Case Study» даёт разъяснения по работе с ситуационными задачами и содержит практические советы и примеры. Приложение 3 «Cluster» позволяет систематизировать и обобщить учебный материал.

В пособии есть ссылки на электронные ресурсы или информационные источники непосредственно в текстах и заданиях, что упрощает получение необходимой информации по изучаемому вопросу.

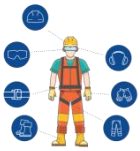
Глоссарий направлен на овладение профессиональной лексикой, которая наиболее часто встречается не только в текстах практикума, но и в материалах англоязычных сайтов.

В учебном пособии есть материал и задания, отмеченные специальными символами.

ситуационная задача

работа с текстом

письменное задание



работа с инструкциями

Чёткая последовательность выполнения заданий уроков позволит достичь поставленных целей и добиться хороших результатов в освоении иностранного языка.

I. GENERAL INFORMATION

1.1. What is Industrial Safety?[1]

I. Read and translate the text

Most of today's advanced and computer-controlled industrial processes involve large amounts of energy and have the potential for devastating accidents. So a well-engineered and reliable industrial safety system is essential for protection against those accidents and loss of life.

Thousands of industrial accidents every year caused the realization of the importance of industrial safety with technological advancement in manufacturing. The dangers of human life are increasing day by day. In order to avoid accidents, employees must be aware of industrial safety principles and danger areas of that industry. The following are some reasons why industrial safety is necessary:

1. for the safety of people in their workplaces;
2. for protecting the environment against damage from industrial accidents;
3. for protecting businesses against serious losses from damage to plant and machinery;
4. for eliminating accidents causing work stoppage and production loss;
5. for creating awareness of the good practices available for the delivery of effective safety instrumented systems;
6. for providing basic training in well-established techniques for engineering of safety systems;
7. for assisting engineers and technicians to support and participate in the safety systems activities at their work with good background knowledge of the subject;
8. for being aware of what can go wrong and how to avoid it.

All industrial personals must be trained enough about safety aspects of man, machines, and material and other infrastructure facilities for avoiding minor or major accidents. Safety is the first requirement and every industrial employee must learn safety measures even before he starts working on a machine or equipment.

A practical goal of industrial safety is to lighten the environmental impact on the manufacturing unit and each person and the role of the industrial safety professionals is to find leverage or opportunities for considerable improvement using practical effort. The objectives of industrial safety systems are as follows:

1. to check all the possible chances of accidents for preventing loss of life and permanent disability of any industrial employee, any damage to machine and material;
2. to eliminate accidents causing work stoppage and production loss;
3. to reduce workman's compensation, insurance rate, and all the cost of accidents;
4. to achieve better morale among industrial employees;
5. to increase production means to a higher standard of living;

[1] https://analyseameter.com/2019/10/industrial-safety.html

6. to prevent accidents in the industry by reducing any hazards.

In industries, the fire hazards, accidents and industrial disasters may be reduced through careful safety planning. All those unfortunate events can be avoided by effective planning for safety. Some important considerations for industrial safety are the following: Proper Plant Layout Proper Fire Prevention system Health & Hygiene Proper Safety Training Proper Alarms and warning systems Appropriate sensors and safety gears for employees Sufficient lighting in the work area as well as the pathways Cleanliness and dryness of shop floor Proper pressure gauges and other safety equipment Electrically insulation Proper signboards for safety instructions.

I. *Make up clusters: «The objectives of industrial safety systems», «Some reasons why industrial safety is necessary»*[2]
II. *Answer the questions:*

1. Why is a well-engineered and reliable industrial safety system essential for protection against those accidents and loss of life?
2. Who must be aware of industrial safety principles and danger areas of that industry?
3. Why industrial safety is necessary?
4. What is a practical goal of industrial safety?
5. What are the objectives of industrial safety systems?
6. May the fire hazards, accidents and industrial disasters be reduced through careful safety planning?

1.2. Industrial Hazards

Words:

industrial hazard – промышленная опасность
raw material – сырьё
waste products - отходы
toxic release – токсичный выброс
environmental damage - ущерб окружающей среде

I. Read and translate the text.
II. Complete it with the words or expressions from the box.

a) water b) bang c) pollution problems d) skin burns e) miles f) threat

Industrial hazards consist of four principle hazards. This is because industries employ many different processes involving a wide range of different raw materials, intermediates, waste products and final products.

[2] Смотрите Приложение 3 Cluster

The hazards encountered are fire, explosion, toxic release and environmental damage.

Fire: This is the most frequent of the hazards however the consequences are generally less. The effect of fire on people usually takes the form of (1) ____ and is usually dependent on the exposure time and the intensity of the heat.

Explosion: Explosions are usually heard from far away as a (2) ____. This is the result of a shock wave. This overpressure can kill people but usually the indirect effects of collapsing buildings, flying glass and debris causes far more loss of life and severe injuries. There are different types of explosions which include gas explosions and dust explosions. Toxic/Chemical release:

Sudden releases of toxic vapors have the potential to cause death and severe injuries several (3) ____ from the release point. They are carried by (4) ____ and air. Their release into public sewage systems, rivers, canals and other water courses, either directly or through contaminated water used in fire fighting can result in serious threat to public.

Environmental Damage: As well as having the potential for causing injury, loss of life and damage to property, the hazards of fire, explosion and toxic releases may pose a severe (5) ____ to the environment. Release of other substances, not directly toxic to humans can cause major (6) ____. It is becoming increasingly recognized that damage to natural resources such as plant and animal life can have serious long term consequences.

III. *Answer the questions:*

1. What industrial hazards do you know?
2. Is fire the most frequent of the hazards?
3. What types of explosions can you name?
4. What can pose a severe threat to the environment?
5. What do you think if there is a way to solve this problem?

1.3. Common electrical related hazards

Words:

injury – травма
maintenance staff – обслуживающий персонал
harsh environments – суровые условия
supervision - надзор
to misuse – использовать неправильно

I. *Read and translate the text.*

Those most at risk of an electrical related injury include:

a) maintenance staff
b) those working with electrical plant equipment and machinery

c) people working in harsh environments such as construction and agriculture sites.

Employees should only work on or with electrical equipment if they have suitable training, knowledge, experience and supervision.

Voltages over 50 volts AC or 120 volts DC are considered hazardous. Harm can be caused when exposed to 'live parts' or through conducting objects or materials.

Shocks from equipment can cause severe and permanent injuries. Shocks can also cause indirect injuries, such as falls from

a) ladders
b) scaffolds
c) other work platforms.

Faulty or overloaded equipment can lead to fires which can cause damage, injuries and loss of life.

The most common injuries are caused by

a) faulty wiring
b) poor training
c) incorrectly replaced fuses
d) mixing water and electricity
e) use of overloaded or damaged plugs, sockets or cables
f) misuse of equipment or using equipment which is known to be faulty.

Other potential sources can be

a) work in or on excavations
b) working in wet, harsh or confined conditions
c) working on or near overhead lines, for example tipping loads
d) working on or near equipment that's thought to be dead but has a live current.

Electricity can also ignite flammable or explosive atmospheres, for example in spray paint booths or around refueling areas.

The Electricity at Work Regulations applies to all aspects of the use of electricity within the workplace. They place duties on employers, employees and the self-employed to prevent danger.

Duty holders must

a) have the electrical systems constructed in a way that prevents danger
b) maintain the electrical systems as necessary to prevent danger (including a 5 year fixed installation inspection)
c) carry out work on electrical systems carried out in a way that prevents danger.

Electrical equipment used in hazardous environments must be constructed or protected to prevent it becoming dangerous. This includes:

a) extremes of weather
b) extremes of temperature
c) corrosive conditions.

Employees should only work on or with electrical equipment if they have suitable training, knowledge, experience and supervision.

II. *Find English equivalents*

Механизм, подходящее обучение, опыт, постоянные травмы, поврежденные вилки, работать в стесненных условиях, заправка, предотвратить опасность, опасная среда

III Employees should only work on or with electrical equipment if they have suitable training, knowledge, experience and supervision. Write 7-10 sentences to prove it.

1.4. Safety engineering

Words:

safety engineering - техника безопасности
accident - несчастный случай
safety rules - правила техники
lack - нехватка, отсутствие безопасности
training workshop - учебный цех (мастерская)
to ensure – обеспечивать

I. Read and translate the text:

Accidents to people in industrial enterprises are called industrial traumatism (injury). They occur when workers have not acquired the requisite for skill and lack the necessary experience in handling tools and equipment. Accidents are also caused through neglect of safety rules and regulations in the factories and training workshops.

The purpose of safety engineering is to prevent accidents and to create such conditions of work in industry which will ensure maximum productivity of labour.

When taking up new duties or when first going to work at any industrial enterprise each worker is obliged to acquaint him thoroughly with, and to master the safety instructions.

II. Change the Russian word to English. Use new words.

1) This was *несчастный случай.*
2) All people should keep *технику безопасности.*
3) Do you know *правила техники*?
4) We work in *мастерской.*
5) I *обеспечиваю* safety engineering.

