МІНІСТЕРСТВО ОСВІТИ І НАУКИ, МОЛОДІ І СПОРТУ УКРАЇНИ
НАЦІОНАЛЬНИЙ ТЕХНІЧНИЙ УНІВЕРСИТЕТ УКРАЇНИ
«КИЇВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ»

МЕТОДИЧНІ ВКАЗІВКИ З ДИСЦИПЛІНИ «ІНОЗЕМНА МОВА ПРОФЕСІЙНОГО СПРЯМУВАННЯ» ДЛЯ СТУДЕНТІВ СПЕЦІАЛЬНОСТЕЙ 7.090301/8.090301 «РОЗРОБКА РОДОВИЩ КОРИСНИХ КОПАЛИН», 7.090303/8.090303 «ШАХТНЕ І ПІДЗЕМНЕ БУДІВНИЦТВО» ФАКУЛЬТЕТУ ІЕЕ

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ПЕРЕДМОВА

Методичні вказівки укладено відповідно до програми і спрямовано на розвиток навичок читання і перекладу науково-технічних текстів.

Цю роботу належіть використовувати як перехідну ланку від стабільного підручника з англійської мови до читання оригінальної літератури за фахом.

Видання складається з І0 основних текстів з вправами. Система вправ відповідно до конкретних учбових цілей має на меті як розвиток навичок точного і загального розуміння, так і розвиток навичок з усної мови. Пропонуються також вправи, що мають професійну спрямованість. Виконання студентами методичних вказівок сприяє інтенсифікації процесу навчання іноземній мові і створює умови для правильного і найбільш доцільного тренування, яке забезпечує тривалі навички розуміння структури науково-технічного тексту.

ЗМІСТ

TEXT 1. UNDERSTANDING THE UPS AND DOWNS OF BUILDING UNDERGROUND.

Has the idea of living in an underground home tempted you? If so, you're part of a growing minority. More and more people, worldwide, have already or plan to build an earth-sheltered home. Many underground enthusiasts join local and international organizations for support, ideas and information. Most of these enthusiasts and their groups can readily spiel off what they see as the advantages of an underground lifestyle, and, surprisingly to some, our own U.S. Department of Energy (DOE) agrees. Conservative energy use tops just about everyone's list. The DOE says, "An earth-sheltered home is less susceptible to the impact of extreme outdoor air temperatures, so you won't feel the effects of adverse weather as much as in a conventional house. Temperatures inside the house are more stable than in conventional homes, and with less temperature variability, interior rooms seem more comfortable.

Other advantages cited by the DOE include protection against the extremes of Mother Nature, such as high winds, hailstorms, tornadoes, hurricanes and earthquakes; less susceptibility to fire; lower insurance premiums; less maintenance; natural soundproofing; conservative use of land and natural resources.

A buried house provides maximum protection from not only natural disasters but man-made ones, such as explosions, nuclear accidents, burglaries and break-ins. Many claim that earth-sheltered homes are the only way to gain total privacy. Still others like having the ability to grow your food on top of your house.

So, the most common cause for failure of underground houses is not gross heat escaping the structure but an interior surface temperature that allows condensation.

"The only answer is to have enough insulation so that the interior surface temperature of the walls equals the temperature of the air inside the house. Three inches of urethane or six inches of Styrofoam should be used. And even with super-insulated walls, it's sometimes necessary to dehumidify."

South says. Obviously a Monolithic Dome can be sufficiently insulated to prevent condensation. But before you begin looking for your shovel, you might consider a few other factors. Even the most enthusiastic proponents of underground construction say that getting financing is a problem and resale is almost impossible.

Then too, in some areas building codes could prove troublesome. Some require that all sleeping spaces must have a window with specific dimensions that opens to the outside.

The DOE says that soil type is another critical consideration. They say the best are granular, such as sand and gravel, since they compact well but are permeable and allow water to drain quickly. Cohesive soils, such as clay, and permafrost areas are least suitable for underground construction.

Other factors cited by the DOE include radon, an invisible, odorless radioactive gas produced naturally when uranium in rock decomposes, the groundwater level at a chosen building site, and the selection of an adequate air exchange system.

