А. Г. Широколобова

ENGLISH FOR MINERS

WORKBOOK

Кемерово 2021

Министерство науки и высшего образования Российской Федерации
Федеральное государственное бюджетное образовательное
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«Кузбасский государственный технический университет
имени Т. Ф. Горбачева»

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WORKBOOK

Английский для горных инженеров. Рабочая тетрадь

Учебное пособие

Кемерово 2021

УДК 811.111(078)

Рецензенты
Жиронкина О. В. – доцент кафедры иностранных языков ИФИЯМ ФГБОУ ВО «Кемеровский государственный университет»
Демиденко К. А. – доцент кафедры иностранных языков ФГБОУ ВО «Кемеровский государственный университет»

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В пособии предлагаются упражнения, содержащие необходимую лексику и грамматику для использования в рамках профессионального общения. Задания направлены на расширение словарного запаса, стимулируют обучающихся к обмену мнениями, комментированию и высказыванию своего личного отношения относительно будущей профессиональной деятельности. Каждый раздел завершается упражнениями, нацеливающих на диалог, который требует использования терминологии и грамматики. Подготовлено для студентов специальности 21.05.04 «Горное дело».

Печатается по решению редакционно-издательского совета Кузбасского государственного технического университета имени Т. Ф. Горбачева.

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Содержание

ПРЕДИСЛОВИЕ

Учебное пособие «**ENGLISH FOR MINERS. WORKBOOK**» предназначено для студентов специальности 21.05.04 «Горное дело», составлено в соответствии с рабочей программой дисциплины и является II частью пособия «**ENGLISH FOR MINERS**». Пособие предназначено для аудиторной и самостоятельной работы студентов.

Целью данного электронного учебного пособия является обучение практическому владению горной терминологией с целью ее применения в профессиональном общении. В первой части пособия система упражнений выстроена таким образом, чтобы задания позволяли расширить вокабуляр студентов, активизировать грамматические явления и помочь обучающимся максимально быстро запомнить новые термины. Каждый раздел учебного пособия сопровождается системой коммуникативных и лексических заданий в соответствии с требованиями итогового контроля: формирование навыков устной речи для общения в профессиональной сфере.

Во второй части пособия представлены тесты для контроля лексических, грамматических навыков и навыков чтения и анализа прочитанной информации по будущей профессиональной деятельности.

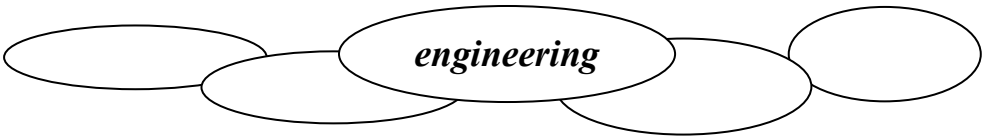
Третья часть пособия направлена на формирование у студентов умений, необходимых для подготовки эссе, аннотаций и реферативного перевода по вопросам, связанным с будущей профессией.

PART I Practical part

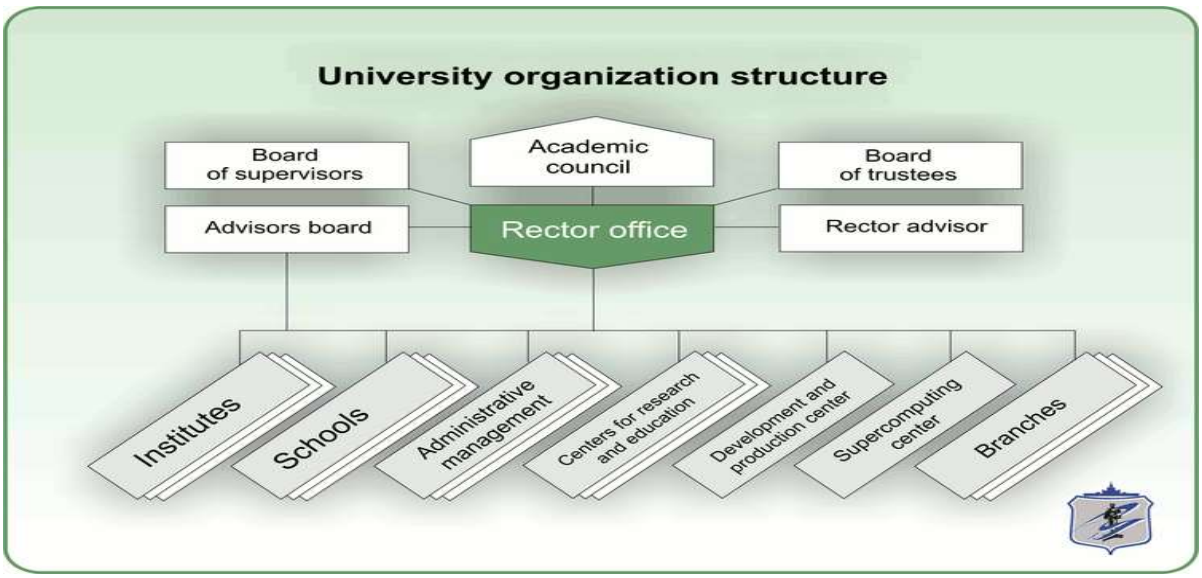
UNIT 1

KuzSTU

Ex. 1. Think of the words associated with the discussed topic.



Ex. 2. Study this university organization structure and draw the KuzSTU university organization structure. Compare two schemes.



(Adopted from https://yandex.ru/images/search)

Ex. 3. Mixed letters. Write words correctly.

atndte		dmeicine	
aadcemic		pimrary	
cpusam		prcipalin	
riccurulum		sperofsor	
egdree		evrise	
ecoicsnom		ncescie	
eninegering		secdaonry	
gduatera		inasemr	
leturce		rtuto	

Ex. 4. Rearrange the words to make complete sentences.

1. the / for / is / known / academic / school / excellence
2. is / accommodation / there / for / campus / students / five / hundred / on
3. an / Maths / is / important / curriculum / school / part / of / the
4. she / of / degree / has / a / in / physics / University / from / the / Edinburgh
5. studying / I / am / and / economics / work / I / want / to / bank / in / a
6. Richard / University / studied / engineering / at / electrical / Manchester
7. graduated / Lina / has / just / university / from
8. I / to / revise / tomorrow / because / I / have / exam / have / an
9. children / studying / started / our / science / they / were / when / young
10. son / my / is / fifteen / school / secondary / and / he / is / at / now
11. seminar / I / every / student / talked / a / lot / in / when / I / was / a

Ex. 5. Gap-fill sentences – education words.

1. The school is known for _____ excellence.
2. There is accommodation for five hundred students on _____.
3. Maths is an important part of the school _____.
4. She has a _____ in physics from the University of Edinburgh.
5. I am studying _____ and I want to work in a bank.
6. Richard studied electrical _____ at Manchester University.
7. Lina has just _____ from university.
8. We went to a _____ on Italian art.

Ex. 6. Choose the correct answer A, B, C or D.

1. ‘What’s the matter with you?’ ‘I _____ a final test soon.’
   A. am having B. having C. am D. have
2. ‘What’s the problem?’ ‘I _____ my exam.’
   A. take B. am taking C. have taken D. am took
3. ‘What do you do?’ ‘I _____ new employees in fire safety.’
   A. maintain B. train C. check D. repair
4. ‘What’s their job?’ ‘They _____ tests in the lab.’
   A. troubleshoot B. add C. repair D. carry out

Ex. 7. Do the crossword.

ACROSS

2) the type of school children go to after age 11 (9)

3) the type of school children go to aged 5–11 (7)

5) the work of an engineer, or the study of this work (11)

8) to go regularly to a place, such as a school or university (6)

11) someone who teaches one person or a very small group of people (5)

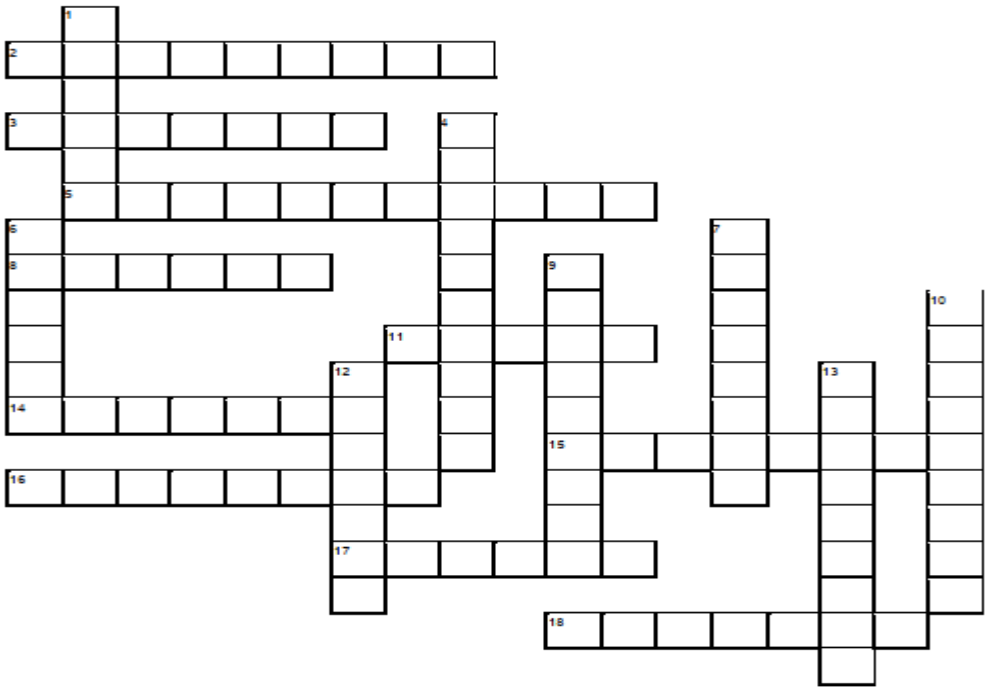
14) the study of the natural world, e.g. biology, physics and chemistry (7)

15) the study of treatment for illness or injury (8)

16) to complete a first university degree successfully (8)

17) to study a subject before you take a test (6)

18) a meeting of a group of people with a teacher or expert for training, discussion, or study of a subject (7)



DOWN

1) a qualification given for completing a university course (6)

4) the group of subjects studied in a school, college, etc. (10)

6) the buildings of a college / university and the land surrounding them (6)

7) related to subjects which involve thinking and studying skills (8)

9) the study of the way in which trade, industry / money are organized (9)

10) a teacher of high rank in a university (9)

12) a formal talk on a serious or specialist subject given to a group of people, especially students (7)

13) the person in charge of a school or college (9)

Crossword-key

Across 2.SECONDARY, 3. PRIMARY, 5.ENGINEERING, 8. ATTEND, 11. TUTOR, 14. SCIENCE, 15.MEDICINE, 16.GRADUATE, 17. REVISE, 18. SEMINAR

Down 1. DEGREE, 4.CURRICULUM, 6.CAMPUS, 7.ACADEMIC, 9.ECONOMICS, 10.PROFESSOR, 12. LECTURE13. PRINCIPAL

Ex. 8. Match words with their definitions.

1) to attend classes	a) an undergraduate course which usually lasts 3-4 years
2) bachelors degree	b) to go to classes
3) boarding school	c) a way of studying where tuition is carried out over the Internet or by post
4) distance learning	d) a school where pupils live during term time
5) face-to-face classes	e) to progress less quickly than others
6) to fall behind with your studies	f) as opposed to distance learning the traditional way of studying in a classroom with colleagues and a teacher
7) a graduation ceremony	g) to offer guidance on a student's work
8) to give feedback	h) an event where a successful student receives his or her academic degree
9) an intensive course	i) education, usually in a college or university, that is followed after high school or secondary school

10) higher education	j) a course that offers lots of training in order to reach a goal in as short a time as possible
11) to keep up with your studies	k) to memorize it
12) to learn something by heart	l) to not fall behind
13) masters degree	m) a student who is older than average and who has usually returned to education after a period at work
14) a mature student	n) a period of study which often follows the completion of a bachelors degree or is undertaken by someone regarded as capable of a higher-level academic course
15) to play truant	o) to finish a job or task in the time allowed or agreed
16) to meet a deadline	p) to stay away from classes without permission
17) to sit an exam	q) to spend a year working or travelling before starting university
18) to take a year out	r) to take an exam
19) tuition fees	s) to have a paid job whilst studying to support yourself financially
20) to work your way through university	t) the money paid for a course of study

Ex. 9. Put the verbs in brackets into the present simple or present continuous.