III. Answer the questions:

1) How are the accidents to people in industrial enterprises called?
2) When do the accidents to people occur?
3) What must one do to prevent accidents?
4) What is the purpose of safety engineering?
5) What is a worker obliged to do when taking up new duties?

1.5. Obligations of an employer

Words:

familiarization training –ознакомительный инструктаж
sophisticated equipment – сложное оборудование
established regulations – установленные правила
criminal liability – уголовная ответственность

I. Read and translate the text.

The owner of the company is obliged to insure the employee against accidents and illnesses that may occur during activities of the enterprise. Instructions for the protection of employees of any organization require conduct familiarization training, training and examination rules. Employees who do not attend these activities and do not have a document about their passing, the activities are not allowed. Subsequent testing of knowledge is carried out every six months.

Some specialties are developed additional applications to the rules. For example, regulations on labor protection appliances contain special provisions relating to the mechanisms of interaction between employee and sophisticated equipment. In order to avoid various accidents that serve enterprises must comply with established regulations.

For violation of rules, which includes the job description for the protection of labor, the employee may be subject to disciplinary, administrative or criminal liability.

II. Answer the questions

1. What is the owner of the company obliged to do?
2. What are instructions for the protection of employees?
3. What kinds of liabilities do you know?

1.6. Occupational Accident

Words:

occupational accident – несчастный случай
performing the work – выполнение работы
degree of severity – степень тяжести
life-threatening – опасный для жизни

I. Read and translate the text.

What is an Occupational Accident?

An occupational accident is the health damage or death of an employee which occurred while performing the work task given by an employer or any other work performed on the authorization of the employer, during the break included in the working time or other time when acting for the benefit of the employer, and which has a cause-and-effect relationship with the employer or the working environment. By the degree of severity, an occupational accident shall be classified as a mild or severe occupational accident or an occupational accident leading to death. An occupational accident shall be considered to be severe if it caused severe health damage or a life-threatening condition to an employee.

II What is an occupational accident? Give a short answer. Keep it in mind:

An occupational accident is the ___ ___ or ___ of an ___ while performing the ___ ___.

II. SAFETY RULES AND SAFETY SIGNS

2.1. Health and Safety Regulations at the Construction Site

10 Simple Construction Site Safety Rules[3]

Construction sites are dangerous places to work. Follow these 10 simple construction site safety rules to keep yourself, and others, safe. From wearing your PPE, to following procedures, you can help make your site a safer place to work, and prevent accidents. Every year, thousands of people are injured at work on construction sites. So, if you work in construction, it's even more important that you put health and safety into everything you do. Study these rules using Pic 1.

Pic. .1. 10 Simple Construction Site Safety Rules

[3] https://www.haspod.com/blog/construction/10-simple-construction-site-safety-rules

I Study the new words[4] and read and translate texts 1-10. Match the texts 1-10 with the most convenient titles from the list below:

a	Report defects and near misses	f	Wear your PPE at all times
b	If in doubt, ask	g	Follow safety signs and procedures
c	Do not put yourself or others at risk	h	Use the right equipment
d	Keep a tidy site	i	Do not start work without an induction
e	Never tamper with equipment	j	Never work in unsafe areas

1. When you enter the site, make sure you have the PPE you need. PPE is important, it's your last line of defence should you come into contact with a hazard on site. Hi-viz helps make sure you are seen. Safety boots give you grip and protect your feet. Hard hats are easily replaced, but your skull isn't. It can't protect you if you don't wear it. Wear your hard hat, safety boots and hi-viz vest as a minimum, along with any additional PPE required for the task being carried out.
2. Each site has its unique hazards and work operations. No two sites are exactly the same. Make sure you know what is happening so that you can work safely. Inductions are a legal requirement on every construction site you work on. Your induction is important. It tells you where to sign in, where to go, what to do, and what to avoid. Don’t start work without one.
3. Construction work is messy. Slips and trips might not seem like a major problem compared to other high-risk work happening on the site, but may cause injuries on construction sites. Remember to keep your work area tidy to reduce the number of slip and trip hazards. Pay particular attention to areas such as access and escape routes.
4. Actions speak louder than words. Especially on construction sites where one wrong move could put you in harm's way. Set a good example, think safe and act safely on site. You are responsible for your own behavior. Construction sites are dangerous places to work. Make sure you remain safety aware throughout your shift.
5. These should be explained to you in your induction (rule number 2). Your employer should ensure a risk assessment is carried out for your activities. Make sure you read and understand it. Control measures are put in place for your safety. Make sure they are in place and working before you start.
6. Know what is happening around you. Be aware. Don’t work at height without suitable guard rails or other fall prevention. Don’t enter unsupported trenches. Make sure you have safe access. Don’t work below crane loads or other dangerous operations.
7. If you notice a problem, don’t ignore it, report it to your supervisor immediately. Fill out a near-miss report, an incident report, or simply tell your supervisor.

[4] смотрите GLOSSARY

Whatever the procedure in place on your site for reporting issues, use it. Action can only be taken quickly if the management has been made aware of the problem. The sooner problems are resolved the less chance for an accident to occur.

8. If some things not working, or doesn't look right, follow rule number 7 and report it. Don't try and force something, or alter something, if you're trained to or supposed to. Never remove guard rails or scaffold ties. Do not remove machine guards. Do not attempt to fix defective equipment unless you are competent to do so. Do not ever tamper with equipment without authorisation.
9. One tool does not fit all. Using the correct tool for the job will get it done quicker, and most importantly, safer. Visually check equipment is in good condition and safe to use before you start.
10. Unsure what to do? Or how to do something safely? Or you think something is wrong? Stop work, and ask. It takes 5 minutes to check, but it might not be so easy to put things right if things go wrong. It's better to be safe than sorry. Mistakes on construction sites can cost lives, don’t let it be yours.

II Find English equivalents

Несчастный случай, защитное ограждение, каска, светоотражающий жилет, вводный инструктаж, защитное ограждение механизмов, опасная или аварийная ситуация (без последствий), СИЗ (средства индивидуальной защиты), защитные ботинки, правила техники безопасности, кронштейн для крепления лесов к стене, нарушать целостность оборудования, подскальзывания и спотыкания.

III Why are safety rules vital? Write 7-10 sentences to prove it.

2.2. Electrical safety rules

Words:

proper protection – надлежащая защита
voltage-rated gloves – перчатки с номинальным напряжением
flame-resistant clothing – огнестойкая одежда
shields - щиты
hoods – капюшоны

1. Read and translate the text.

Michael Foley is an electrical safety instructor with National Technology Transfer Inc. Foley understands the perils of working around electricity, as well as the precautions that should be taken to avoid injuries and accidents.

Among the most common hazards to workers are electrical shocks and burns, boiler fires and explosions, and contact with hazardous chemicals.

The Electrical Safety Foundation International reports that an average of 133 workers die each year due to contact with power lines.

Generally, electric shocks or electrocutions are thought of as the main hazards associated with electrical work. According to Foley, however, 75 percent of all reported lost time electrical-related incidents are due to burn injuries from the arc flash.

Often, the person actually working in an electrical cabinet is wearing proper protection, but others, who may be working with that person but not directly in the cabinet, are not protected at all. An arc can reach 10 feet from the source, so it is important for anyone working near an electrical cabinet or similar electrical equipment to be protected.

In addition to improved training and preplanning, adequate safety equipment is essential. Voltage-rated gloves and tools are a must when working on energized electrical equipment. Flame-resistant clothing is needed, even if not required, to protect power plant workers from arc flashes. Shields and hoods are also necessary.

II. Name the electrician's personal protective equipment.

2.3. Understanding Safety Signs[5]

I Read and translate the text

Construction site safety signs are displayed to deliver a clear health and safety message. Failing to understand the meaning of a health and safety sign on site might mean you lose your life - or your job.

Health and safety signs are displayed everywhere on construction sites, from the site hoarding and entrance points to various locations throughout the site. If you work on construction sites, you are likely to have spotted some of these health and safety signs. They come in bright colours, like red, green, blue and yellow.

What are these signs there for, and what do they mean?

Construction site safety signs are not put up for decoration, and the colours haven't been chosen because they look pretty. Each sign has a meaning, and each colour represents a different message. Knowing what construction health and safety signs mean is important because they could be warning you about a danger, or telling you to do something. And if you don't understand the sign, and fail to follow the message, you could get hurt, or worse.

All safety signs have to conform to the Health and Safety (Safety Signs and Signals) Regulations. Being familiar with the different types of signs means we will be able to spot:

[5] https://theconstructor.org/practical-guide/safety-procedures-construction-site/13412/

- Prohibition Signs
- Mandatory Signs
- Warning Signs
- Safe Condition Signs
- Fire Fighting Equipment Signs

II Agree or disagree with the following sentences

1. Failing to understand the meaning of a health and safety sign on site might mean you lose your life - or your job.
2. Health and safety signs are displayed above the entrance of construction sites.
3. Health and safety signs come in two colours: black and white.
4. Each sign has a meaning, and each colour represents a different message.
5. Construction site safety signs are put up for decoration.
6. If you don't understand the sign, and fail to follow the message, you could get hurt, or worse.
7. Knowing what construction health and safety signs mean is important because they could be warning you about a danger, or telling you to do something.