For all these considerations, the DOE recommends appropriate testing and consultations with professionals. And David South recommends that anyone interested in building an underground Monolithic Dome take "ample advantage of the information and resources we have here at MDL"

Exercise 1. Translate the following words and word combinations from English into Ukrainian:

To tempt, spiel off, extreme outdoor air temperatures, adverse weather, hailstorms, hurricanes, insurance premiums, maintenance, natural soundproofing, man-made disasters, to gain total privacy, urethane, critical consideration, granular, permeable, to drain, cohesive soils, permafrost areas, radon, odorless radioactive gas.

Exercise 2. Translate the following words and word combinations from Ukrainian into English:

Ентузіасти, бути чутливим до, підземна будівля, землетрус, температурна різниця, торнадо, ретельно ізольовані стіни, ядерна катастрофа, пограбування, вибух, вторгнення, специфічні розміри.

Exercise 3. Read and translate the text.

Exercise 4. Answer the following questions:

1. Why has the idea of living in an underground become so popular?
2. Do many underground enthusiasts join local and international organizations for support the idea of living in underground houses?
3. What are the advantages of an underground lifestyle?
4. Are temperatures inside an underground house more stable than in conventional homes?
5. Can the protection against the extremes of Mother Nature, such as high winds, hailstorms, tornadoes, hurricanes and earthquakes be provided in an underground house?
6. What man-made disasters does a buried house provide maximum protection from?
7. What is the most common cause for failure of underground houses?
8. What kinds of soils are least suitable for underground construction?
9. What other critical factors cited by the DOE must be taken into consideration while building an ubnderground house?
10. Why should anyone interested in building an underground Monolithic Dome take ample advantage of the information and resources available at MDL?

Exercise 5. Define whether the following statements are true or false.

1. More and more people, worldwide, have already or plan to build an earth-sheltered home.
2. An earth-sheltered home is more susceptible to the impact of extreme outdoor air temperatures, so you will feel the effects of adverse weather as much as in a conventional house.
3. Other disadvantages cited by the DOE include protection against the extremes of Mother Nature, such as high winds, hailstorms, tornadoes, hurricanes and earthquakes; less susceptibility to fire; lower insurance premiums; less maintenance; natural soundproofing; conservative use of land and natural resources.
4. A buried house provides maximum protection from only natural disasters.
5. Many claim that earth-sheltered homes are the only way to gain total privacy. Still others like having the ability to grow your food on top of your house.
6. The only answer is to have enough insulation so that the interior surface temperature of the walls equals the temperature of the air inside the house.
7. Obviously a Monolithic Dome can be sufficiently insulated to prevent condensation.
8. Some require that all sleeping spaces must have a window with specific dimensions that opens to the inside.
9. Cohesive soils, such as clay, and permafrost areas are least suitable for underground construction.
10. The DOE recommends appropriate testing and consultations with professionals for anyone interested in building an underground Monolithic Dome.

Exercise 6. Refer to the text and complete the sentences below:

1. An earth-sheltered home is less susceptible to the impact of extreme outdoor …
2. Other advantages cited by the DOE include less lower insurance premiums; less maintenance; natural soundproofing; conservative use of …
3. A buried house provides maximum protection from not only natural disasters but man-made ones, such as...
4. Many claim that earth-sheltered homes are the only way to gain total privacy. Still others like having the ability to grow your food on top of your house.
5. The most common cause for failure of underground houses is not gross heat escaping the structure but an interior surface temperature that allows...
6. The DOE says that soil type is another critical...
7. Cohesive soils, such as clay, and permafrost areas are least suitable for ...
8. Other factors cited by the DOE include radon, an invisible, odorless radioactive gas produced naturally when uranium in rock…
9. For all these considerations, the DOE recommends appropriate testing and consultations with ...

Exercise 7. Make dialogues. Discuss all possible advantages and disadsvantages of underground houses.

Exercise 8. Write a summary of the text.

TEXT2. MINING.

Mining is the process by which ores or related materials are extracted from the Earth. Ore is defined as a rock or mineral, generally metallic, which can be mined, processed, transported, and sold at a profit. Therefore, the classification of an Earth material as ore depends as much on economics and technology as geology. Nonmetallic substances that are commonly mined but not considered to be ores include coal, phosphate, and sand and gravel.