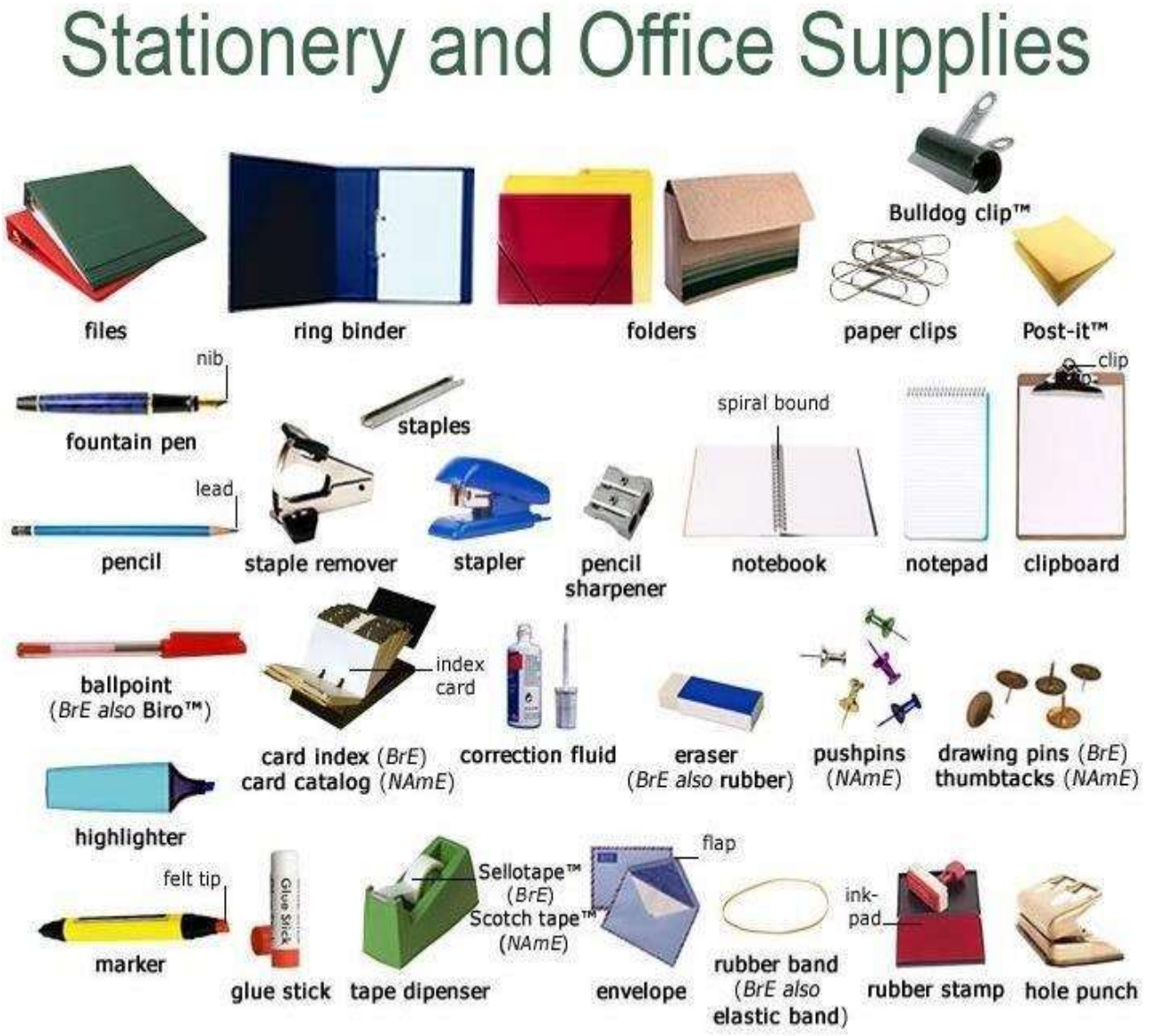
1. Water …… (boil) at 100 degrees Celsius.
2. Listen to those people. What language …… they …… (speak)?
3. The number of people without jobs …… (increase).
4. Jim …… (go) to the library every Saturday.
5. I …… (not/know) the name of your professor.
6. What …… you usually …… (do) after studying?
7. Ron is in Oxford at the moment. He …… (study) at the library.

Ex. 10. Ask your groupmates.

1. Tell me about yourself. How would you describe yourself?
2. What are you best at?
3. What are your main interests?
4. How would you define your subject?
5. Why is your subject important?
6. What are the most important current developments in your subject?
7. What are your views on the funding of universities?
8. How do you think universities should achieve a good social mix in their intake?
9. What have you most enjoyed at school?
10. What do you dislike about school?
11. Are you good at working on your own?
12. What opportunities have you had for exercising leadership?
13. Describe a situation where you were put under pressure?
14. What are your strengths?

15. What are your weaknesses?

Ex. 11. Study these words, which can be useful for you.



(Adopted from https://vk.com/photo-36775085_282953028)

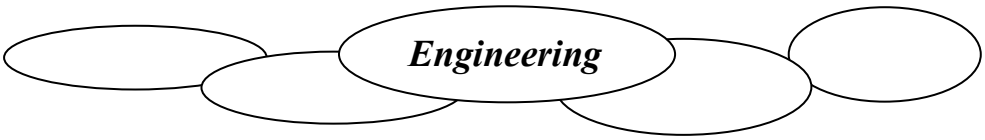
Ex. 12. Label the buildings of the university campus.

(Adopted from https://kuzstu.ru)

UNIT 2

My future profession is an engineer

Ex. 1. Think of the terms associated with the discussed topic.



Ex. 2. Group the following terms into the proper column.

engineering	**equipment**	**processes in mining**

chemical, underground, civil, electrical, electronic, surface, highway, hydraulic, industrial, prospecting, mechanical, mining, structural, production, boiler, crane, pump, exploring, turbine, drill, gas engine, developing, exploiting, cage, loader, shovel

Ex. 3. Complete the table and make 5 sentences of your own.

verb	**noun**	**adjective/ participle**
expose		
	production	
		excavating/excavated
create		
		acidic
	engineer	
		industrial
develop		

Ex. 4. Fill the gaps in the sentences with the verbs in their correct tense (present perfect or simple past).

Modern techniques such as X-ray diffraction, transmission electron microscopy (TEM) and scanning electron microscopy (SEM) … (make) it possible to better understand their characteristics. By now, more than 50,000 materials … (develop). Materials scientists … (long envy) the resilience of certain naturally occurring materials. Past efforts to reproduce the architecture of, e.g. a shell … (not be successful).

Ex. 5. Complete the jobs description. Use the correct form of these verbs.

a) maintain b) operate c) repair d) report e) supervise

1. The Assistant Sub-Sea Engineer … and … the platform and the pipes under the sea. He … to the Sub-Sea Engineer.
2. The Assistant Crane Operator … and … the cranes on the main deck. He … to the Crane Operator.
3. The Assistant Driller … the drilling equipment. He … the Derrick Man and the Pump Man. He … to the Driller.
4. The Chief Electrician … and … all the electrical equipment on the rig. He … three electricians. He … to the Maintenance Supervisor.

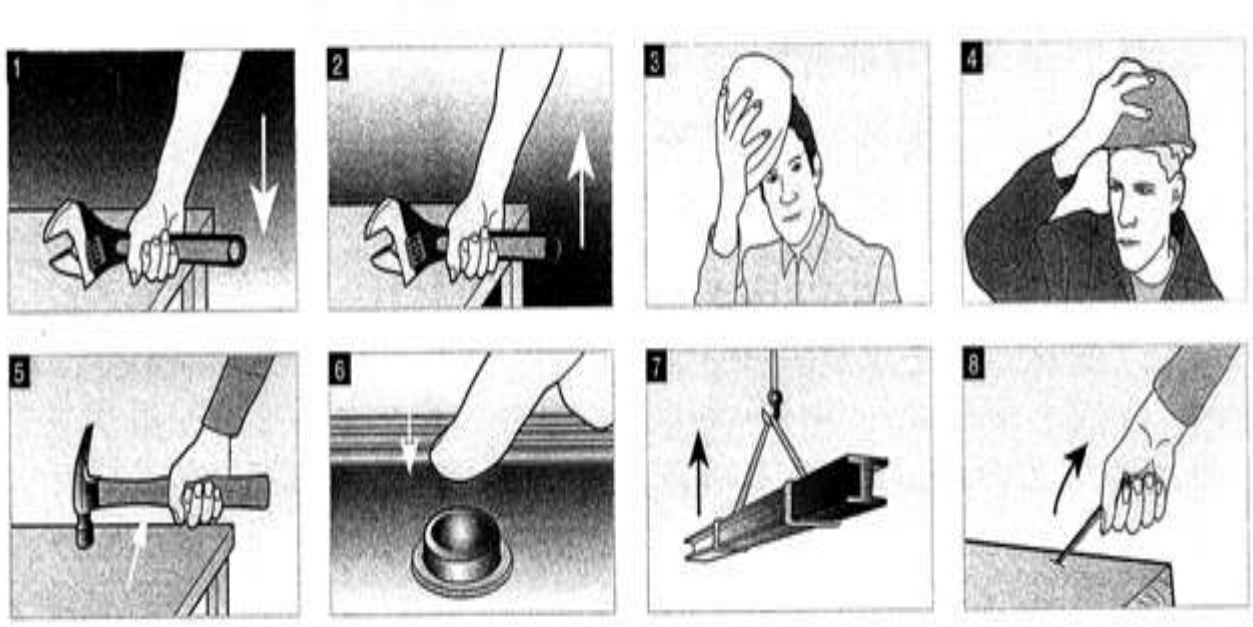
Ex. 6. Match the following descriptions with one of the jobs bellow.

production planner electronic engineer joiner mechanic fitter machine operator inspector welder electrician lab technician

1. Someone who works with wood –
2. Someone who works in a laboratory –
3. Someone who works with a machine on a production line –
4. Someone who put together, adjust or install machinery or equipment –
5. Someone who works with electric equipment –
6. Someone who joins metal together, usually using heat –
7. Someone who repairs and maintains engines, especially car engines –
8. Someone who checks the quality of work or goods –
9. Someone who schedules the order of production runs –
10. Someone who works with things like computers, TVs, radios, etc. –

Ex. 7. Match the pictures with the verbs.

a) lift up *b) pick up* *c) pull out* *d) put down*
e) put on *f) take away* *g) take off*



(Adopted from «Oxford English for Engineering»)

Ex. 8. Study the following items of engineering equipment.

(Adopted from https://yandex.ru/images/search)

Ex. 9. Match the professions with the pictures.

a) surveyor b) oil and gas engineer c) miner d) excavator driver

1. 	2. 
3. 	4. 

(Adopted from https://yandex.ru/images/search)

Ex. 10. Match the products and industry.

1. Diesel oil	a. Pharmaceutical industry
2. Car components	b. Construction industry
3. Buildings	c. Textile industry
4. Drugs	d. Electronics industry
5. Jet engines	e. Aerospace industry
6. Cardboard boxes	f. Telecommunication industry
7. Semi-conductors	g. Automotive industry
8. Gold	h. Packaging industry
9. Cloth	i. Petrochemical industry
10. Mobile phones	j. Mining industry

Ex. 11. Match the terms or phrases with the definitions.

1. Maintenance worker	a. Leads team of employees
2. Mechanic	b. Uses heavy equipment
3. Medic	c. A miner with at least one year of mining experience
4. Equipment operator	d. Fixes and installs equipment
5. Shift supervisor	e. Works with a more experienced worker to gain experience
6. Apprentice	f. Fixes machines
7. Black hat	g. Provides medical care

Ex. 12. Fill in the gapped sentences with the following word combinations.

a) revision b) eco-friendly c) learning styles d) access to information e)go online f) power consumption

1. Understanding your own preferred …… can help you study more effectively.
2. There will be significant growth in both gas and nuclear …… in the next 10 years.
3. I'll just …… and look up the university address.
4. …… is becoming easier nowadays due to the use of computer technologies.
5. I know I haven't done enough …… for tomorrow's exam.
6. ……. homes are good for the environment and the future of our planet.

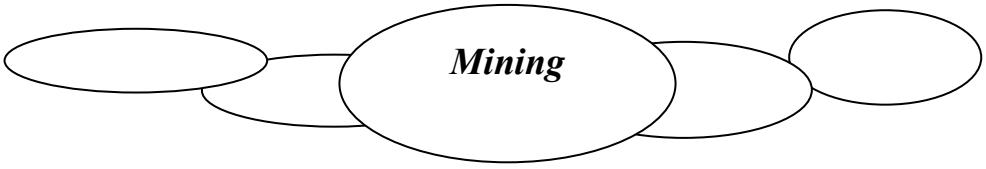
Ex. 13. Answer the questions.

1. What are some different jobs in mining?
2. Why do you want a job of a miner?
3. What are the responsibilities of a miner?
4. What do you like about working in the mines?
5. Why did you choose a career in mining?
6. What are your career goals?
7. Are you aware of the dangers of this job?
8. What do you like most about being a miner?
9. What do you dislike about working in the mines?

UNIT 3

Mining engineering in Kuzbass

Ex. 1. Think of the terms associated with the discussed topic.



Ex. 2. Choose a term from the box to make the name of a place where something is produced or processed.