III What do the different types of signs look like, and what do they mean? Read and translate the texts about signs and their meanings

Prohibition Signs

The first sign you might be familiar with is the prohibition sign, although you might just recognise it as a red danger sign. On the entrance to nearly every construction site, you will see this type of sign, usually with the text 'No unauthorized access'. Prohibition signs have a red circle with a crossbar on a white background. Any lettering is black.

Examples: Stop, No Entry, No Smoking.

Meaning: do not, you must not, stop it.

Mandatory Signs

Mandatory signs are the opposite of a prohibition sign. Instead of telling you not to do something, they tell you what you must do. You can also spot this type of sign through construction sites, telling you what you need to do, for example, 'Safety helmets must be worn' or even 'Keep out'. Mandatory signs have a solid blue circle with a white symbol and/or lettering.

Examples: *Wear hard hats, Safety footwear must be worn, Keep locked shut*.

Meaning: you must do, obey.

Warning Signs

Warning signs don't tell you what to do, but they are used to make you aware of a danger or a hazard. The first sign you might see on a construction site is a warning sign, with the text 'Warning Construction Site' or 'Danger Construction Site'. Warning signs have a solid yellow triangle (pointing up) with a black border. Any symbol or lettering is also black on yellow.

Examples: *Deep Excavations, High Voltage, Asbestos, Work Overhead*

Meaning: you have been warned, be careful, be aware.

Safe Condition Signs

Safe conditions signs can be considered the opposite of a warning sign. Instead of warning you about danger, they are alerting to you to a safe place. You might see this type of sign on a construction site to let you know where the first aid kit is, where the fire exits are, or who to report to. Safe condition signs have a solid green square or oblong, with a white symbol or symbol and text.

Examples: *Fire Exit, First Aid*

Meaning: follow this sign to reach safety.

Pic. 1. Types of safety signs

Fire Equipment Signs

Fire equipment signs let you know where fire equipment is. They are red in colour but square so that you can tell them apart from prohibition signs. You will find this type of sign on construction sites where the fire extinguishers are located, or at fire call points. Fire equipment signs have a solid red rectangle with white symbols and/or lettering.

Examples: *Fire Alarm, Hydrant, and Extinguisher*.

Meaning: here is the fire equipment.

Now you should be able to understand construction site safety signs, and importantly, make sure that when you see one, you can follow the health and safety message and comply with the instruction.

IV Fill in the table

sign	type	meaning	examples
			
			
			
			
			

IV You are responsible for H&S at a building site. Look at the picture 3 and give your employees a proper induction into his new job.[6]

Pic. 2. Site safety

2.4. Personal protective equipment

I Read and translate the text

Any construction site is a dangerous occupation for all personnel, especially for labors working on site and so one must be prepared every day for safety. For this purpose, various safety measures have to be taken.

Personal protective equipment (PPE) are supplied to all the personnel's working on site and even for the personal who are temporary visiting to the site PPE can be classified as:

- Minimum Personal protective equipment (PPE)
- Additional Personal protective equipment (PPE)

[6] Пояснение по решению ситуационных задач смотрите Приложение 2 Case study

Minimum PPE Requirements for Safety at Construction Site

Hard Hat or Helmet	Hard hat or helmet is issued to each and every personnel working on site. It has to be worn all times at job site.
Safety Glasses	Safety glasses are required at construction site every time debris is filled in air due to activities on site.
Hand Protection Gloves	Hand gloves are supplied to all personals to protect against cuts when handling material or equipment's, during cleaning operations, cutting metal studs or similar works
Safety Vests	Purpose of safety vest is to keep the person always clear in view, even in the dark and he should be visible to everyone. Safety vests are of different bright colors like red, green, yellow so it's easy for workers to see and locate each other.
Proper Clothing	Shirts, long pants and hard soul shoes, a 6-inch-high boot are recommended.

Additional PPE for Safety at Construction Site

Hearing Protection	It is compulsory to wear hearing protection equipment near any equipment, tool or machinery which makes loud noises.
Respiratory Protection	Sometimes as voluntary respiration policy dust mask is supplied, any employee looking for additional comfort or safety while working with fiber glass, fire proofing, cleaning the floors or handling debris.
Face shields	A full face shield should be worn along with safety glasses when working in a high debris, operating grinder or any spark producing activity or similar activities or when done on site. An approved welding shield is compulsory to wear during all welding operations.
Safety Harness	The safety harness is an attachment between a fixed and mobile object and is usually fabricated from rope, cable and locking hardware. Full body safety harness to be used as a procedure for fall protecting system, ignorance can result in severe physical harm. Safety harnesses keep workers safe and are helpful in freeing their hands for work even while hanging on the side of a building.

II. Read and translate the instruction

Personal protective equipment and protective clothing

Personal protective equipment and protective clothing should comply with standards set by the competent authority, taking into account as far as possible ergonomic principles.

1. Employers should provide the workers with the appropriate means to enable them to use the individual protective equipment and should require and ensure its proper use
2. A competent person having a full understanding of the nature of the hazard and the type, range and performance of the protection required should:
   a. select suitable items of personal protective equipment and protective clothing;
   b. arrange that they are properly stored, maintained, cleaned and, if necessary for health reasons, disinfected or sterilized at suitable intervals.
3. Workers should be required to make proper use of and to take good care of the personal protective equipment and protective clothing provided for their use.
4. Workers should be instructed in the use of personal protective equipment and protective clothing.
5. Workers working alone on construction sites in confined spaces, enclosed premises or in remote or inaccessible places should be provided with an appropriate alarm and the means of rapidly summoning assistance in an emergency.
6. Where necessary, workers should be provided with and wear the following personal protective equipment and protective clothing:
   a. safety helmets or hard hats to protect the head from injury due to falling or flying objects, or due to striking against objects or structures;
   b. clear or coloured goggles, a screen, a face shield or other suitable device when likely to be exposed to eye or face injury from airborne dust or flying particles, dangerous substances, harmful heat, light or other radiation, and in particular during welding, flame cutting, rock drilling, concrete mixing or other hazardous work;
   c. protective gloves or gauntlets, appropriate barrier creams and suitable protective clothing to protect hands or the whole body as required when exposed to heat radiation or while handling hot, hazardous or other substances which might cause injury to the skin;
   d. footwear of an appropriate type when employed at places where there is the likelihood of exposure to adverse conditions or of injury from falling or crushing objects, hot or hazardous substances, sharp-edged tools or nails and slippery or icecovered surfaces;

e. respiratory protective equipment, suitable for the particular environment, when workers cannot be protected against airborne dust, fumes, vapours or gases by ventilation or other means;
f. a suitable air line or self-contained breathing apparatus when employed in places likely to have an oxygen deficiency;
g. respirators, overalls, head coverings, gloves, tight-fitting boiler suits, impermeable footwear and aprons appropriate to the risks of radioactive contamination in areas where unsealed radioactive sources are prepared or used;
h. waterproof clothing and head coverings when working in adverse weather conditions;
i. safety harnesses with independently secured lifelines where protection against falls cannot be provided by other appropriate means;
j. life vests and life preservers where there is a danger of falling into water;
k. distinguishing clothing or reflective devices or otherwise conspicuously visible material when there is regular exposure to danger from moving vehicles.

Translate words and word combinations into English:
Средства индивидуальной защиты, защитные каски, прозрачные или цветные защитные очки, защитные перчатки или нарукавники, респираторы, комбинезоны, головные уборы, перчатки, привязные ремни, спасательные жилеты

II Look at the picture 4 and write when and where you must wear the above mentioned PPE.[7]

Pic. 3. Site Safety Rules

III Make up clusters: Minimum PPE, Additional PPE[8]

[7] Пояснение по решению ситуационных задач смотрите Приложение 2 Case study

III. INSTRUCTIONS

3.1. Basic rules of safety on production

I. Read and translate the instructions

The following is prohibited within the territory of the Company:

1) Concealment of information on accidents, fires, incidents, industrial injuries, facts of operating regime disturbance.
2) Performance of hazardous works without a work permit.
3) Disconnection or disturbance of the interlocks integrity and other safety devices on operating equipment without the relevant written permission.
4) Staying within the territory of the Company in a state of alcoholic, narcotic or other intoxication.
5) Smoking within the territory of the Company outside specially designated areas.
6) Using open fire outside specially designated areas, unless expressly specified in a work permit.
7) Performance of works without personal protection equipment issued by the employer and required for the safe performance of works.

Employees and visitors of the Company shall:

1) Undergo induction in the Directorate of Health, Safety, Civil Defense and Environmental Protection.
2) Undergo induction in the relevant structural unit where they are going.
3) Comply with the requirements of the structural unit manager or the accompanying persons.
4) Apply personal protective equipment.
5) When visiting industrial facilities, it is necessary to use (where required) the following personal protection equipment: a safety helmet, safety goggles, headphones or ear plugs, special shoes, overalls.

Rules of movement within the territory:

1) When entering and exiting the building, it is necessary to be attentive to avoid stumbling.
2) When climbing and going down the stairs, it is necessary to hold the rails.
3) It is prohibited to use a mobile phone when moving up- and down stairs and in rooms of operator, process plants of the Company.
4) Pipelines may be crossed only in the areas with cross bridges, it is prohibited to walk on pipelines.
5) It is prohibited to walk on self-made paths, under racks and in other non-designated areas.