Mining can occur either at Earth's surface in strip mines or open pit mines, or beneath the surface in underground mines. The method used depends on the depth, lateral extent, and economic value of the rock being mined. The deepest underground mine on Earth, which is 2.4 mi (3.8 km) deep, is a South African gold mine. The open-pit Bingham Canyon Mine near Salt Lake City, Utah, is more than 2.5 mi (4 km) wide and more than 0.62 mi (1 km) deep. It is the largest man-made excavation on Earth. Excavation of the pit began in 1906 and has continued into the early twenty-first century, producing primarily copper with smaller amounts of gold, silver, and molybdenum.

Many metals occur in their native state or in readily accessible ores. Thus, the extraction and working of metals dates much further back in time than does the mining industry. Some of the earliest known mines were those developed by the Greeks in the sixth century B.C. As were mines for many centuries thereafter, the workers in these mines were slaves and prisoners of war. By the time the Roman Empire reached its peak, it had established mines throughout the European continent, in the British Isles, and in parts of North Africa. The first scientific description of mining operations was the book *De Re Metallica* by the Saxon physician Georgius Agricola (1494–1555). *De Re Metallica,* which remained an authoritative reference for nearly 200 years, was translated from Latin to English by mining engineer and former United States president Herbert Hoover (1874–1964) and his wife Lou Henry Hoover (1874–1944).

Underground mining involves the excavation of tunnels and rooms beneath Earth's surface. Compared to surface mining, underground mining is expensive and dangerous. Therefore, it is used primarily in situations where high-value ores such as gold are concentrated in narrow veins or other unusually rich deposits. Unlike surface mines, underground mines can also be excavated beneath bodies of water.

The vocabulary of underground mining has developed over several centuries. Shafts are vertical passages excavated downward from Earth's surface, whereas raises and winzes are vertical passages excavated upward and downward, respectively, between horizontal workings beneath the surface. An adit is a horizontal passage excavated into a hillside, whereas an incline is a sloping passage excavated inward from a hillside. Horizontal underground passages following the trend of the ore body are known as drifts. An open room beneath the surface is a stope and its roof is known as the back.

Underground mines are excavated using a variety of methods. Room-and-pillar mining is the excavation of large open rooms supported by pillars. Coal and rock salt (halite) are commonly mined using room-and-pillar methods. Longwall mining is a form of underground mining widely used in the coal industry. A coal seam is completely removed using specialized machines, leaving no support and allowing the overlying rock to slowly subside as the seam is mined. Open-stope mining, in contrast, consists of rooms without any supporting pillars. It is employed if the ore body is small or the rock is strong enough to withstand collapse into the stope. Sub-level caving and block caving involve the excavation of vertical chutes and horizontal passages beneath an ore body, which is then allowed to collapse into the openings under its own weight. Gloryhole mining is a term used to describe caving methods that result in the formation of a crater or depression on the surface above the mine.

Certain water-soluble minerals can be removed from the Earth by dissolving them with hot water piped into the ground under pressure. This practice is known as solution mining. The minerals dissolve in the hot water and then are carried to

the surface. In the Frasch process, a system of pipes is sunk into a known deposit of sulfur at some depth under ground. Steam forced into one pipe melts the sulfur, which is then extracted in a liquid form through a second pipe.

Exercise 1. Translate the following words and word combinations from English into Ukrainian:

Strip mines
readily accessible ores
excavation of tunnels
surface mining
underground mining
shafts
vertical passages
raises and winzes
horizontal workings
adit
hillside
sloping passage
drifts
stope.

Exercise 2. Translate the following words and word combinations from Ukrainian into English:

Видобувати з надр, обробляти, транспортувати, отримувати прибуток, залежати від, економічна цінність, мідь, молібден, надзвичайно багаті родовища.

Exercise 3. Read and translate the text.

Exercise 4. Answer the following questions:

1. What process is called mining?
2. How is ore defined and classified? What does the classification of ore depend on?
3. What are the two principal methods of mining?
4. What are some nonmetallic substances that are commonly mined but not considered to be ore?
5. What does the mining method depend on?
6. Where is the deepest underground mine on Earth?
7. What are some of the earliest known mines? Who developed them and when were they developed?
8. What is the first scientific description of mining operations?
9. What is the difference between underground mining and surface mining?
10. What are advantages and disadvantages of these two kinds of mining?
11. How do we call vertical passages excavated downward from Earth's surface?
12. How do we call vertical passages excavated upward and downward, respectively, between horizontal workings beneath the surface?
13. What is the name of a horizontal passage excavated into a hillside?
14. What is the name of horizontal underground passages following the trend of the ore body?
15. What is room-and-pillar mining?
16. Coal and rock salt (halite) are commonly mined using room-and-pillar methods.
17. Where is longwall mining widely used?