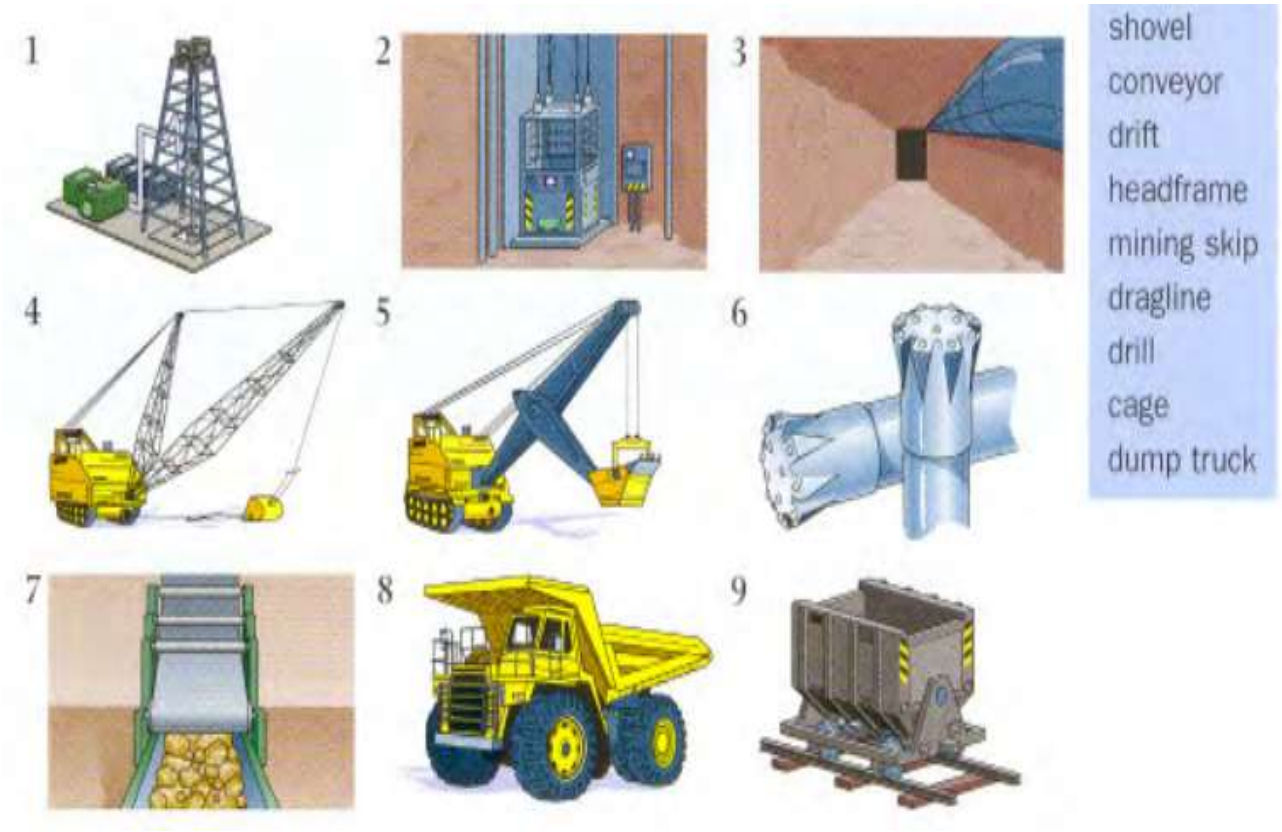
factory mine station yard refinery
works mill reactor

Power ...	*Ship ...*
Oil ...	*Nuclear ...*
Steel ...	*Chocolate ...*
Coal ...	*Cotton ....*

Ex. 3. Match the terms or phrases with the definitions.

1. Highwall mining	a. Mining by piping water down a vertical hole
2. Boreholl mining	b. Excavating a river or sea bed
3. Placer mining	c. Using high pressure water to remove deposits
4. Quarry	d. An open surface excavation for the extraction of materials
5. Hydrauliking	e. Drilling into the steep wall of a quarry
6. Dredging	f. Using water to separate heavy minerals from lighter deposits

Ex. 4. Label the following items of mining equipment with the terms from the box.



(Adopted from «Technical English. Grammar and Vocabulary»)

Ex. 5. Choose the best word or phrase that best fits each blank.

1. *Open pit mining / leaching*

A. The company extracted the salt using … methods.

B. Sam's work experience mostly includes …

2. *Mountain top removal / open-cast mining*

A. … is possible if there are deposits inside a mountain.

B. A large pit remains where a company used to use …

3. *Longwall mining / block caving*

A. … is an example of caving method.

B. … does not require a large workforce.

4. *Shrinkage stopping / supported method*

A. … is one of the safest mining methods.

B. Stull stopping is an expensive supported method.

Ex. 6. Match the pictures with the terms.

a) open-cast mining *b) mountain top removal* *c) dredging*

d) hydraulicking *e) quarry* *f) borehole mining*

<table>
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3.</td>
<td> 
4.</td>
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</table>

5. 

6. 

(Adopted from https://yandex.ru/images/search)

Ex. 7. Place the terms under the correct headings.

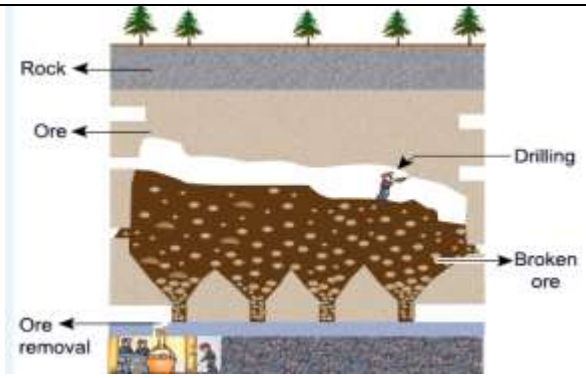
cut-and-fill stopping longwall mining room-and-pillar stull stopping block caving subvel stopping shrinkage stopping square-set stopping

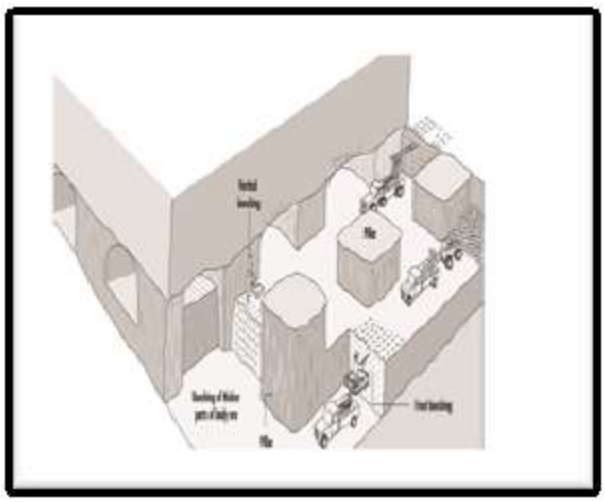
Unsupported methods	Supported methods	Caving methods

Ex. 8. Match the pictures with the terms.

a) longwall mining b) block caving c) square-set stopping d) room-and-pillar method e) shrinkage stopping f) cut-and-fill stopping

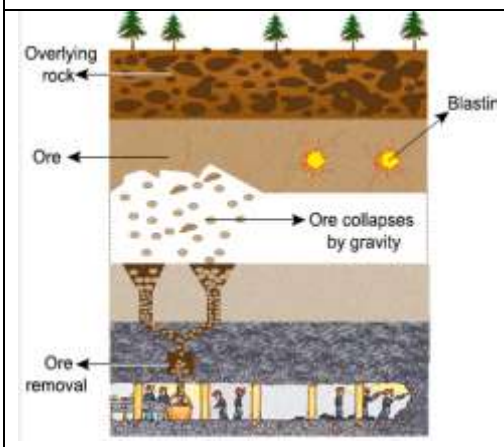
1. 

2. 



3.

4.



5.

6.

(Adopted from https://yandex.ru/images/search)

Ex. 9. Put the words in the sentences into the order.

1. was / the television / The entire / Neil Armstrong / watching / on the day / on / landed / world / the moon

2. in 1990 / new / was introduced / A / approach / pollution control / in European Union / of integrated

3. in its / decided / UK enterprise / cars / German factory / and / Ford / to its / to manufacture / deliver them / for sale

4. comfortable / when / Output / is improved / conditions / are made / more / for workers

5. Apple i-Book / in April / Western Europe / and they're planning / was announced / to ship it / The new / to

6. the new / held / Personal / to launch / a special party / They / Communications Computer

7. Remarkable innovations / transportation / products and services / have resulted in / and / communications / new / in manufacturing

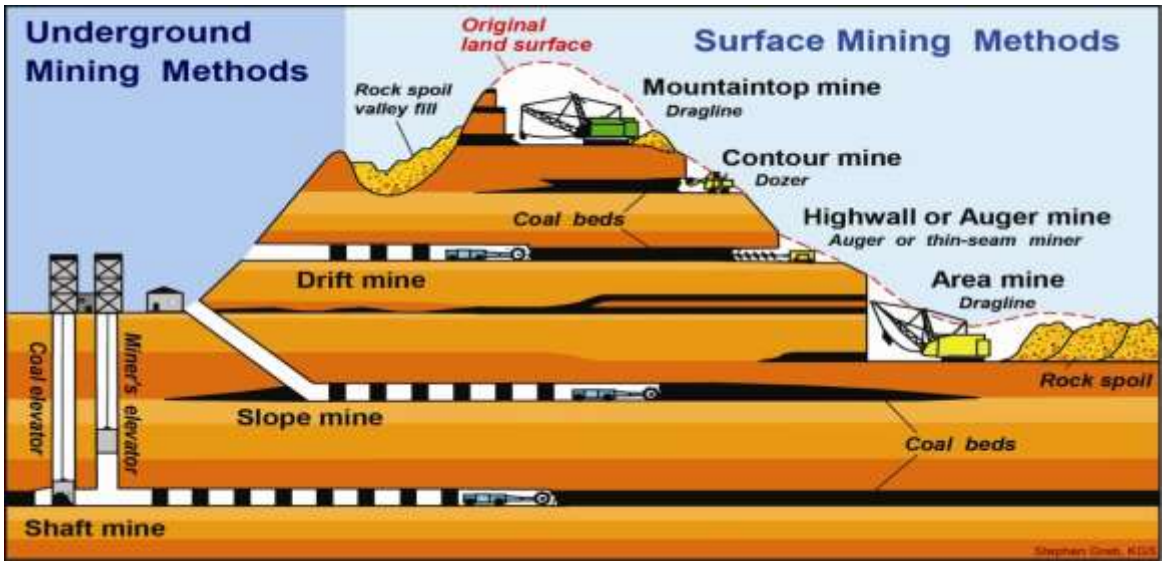
8. have / a wide range of / computers / applications / Currently / for businesses

9. and / weather patterns / send it / Satellites / on / collect data / back to earth

10. laptops / These / the time / batteries / most of / run on / will

11. with / the world / The children / to go / our machines / are going / online / of

Ex. 10. Look at the scheme of mining methods and say whether they are used in Kuzbass or not.



(Adopted from https://yandex.ru/images/search)

Ex. 11. Put the words in the sentences into the order.

1. was / the television / The entire / Neil Armstrong / watching / on the day / on / landed / world / the moon

2. in 1990 / new / was introduced / A / approach / pollution control / in European Union / of integrated

3. in its / decided / UK enterprise / cars / German factory / and / Ford / to its / to manufacture / deliver them / for sale

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11. with / the world / The children / to go / our machines / are going / online / of

Ex. 12. Correct the sentences. Pay attention to adjectives.

1. The exam was easy than we expected.

2. I'd like to have the more reliable car.

3. It’s becoming more hard and more hard to find a job.

4. The more difficult thing about English is the prepositions students usually say.

5. I can remember the days when the better computer was the biggest computer.

6. The aerospace industry is largest user of titanium.

7. Bosses today are more young and more close in age to the workers they supervise.

Ex. 13. Put these words in the correct order to make sentences about refineries and refinery jobs.

1. oil / is separated / components / The / different / into / crude.
2. products / are added / final / make / to / the / Chemicals.
3. in / area / Hazardous / are stored / the /materials / hazmat.
4. tests / Lab / the / carry out / products / technicians / on.
5. instructors / in / emergency / train / procedures / Safety / all the employees.

Ex. 14. Answer the questions of your partner.

1. What are some different types of surface mining?
2. What are some different types of subsurface mining?
3. Why do many companies need to use different methods of extraction?
4. What are the similarities between the mining methods?
5. What are the advantages of both methods?
6. What is the most favorable mining method in Kuzbass?

UNIT 4

Kuzbass ecological problems

Ex. 1. Think of the words associated with the discussed topic.

Ex. 2. Match two halves of the sentences.

1. Global warming means that	a) pollute the air in most cities.
2. Heavy traffic and exhausted fumes	b) which is taken to landfill sites.
3. The emissions produced by factories	c) have caused serious flooding.
4. The pesticides used on crops in the countryside	d) create acid rain which destroys crops.
5. Heavy rain and rising water levels in rivers	e) the weather is becoming hotter and drier.