III.  Write safety rules you have complied with in practice.

[8] Пояснения по составлению кластера смотрите Приложение 3 Cluster

3.2. Basic Safety Precautions at Construction Site

I Read and translate the text

In any construction project for basic safety precautions to be implemented are:

1. Guard rails to be installed at open scaffold areas, all openings in the building floor, in the excavated areas, at mobile elevated platforms.
2. Yellow stickers with safety notes to be pasted where necessary.
3. All the working platforms should be stable, properly braced, should not be overloaded and safe for the working personnel.
4. All the working areas and passageways should be free from waste or debris or any of obstruction like stored material.
5. The site should be clean all the times and the material should be stored safely.
6. There should be proper arrangement of collection and disposal of waste materials.
7. First aid should be available at all times on site for cuts burns or any mishaps.
8. Fire extinguishers to be placed on site on proper locations in case of any fire.
9. That should be proper lighting arrangements on the site especially when the work is carried out during the night stand.

To summarize, world class construction project execution is impossible without proper health and safety management.

II Match two halves

1. Guard rails to be installed at open scaffold areas,	a to be pasted where necessary.
2. Yellow stickers with safety notes	b collection and disposal of waste materials.
3. All the working platforms should be stable, properly braced,	c waste or debris or any of obstruction like stored material.
4. All the working areas and passageways should be free from	d for cuts burns or any mishaps.
5. The site should be clean all the times and	e especially when the work is carried out during the night stand.
6. There should be proper arrangement of	f on proper locations in case of any fire.
7. First aid should be available at all times on site	g the material should be stored safely.
8. Fire extinguishers to be placed on site	h should not be overloaded and safe for the working personnel.
9. That should be proper lighting arrangements on the site	i all openings in the building floor, in the excavated areas, at mobile elevated platforms.

3.3. Be safe at work!

I. Read and translate the text

Working with electrical wiring is often dangerous. The proper safety equipment can save your life. Remember these tips:

Always protect your head, eyes, hands and feet. Never work without wearing the following items:

a. a hard hat
b. a pair of leather gloves
c. steel toe boots
d. safety glasses

On the job, there is sometimes danger of electric shock or explosion. In these cases, dress properly. Wear the following:

a. an arc shield
b. arc flash clothing
c. electrical hot gloves

When working with live wires, be extra careful. Protect yourself from shocks. Use an arc flash blanket and stand on a rubber mat. Finally, hold onto a hot stick.

I. Read the safety poster. Then, mark the following statements as true (T) or (F)

1. __ Safety glasses should be worn if needed.
2. __ Arc flash clothing helps if there is an explosion.
3. __ Hold a hot stick when working with dead wires.

II. Match the words (1-7) with the definitions (A-G)

1. __ arc shield
2. __ rubber mat
3. __ hot stick
4. __ safety glasses
5. __ electrical hot gloves
6. __ arc flash blanket
7. __ arc flash clothing

A. clear glasses that are made of thick plastic
B. a blanket used to protect from explosions or shock
C. a fiberglass rod that protects from shocks
D. gloves made of rubber that protect from shocks
E. a mat made of rubber that electricians stand on
F. pants, shirts, jackets, and shoes designed to protect from scocks or explosions
G. a protective plastic shield for the eyes and face

IV. Fill in the gaps in the instructions with the correct words:

a. shoes caught c. long d. sleeves

Always keep hair short since 1_____ hair can be caught in moving machinery. Fasten all buttons as loose clothing can be 2_____ in moving machinery. Feet can easily be injured when lightweight 3_____ are worn. 4_____ should always be rolled up because loose cuffs can catch in moving machinery.

IV. TOOLS AND EQUIPMENT

4.1. Hand Tools and Electrical Tools

I Make up a cluster «Hand Tools» choosing the appropriate words from the list below[9]

Chisel, claw hammer, glass cutter, brick, hammer, level tube, wall, pliers, putty knife, paint, saw, screwdriver, spray gun, rotary hammer drill, circular saw.

II Guess the words on their meaning

1. A tool with a long metal blade that has a sharp edge for cutting wood, stone, etc.
2. A tool consisting of a piece of metal with a flat end that is fixed onto the end of a long, thin, usually wooden handle, used for hitting things.
3. A small tool with two handles for holding or pulling small things like nails, or for cutting wire.
4. A tool with a blade or sharp cutting points, used for cutting hard materials such as wood or metal.
5. A tool for turning screws, consisting of a handle joined to a metal rod shaped at one end to fit in the cut in the top of the screw.
6. A device that is held in the hand and used for spraying liquid such as paint in very small drops.
7. A tool for cutting hard materials that has a circular blade, sometimes with sharp points along the edge.
8. A tool for cutting glass.

III Read and translate the Text:

Tools Needed

Tool kits need to contain the basic tools needed for electrical jobs. These basic tools are sold at most hardware stores.

Pliers are needed for pulling and cutting wires. Your kit needs to include long nose pliers and end cutting pliers. Side cutters and diagonal cutters are recommended.

You must have wire strippers in your kit. Make sure they are able to strip the most common wires. You will also need several types of screwdrivers on the job.

A flashlight, measuring tape and utility knife will round out your kit.

Mark the following statements as true (T) or false (F).

1. __ Employees can buy the tools at hardware stores.
2. __Side cutters and diagonal cutters are needed in the tool kit.
3. __Wire strippers are used for cutting and pulling wire.

[9] Пояснения по составлению кластера смотрите Приложение 3 Cluster

Match the words (1-6) with the definitions (A-F).

1. __ tool kit
2. __side cutters
3. __ screwdriver
4. __ long nose pliers
5. __ measuring tape
6. __ wire stripper

A a tool with blades able to grip or cut wires
B a tool used to tighten or loosen screws
C a tool for cutting, twisting or pulling wires
D a tool used to pull the covering off of wires
E a tool used for finding the length of an object
F a bag or box used to hold a set of tools

IV Read and translate the instructions

Hand tools

1. Hand tools and implements should be tempered, dressed and repaired by competent persons.
2. The cutting edges of cutting tools should be kept sharp.
3. Heads of hammers and other shock tools should be dressed or ground to a suitable radius on the edge as soon as they begin to mushroom or crack.
4. When not in use and while being carried or transported sharp tools should be kept in sheaths, shields, chests or other suitable containers.
5. Only insulated or non-conducting tools should be used on or near live electrical installations if there is any risk of electrical shock.
6. Only non-sparking tools should be used near or in the presence of flammable or explosive dusts or vapours.

Electrical tools

1. Portable electrical tools should generally be used on reduced voltage to avoid as far as possible the risk of a lethal shock.
2. All electrical tools should be earthed, unless they are "all insulated" or double insulated" tools which do not require an earth. Earthing should be incorporated in metallic cases, and as a safeguard against damaged cables where wires enter the tool.
3. All electrical tools should receive inspection and maintenance on a regular basis by a competent electrician, and complete records kept.

V You are going to work with a new employee at a building site. Give an order what he has to do when working with electrical and hand tools.[10]

[10] Смотрите Приложение 1 Grammar review Повелительное наклонение

4.2. Tower Cranes

I Read and translate the instruction

1. Where tower cranes have cabs at high level, persons should only be employed as crane operators who are capable and trained to work at heights.
2. The characteristics of the various machines available should be considered against the operating requirements and the surroundings in which the crane will operate before a particular type of crane is selected.
3. Care should be taken in the assessment of wind loads both during operations and out of service. Account should also be taken of the effects of high structures on wind forces in the vicinity of the crane.
4. The ground on which the tower crane stands should have adequate bearing capacity. Account should be taken of seasonal variations in ground conditions.
5. Bases for tower cranes and tracks for rail-mounted tower cranes should be firm and level. Tower cranes should only operate on gradients within limits specified by the manufacturer. Tower cranes should only be erected at a safe distance from excavations and ditches.
6. Tower cranes should be sited where there is clear space available for erection, operation and dismantling. As far as possible, cranes should be sited so that loads do not have to be handled over occupied premises, over public thoroughfares, other construction works and railways or near power cables.
7. Where two or more tower cranes are sited in positions where their jibs could touch any part of the other crane, there should be direct means of communication between them and a distinct warning system operated from the cab so that one driver may alert the other to impending danger.
8. The manufacturers' instructions on the methods and sequence of erection and dismantling should be followed. The crane should be tested in accordance with national laws or regulations before being taken into use.
9. The climbing operation of climbing tower cranes should be carried out in accordance with manufacturers' instructions and national laws or regulations.
10. A windspeed measuring device should be provided at an elevated position on the tower crane with the indicator fitted in the drivers' cab.
11. Devices should be provided to prevent loads being moved to a point where the corresponding safe working load of the crane would be exceeded. Name boards or other items liable to catch the wind should not be mounted on a tower crane other than in accordance with the manufacturers' instructions.
12. Tower cranes should not be used for magnet, or demolition ball service, piling operations or other duties which could impose excessive loadings on the crane structure.