Exercise 5. Match the words and word expressions with their definitions.

a) nonmetallic substances, b) raises and winzes, c) mining, d) drifts, e) a stope, f) strip mines g) ore, h) an incline, i) an adit, j) shafts, k) underground mines

1. Mining is the process by which ores or related materials are extracted from the Earth.
2. Ore is defined as a rock or mineral, generally metallic, which can be mined, processed, transported, and sold at a profit.
3. Nonmetallic substances that are commonly mined but not considered to be ores include coal, phosphate, and sand and gravel.
4. Mining at Earth's surface in strip mines or open pit mines,
5. Mining beneath the surface in underground mines.
6. Vertical passages excavated downward from Earth's surface,
7. Vertical passages excavated upward and downward, respectively, between horizontal workings beneath the surface.
8. A horizontal passage excavated into a hillside
9. A sloping passage excavated inward from a hillside.
10. Horizontal underground passages following the trend of the ore body.
11. An open room beneath the surface

Exercise 6. Define whether the following statements are true or false.

1. Ore is defined as a rock or mineral, generally nonmetallic, which can be mined, processed, transported, and sold at a profit.
2. Mining can occur either at Earth's surface in underground mines or beneath the surface in strip mines or open pit mines.

3. The deepest underground mine on Earth, which is 2.4 mi (3.8 km) deep, is a South African molybdenum mine.
4. Some of the earliest known mines were those developed by the Greeks in the sixth century B.C.
5. By the time the Roman Empire reached its peak, it had established mines throughout the Asian continent and in parts of North Africa.
6. The first scientific description of mining operations was the book *De Re Metallica* by the Saxon physician Georgius Agricola (1494–1555).
7. Room-and-pillar mining is the excavation of large open rooms supported by rocks.
8. Longwall mining is a form of underground mining widely used in the coal industry.
9. Open-stope mining consists of rooms with supporting pillars.
10. Gloryhole mining is a term used to describe caving methods that result in the formation of a crater or depression on the surface above the mine.

Exercise 7. Refer to the text and complete the sentences below:

1. Therefore, the classification of an Earth material as ore depends as much on …
2. The open-pit Bingham Canyon Mine near Salt Lake City, Utah, is the largest man-made ...
3. As were mines for many centuries thereafter, the workers in these mines were...
4. *De Re Metallica*, which remained an authoritative reference for nearly 200 years, was translated from … to … by mining engineer and former United States president Herbert Hoover and his wife Lou Henry Hoover.
5. Shafts are vertical passages excavated downward from …
6. Raises and winzes are vertical passages excavated upward and downward, respectively, between …

7. An adit is a horizontal passage excavated into a …
8. An incline is a sloping passage excavated inward …
9. Horizontal underground passages following the trend of the ore body are known as ...
10. An open room beneath the surface is a … and its roof is known as the ...

Exercise 8. Make dialogues. Discuss the history of mining, different methods of mining as well as a mining vocabulary.

TEXT 3. FACTS ON THE GROUND: THE OK TEDI MINE.

The Ok Tedi mine, on the banks of the Ok Tedi river in western Papua New Guinea, began producing copper and gold for the giant Australian mining corporation BHP (Broken Hill Properties Ltd.) in 1984. Because the mine's tailing dam was destroyed during construction by a massive landslide, the company convinced the government to allow it to dump waste directly into the river.

Currently the mine discharges, on a daily basis, 80,000 tons of ore and 120,000 tons of waste rock into the Ok Tedi river. One industry- funded study predicts that if the dumping continues at that rate until the mine is scheduled to close in 2010, the total amount of sediment in the river would be 1.72 billion tons, or the weight of 4,712 Empire State Buildings.

The dumping has contaminated the river with toxic metals and caused an enormous, permanent flood. Nearly all the fish in the river have been poisoned, and some fish species appear to have gone extinct. Vast tracts of forest have been drowned. A 1999 estimate put the amount of forest damaged in that year alone at 176 square kilometers, an area nearly three times the size of Manhattan. Most of the wildlife has disappeared from the region. Plantings of sago palm and other staple crops have died, and some 30,000 to 50,000 people have been displaced. One anthropologist studying the situation coined a new term to describe it: "ecocide."