6. Most households produce large amounts of waste	f) are dangerous to birds and other wildlife.

Ex. 3. Complete the sentences with a term given below.

recycling pollution environmentally disposable
environment dispose recyclable pollutants

1. Most types of paper are …
2. There are six main air …
3. We are setting up an … management system.
4. It's an … friendly product.
5. We have an office-paper … scheme in our company.
6. … is having an effect on the world climate.
7. They manufacture cheap … cigarette lighters.

Ex. 4. Rearrange these words to form questions. Answer them.

1. plastic / how / be / can / recycled?
2. you / limits / happen / if / permitted / the / what / exceed?
3. of / you / waste /how / products /your / dispose / do?
4. VOC's / explain / are / can / you / what?
5. you / of / what / source / use / other / energy / do?
6. ways / environmentally / products / are / in / your / what / friendly?
7. does / ozone / environment / what / do / the / damage / to?
8. heat / explain / is / recovery / what / could / you?

Ex. 5. Complete the sentences.

1. The industrial enterprises … the air we breathe.
2. Carbon dioxide, methane, and nitrous oxide contribute to the … effect.
3. The industry pollutes the atmosphere with dust and other … substances.
4. The … radiation heats the earth's surface.
5. The amount of carbon dioxide has been increasing because of the use of fossil …
6. The climate can change because of the global …

Ex. 6. Match the problem with the pictures.

a) soil pollution b) waste products c) acid rain d) dust e) coal-fired power plants f) fly ash capture g) water pollution h) air pollution

1.

2.

3.

4.

5. 

6. 

7. 

8. 

(Adopted from https://yandex.ru/images/search)

Ex. 7. Read these pairs of sentences. Chose the sentence that uses the underlined part correctly.

1. **A.** Many of the world's forests are shrinking due to deforestation.
   B. Harmful materials can cause a sinkhole in water sources.

2. **A.** The main goal of a mill is to produce byproducts.
   B. Siltation can contaminate water and make it cloudy.

3. **A.** Workers have to be very careful not to pollute groundwater.
   B. Miners are learning more hazardous methods of disposing of waste.

Ex. 8. Chose the word which suits better.

1. Does this businessman realize the damage these chemicals do to the (environmental / environment) … in our town?
2. Local government should support the idea of recycling and provide each house with bins for different types of (to waste / waste) … .
3. If we want to protect our environment, lots of things should be changed in our life, but first of all we should improve (ecological / ecologist) … education.
4. To reduce air (to pollute / pollution) … people should use public transport. Too many people use their own cars.
5. If we want to keep our beautiful beaches as the main tourist (to attract / attraction) … we must protect them from litter pollution.
6. If you care about the protection of the environment and you want to be healthy, you should buy only (nature / natural) … food with no added chemicals.

Ex. 9. Mark these statements as true or false (T/F). Prove the true sentences and correct the false ones.

1. The biosphere is sphere of soils and rocks.
2. At the ecosystem and biosphere levels, there is a continual recycling of carbon, nitrogen, oxygen and other elements, such as phosphorus, calcium, and potassium.
3. The process of photosynthesis releases carbon.
4. Glucose and other sugar molecules are concentrated in nectar and attract pollinators to aid plants in reproduction.

5. Water and carbon dioxide are the two constituents which cause the process of cellular respiration.
6. Water cycles between the hydrosphere, lithosphere, atmosphere and biosphere.

Ex. 10. Put in the verbs in brackets in the correct form.

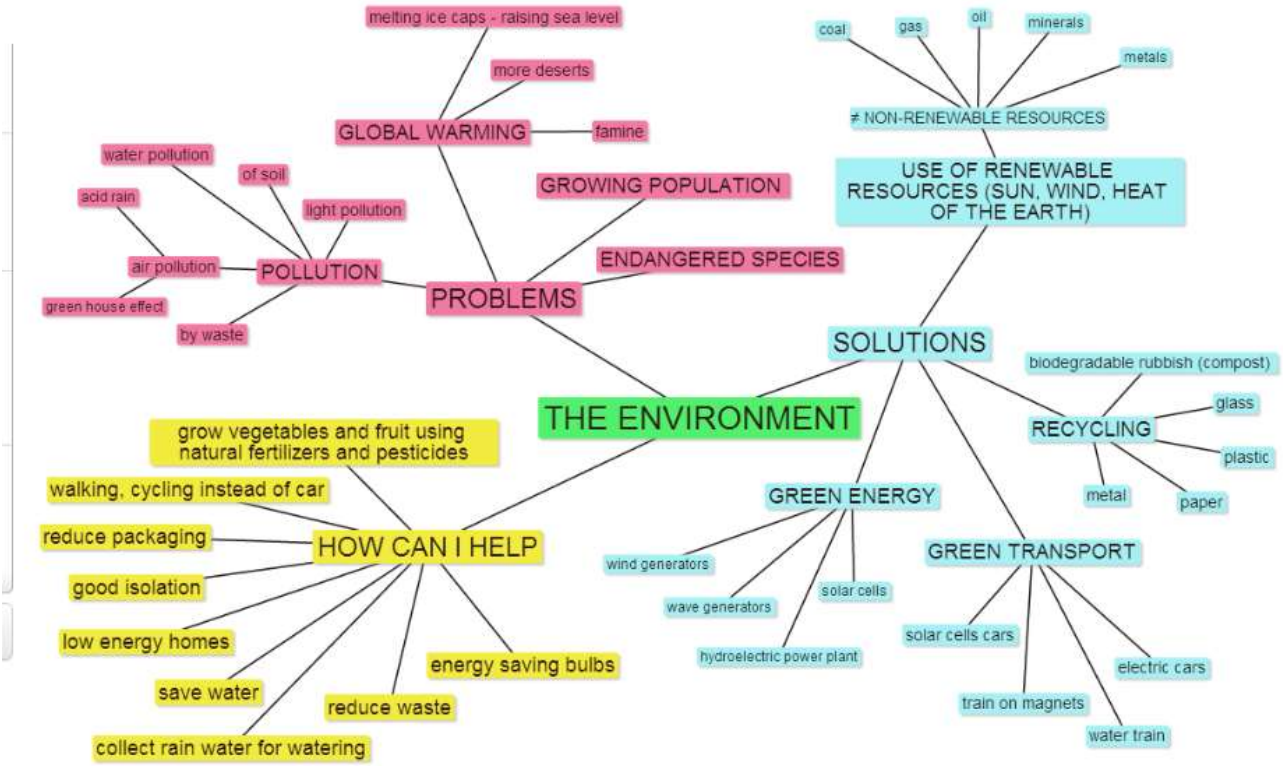
Generally (1)_____ (think) of as a place to store things you don't want to see, warehouses (2)_____ (not have) a glamorous image. However, in today's competitive manufacturing and business environment, (3)_____ (run) the warehouse efficiently is vital to a company's success. (4)_____ (create) a critical link between a manufacturing plant and the external world, the warehouse (5)_____ (affect) the performance of the entire manufacturing and logistics system. (6)_____ (finally install) a new system two months ago, our new warehouse (7)_____ (locate) near the airport, is now proving excellent, already (8)_____ (lower) costs by 20% and (9)_____ (improve) efficiency by 15%. In fact it (10)_____ (achieve) such excellent results, we are planning to install the same system in the other warehouses.

Ex. 11. Define if the following nouns are countable or uncountable and write them in the appropriate column below.

Drill dye electronic mail equipment factory fault information laboratory machine machinery packaging pollution reliability silk tunnel

countable	uncountable

Ex. 12. Comment the following scheme.



(Adopted from https://yandex.ru/images/search)

Ex. 13. Choose the correct form of an adjective.

1. I enjoyed the book. It was very *interested / interesting.*
2. Are you *interested / interesting* in art?
3. I thought the story was quite *amused / amusing.*
4. They were *shocked / shocking* when they heard the news.
5. We were all very *worried / worrying* when he didn't come home.
6. It was *surprised / surprising* that she didn't come to the meeting.
7. I usually find football rather *bored / boring.*
8. Are you *frightened / frightening* of spiders?

Ex. 14. Complete the sentences. Use adjectives formed by adding *ing* or *ed* to the words in brackets.

1. I find it quite … to give presentations in front of a group of people. (embarrass)
2. I think reading scientific reports is … (depress)
3. I'm … in all kinds of research work. (interest)
4. I find walking after work very … (relax)
5. I think learning a language is very … (interest)
6. I get … when people are late. (annoy)
7. I don't normally get … when I watch horror films. (frighten)
8. I don't get … very easily. (embarrass)

Ex. 15. Answer the questions.

1. What produces waste and pollution?
2. How are consumers responsible for waste and pollution?
3. What proves that pollution is an international problem?
4. Is balance between industrial production and nature's limits essential?
5. Are waste and pollution a price society pays for rising populations, urbanization, and more goods and services.
6. Do industrial societies create a disproportionate share of the world's pollution and waste?
7. Are consumers responsible for solid waste and pollution?
8. Do ecological impacts extend far beyond national boundaries?

UNIT 5

Coal mining

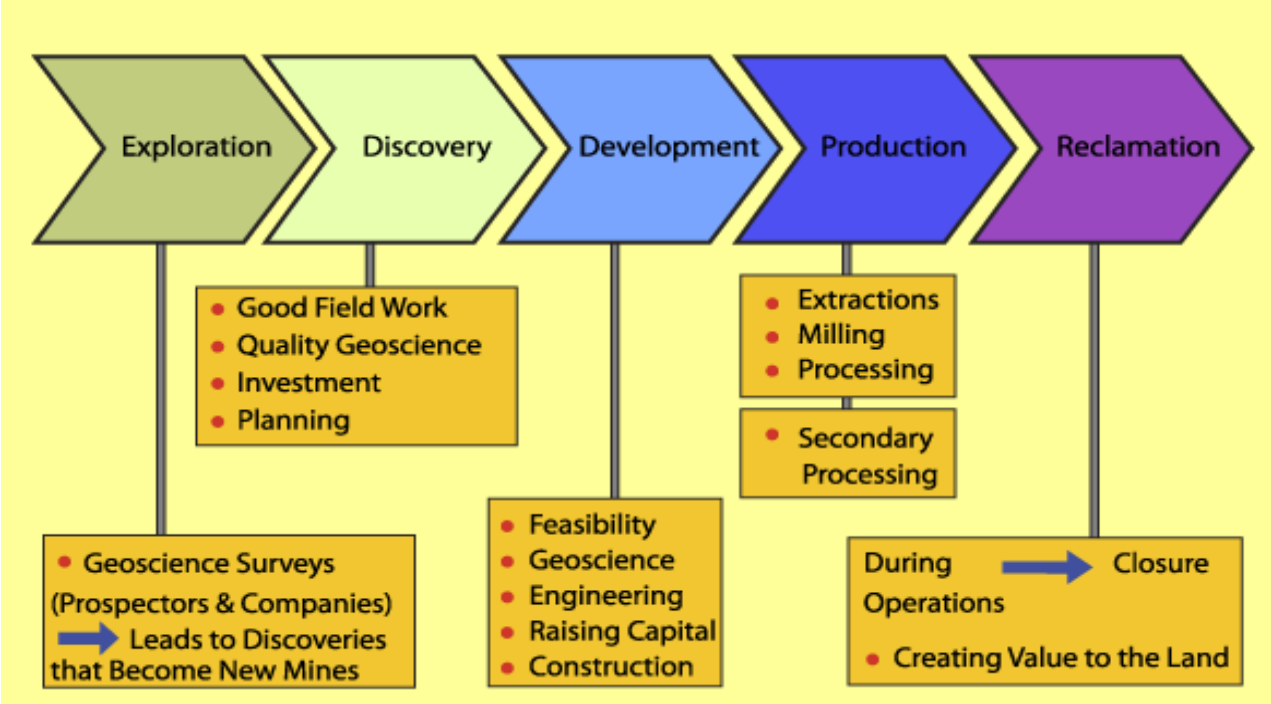
Ex. 1. Think of the terms associated with the discussed topic.

Ex. 2. Place the terms under the correct headings.

loading hoisting blasting excavation boring haulage

Extracting	Transporting	Extracting and transporting

Ex. 3. Look at the picture. What does the following scheme show?



(Adopted from https://yandex.ru/images/search)

Ex. 4. Match two halves of the sentences.

1. Mining is the process	a) the second mineral discovered.
2. Mining was known	b) appeared in England in 1813.
3. Prospecting require	c) a costly and complicated business.
4. Copper was	d) a great deal of knowledge in the Earth sciences.
5. The first rotary drill	e) of extracting minerals from the surface of the Earth.
6. Modern mining is	f) as a surface operation.
7. Mining can be done	g) in prehistoric times.

Ex. 5. Match questions and answers. Write a letter (A–F) in each space.

1. What are the advantages and disadvantages of hydrogen as a fuel?
2. What are the main components of a fuel cell?
3. What happens in a fuel cell car when it is braking or decelerating?
4. Where are the hydrogen storage tanks located?
5. Why is the fuel cell positioned below the passenger area of the car?
6. How are the hydrogen storage tanks connected to the fuel cell?