II Find English equivalents

Крановщик, эксплуатационные требования, оценка ветровых нагрузок, в непосредственной близости от крана, несущая способность, сезонные колебания грунтовых условий, рельсовый башенный кран, безопасное расстояние от котлованов и траншей, методы и последовательность монтажа и демонтажа, протестировано в соответствии с государственными законами или нормативными актами, подъемные работы грузоподъёмных башенных кранов, устройство для измерения скорости ветра.

4.3. Concrete work equipment

I Read and translate the instruction

1. Concrete mixers should be protected by side railings to prevent workers from passing under the skip while it is raised.
2. Hoppers into which a person could fall, and revolving blades of trough or batch-type mixers, should be adequately guarded by grating.
3. In addition to the operating brake, skips of concrete mixers should be provided with a device or devices by which they can be securely blocked when raised.
4. While the drum of a concrete mixer is being cleaned, adequate precautions should be taken to protect the workers inside by locking switches open, removing fuses or otherwise cutting off the power.
5. Concrete buckets for use with cranes and aerial cableways should be free as far as practicable from projections from which accumulations of concrete could fall.
6. Loaded concrete buckets should be guided into position by appropriate means.
7. Concrete buckets positioned by crane or aerial cableways should be suspended by safety hooks.
8. When concrete is being tipped from buckets, workers should keep out of range of any kick-back due to concrete sticking to the bucket.
9. Concrete bucket towers and masts with pouring gutters or conveyor belts should:
   a) be erected by competent persons;
   b) be inspected daily.
10. Pipes for carrying pumped concrete should:
    a) be securely anchored at the ends and at curves;
    b) be provided near the top with air release valves;
    c) be securely attached to the pump nozzle by a bolted collar or equivalent means.

II Find English equivalents

Бетономешалки, защитные боковые ограждения, вращающиеся лопасти, желобчатая или цикличная бетономешалка, опрокидывающийся резервуар бетономешалки, бетонораздаточный ковш, грузоподъёмный крюк с карабином, трубы для транспортировки перекачиваемого бетона.

4.4. Concrete mixer

I Read and translate the text

A concrete mixer (also commonly called a cement mixer) is a device that homogeneously combines cement, aggregate such as sand or gravel, and water to form concrete. A typical concrete mixer uses a revolving drum to mix the components. For smaller volume works portable concrete mixers are often used so that the concrete can be made at the construction site, giving the workers ample time to use the concrete before it hardens. An alternative to a machine is mixing concrete or cement by hand. This is usually done in a wheelbarrow; however, several companies have recently begun to sell modified tarps for this purpose. The concrete mixer was invented by Columbus industrialist Gebhardt Jaeger.

A variant of standard concrete transportation is the concrete or cement mixing trailer. These small versions of a transit-mix truck are used to supply short loads of concrete. These cart-away style trailers have a concrete mixing drum with a capacity of between 1-yard and 1.75 yards. Cartaways are usually pulled behind a pick-up truck and batched from smaller batching systems. The mixing trailer system is popular with rental yards and building material locations, which use them to supply ready-mix to their regular customer base.

Today's market increasingly requires consistent homogeneity and short mixing times for the industrial production of ready-mix concrete, and more so for precast/prestressed concrete. This has resulted in refinement of mixing technologies for concrete production. Different styles of stationary mixers have been developed, each with its own inherent strengths targeting different parts of the concrete production market. The most common mixers used today fall into 3 categories: Twin-shaft mixers, Vertical axis mixers (Pan and Planetary mixers) and Drum mixers (Reversing Drum and Tilting Drum)

II Answer the questions

1. What`s the concrete mixer?
2. What does it do?
3. What kinds of concrete mixers do you know?

V. ENVIROMENTAL SAFETY

5.1. Causes, Effects and Solutions to Industrial Pollution on Our Environment[11]

I Read and translate the text

With the coming of the Industrial Revolution, humans were able to advance further into the 21st century. Technology developed rapidly, science became more advanced, and the manufacturing age came into view. With all of these comes one more effect: industrial pollution. Earlier, industries were small factories that produced smoke as the primary pollutant.

However, since the number of factories was limited and worked only a certain number of hours a day, the levels of pollution did not grow significantly. But when these factories became full-scale industries and manufacturing units, the issue of industrial pollution started to take on more importance.

Together with the industrial revolution, more factories and technologies were developed, which caused a lot of air, land, and water pollution on our planet. This kind of pollution is one of the worst because the smoke that the industry emits in the air contributes a lot to ozone depletion, health problems to both animals and humans, and global warming.

Furthermore, the waste from these industries is being thrown on land and water, which causes a lot of health problems as well for both animals and plants. These industrial pollutants release a lot of harmful and unnatural chemicals into both soil and water, which eventually lead to the extinction of some plant and animal species.

Any form of pollution that can trace its immediate source to industrial practices is known as industrial pollution. Most of the pollution on the planet can be traced back to industries of some kind.

Countries facing sudden and rapid growth of such industries are finding it to be a serious problem that has to be brought under control immediately.

Industrial pollution takes on many faces. It contaminates several sources of drinking water, releases unwanted toxins into the air and reduces the quality of soil all over the world.

II Answer the questions

1. Why did industrial pollution begin?
2. When did the issue of industrial pollution start to take on more importance?
3. What kind of pollution is one of the worst?
4. Can industrial pollution trace its immediate source to industrial practices?
5. Does industrial pollution take on many faces?

[11] https://www.conserve-energy-future.com/causes-effects-of-industrial-pollution.php

5.2. How do industries pollute the environment?

I Read and translate the text

Industries pollute the environment by releasing their toxic waste into bodies of water, land, and air. Industries manufacture most of their products in factories. The factories release toxic smoke into the air, which pollutes our environment.

The smoke contains chemicals that are unnatural and toxic for the environment, as well as gases that are harmful to the atmosphere. With that, animals, plants, and humans may inhale the smoke from the factories, which could lead to health complications or worse death. Other than that, other gases are causing the depletion of the ozone layer, which contributes to global warming.

On the other hand, industries also use water for their manufacturing. The excess water used by factories is being dumped or released again into open oceans or rivers. The toxic chemicals that go along with the dumped factory excess water could reach aquatic animals and harm them.

Other than that, the water is also being processed again for commercial use, which could affect plants, animals, and humans as they consume it, or the water is being used for irrigation. With that, the water cycle of the environment is being severely disrupted and harmed, making some sources useless for consumption.

Furthermore, industries pollute the environment by throwing their liquid and solid waste on land. The waste causes soil pollution, which leads to agricultural problems as well as chronic health issues for humans and animals.

Lastly, industries pollute the environment, which leads to the extinction of some animal and plant species. Due to the accumulative effects of industrial pollution, the environment is continuously being affected by its disruption, affecting its natural system.

A lot of soil is becoming inhabitable for plants; global warming is becoming so severe that even glaciers are melting and polar bears are losing their home; more natural disasters are happening and are not being controlled by nature anymore; and animals are continuously losing their homes.

II Agree or disagree with the following statements. Use the following expressions:

a) if you agree

- I agree with this statement. Я согласен с этим утверждением.
- That’s right. Это верно.
- It’s true. Это правильно.

b) if you disagree

- I disagree with this statement. Я не согласен с этим утверждением.
- That’s wrong. Это неправильно.
- It’s false. Это неверно.

c) if you share your opinion

- I think (believe, suppose, guess) - Я думаю (считаю, полагаю, предполагаю)

- I’m quite convinced - Я абсолютно убежден, что…
- As far as I concerned - Насколько я уверен, …
- If my memory serves me right - Если мне не изменяет память, …
- I’m a hundred per cent certain that - Я на сто процентов уверен, что…
- I’m not sure, but I think… Я не уверен, но я думаю…
- It’s obvious - Это очевидно, …
- I know for sure that… - Я точно знаю, что…

1. Industries pollute the environment by releasing their toxic waste into bodies of water, land, and air.
2. The smoke contains chemicals that are unnatural and toxic for the environment, as well as gases that are harmful to the atmosphere.
3. Other gases are causing the depletion of the ozone layer, which is not harmful for the nature.
4. Industries use water for their manufacturing.
5. The toxic chemicals don’t go along with the dumped factory excess water.
6. Industries pollute the environment by throwing their liquid and solid waste on land.
7. Soil pollution leads to agricultural problems as well as a good health for humans and animals.
8. Due to the accumulative effects of industrial pollution, the environment is continuously being affected by its disruption, affecting its natural system.

5.3. Causes of Industrial Pollution

I The effects of industrial pollution are far-reaching and liable to affect the ecosystem for many years to come. Read and translate texts 1-6. Match the texts 1-10 with the most convenient titles from the list below:

a Presence of a large number of small scale industries.
b Inefficient waste disposal.
c Unplanned industrial growth.
d Natural Resource Use.
e Lack of policies to control pollution.
f Use of outdated technologies.

1. Lack of effective policies and poor enforcement drive allowed many industries to bypass laws made by the pollution control board, which resulted in mass-scale pollution that affected the lives of many people.
2. In most industrial townships, unplanned growth took place wherein those companies flouted rules and norms and polluted the environment with both air and water pollution.