The people affected were unable to negotiate a settlement with BHP directly, so a delegation of them addressed their concerns to the International Water Tribunal in The Hague. Although the tribunal had little power to enforce change, its involvement drew international attention. In 1996, an out-of-court settlement was reached: BHP was required to pay compensation and reform its waste disposal practices. But even the industry and its funders were beginning to wonder whether the mine was worth the damage it was doing. In 2000, the World Bank publicly suggested that the mine be closed. In 2002, the CEO of BHP

Billiton (the successor company to BHP) called the project “an environmental abyss” and said it should never have been built.

In the same year, BHP Billiton handed over its 52 percent share of the project to a government-controlled local corporation, in exchange for indemnity from future legal claims. In an effort at remediation, the government has begun dredging the river to remove about 20 million tons of sediment per year. The dredging has begun to reverse the flooding, and vegetation is slowly returning to some areas. Ultimately, however, up to 6,600 square kilometers of vegetation may be destroyed during the life of the mine.

Exercise 1. Translate the following words and word combinations from English into Ukrainian:

The giant Australian mining corporation
mine’s tailing dam
mine discharges
to predict
dumping
sediment
to contaminate
permanent flood
wildlife
to disappear
sago palm
“ecocide”
to address concerns
to enforce change
waste disposal practices
“an environmental abyss.”

Exercise 2. Translate the following words and word combinations from Ukrainian into English:

Мідь

масивний зсув

переконати

токсичні метали

отруїти

види риб

вимирати

антропологи

мати вплив

звернути увагу міжнародної спільноти

сплатити компенсацію.

Exercise 3. Read and translate the text.

Exercise 4. Answer the following questions:

1. When did the Ok Tedi mine, on the banks of the Ok Tedi river in western Papua New Guinea, begin producing copper and gold for the giant Australian mining corporation Broken Hill Properties Ltd.?
2. Why did the BHP Company convince the government to allow it to dump waste directly into the river?
3. How many tons of ore and waste rock does the mine currently discharge into the Ok Tedi river?
4. What is the prediction of the industry- funded study?
5. What has contaminated the river with toxic metals and caused an enormous, permanent flood?
6. What impact did the contamination make on the fish in the river, vast tracts of forest, most of the wildlife in the region?

7. What a new term was introduced by one anthropologist studying the situation?
8. Why did the delegation of the affected people address its concerns to the International Water Tribunal in the Hague?
9. Did the tribunal had much power to enforce change, and what was the result of its involvement?
10. What out-of-court settlement was reached in 1996?
11. Was the mine worth the damage it was doing?
12. When did the World Bank publicly suggest that the mine be closed?
13. How did the CEO of BHP Billiton (the successor company to BHP) call the project?
14. Why has the government begun dredging the river and what is the result of it?

Exercise 5. Define whether the following statements are true or false.

1. Because the mine's tailing dam was destroyed during construction by a massive hurricane, the company convinced the government to allow it to dump waste directly into the river.
2. Currently the mine discharges, on a daily basis, 80,000 tons of ore and 120,000 tons of waste rock into the Ok Tedi river.
3. One industry- funded study predicts that if the dumping continues at that rate until the mine is scheduled to close in 2010, the total amount of sediment in the river would be 1.72 billion tons.
4. The tornado has contaminated the river with toxic metals and caused an enormous, permanent flood.
5. All the fish in the river have been poisoned, and all fish species appear to have gone extinct.
6. A 1999 estimate put the amount of forest damaged in that year alone at 176 square kilometers, an area nearly three times the size of Manhattan.
7. All the wildlife has disappeared from the region.

8. One anthropologist studying the situation coined a new term to describe it: “ecocide.”
9. The people affected were able to negotiate a settlement with BHP directly.
10. Although the tribunal had little power to enforce change, its involvement drew international attention.
11. In 1996, an out-of-court settlement was reached: BHP was required to pay compensation and reform its waste disposal practices.
12. In 2000, the World Bank publicly suggested that the mine be restored.
13. In 2002 BHP Billiton handed over its 52 percent share of the project to a government-controlled local corporation, in exchange for indemnity from future legal claims.
14. In an effort at remediation, the government has begun dredging the river to remove about 20 million tons of sediment per year.