A. When this happens, electricity is generated by the wheels and sent to the capacitor.

B. They're linked by means of pipes which are made of a pressure-resistant metal.

C. They're positioned at the rear of the car behind the fuel cell.

D. It has zero carbon emissions, but unfortunately it is expensive to manufacture.

E. This is done to provide more space for the other components.

F. It consists of an anode and a cathode, separated by a membrane.

Ex. 6. Complete the sentences with the following terms.

high technologies enterprises economic development
mineral deposits coal mining demands of

1. Kuzbass is extraordinary rich in **a)** … resources. All the minerals of Mendeleev table of elements are found here. Resources of coal are 700 bln tones, which is most important for the economy of the region.

2. There are also **b)** … of gold, silver, manganese, zinc, lead, copper and other rare elements. So, Kuzbass has got the largest raw potential determining the specific **c)** … of the region.

3. The base of the regional economy is **d)** … 61% coal, extracted in the whole Russia, is mined in Kuzbass. 85% is the most valuable coking coals. The coal meets the **e)** … the whole country and exported to many countries.

4. Now in Kuzbass a new type of coal mining branch is being created. Coal mining companies aim at using **f)** … , making miners' work safe.

5. For the latest 7 years there are more than 1,7bln Euro invested to the coal industry of Kuzbass. 27 new modern coal mining **g)** … are made, the problem of industrial safety there is solved due to high mechanization and automation.

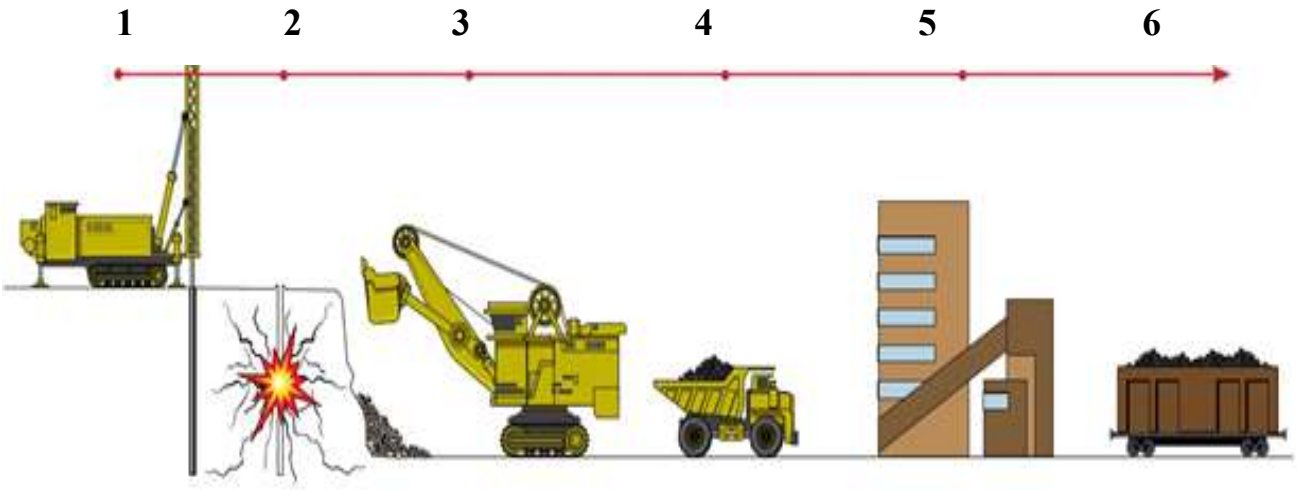
Ex. 7. Mark these statements as true or false (T/F). Prove the true sentences and correct the false ones.

1. Today the most urgent problem is a waste-free production in the mining of minerals.
2. All minerals are under the ground.
3. People, use number of instruments and mechanisms to get them out and always positively effect on nature.
4. The problem is that a significant amount of waste is accumulated in areas where coal preparation plants and coal mines are

5. There are also disadvantages in mining of solid minerals.
6. Coal and oil shale are mined by open and underground methods.

Ex. 8. Match the actions with the terms.

a) blasting operations b) drilling operations c) transportation
d) overburden rock loading e) processing unit f) unloading



(Adopted from https://yandex.ru/images/search)

Ex. 9. Answer the questions.

1. What processes occur before mining takes place?
2. How do miners extract minerals from the earth surface?
3. What is coal?
4. What main types of fossil fuels do you know?
5. What is the process of coal formation?
6. How and where is peat formed?

7. What are the main coal types and their characteristics?
8. What is needed to have a successful mine?
9. What do miners use tunnels an passages for?
10. What are some types of explosives that miners use?
11. What equipment is used for surface mining?
12. Why is haulage an important part of mining?

Ex. 10. Fill in the blanks with MUST (NOT) / CAN (NOT) / (NOT) HAVE TO / NEEDN'T.

1. You … stay in that laboratory. It is not permitted.
2. Look at this machine. It is working very well. It … be broken.
3. There's someone at the door. I'm expecting Paul. It … be Paul.
4. Ali's car is here. He … be here.
5. The baby is asleep. You … shout.
6. You've got plenty of time. You … hurry.
7. A: "Do you want me to wait for you?"
8. B: "No, it's OK. You … wait."
9. I can't get any answer from my telephone. It …. be out of order.
10. Ann stayed in bed this morning because she … go to work.

UNIT 6

Rocks of the Earth crust and useful minerals

Ex. 1. Think of the terms associated with the discussed topic.

Ex. 2. For each question below a number of similar words appears, but only one is spelled correctly and matches the clue that is provided. Write the letter of the correctly spelled word in the space by the question number.

1. A science that deals with the history of the earth as recorded in rocks.

A. geology B. geologi C. geologe D. geologee

2. Molten rock in the earth’s crust.

A. magsa B. megme C. magma D. magmae

3. Rock formed by the solidification of molten magma.

A. igneous rock B. igneows rock C. igneos rock D. ineous rock

4. The property of being rigid and resistant to pressure; not easily scratched; measured on Mohs scale.

A. hardnes B. handness C. hardnness D. hardness

5. The remains (or an impression) of a plant or animal that existed in a past geological age andthat has been excavated from the soil.

A. fosssil B. fossill C. fossile D. fossil

6. Solid homogeneous inorganic substances occurring in nature having a definite chemical composition.

A. minnerals B. minirals C. minerals D. minerrals

7. Rock formed from consolidated clay sediments

A. sedimentary ruck B. cedimentary rock C. sedimentary rock

D. sedimentary rock.

Ex. 3. Match the terms or phrases with the definitions.

1. mixture	a) sedimentary rock formed from fragments of previously existing rocks
2. leavage	b) two or more substances physically combined
3. molecule	c) rock changed in form because of heat, chemical reactions, or pressure
4. metal	d) two or more atoms held together by a chemical force
5. metamorphic	e) element that has a dull surface, is a poor conductor of electricity and heat, and is not easily shaped
6. clasticrock	f) the way a mineral does not cleave breaks along a rough or jagged surface
7. atom	g) sedimentary rock that is formed either directly or indirectly from material that was once alive
8. rockcycle	h) mineral or rock from which useful metals or nonmetals can be removed
9. chemicalrock	i) element that is shiny, conducts electricity and heat and is easily shaped
10. fracture	j) solid in which the atoms or molecules are arranged in a definite pattern that is repeated over and over
11. mteamorphism	k) not formed from living things or the remains of living things

12. sediment	l) igneous rock fromed from lava that cools on the Earth’s surface
13. extrusive rock	m) rock made by compacting and cementing of sediments
14. ore	n) chemical substance made of atoms of different elements bonded together
15. streak	o)process by which metamorphic rocks are formed
16. inorganic	p) combination of chemical symbols used to represent compounds
17. hardness	q) color of the powder left by a mineral when it is rubbed against a hard surface
18. luster	r) tendancy of a mineral to break along smooth, definite surfaces
19. igneous	s) hard substance composed of one or more minerals
20. density	t) hard, beautiful, durable substance that can be cut and polished for jewelry and decoration
21. compound	u) igneous rock that formed from magma that cools inside (beneath) the Earth's surface
22. crystal	v) smallest part of an element with all the properties of that element; building blocks of matter
23. organicrock	w) mass per unit volume of a substance
24. chemicalformula	x) rock formed from molten lava
25. gemstone	y) anything that takes up space and has mass

26. matter	z) the way that a mineral reflects light from its surface
27. intrusiverock	aa) naturally occurring, inorganic solid that has a definite chemical composition and crystal shape
28. sedimentary	bb) processes that causes rocks to change from one kind to another
29. mineral	cc) non-clastic sedimentary rock forned by inorganic processes such as evaporation
30. rock	dd) particles of rock, shell, and other material that have been carried by wind, water or glaciers
31. nonmetal	ee) ability of a mineral to resist being scratched

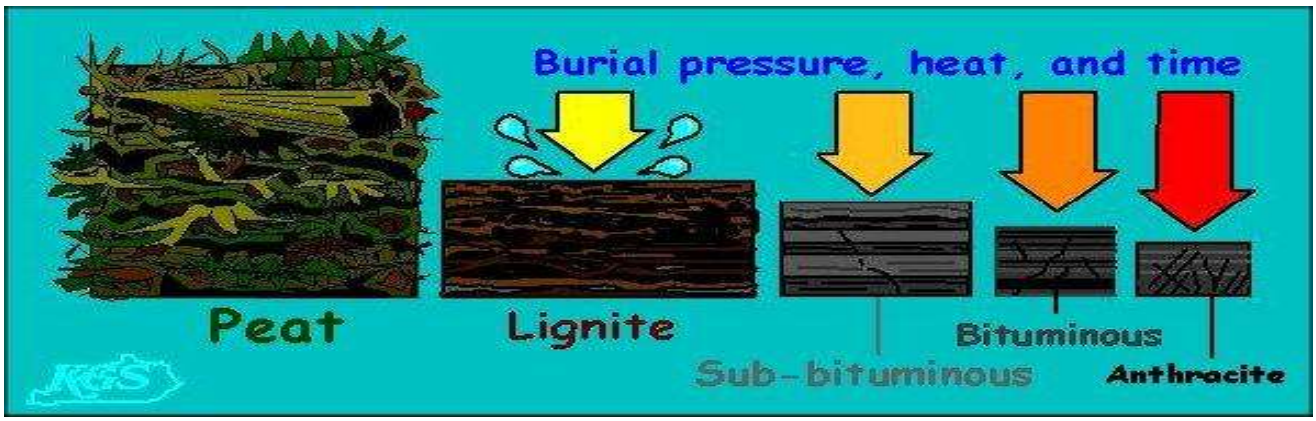
Ex. 4. Find the terms.

fracture *mixture* *density* *clastic rock* *chemical rock* *hardness* *molecule* *metamorphic* *metamorphism* *rock cycle* *compound* *sedimentary*

Ex. 5. Fill in the chart.

Rank of coal	*Used for*
1. 2. 3. 4.	

Ex. 6. Speak about coal formation.



(Adopted from https://yandex.ru/images/search)

Ex. 7. Complete this dialogue. Use the correct form of the verbs in brackets.

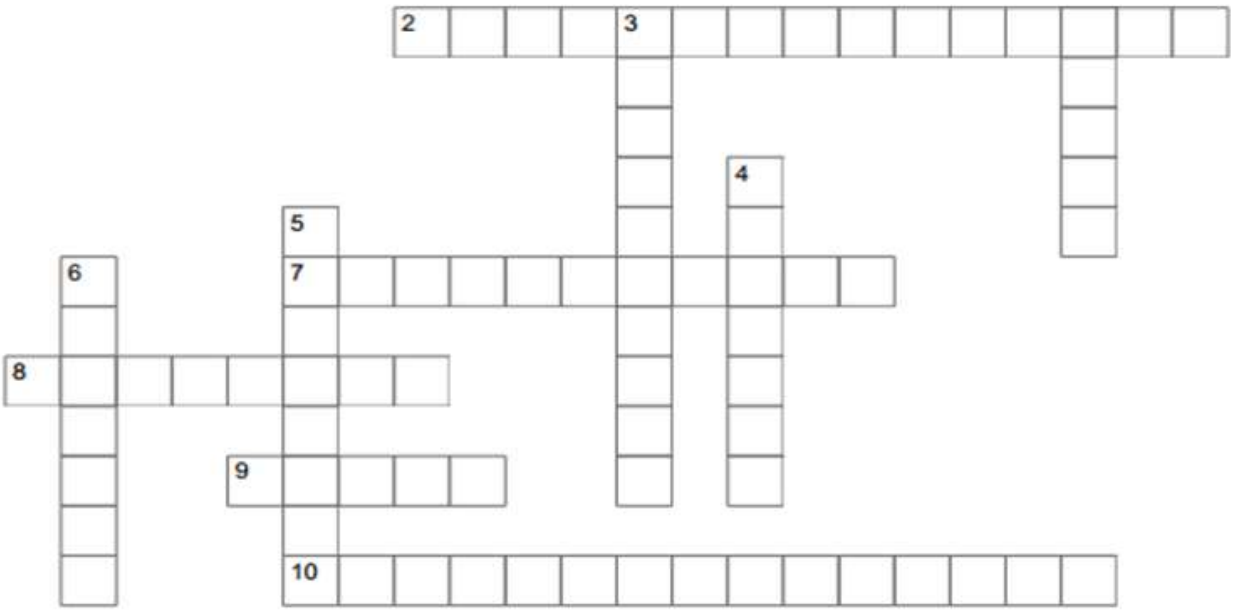
Q: How did people dig wells in the past?