3. Most industries still rely on old technologies to produce products that generate a large amount of waste. To avoid high costs and expenditure, many companies still make use of traditional technologies to produce high-end products.
4. Many small-scale industries and factories that don't have enough capital and rely on government grants to run their day-to-day businesses often escape environmental regulations and release a large number of toxic gases into the atmosphere.
5. Water pollution and soil pollution are often caused directly by inefficiency in the disposal of waste. Long-term exposure to polluted air and water causes chronic health problems, making the issue of industrial pollution a severe one. It also lowers the air quality in surrounding areas, which causes many respiratory disorders.
6. Raw materials are a must for industries, which often requires them to pull out underground elements. Most industries require large amounts of water for their work. When involved in a series of processes, the water comes into contact with heavy metals, harmful chemicals, radioactive waste, and even organic sludge. Air pollution has led to a steep increase in various illnesses, and it continues to affect us on a daily basis. With so many small, mid-sized and large-scale industries coming up, air pollution has taken a toll on the health of the people and the environment.

5.4. Ways to Control or Reduce Industrial Pollution

I Read and translate the text

The issue of industrial pollution is critical to every nation on the planet. With the increase in the harmful effects of industrial pollution, there are many agencies and individuals who are working to reduce carbon footprints and live and work in an eco-friendly way.

However, industrial pollution is still rampant and will take many years to properly control and regulate. Many steps can be taken to seek permanent solutions to the problem.

1. Source Control. Adopting new technology, efficient training of employees for safe use, and development of better technology for disposal of waste, and being more conscientious about the use of raw materials can help control industrial pollution at the source.
2. Recycling as much polluted water in the industries as possible by increased recycling efforts to reduce industrial pollution.
3. Cleaning of Resources. Organic methods should be adopted to clean the water and soil, such as using microbes that use heavy metals and waste as feed naturally. Cooling rooms or bins need to be developed that allow industries to recycle the water they need instead of pushing it back into the natural water source it came from.

4. Industry Site Selection. Consideration of the location of the sites and the potential impact on the surrounding environment can help reduce harmful consequences.
5. Proper Treatment of Industrial Waste. By developing and implementing adequate treatment facilities for handling industrial waste and proper habits can reduce pollution.
6. Rebuilding Habitats and Afforestation. Rebuilding habitats by planting more trees and plants can help give wildlife back their homes, and the trees can help purify the air with enough oxygen and act as a buffer against the environment.
7. Stricter Laws and Enforcement. The Environmental Protection Agency (EPA) works to correct the damage from industrial pollution. There should be more stringent rules to take action against companies who do not follow proper protocol and more significant rewards for companies that operate properly. It requires creating policies that prevent the misuse of land.
8. Regular Environmental Impact Assessments. Being a responsible company or industry should require regular environmental impact assessments that are reported for evaluation. If there are harmful impacts discovered during the review, necessary actions to correct the negative consequences should be developed and enforced.

II *What steps can be taken to seek permanent solutions to the problem of industrial pollution? Make up a cluster «Sustainable Enterprise»*[12]

Note: sustainable /səˈsteɪ.nə.bəl/ causing, or made in a way that causes, little or no damage to the environment and therefore able to continue for a long time[13]:

A large international meeting was held with the aim of promoting sustainable development in all countries.

III Say what environmental protection measures are being taken by your city authorities. Give examples. What else should be done from your point of view?

IV *Solve the problem*[14]

You are responsible for sustainable development of a big modern enterprise. Ecological reports show, that the activities causing pollution include:

- Burning fossil fuels like oil, natural gas, and petroleum
- Chemical solvents used in dyeing and tanning industries
- Untreated gas and liquid waste being released into the environment
- Improper disposal of radioactive material.

What steps should be taken to seek permanent solutions to the problem? Write the plan of sustainable development of your business.

[12] Смотрите Приложение 3 Cluster
[13] Определение из https://dictionary.cambridge.org/dictionary/english/sustainable
[14] Пояснение по решению ситуационных задач смотрите Приложение 2 Case study

5.5. Sustainable Development of Magnitogorsk Iron and Steel Works[15]

I Read and translate the text

The Company is one of the world's largest steel producers and holds leading positions among Russian steel companies.

The Company's assets in Russia represent a large steelmaking complex with a full production cycle, from preparation of iron ore to production of downstream products.

MMK produces a wide range of steel products with a predominant share of premium products.

Sustainable Development is an integral part of the company's corporate strategy.

MMK contributes to the development of the regions where it operates, enhances the social well-being of residents and preserves the environment by fulfilling its economic commitments and its social and environmental goals.

A continued focus on mitigating and preventing an adverse impact on the environment is an integral part of our long-term sustainable development strategy. It contains protection of air, water, earth and green city planning.

II Find English equivalents:

Производители стали, лидирующие позиции, крупный металлургический комплекс, полный производственный цикл, глубокая переработка черных металлов, преобладающей долей продукции премиум класса, неотъемлемая часть, делать вклад в развитие региона, социальные и экологические цели, стратегия долгосрочного устойчивого развития.

III Answer the questions

1. Is Magnitogorsk Iron and Steel Works one of the world's largest steel producers and holds leading positions among Russian steel companies?
2. What do the Company's assets in Russia represent?
3. What does MMK produce?
4. Why does MMK contribute to the development of the regions where it operates?
5. What does long-term sustainable development strategy contain?

[15] Все материалы взяты с официального сайта ММК https://mmk.ru/en/sustainability/

VI Study the table Achievements 2000-2021. Complete the sells with the appropriate names of protected environment: Green City, Air, Earth, Water according to the steps taken by the Company.

protected environment	taken steps
	– Construction of electric arc furnaces and the transition to continuous casting of steel, which enabled MMK to decommission all open-hearth furnaces. – Construction of dust exhausting systems for cast houses and blast furnace stock houses with an overall capacity of 7.2 mcm/hour.
	– Construction of new and redesign of existing local circulation water supply systems. – Redesign of the mining facilities' wastewater system. – Elimination of the impact of water treatment facilities' repairs on the circulation water supply system.
	– Reusing 100% of iron-containing waste. – Construction of a plant for draining sludge deposits formed during the treatment of converter gases. – Construction of a plant to enrich iron-containing sludge deposits from storage facility No. 2 with an annual processing capacity of up to 2 million tonnes of industrial waste. – Utilising 100% of the annually generated slag. – Reclamation of retired iron ore pits and waste storage facilities.
	– Over six years, the Company plans to allocate RUB 57 million to plant 11,000 tree and shrub seedlings in Magnitogorsk. – As part of our greening programme, we focus on both the Company's facilities and adjacent land plots as well as the city's residential areas and territories of social institutions, parks and public gardens.

Table 1 Achievements 2000-2021

VI Study the Environmental Policy of PJSK MMK[16] picture 5. What does the Company do for protection of nature? What are the most important activities? Write 10-12 sentences.

Appendix to order
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MAGNITOGORSK IRON & STEEL WORKS

ENVIRONMENTAL POLICY OF PJSC MMK

MAGNITOGORSK IRON AND STEEL WORKS is one of the largest iron and steel companies in Russia, operating with an understanding of responsibility for the environmental impact and striving for the environmentally oriented development of its production potential.

THE PRIORITY OF THE COMPANY'S DEVELOPMENT STRATEGY is to create a comfortable and favorable environment for human life and health in the locations of the Company's assets.

PRINCIPLES:

To comply with best practices in the field of sustainable development; ▶ **Leadership in implementing the best available technologies;** ▶ **Environmental safety at all stages of the life cycle of steel products.**

GOALS:

- To eliminate excessive air pollution.
- To achieve specific environmental impact indicators that meet the best international practices in the industry.
- To use energy, raw materials and water resources rationally.
- To increase the share of recyclable industrial wastes and their environmentally safe disposal.
- To counteract climate change and biodiversity decline and restore disturbed lands.

COMPANY'S OBLIGATIONS:

- To comply with the requirements of Russian environmental legislation and the international standard ISO 14001.
- To continuously improve the environmental management system.
- To apply the best available technologies, taking into account the conservation of specially protected natural areas, when implementing investment projects.
- To develop a system of responsible water use and water resources management.
- To manage the risks and opportunities associated with environmental impacts and climate change.
- To reduce the carbon footprint of products and maximize the utilization of secondary energy resources.
- To implement measures aimed at preserving biodiversity, natural landscapes and aquatic ecosystems.
- To use raw materials, supplies, equipment and services from environmentally responsible suppliers.
- To monitor compliance with the environmental protection requirements for organizations performing works at MMK facilities.
- To provide information on environmental impact and interact with stakeholders on environmental safety issues.

MANAGEMENT COMMITMENTS:

- To set environmental and climate goals and monitor their implementation.
- To allocate resources and create conditions for the implementation of the Environmental Policy.
- To motivate and train personnel in the field of environmental protection.

COMMITMENTS OF PERSONNEL:

- To comply with the established requirements for environmental safety.
- To identify the risks of environmental pollution and inform the management about them.
- To take care of natural resource conservation and keep production facilities and territories clean and orderly.

Success in achieving the Goals is ensured by the involvement of each employee of the Company in environmental protection and environmental safety activities.