Exercise 6. Refer to the text and complete the sentences below:

1. The company convinced the government to allow it to dump waste directly into the...
2. Currently the mine discharges, on a daily basis, 80,000 tons of … and 120,000 tons of … into the Ok Tedi river.
3. The dumping has contaminated the river with toxic metals and caused an enormous, permanent...
4. Nearly all the fish in the river have been poisoned, and some fish species appear to have gone…
5. Vast tracts of forest have been …
6. One anthropologist studying the situation coined a new term to describe it: “...”
7. The tribunal had little power to enforce change, but its involvement drew international...
8. In 1996, an out-of-court settlement was …

9. In 2000, the World Bank publicly suggested that the mine be... In 2002, the CEO of BHP Billiton (the successor company to BHP) called the project “an environmental …”
10. In an effort at remediation, the government has begun dredging the river to remove about 20 million tons of … per year. The dredging has begun to reverse the flooding, and … is slowly returning to some areas.

Exercise 7. Make dialogues. Discuss all negative impacts of such actions on the environment of the region.

Exercise 8. Retell the text.

TEXT 4. FACTS ON THE GROUND: THE YANACOCHA MINE.

On June 2, 2000, a truck from the Yanacocha gold mine in northern Peru spilled 150 kilograms of mercury out of some poorly sealed containers and onto a 43-kilometer stretch of road running through the towns of Choropampa, Magdalena, and San Juan. (Mercury is a secondary product of the mine.) Many local people, not knowing what the material was or that it was toxic, collected it in the hope that it might be valuable. Other villagers were hired by the mine to clean up the spill—but were not provided with any protective gear. Mercury can damage the lungs, kidneys, and nervous system. It can also cause birth defects.

The spill affected an estimated 925 people; 400 of them were treated for mercury poisoning and over 130 were hospitalized. The Newmont Mining Company, the US-based corporation and the World Bank’s International Finance Corporation (IFC), spent $12 to 14 million on the clean-up, but was unable to account for nearly 15 percent of the spilled mercury. In exchange for agreeing not to sue the mine, some of the spill victims were offered small cash settlements and medical care. But many residents continue to report health problems and some have attempted to press their case against Newmont in US courts.

Yanacocha, located high in the Andes, is the most profitable gold mine in South America and the second largest gold mine in the world (after the Grasberg mine in Indonesia). Newmont insists that it has been a good corporate citizen of the Yanacocha region. The communities affected by the mine, the company argues, receive a share of the mining wealth. The company also claims that it has created over 1,600 jobs in the area, and helped build schools and clinics.

But many area residents worry about the mine. Some argue that by causing local inflation and driving people off their land, it has deepened their poverty. They also worry about the condition of their streams. “The water that comes down from the mountains is now brown, full of sediments,” says one resident. “The trout are dying.” They worry about the cyanide used to leach the gold out of the ore; they fear it has contaminated the water and is sickening their livestock. And they worry about what’s in the dust that blows off the tailing piles and into their homes.

Since the mercury spill, Newmont has proposed expanding the mine to Quilish Mountain, the sixth mountain in the area the company would be leveling for gold. Quilish is a critical source of water for over 100,000 people in and around the nearby city of Cajamarca. Many local residents, concerned about the risks of water pollution, oppose the plan. There have been mass protests, including one in April 2003 that drew thousands of people to Cajamarca’s main square. “I’m aware that Peru is a country that relies on mining,” Jorge Hoyos, the Mayor of Cajamarca, told a Reuters reporter in 2002. “But we can’t sit by and wait for our water supply to be ruined. We can’t swap gold for lives.”

Exercise 1. Translate the following words and word combinations from English into Ukrainian:

Poorly sealed containers
protective gear
to cause birth defects

to sue the mine

a share

to deepen the poverty

trout

cyanide

to leach the gold out of the ore

to ruin water supply.

Exercise 2. Translate the following words and word combinations from Ukrainian into English:

Ртуть

пролити

токсичний

цінний

легені

нирки

скаржитись на проблеми здоров'я

нервова система

отруєння

госпіталізувати

жертва

медична допомога,

Exercise 3. Read and translate the text.

Exercise 4. Answer the following questions

1. When and where did a truck from the Yanacocha gold mine spill 150 kilograms of mercury out of some poorly sealed container?
2. Why did many local people collect the mercury spilleed?