A: The boreholes (1)_____ (make) by a process called percussion drilling. A heavy cutting tool (2)_____ (lift) up by a rope, and then dropped onto the rock. The weight of the tool (3)_____ (break) the rock.

Q: How do people dig oil wells today?

A: A deep hole (4)_____ (dig) into the ground using a method called rotary drilling. A powerful engine (5)_____ (turn) a sharp drill inside the hole. The rock layers (6)_____ (break) by the drill bit, which rotates at high speed.

Ex. 8. Using the Across and Down clues, write the correct words in the numbered grid below.



ACROSS		DOWN
2. Rock altered by pressure and heat 7. Rock formed by the solidification of molten magma 8. The property of being rigid and resistant to pressure; not easily scratched; measured on Mohs scale 9. Molten Rock in earth's crust 10. Rock formed from consolidated clay sediments		1. The remains (or impression) of a plant or animal that existed in a past geological age and that has been excavated from the soil 3. Geologists use this to study different minerals that make up a rock's composition 4. A science that deals with the history of the earth as recorded in rocks 5. Solid homogeneous inorganic substances occurring in nature having a definite chemical composition 6. Very hard native crystalline carbon valued as a gem; can cut glass

Ex. 9. Answer the following questions.

1. What is the annual volume of the Kuzbass exportable coal?
2. How much does the conditioned reserves of black coal in Kuzbass exceed?
3. How much of Russia's coking coals are mined in Kuzbass?
4. What is the main feature of the Barzas coal basin?
5. Why are Kuzbass coals unique?

UNIT 7

Mechanization and automation in mining

Ex. 1. Think of the terms associated with the discussed topic.

Ex. 2. Decide which word from the list best fits each space.

required commonly tip variety enables major contribution tower cubic yards

1. Page made … to the evolution of draglines.
2. The bucket can come in the … of sizes.
3. Draglines were … used throughout Australia and Canada.
4. Draglines can … more than 23 yards from the ground.
5. If the bucket is too heavy for the boom, it can … the machine.
6. The capacity of the bucket … to hold the big amount of dirt.

7. The size … for the bucket depends on its needs.
8. The bucket is measured in …

Ex. 3. Decide if the statements are true or false.

1. Draglines are used for longwall continuous mining.
2. Booms angles are typically at 35 degrees.
3. The dragline uses hydraulics system.
4. The world largest dragline goes to Muskie.
5. The first dragline was invented in 1912.
6. The dragline can not ensure accuracy.

Ex. 4. Fill the gaps with modals. Several modals may apply, depending on the intention you want to express. Remember to use the passive voice when necessary.

1. The term smart … (apply) to rather sophisticated systems.
2. Viscosity … (change) when applying an electric or magnetic field.
3. Materials ... (make) that bend, expand or contract when a voltage is applied.
4. Recyclable materials … further … (develop).
5. Materials for more efficient fuel cells … still ... (find).
6. Nanotubes ... (be) applicable in many ways.
7. The ecological impact of manufacturing materials ... (consider).

Ex. 5. Add the prepositions from the box, some of which will have to be used several times, and change the verbs into the gerund.

about against at for in of on to with

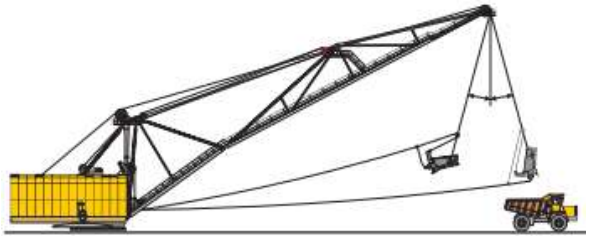
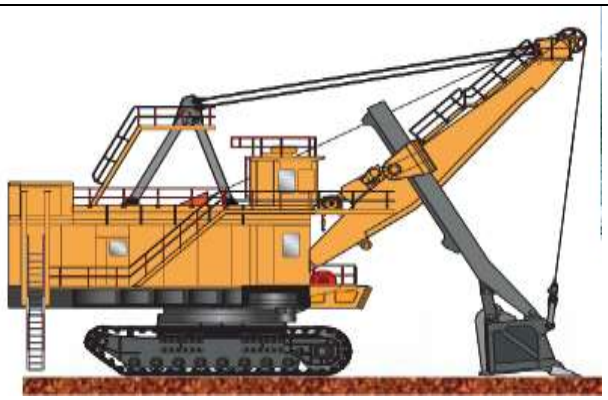
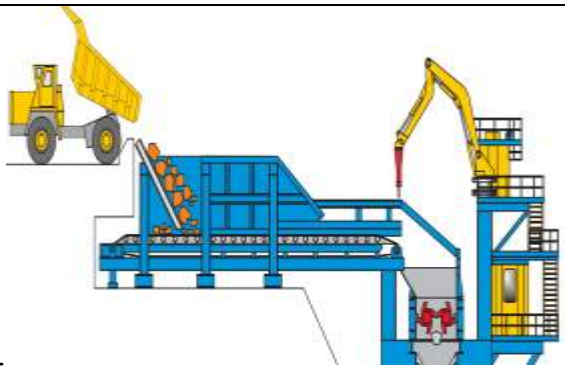
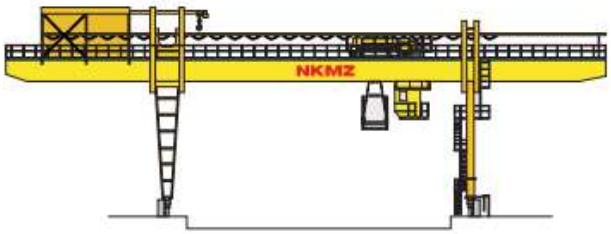
1. She is good/bad ... (work) with students.
2. He is angry … (lose) his notebook, Professor X. is disappointed ... (see) such a bad report.
3. The instruments are famous ... (give) reliable performance.
4. The company is interested ... (hire) him.

Ex. 6. Underline the correct word in brackets.

1. A four-wheel-drive (4×4) is a useful *(device / specialist / vehicle / instrument)* for driving on wet, sandy or rocky surfaces.
2. A theodolite is a precision *(instrument / vehicle / process / specialist)* which is used by surveyors for measuring the land.
3. The global positioning (or GPS) *(device / instrument / vehicle / system)* consists of at least three satellites connected to a hand-held receiver.
4. An X-ray technician is a *(device / tool / specialist / system)* who operates the X-ray machine in a hospital or clinic.

Ex. 7. Match equipment with the pictures.

a) staker reclaimer b)bucket-wheel excavator c) walking
d) dragline belt conveyer e) drilling rig f) open cast power shovel
g) crushing and reloading unit h) warehousing equipment

 1.	 2.
 3.	 4.
 5.	 6.
 7.	 8.

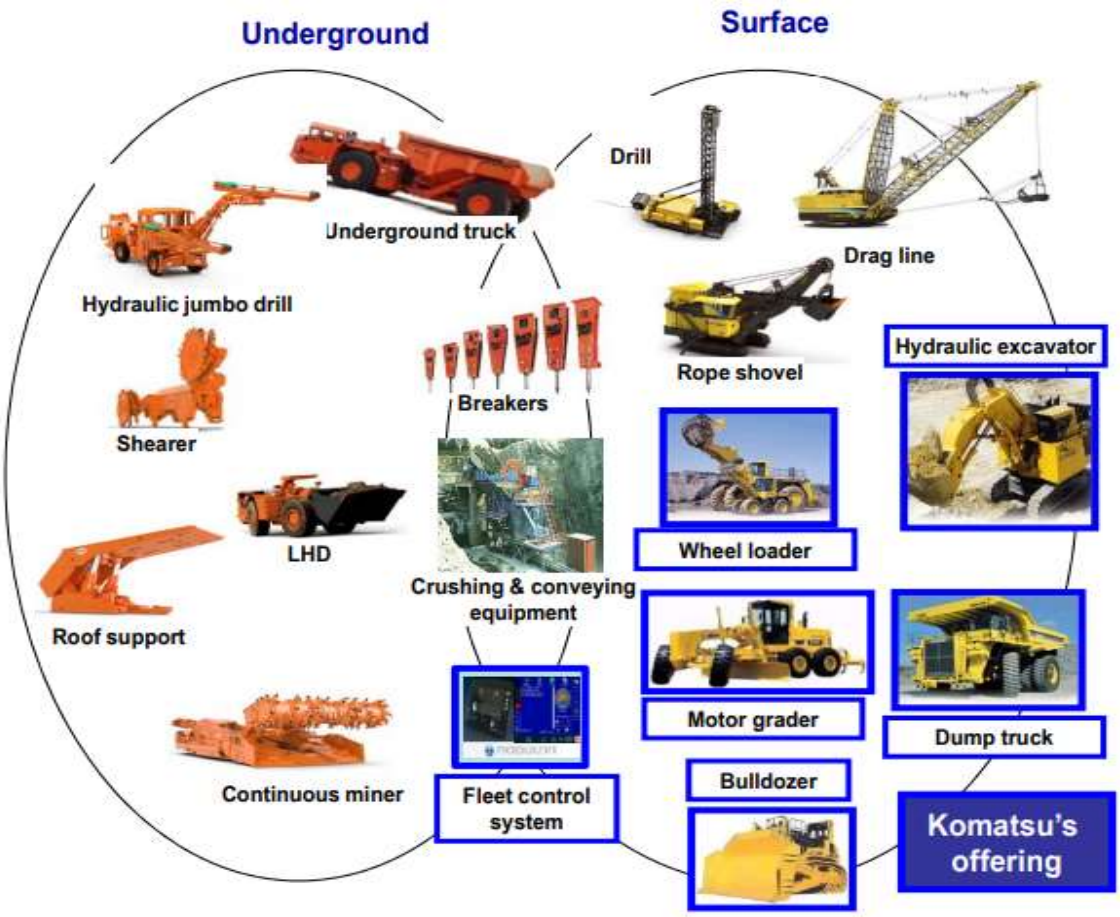
(Adopted from https://yandex.ru/images/search)

Ex. 8. Complete each sentence using one of the words in brackets.

1. Before you walk onto the building site, please take _____ (apart / on / off / up) your shoes and then put on these safety boots.
2. Here are all the parts of the telephone. Please put them (in / away / on / together) and make a complete telephone.
3. He lifted the car wheels up 10 cm from the ground using the _____ (flap / jack / socket / wheel gun).
4. Pete is the chief _____ (electrics / electrician / electrical / electricity) in the factory.
5. Before you add more oil to the engine, you should pull out the _____ (oil filler cap / spark plug / wheel nuts / dipstick) and check the oil level. Bill's job is to _____ (maintain / inspect / operate / repair) the sub-sea oil pipe.
6. He does this by filming the pipe with an underwater video camera. I can't meet you at three o'clock because I'm _____ (working / training / visiting / attending) a project meeting then.
7. The safety officer is _____ (conducting / becoming / meeting / operating) a fire drill at 9 o'clock tomorrow morning on the main deck.
8. «What _____ (work experience / qualifications / job title / education) do you have for this job?» «Well, I repaired telephones for four years and now I repair mobile phones.»
9. John is a junior technician in the IT department. He _____ (supervises / reports to / manages / reports from) the senior technician.
10. The correct temperature in the building is 22 °C. If the temperature is above or below this, you have to _____ (inspect / take / adjust / replace) it to 22 °C.

11. You can (activate / locate / detect / appreciate) this generator by pulling this cable. It starts immediately when you do that.

Ex. 9. Comment the following scheme. Say what type of equipment is used in underground and surface mining.



(Adopted from https://yandex.ru/images/search)

Ex. 10. Insert one missing word from the box in each sentence. You don't need all the words. Mark the position with a dash (/). Write the missing word in the space.

one / by / to / for / than / of / more / who / which

1. The lorry is too heavy the bridge. _____My new sports car is much faster my old one. _____

2. The firemen have bought a new vehicle take them more quickly to a fire. _____

3. These days, most cars are painted and assembled robots. _____

4. Cold water flows to the water pump, then pumps the water into the engine. _____

5. Give me the spanner. No, not that one. I want the large, please. ____

6. A notebook computer is usually expensive than a desktop computer. _____

7. Please send complaints to our customer service officer, will telephone you. _____

Ex. 11. Answer the following questions.