General Director, PJSC MMK.
Pavel V. Shilyaev

Pic. 4. Environmental Policy

[16] Материал с официального сайта ММК https://mmk.ru/en/sustainability/ecology/

Приложение 1

GRAMMAR REVIEW

Повелительное наклонение

Повелительное наклонение выражает волю говорящего, побуждение к действию, просьбу или приказание. Форма повелительного наклонения по отношению ко второму лицу в единственном и множественном числе образуется из инфинитива путем отбрасывания частицы to:

Read! Читай! Читайте!

Look at the blackboard! Смотри(те) на доску!

Отрицательная форма повелительного наклонения образуется при помощи вспомогательного глагола to do (делать) и частицы not. Частица not обычно сливается со вспомогательным глаголом:

Don´t read! Не читай(те)!

Don´t look at the blackboard! Не смотри(те) на доску!

Для выражения воли говорящего по отношению к третьему и первому лицу употребляется глагол to let (позволять, давать, разрешать):

Let him read! Дай(те) ему читать! Пусть он читает!

Let them look at the blackboard! Дай(те) им посмотреть на доску! Пусть они посмотрят на доску!

Let us read! Давайте читать! Почитаем!

Глагол to let может использоваться и в своем основном значении «позволять», «разрешать». Тогда предложение Let us read! будет иметь смысл «Разрешите нам читать!». В этом случае местоимение us получит ударение.

Отрицательные формы предложения с let также образуются с помощью вспомогательного глагола to do и частицы not:

Don´t let us read! Давай(те) не будем читать!

В вежливых просьбах перед глаголом ставится оборот will you:

Will you look at the blackboard, please? Посмотрите, пожалуйста, на доску.

Will you let me read, please? Пожалуйста, разрешите мне читать.

Еще более вежливый оттенок придает просьбе употребление глагола would:

Would you open the door? Вы не могли бы открыть дверь? Будьте добры, откройте, пожалуйста, дверь.

Exercises

Exercise 1. Recommend your friend not to do what he does

Example: You smoke too much.
Don´t smoke too much.

(to talk on the phone too much, to read too late at night, to come home too late, to work on Sunday too much, to play tennis too much, to eat and sleep too much).

Exercise 2. Change the sentences according to the model

I want to have a look at the new text.
Please, let me do it.

1. I want to put down the new words.
2. We want to see a new film.
3. Our students want to go home early today.
4. My wife wants tohave a talk with you.
5. My friend wants to go on business to London.

Exercise 3. Translate from Russian into English

1. Не закрывайте окна.
2. Позовите носильщика, пожалуйста.
3. Пойдемте домой.
4. Не сердитесь на меня.
5. Прочитайте эту статью.
6. Покажите мне эти документы.
7. Пусть он пойдет туда один.
8. Пусть она сделает эту работу сама.
9. Пусть они подождут меня внизу.
10. Пусть он не ходит туда сегодня вечером.

Check yourself

Complete the sentences putting the verbs into the Imperative Mood:
1. ____ with the fish. It's food. (not to play)
2. Please ____ the instructions for filing bug reports. (to read)
3. ____ your hair from your face. (to brush)
4. ____ upstairs to get on the docket. (to go)
5. ____ late, or I'll start without you. (not to be)
6. ____, I'm not done with you. (to sit down)
7. ____ like that. (not to talk)
8. ____ the bin, John. (to empty)
9. ____ in dirty water. (not to swim)
10. Please ____ the animals.
11. ____ your homework before you watch TV. (to do)

Приложение 2

CASE STUDY 

Кейс (от англ. case) — это описание конкретной ситуации или случая в какой-либо сфере: социальной, экономической, и т. д. Как правило, кейс содержит некую проблему или противоречие и строится на реальных фактах. Соответственно, решить кейс — это значит проанализировать предложенную ситуацию и найти оптимальное решение.

Вам предлагается готовая ситуация, которая в той или иной степени имитирует реальную, жизненную. Чаще всего она излагается письменно в виде готовой «истории», причем финал остается «открытым». В качестве учебной задачи ее следует проанализировать и предложить свое решение.

Оценка работы над кейсами происходит по следующим критериям:

- степень проработки проблемы (обоснованность альтернативных решений, наличие рисков и ограничений);
- обоснованность и аргументированность решения;
- оригинальность, креативность подхода участников группы при разработке альтернатив;
- применимость решения на практике.

1. *Solve the problem*

There are 10 main safety regulations. But some words are missing. Fill in the blanks with the following words:

Electrical devices, electricity, damaged insulation, disconnect, circuit breaker, flammable, insulated, goggles, steel

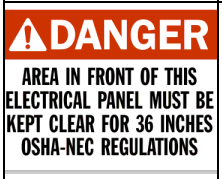
1. Treat all ____ as if they are energized.
2. Avoid water at all times when working with ____. Never touch or try repairing any electrical equipment or circuits with wet hands. It increases the conductivity of electric current.
3. Never use equipment with frayed cords, ____ or broken plugs.
4. ____ the power source before servicing or repairing electrical equipment.
5. Never touch another person’s equipment or electrical control devices unless instructed to do so.
6. If water or a chemical is spilled onto equipment, shut off power at the main switch or ____ and unplug the equipment.
7. Do not store highly ____ liquids near electrical equipment.
8. Always use ____ tools while working.
9. Always use appropriate insulated rubber gloves and ____ while working on any branch circuit or any other electrical circuit.

10. Never use an aluminium or ____ ladder if you are working on any receptacle at height in your home. An electrical surge will ground you and the whole electric current will pass through your body.

2. Solve the problem

At the enterprise, you need to be careful and pay attention to the safety signs. The safety signs follow the ISO international standard. There are three types of safety sign: warning signs, prohibition signs and mandatory action signs. Match the signs to the instructions. There is one odd instruction. 10 min. to do it.

Put your answers into the grid bellow:

1		A. Don't put anything on the electric panel. B. You mustn't switch on! It's dangerous for other people. C. Be careful in this area. D. Don't put anything in front of this electric panel. E. Be careful and protect your hands. F. Be careful and protect your head. G. You can get an electric shock. H. Your mobile phone might not work here. I. You must disconnect the power source before servicing.		5
2				6
3				7
4				8

1	2	3	4	5	6	7	8

3. Solve the problem

The owner of the enterprise is obliged to insure the employee against accidents that may occur while performing the work. Instructions for the protection of employees of any organization require conduct safety instruction.

Imagine that you were hired and instructed in safety. Your task is to read the following safety rules and fill in the table:

What is allowed and prohibited in the workplace.

YOU MUST YOU MUSTN`T

1. If you have people on site, take measures to evacuate them and to extinguish the flames before firefighters arrived.
2. observe the rules of hygiene.
3. distract from the work.
4. turn the light and wait about 5-7 minutes to adapt your vision to the conditions. when you go out in the dark from a lighted room on the dark area.
5. touch or stand on insulation electric wires.
6. fulfill obligations not covered by an employment contract.
7. verify the vehicle after a stop.
8. leave your post. The exception may be a need to prevent violations, arrest criminals.
9. know the procedure for bypassing the territory, places of possible intruders and fire.
10. observe traffic rules while moving on the premises.
11. observe the rules on electrical safety.
12. use heating devices with open spiral, leave them plugged in without supervision, repair tools, folding clothes or dry them.
13. prevent the burning of materials, waste, grass on the site.
14. properly use protective equipment.
15. drink alcohol during the change.

4. Solve the problem

A moving part of equipment was blocked by a part. This would cause emergency situation at the production site. An employee rushes to the blocked machine. He manages to pull out the part, falling on his back, barely dodges the moving mechanism.

Having learned about the incident the machine-shop manager thanked the employee and suspended the foreman without pay.

Task:
1. Was the machine-shop manager right?
2. What would you do to avoid the incident?
3. What actual policy on such issues should the management of the enterprise take?

5 Solve the problem

A 30-year-old electrical technician was helping a company service representative test the voltage-regulating unit on a new rolling mill. While the electrical technician went to get the equipment service manual, the service representative opened the panel cover of the voltage regulator’s control cabinet in preparation to trace the low-voltage (120 V) wiring in question (the wiring was not color-coded). The service representative was not using PPE.

The service representative climbed onto a nearby cabinet in order to view the wires. The technician returned and began working inside the control cabinet, near exposed, energized electrical conductors. The technician tugged at the low-voltage wires while the service representative tried to identify them from above. Suddenly, the representative heard the victim making a gurgling sound and looked down to see the victim shaking as though he were being shocked. Cardiopulmonary resuscitation (CPR) was administered to the victim about 10 minutes later. He was pronounced dead almost 2 hours later as a result of his contact with an energized electrical conductor.

Task:

1. List the procedures and steps that should have implemented to prevent this accident.
2. What personal protective equipment should have been used?

6 Solve the problem

An apprentice electrician was severely injured when he touched live equipment whilst doing work to install ceiling fans in a substation. His employer failed to adequately control the system of work where there were exposed live bus bars. There was no safe system of work, the supervision was inadequate, and the management of the activity was left to an electrician who had insufficient experience to do the job safely. No attempt was made to get the electricity distribution company to screen the live equipment.
The employer of the apprentice electrician was prosecuted under the Health and Safety At Work and fined £30,000. The supervising electrician and owner of the substation were also prosecuted under the Health and Safety At Work.
Task:
1. Do you agree with this decision?
2. What would you do to avoid the incident?