3. Were other villagers, hired by the mine to clean up the spill, provided with any protective gear?
4. What negative effects can mercury have on human body?
5. How many people did the spill affect and in which ways?
6. How much money was spent on the clean-up by the Newmont Mining Company, the US-based Corporation and the World Bank's International Finance Corporation (IFC)?
7.
8. What were some of the spill victims offered in exchange for agreeing not to sue the mine?
9. Where is the second largest gold mine in the world (after the Grasberg mine in Indonesia)?
10. Do the communities affected by the mine receive a share of the mining wealth?
11. What other kind of assistance does the community receive from the company?
12. Why do many area residents worry about the mine?
13. What negative results are made on the nature of the region?
14. What has Newmont proposed doing in connection with and what is the reaction of the local people?

5. Define whether the following statements are true or false.

1. Many local people, knowing that the material was was toxic, collected it hoping that is valuable.
2. Other villagers were hired by the mine to clean up the spill—and were provided with good protective gear.
3. Mercury can damage the lungs, kidneys, and nervous system. It can also cause birth defects.

4. The spill affected an estimated 925 people, but none of them was treated for mercury poisoning and hospitalized.
5. In exchange for agreeing not to sue the mine, some of the spill victims were offered small cash settlements and medical care.
6. Yanacocha, located high in the Andes, is the most profitable gold mine in South America and the first largest gold mine in the world.
7. The company also claims that it has created over 1,600 jobs in the area, and helped build schools and clinics.
8. Many area residents argue that by causing local inflation and driving people off their land, it has deepened their poverty.
9. They worry about the cyanide used to leach the gold out of the ore; they fear it has contaminated the water and is sickening their livestock.
10. There have been mass protests, including one in April 2003 that drew thousands of people to Cajamarca's main square.

Exercise 6. Refer to the text and complete the sentences below:

1. On June 2, 2000, a truck from the Yanacocha gold mine in northern Peru spilled 150 kilograms of mercury out of some …
2. Other villagers were hired by the mine to clean up the spill—but were not provided with any ...
3. Mercury can cause birth...
4. The spill affected an estimated 925 people; 400 of them were treated for mercury …
5. The Newmont Mining Company, the US-based corporation and the World Bank's International Finance Corporation (IFC), spent $12 to 14 million on the …
6. In exchange for agreeing not to sue the mine, some of the spill victims were offered small cash … and medical ...
7. Yanacocha is located high in the …

8. The company also claims that it has created over 1,600 jobs in the area, and helped build ...

9. They also worry about the condition of their...

10. “The trout are ...”

11. They worry about the cyanide used … the gold out of the ore; they fear it has… the water and is sickening their livestock.

12. Many local residents, concerned about the risks of water …, oppose the plan.

Exercise 7. Make dialogues. Discuss the problems connected with the mercuty spill and the impacts it made on people’s health.

Exercise 8. Retell the text.

TEXT 5. SURFACE MINING.

Surface mining is less expensive and safer than underground mining. About 90% of the rock and mineral resources mined in the United States and more than 60% of the nation's coal is produced by surface mining techniques. Coal mining accounts for about half of all surface mining, extraction of sand, gravel, stone, and clay for another 35%, phosphate rock for about 5%, and all metallic ores, for about 13%.

There are four kinds of surface mines: open-pit mines, strip mines, mountaintop mines, and alluvial (or placer) mines. Open-pit mines consist of deep cone-shaped holes or pits that are excavated in rock that is first loosened by blasting. In order to prevent the sides of the pit from collapsing, open-pit mines must be continually widened as they are deepened. Open-pit mines are used when the ore is of low grade, meaning that the amount of metal per cubic meter or kilogram of rock is small, and disseminated, meaning that the metals are distributed throughout large volumes of rock rather than being concentrated in veins. The size of open-pit mines, which often take decades to excavate, makes it uneconomical to reclaim the pits by filling them with rock.

Strip mines consist of shallow excavations, perhaps 109 yd (100 m) or less, that are used to mine tabular bodies of rock such as coal. Soil and rock above the mined material, known as overburden, are removed and set aside. Because the strip mines consist of shallow excavations, the overburden can be economically replaced, re-contoured to resemble the original topography, and replanted.

Mountaintop mining came into widespread use in Appalachian coal fields following the 1997 passage of the Surface Mining Control and Reclamation Act by the United States Congress. Mountaintop mining is similar to strip mining in that the overburden above a tabular coal deposit is removed. Instead of being stockpiled and used to restore the original topography, however, the overburden is used to fill adjacent valleys. Although mountaintop mining is an inexpensive

method of mining coal in mountainous areas, the filling of valleys can have negative environmental impacts. Mountain-top mining in West Virginia was halted by a court order in 2002 on the grounds that the practice violated the Clean Water Act, but changes to the act may again make the method legal.