1. How is your industry/ technology changing?
2. How is life changing in your country?
3. What do you use the Internet for? What sites do you recommend? Why?
4. What jobs do you want in the future?
5. Tell me about your typical day at work or college. What happens and when does it happen?
6. Why do you need English? When did you start learning English?
7. How often do you attend meetings/ lessons? What are they about? Are they useful?
8. Tell me about your company's product or service. Compare it your competitor's.

9. What are three key events in your life? What happened? Why were they important?
10. Tell me about a recent problem you had at work / college. How did you solve it?
11. Tell me about the history of your industry.
12. Describe a useful tool, instrument or item of equipment in your industry. What does it look like? What does it do? Why it is useful?
13. Describe an important process in your industry. Why is it important? Explain the main steps in that process.
14. Make some predictions about the future for your industry.
15. Why do you think these changes are going to happen? How will they affect your career?

PART II Tests

Check yourself

TEST 1

SECTION 1: VOCABULARY

1. One word in each sentence is in an incorrect form. Delete it and write the word in its correct form in the space.

For example: A powerful ~~compressive~~ pumps the fluid around the pipes. *Compressor*

1. When a gas condensation, it gives out heat and changes into a liquid. _____
2. Inside the evaporates, the fluid changes into a gas. _____

3. This food has to be kept cold, so please put it into the refrigerant. _____

4. When a rubber band is pulled, the length expansions and the width contracts. _____

5. The fan in the room is powerful enough to extractor all the petrol fumes. _____

6. The robot drives the forklift truck just like a human operate. _____

7. We apologise for this mistake, and we are pleased to offer you a reduce in the price. _____

8. The pistons moved up and down in a rapid reciprocates motion. _____

2. Replace the underlined phrase with a verb from the box that has the same or similar meaning. Write the verb in its correct form.

decompressemit absorb solidity extract liquefy

1. The pieces of glass were <u>pulled out</u> from the injured man's arm. _____

2. A loud beeping sound was <u>given out</u> every two seconds from the locating device. _____

3. Heat is <u>taken in</u> from the surrounding air into the fluid when it evaporates. _____

4. When the liquid was cooled to below freezing point, it quickly <u>became hard</u>. _____

5. When the valve was opened, the air in the tyre immediately lost its pressure. _____

6. When the ice cube was heated, it melted and quickly turned into a fluid. _____

3. Look at these sentences about the internal combustion engine. Underline one word in each sentence and write a word from the box with the same or similar meaning. You don't need all the words.

stroke shaft port exhaust chamber

1. The piston moves up and down inside a sealed cylinder. _____
2. When the fuel ignites, it causes a downward movement of the piston. _____
3. Air mixes with petrol and flows in through a special opening. _____
4. Power is transmitted from the pistons to the wheels by means of a rotating rod. _____

SECTION 2: GRAMMAR

4. Choose the correct answers. Write a letter (*a–d*) in each space.

1. If you want to become an engineer, you could try _____ a degree course at this college.

a) follow b) for follow c) you follow d) following

2. There was an accident on the motorway this morning. This might _____ causing the traffic jam.

a) be b) is c) for d) has

3. My car doesn't start, but the battery is OK. I think the petrol tank _____ empty.

a) must have b) must c) must be d) must to be

4. How many boxes _____ in the warehouse last week?

a) have damaged the fire b) were damaged by the fire

c) the fire damaged d) the fire has damaged

5. The tree has burnt to the ground. The lightning must have _____ it in the storm last night.

a) to strike b) struck c) be striking d) strike

6. All the main repairs to the building _____ completed more than three months ago.

a) did b) have c) are d) were

7. The car engine drives the fan belt, _____ makes the fan blow cold air on the radiator.

a) which b) when c) what d) where

8. If your computer has broken down, why _____ send it for repair to our IT specialists?

a) you don't b) aren't you c) don't you d) not you

9. The first module of the International Space Station _____ into space in 1998.

a) they sent b) was sent c) did send d) which sent

10. When the heat is too high, _____ makes the steel beams in the building expand and bend.

a) and it b) which c) it d) and

11. The burnt gases escape from the cylinder _____ the exhaust port opens.

a) why b) which c) what d) when

12. The piston becomes hotter _____ it moves up and down inside the cylinder.

a) than b) as c) that d) which

5. Rewrite these sentences to give the same or similar meaning.

1. Our contractor took the photos and wrote the report. The report _____ and the photos _____ our contractor

2. Here's a suggestion. You could close your program and reboot your computer.

3. Here's a suggestion. Why _____ try _____?

4. The water that flows down from the dam drives the turbine. The turbine _____ the water which _____.

5. I'm sure that yesterday's e-mail brought a virus into my computer. Yesterday's e-mail must _____.

SECTION 3: READING

6. These phrases are missing from description of the new type of engine. Decide where they fit. Write a letter (A–J) in each space.

A ordinary water is pumped into the cylinder

B which forces the piston down

C which uses this heat

D is very hot

E pushes the steam out of the cylinder

F you can touch the engine block

G intake valve

H into steam

I cools the engine from inside

J on the normal four-stroke engine

The six-stroke internal combustion engine – a new invention

Four-stroke internal-combustion engines waste a lot of heat. Here is my idea for a new invention (1)_____ and converts it into more energy. My new invention is the *six-stroke* engine. It's based (2)_____, but it has two extra strokes and one extra (3)_____. What do you think comes into the engine through this valve? It's water!

After the exhaust gases flow out of the engine cylinder, (4)_____ through the extra valve. Inside the cylinder, which (5)_____, the water immediately changes (6)_____. The steam expands to 1,600 times its volume, (7)_____ for a *second power stroke*.

Then a *second exhaust stroke* (8)_____, and then the six-stroke cycle begins again.

This six-stroke water-injection cycle provides extra power, but it also (9)_____. When the engine is running, (10)_____ with your hand. It's not hot, but only warm!

TEST 2

Answer all the questions.

SECTION 1: VOCABULARY

1. Choose the correct option (a–j).

1. Archimedes principle states that a body immersed in a fluid experiences a _____ force equal to the weight of the liquid displaced.

a) buoyant b) floating c) rising d) equivalent

2. I think I've _____ the main points. Any questions?

a) kicked b) handed over c) covered d) turned

3. They use _____ packs which expand to isolate one zone from another in snake well drilling.

a) adjustable b) swellable c) steerable d) convertible

4. I am now going to _____ over to my colleague to finish the presentation.

a) kick b) turn c) cover d) hand

5. A single snake well can access multiple pockets of oil to achieve output _____ to several individual wells.

a) attached b) separated c) adjacent d) equivalent

6. When you are drilling pockets of oil, you don't want fluid from one zone flowing into the _____ zone.

a) adjacent b) steerable c) restricted d) coherent

7. Bar coding was _____ invented to help space agencies keep track of millions of spacecraft parts.

a) frequently b) primarily c) usually d) necessarily

8. The _____ temperature in the room tends to be between 10–29 °C so the equipment has to work within that.

a) ambient b) solar c) apparent d) sufficient

9. The solar _____ of the material lets about 45% of sunlight through it.

a) reflectancy b) acoustics c) translucency d) amplification

10. Furniture has to be made out of _____ material these days to prevent it from catching fire too easily.

a) heat-reflective b) combustible c) lightweight d) non-flammable

11. The roof material must have good _____ protection so that it does not overheat.

a) thermal b) solar c) light d) melting

12. I'm sorry, but what you're saying doesn't make any _____

a) comment b) thoughts c) sense d) ideas

13. John _____ off the meeting by asking everyone to introduce themselves.

a) opened b) kicked c) made d) worked

14. It's important that there are no _____ on leg movement, as they need to be able to move freely within the support.

a) constraints b) concerns c) increments d) inclines

15. The measurements need to be very_____. There is zero tolerance for error.

a) sufficient b) precise c) comparative d) concise

SECTION 2: LANGUAGE

2. Complete the paragraphs by putting the verbs in brackets into the most appropriate form and ONE word in the other gaps.

Spencer Silver (1)_____ (work) in the 3M research laboratories trying to find a new strong adhesive. Unfortunately, the adhesive he came up with was even weaker than 3M's current adhesive and no one was interested in his discovery. Then, one day, when Arthur Fry, a colleague of Silver's, (2)_____ (sing) in his church choir, the bookmarks in his hymn book kept falling out so he (3)_____ (use) some of Silver's adhesive to keep them in place. The bookmarks (4)_____ not fall out and when he found that he was (5)_____ to take them off without damaging the pages of the book, the Post It was born!

Another invention (6)_____ is used very widely today is Velcro. Most of us (7)_____ (use) this for years but probably do not know that the idea came from nature. George de Mistral (8)_____ (walk) his dog one day when he noticed burrs stuck to his clothes. They were difficult to get off so he looked at the burrs under a microscope and (9)_____ (see) that their tiny hooks had attached themselves to the loops in the material of his clothes. This started him thinking of how the substance could be used to bind two surfaces together and, although he was ridiculed initially, he persevered and finally Velcro (10)_____ (create).

SECTION 3: READING

4. In which paragraph (A–E) are the following mentioned?

1) improvement in work efficiency _____

2) government legislation _____

3) a joint venture _____

4) a dental procedure _____

5) material designed for comfort _____

A

When NASA was created back in 1958, the law decreed that any of its research and advancements should be used for the benefit of everyone and not just ***those*** in the space industry. As a result, there have been a vast number of spin-off products created, many of which we use daily and take for granted having no idea of ***their*** 'space' history.

B

One very successful product whose lineage comes from NASA, is the development of the invisible brace to straighten teeth. Until NASA developed a product called translucent polycrystalline alumina (PTA) to protect the infrared antennae of heat-seeking missile trackers, hundreds and thousands of teenagers had to put up with wearing mouthfuls of shiny metal in their mouths to position their teeth correctly. The material's strength and invisibility was found to be perfect for this piece of orthodontic equipment and is now one of the most successful products in ***that*** industry.

C

There is nothing better than a good night's sleep, but finding a good mattress has always been a problem until the development of memory

foam. This material was developed at NASA for use in aircraft seats to reduce the impact during landing. The unique property of the material is that weight and pressure are evenly distributed and when ***it*** is compressed it returns to its original shape. No more sagging, lumpy mattresses that are either too hard or too soft.

D

There have been many spin-off products in the health industry but one of the smallest and most commonly used is the ear thermometer. It has revolutionised the way temperatures are taken making it both easier, quicker and more accurate. For the health businesses ***this*** has meant considerable time and cost-saving. It is based on a NASA infrared technology which was developed to take the temperature of stars. In the thermometer, infrared sensors are used to measure the amount of energy an eardrum gives off into the ear canal and, because this is inside the body, the reading is far more accurate than conventional thermometer types.

E

And finally, next time you are using a cordless tool around the home, you may have a little more respect for it if you know that the technology was as a result of the Apollo space missions. When NASA was preparing for these in the 1960's, it needed to develop a drill which was lightweight, compact and very powerful so it teamed up with Black and Decker and invented a battery-powered magnet motor drill to collect samples from the surface of the moon. Black & Decker then used the same principles to develop cordless power tools for the DIY enthusiast.

5. What do these *bold, italicised* words refer to:

1. (para A) ***those***

   a) advancements b) everyone c) NASA employees

2. (para A) ***their***

   a) everyone b) products in daily use c) all spin-off products

3. (para B) ***that***

   a) medical b) orthodontic c) space

4. (para C) ***it***

   a) weight b) pressure c) material

5. (para D) ***this***

   a) the way temperatures are taken b) the ear thermometer

   c) the health industry

TEST 2

Answer all the questions.

SECTION 1: VOCABULARY

1. Complete the paragraph with words form the box. There are some EXTRA words you do not need.

relinquishes / interprets / mechanism / activates/actuator / controls / retains / detects / regains / controller / computerized / establishes / counteracts

'*By-wire*' systems are (1)_____ control systems often used in vehicles and aircraft. An electronic sensor (2)_____ movement of the accelerator pedal in a car and sends a signal to the

(3)_____ which (4)_____ the data and sends instructions to a tiny motor or (5)_____. In an aircraft, the pilot first (6)_____ flight details and then (7)_____ control of the flight to the computer system. He (8)_____ control by overriding the autopilot at any time.
He also (9)_____ control until he (10)_____ the autopilot again.

2. Complete these sentences with a noun derived from a phrasal verb. The first letter is given.

1. The **b**_____ of pressure caused the valve to blow.
2. Our flight should have left at 7am but the **t**_____ was delayed until midday.
3. The **i**_____ mechanism for the cruise control is the accelerator pedal.
4. There were too many people at the conference so the **o**_____ had to be accommodated in another room.
5. The **t**_____ of our competitor gave us the technical expertise our company needed.