7 Solve the problem

An employee sustained a 240 volt electric shock that broke both shoulders whilst attempting to test a newly manufactured appliance that had been incorrectly wired to the mains lead. Suitable precautions had not been taken to prevent electrical injury to employees engaged in testing work on electrical appliances. Employees were exposed to live wires at 240 Volts ac, there was exposed metal in the test area, there was no PAT test of mains lead prior to live test and no risk assessment for electrical testing work.

Answer the question:
1. Were the employers prosecuted? What do you think?
2. Give your opinion on this accident.

Приложение 3

CLUSTER

Cluster (англ.)— «скопление», «пучок», «созвездие» — это графическая форма организации информации, когда выделяются основные смысловые единицы, которые фиксируются в виде схемы с обозначением всех связей между ними. Он представляет собой изображение, способствующее систематизации и обобщению учебного материала.

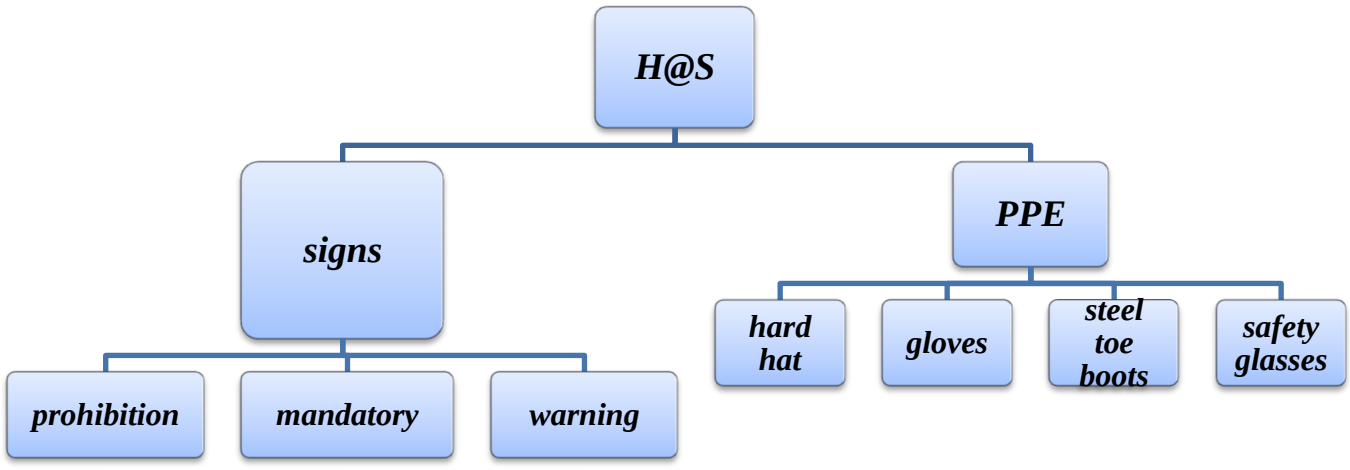
Вокруг ключевого слова записываются слова, ассоциирующиеся с ключевым; все слова обводятся и соединяются с основным словом, образуя таким образом «грозди».

Кластер может быть оформлен на доске, на отдельном листе или в тетради у каждого студента при выполнении индивидуального задания.

Технология составления кластера:

1. Ключевое слово;
2. Запись слов вокруг основного слова. Они обводятся и соединяются с основным словом;
3. Каждое новое слово образует собой новое ядро, которое вызывает дальнейшие ассоциации. Таким образом, создаются ассоциативные цепочки;
4. Взаимосвязанные понятия соединяются линиями.

Пример кластера:



Task:

Составьте кластер по теме: «The Industrial Equipment»

ЗАКЛЮЧЕНИЕ

Проделанная работа может существенно повлиять как на качество и эффективность изучения английского языка, так и профессионального обучения в целом. Такой вывод можно сделать исходя из следующего:

1 Практикум поможет обучающимся изучить вопросы охраны труда и техники безопасности, подготовиться к трудовой деятельности на современных безопасных предприятиях, где создаются условия, при которых будет исключена возможность производственного травматизма и профессиональных заболеваний. Таким образом, подобранный материал способствует формированию и развитию культуры безопасности в профессиональной среде.

2 Изучение вопроса экологической безопасности нацелит будущих специалистов на ответственное отношение к окружающей среде и результату работы предприятия в целом, а так же позволит осознать ответственность за будущее планеты в целом и региона в частности.

3 Исходя из того, что на многих современных предприятиях эксплуатируются импортные агрегаты и механизмы, специалистам придётся сталкиваться с инструкциями на иностранных языках, и чаще всего документация составлена на английском. Следовательно, осваивая данную тему в рамках изучения учебной дисциплины «Иностранный язык», обучающиеся научатся понимать содержание инструкций, руководств, условные обозначения и т.д.

GLOSARY

1. accident [ˈæksɪdənt] несчастный случай
2. alter [ˈɔːltə] изменять, менять
3. avoid [əˈvɔɪd] избегать
4. be aware [biː əˈweə] быть осторожным
5. chisel /ˈtʃɪz.əl/ зубило, стамеска, долото
6. circular saw /ˌsɜː.kjə.lə ˈsɔː/ циркулярная пила
7. claw hammer молоток-гвоздодёр; плотничный молоток
8. construction site строительная площадка
9. dangerous [ˈdeɪndʒərəs] опасный
10. defence [dɪˈfens] защита
11. glass cutter /ˈglɑːs ˌkʌt.ər/ стеклорез
12. guard rail [gɑːd reɪl] защитное ограждение
13. hammer /ˈhæm.ər/ молоток
14. hard hat каска
15. hazard [ˈhæzəd] опасность
16. hi-viz (high visibility) vest светоотражающий жилет
17. induction [ɪnˈdʌkʃn] вводный инструктаж
18. injure ['ɪndʒə] травмировать
19. level tube уровень
20. machine guard защитное ограждение механизмов
21. messy [ˈmesɪ] грязный, захламленный
22. near-miss report докладная об опасной или аварийной ситуации
23. near-miss опасная или аварийная ситуация (без последствий)
24. pliers /ˈplaɪ.əz/ плоскогубцы
25. PPE (personal protective equipment) СИЗ (средства индивидуальной защиты)
26. protect [prəˈtekt] защищать
27. putty /ˈpʌt.i/ knife шпатель для шпаклевки
28. rotary hammer drill перфоратор
29. safety boots [ˈseɪftɪ buːts] защитные ботинки
30. safety rules [ˈseɪftɪ ruːlz] правила техники безопасности
31. saw /sɔː/ пила
32. scaffold tie кронштейн для крепления лесов к стене
33. screwdriver /ˈskruːˌdraɪ.vər/ отвертка
34. skull [skʌl] череп
35. spray gun /ˈspreɪ ˌgʌn/ краскопульт
36. tamper [ˈtæmpə] нарушать целостность
    with equipment оборудования
37. tidy [ˈtaɪdɪ] аккуратный, чистый
38. procedure [prəˈsiːdʒə] порядок, процедура

БИБЛИОГРАФИЧЕСКИЙ СПИСОК

1. 10 Simple Construction Site Safety Rules // Darley PCM Ltd: [сайт]. - 2022. - URL: https://www.haspod.com/blog/construction/10-simple-construction-site-safety-rules (дата обращения: 28.04.2023). — Текст : электронный.
2. Causes, Effects and Solutions to Industrial Pollution on Our Environment // Conserve Energy Future: [сайт]. - 2023. - URL: https://www.conserve-energy-future.com/causes-effects-of-industrial-pollution.php (дата обращения: 22.05.2023). - Текст: электронный.
3. Safety procedures at construction site – safety precautions and PPEs // The Constructor : [сайт]. - 2009-2021. - URL: https://theconstructor.org/practical-guide/safety-procedures-construction-site/13412/ (дата обращения: 28.04.2023). — Текст : электронный.
4. Sustainable development // Magnitogorsk Iron and Steel Works [официальный сайт]. - 2023. - URL: https://mmk.ru/ru/sustainability/ecology/ (дата обращения: 22.05.2023). - Текст: электронный.
5. What is Industrial Safety? Importance, Objectives and planning // Analyse A Meter: [сайт]. - 2023. - URL: https://analyseameter.com/2019/10/industrial-safety.html (дата обращения: 22.05.2023). - Текст: электронный.
6. Анюшенкова, О. Н., Английский язык для строительных специальностей : учебник / О. Н. Анюшенкова. — Москва : КноРус, 2021. — 321 с. — ISBN 978-5-406-05203-7. — URL: https://book.ru/book/938662 (дата обращения: 28.04.2023). — Текст : электронный.
7. Литвинская, С. С. Английский язык для технических специальностей : учебное пособие / С.С. Литвинская. — Москва : ИНФРА-М, 2022. — 252 с. — (Среднее профессиональное образование). - ISBN 978-5-16-014535-8. - Текст : электронный. - URL: https://znanium.com/catalog/product/1694420 (дата обращения: 05.06.2023). – Режим доступа: по подписке.

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