SECTION 2: LANGUAGE

3. Complete the paragraph by putting ONE word in each gap.

We are having problems with one of the machines at the factory at the moment. Until now, our investment in sophisticated machinery has paid (1)_____ – increasing our capacity by 25%. (2)_____ when it breaks (3)_____, it's a

different matter. Now, (4)_____ the machine is being (5)_____ out by the engineers, we are doing everything we can to avoid shutting the factory (6)_____ completely as we have very full order books. The engineers are (7)_____ out extensive tests to (8)_____ out the cause of the fault. (9) _____ we have had problems with this machine in the past, it has never been this bad. Last time we managed to carry (10) _____ production (11)_____ this time it has interrupted production quite considerably so we can't (12)_____ out being unable to supply our customers for the rest of the week. I am putting (13)_____ making a final decision about that until the engineers get (14)_____ to me. I have just taken (15)_____ several new staff and if the factory closes we will have to pay them for nothing. Let's hope the engineers can solve the problem quickly.

SECTION 3: READING

4. Read the text below and decide if these statements are True (T), False (F) or Not Given (NG).

1. The Standard Theory proves the Theory of Relativity.
2. The Standard Theory deals with all the basic forces of the universe.
3. The Higgs boson particle is a subatomic particle.
4. The LHC consists of three main sections.
5. The Grid consists of the greatest computing power in world.
6. There is less pressure on the moon than in the LHC.
7. More than 11,000 collisions happen every second in the LHC.

8. Particles are guided round the collider by magnets.
9. Liquid nitrogen is used to cool the magnets.
10. The experiment has confirmed the existence of the Higgs boson.

THE LARGE HADRON COLLIDER

The Large Hadron Collider (LHC) was created to help physicists around the world answer basic questions about the universe. Up to now, scientists have developed the Standard Theory, which tries to define and explain fundamental particles that make up the universe. The theory combines elements form Einstein's Theory of Relativity with Quantum Theory, dealing with three of the four basic forces of the universe: strong nuclear force, weak nuclear force and electromagnetic force. The only one it doesn't address is gravity. Their prime target is a theoretical particle known as the Higgs boson whose existence they hope will be confirmed by the collider experiments.

The Large Hadron Collider is the world's largest and higher energy particle accelerator. It weighs more than 38,000 tones and the 27 km tunnel is buried 100 meters underground. However, the collider is only one part of the LHC project as there are also the detectors, which are located in large chambers around the tunnel, and the global network of computers known as the Grid. The detectors job is to track the motion of the particle beams and measure the energy and charge of the new particles created by the collisions. The Grid is the way in which information is shared through the internet and the world wide web so that CERN can share global computing power.

The LHC uses 10,080 tones of liquid nitrogen and is filled with nearly 60 tones of liquid helium. The internal pressure of the LHC is 10^{-13} atm, ten times less than the pressure on the moon and temperatures 100,000 times hotter than the centre of the sun can be reached inside the collider. The LHC has two functions: to accelerate particles to high speed beams about 2 mm wide and to direct them to collide head-on. At full power, trillions of particles race around the tunnel 11245 times a second, 99.99% the speed of light and 600 million collisions occur every second. The 9,300 superconducting magnets are pre-cooled to –193 °C and they steer and focus the particle beams as they speed round the tunnel in opposite directions. When the beams collide, they briefly share the same pipes enclosed by the magnets and are cooled to 1.9 K (–271.3 °C) by the liquid helium.

Has it achieved its purpose? Well from the data collected so far there are signs that they may be close to finding the Higgs boson, but scientists hope that it will also throw up more questions and information which they haven't yet considered.

TEST 3

SECTION 1: VOCABULARY

1. Choose the correct option (a–d).

1. We think the items were stolen _____ to the picking stage.

a) beforehand b) previous c) prior d) smallest

2. A lot of _____ data, that is personal information, is lost when staff lose their phones.

a) sensible b) sensitive c) sensory d) sensing

3. We need to have a system that can _____ the data if a phone is lost. We don't want company and personal information being stolen.

a) wipe b) contact c) pre-set d) overlay

4. The security system allows the administrator to send an _____ SMS message to delete the important data.

a) encrypted b) out-of-contact c) interrupted d) ambient

5. The _____ and crossbones sign indicates that a substance is toxic.

a) head b) face c) skull d) body

6. An infrared touch screen can be sealed against _____ .

a) coatingsb) resistance c) security d) contaminants

7. The _____ of a substance is its ability to bend without breaking.

a) resistance b) resilience c) resolution d) radiation

8. The engineer agreed to some _____that the problem could be a design fault.

a) point b) doubt c) level d) extent

9. On the _____. I think you're completely wrong.

a) contrary b) opposite c) reverse d) contradiction

2. Complete the sentences with a word formed from the word in capitals at the end.

1. We need to make sure that no _____ user has seen that data. It would be disastrous for the company. AUTHORITY
2. The screen has several _____ layers. METAL
3. They found an alloy with high _____ which was just right for the task. FLUID
4. The _____ of the voice on this phone is truly excellent. CLEAR
5. The _____ of some substances can cause a problem when transporting them so they carry a warning sign. STABLE
6. Can you explain the _____ between the two systems please? SIMILAR

SECTION 2: LANGUAGE

3. Put the verbs in brackets into the correct form and ONE word only in the other gaps.

FACTORY THEFTS

Last night several expensive components (1)_____ (steal) from our factory. Now we think that they must (2)_____ (take) by someone inside the company, as there was no sign of a break-in. Recently we (3)_____ (have) a series of small thefts but, (4)_____ with these, last night's was much (5)_____ serious as it included the prototype for our new product. We need (6)_____ (identify) weaknesses in our security. Could these thefts (7)_____ (prevent)? (8)_____ have we gone wrong? Perhaps we

(9)_____ (not/train) our staff carefully enough. So what (10)_____ we have done to prevent this situation? It seems that currently too many people (11)_____ (have**)** access to the door codes, (12)_____ in the past only the production manager and his assistant had them. So perhaps we should start by (13)_____ (reduce) the number of people who are allowed to know the code. In my opinion, the production manager should be totally responsible for access to the factory and for checking that everything is locked when he (14)_____ (leave). I know that many of the staff will not (15)_____ complain vehemently so we must explain to them why we are taking this action.

SECTION 3: READING

4. Read the text an decide if these statements are True (T), False (F) or Not Given (NG).

1. Augmented reality research started more than a decade ago.
2. Aircraft maintenance used some of the first augmented reality technology.
3. Mobile phone companies are doing all the current research.
4. Virtual reality consists of real and virtual objects.
5. Advertisers want to keep in touch with consumers at all times.
6. Teenagers enjoy learning through video games.
7. Phones could be used by school children to do some assignments.

5. Choose the correct option (a–d).

1. Which of these general applications is not mentioned?

a) locating a vehicle

b) finding food and drink establishments

c) studying the stars

d) car maintenance manuals

2. Which of these educational applications is not mentioned?

a) learning to read

b) doing physics and chemistry experiments

c) studying geography

d) doing economic projects

3. Which future application is mentioned?

a) furnishing an augmented reality room

b) working outside the computer screen

c) playing video games in a virtual environment

d) improving vision for people who wear glasses

AUGMENTED REALITY

Active research into augmented reality has been going on for more than ten years but it isn't until recently that the technology has made it possible for extensive use. One of the earliest forms of the technology was for aircraft maintenance, where a schematic on a display was overlayed onto aircraft wire harnesses which were being repaired. This saved the technicians having to look away at the instruction manuals all the time. In the early days, researchers had to carry backpacks of equipment to make it work, but now mobile phones and laptops are so powerful that they can be used and have therefore made the technology much more of a commercial prospect. And the mobile phone is currently driving the development.

Augmented reality technology works by superimposing graphics, audio and other sensory enhancements over a real-world environment in real time. Taking the elements from TV and computer screens, it allows the user to see the world in a different way. It is in fact a hyper-environment, a tri-dimensional and interactive environment generated by computer and made up of real objects and virtual objects.

iPhone apps have led the way, although all major phone manufacturers are now involved. One of their apps is an instant English/Spanish translator which works by holding the phone's camera up to a sign in either of those languages. Other popular apps involve astronomy, measuring distances, a theodolite, finding your car and of course the ubiquitous guides to restaurants and bars. Developed in the Netherlands, Layar is very popular application which uses your phone's camera and GPS to gather information about the surrounding area. It then shows information about restaurants and other sites, which is overlays on the phone screen. One new application is a pair of goggles for skiers, which tell them in real time how fast they are going as well as the time and the temperature. Advertisers have seen the potential of this technology as it allows them to reach consumers closer to their merchandise and send them information about the product they are looking at. Furthermore it also has many applications in the medical industry from training doctors to performing surgery.

It has benefits for education too. A science teacher could build 3D images and simulations for the class instead of having to use 2D static diagrams. One application currently on the market helps primary school children learn their alphabet. For example for the letter G, a giraffe can

appear in the child's hands, moving, making noises and responding to the child. By pressing a few buttons the child can also hear the letter sounds and generally have fun. Many educational experts are looking at the benefits of an augmented reality curriculum. One advantage is that with disillusioned teenagers it seems to engage them more, but on the other hand they can also be overloaded with information, which rather defeats the object. Educationalists are working to establish a balanced use of the new technology. However youngsters could use their phones to collect data from communities for social studies projects, from shopping centres to understand economics and from museums to learn more about the exhibits.

Augmented reality is here to stay and its future is exciting. There is likely to come a time when we are no longer limited to our computer screens, but will be able to use glasses to view the screen icons in the air around the computer. We could have virtual objects like paintings on our walls paying a fraction of the cost of the original painting. As far as video games are concerned, players will be able to run around outside, without being confined to buttons and joysticks and they may, one day, even be able to enter game space with other people in this way. The applications seems endless.

PART III Методические указания к выполнению реферативных переводов и аннотирования

I. Учебные цели и задачи реферативных переводов

Реферирование – краткое изложение текста. Цель – в наиболее краткой форме передать содержание подлинника, но выделить особо важное или новое, что содержится в реферируемом материале. Целью реферативного перевода является подготовка студентов (будущих специалистов в той или иной области и ученых) к работе с иноязычной литературой по выбранной специальности. Работа над реферативным переводом предполагает следующие шаги:

• выделение ключевых фрагментов текста;

• полное или частичное перефразирование части выделенных ключевых фрагментов;

• обобщение смысловых кусков реферируемого текста и их сокращение на родном языке;

• изложение полученных стяжений при условии введения в новый текст переходных элементов, подсказываемых логикой развития мысли.

II. Структура реферативного перевода

Реферативный перевод должен содержать:

• титульный лист;

• план;

• выходные данные печатного материала (название, имя автора, источник, год издания);

• основное содержание текста;

• выводы.

Оптимальный объем 5–7 страниц машинописного текста через 1,5 интервал.

Аннотация – это предельно сжатая характеристика материала. В отличие от реферата, аннотация не может заменить самого материала, так как она призвана дать лишь общее представление о содержании книги или статьи. Именно поэтому для аннотирования важно определить, что является самым главным.

Аннотированием называется процесс составления кратких сведений о печатном произведении (книге, статье, докладе и т. д.), позволяющих судить о целесообразности его более детального изучения. При аннотировании учитывается содержание произведения, его назначение, ценность и направленность.

Аннотация должна быть написана простым языком без использования ненужных и малопонятных терминов. Она должна в сжатой форме сообщать, о чем говорится в тексте и какую пользу от его прочтения можно получить, то есть требования к читательским знаниям предъявляет.

План реферирования

The Plan of Rendering Newspaper Article

1. The title of the article.

a) The headline of the article is ...

b) The article is headlined ...

c) The headline of the article I've read is ...

2. The author of the article

a) The author of the article is ...

b) The author of the article is ...

c) The article is written by ...

3. Where and when the article was published.

a) The article is taken from the newspaper...

b) It is (was) published in ...

c) it is (was) printed in ...

4. The main idea of the article.

a) The main / central idea of the article is ...

b) The article is about ...

c) The article is devoted to ...

d) The article deals with ...

e) The article touches upon ...

f) The purpose of the article is to give the reader some information on ...

g) The aim of the article is to provide the reader with some facts / material / data on ...

5. Give a summary of the article (no more than 10–20 sentences).

a) The author starts by telling (the reader) (about, that ...)

b) The author writes (states, stresses upon, thinks, points out) that ...

c) The article describes ...

d) According to the text ...

e) Further the author reports (says) that ...

f) The article goes on to say that ...

6. State the main problem discussed in the article and mark off the passages of the article that seem important to you.

7. Look for minor peculiarities of the article.

8. Point out the facts that turned out to be new for you.

9. Look through the text for figures, which are important for general understanding.

10. State what places of the article contradict your former views.

11. State the questions, which remained unanswered in the article and if it is possible add your tail to them.

12. Speak on the conclusion the author comes to.

a) In conclusion ...

b) The author comes to the conclusion that ...

13. Express your own point of view on the problem discussed.

a) I find / found the article topical=urgent (interesting, important,
dull, of no value, too hard to understand) because ...

b) In my opinion the article is worth reading because ...

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Анастасия Георгиевна Широколобова

ENGLISH FOR MINERS

WORKBOOK

Английский для горных инженеров. Рабочая тетрадь

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имени Т. Ф. Горбачева, 650000, Кемерово, ул. Весенняя, 28
Издательский центр Кузбасского государственного технического
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