Alluvial mining is a form of surface mining used to recover heavy minerals such as gold from sand and gravel beds, including stream beds, known as placer deposits. In some cases these deposits can be removed mechanically by agitating the sand and gravel in simple pans. A more sophisticated and efficient way of separating placer minerals from the sand and gravel is a sluice box, a long, shallow box with wooden separators placed along its bottom. As sand and gravel is shaken in the sluice box, lighter sand grains are washed away and heavier metals are left behind. A particularly destructive form of alluvial mining is hydraulic mining, in which pressurized water is used to wash away large amounts of sand and gravel. Dredges are used in other large-scale alluvial mining operations.

Exercise 1. Translate the following words and word combinations from English into Ukrainian:

Underground mining, rock and mineral resources, surface mining techniques, extraction of gravel, phosphate rock, open-pit mines, strip mines, mountaintop mines, and alluvial (or placer) mines, deep cone-shaped holes, blasting.

Exercise 2. Translate the following words and word combinations from Ukrainian into English:

Мінеральні ресурси, видобуток, розширювати, поглиблювати, негативний вплив на навколишнє середовище, металева руда, економічний метод видобутку.

Exercise 3. Read and translate the text.

Exercise 4. Answer the following questions:

1. Which of the two methods is less expensive and safer: surface mining or underground mining?
2. How many kinds of surface mines can be singled out?
3. What are general characteristics and main differences of open-pit mines, strip mines, mountaintop mines, and alluvial mines?
4. What mines consist of deep cone-shaped holes or pits that are excavated in rock that is first loosened by blasting?
5. What mines consist of shallow excavations that are used to mine tabular bodies of rock such as coal?
6. What mines are used when the ore is of low grade?
7. What are main advantages and disadvantages of mountaintop mining?
8. When is such a form of surface mining as alluvial mining used?
9. How can such deposits as heavy minerals such as gold from sand and gravel beds be removed?
10. What is a more sophisticated and efficient way of separating placer minerals from the sand and gravel?
11. What is a particularly destructive form of alluvial mining and why?

Exercise 5. Match the words and word expressions with their definitions.

a) strip mines

b) mountaintop mining

c) overburden

d) open-pit mines

e) hydraulic mining

f) alluvial mining.

1. Mines that consist of deep cone-shaped holes or pits that are excavated in rock that is first loosened by blasting.
2. Mines that consist of shallow excavations, perhaps used to mine tabular bodies of rock such as coal.
3. Soil and rock above the mined material which are removed and set aside.
4. A kind of mining, similar to strip mining, in that the overburden above a tabular coal deposit is removed, but instead of being stockpiled and used to restore the original topography, however, the overburden is used to fill adjacent valleys.
5. A form of surface mining used to recover heavy minerals such as gold from sand and gravel beds, including stream beds, known as placer deposits.
6. A particularly destructive form of alluvial mining in which pressurized water is used to wash away large amounts of sand and gravel.

Exercise 6. Define whether the following statements are true or false.

1. Surface mining is more expensive than underground mining.
2. Strip mines are used when the ore is of low grade, meaning that the amount of metal per cubic meter or kilogram of rock is small, and disseminated, meaning that the metals are distributed throughout large volumes of rock rather than being concentrated in veins.
3. A particularly destructive form of alluvial mining is hydraulic mining, in which pressurized water is used to wash away large amounts of sand and gravel.
4. Alluvial is similar to strip mining in that the overburden above a tabular coal deposit is removed. Instead of being stockpiled and used to restore the original topography, however, the overburden is used to fill adjacent valleys.
5. Although mountaintop mining is an inexpensive method of mining coal in mountainous areas, the filling of valleys can have negative environmental impacts.
6. The size of open-pit mines, which often take decades to excavate, makes it economical to reclaim the pits by filling them with rock.

Exercise 7. Refer to the text and complete the sentences below:

1. Because the strip mines consist of shallow excavations, the overburden can be economically…
2. Coal mining accounts for about half of all surface mining, extraction of …
3. In order to prevent the sides of the pit from collapsing, open-pit mines must be continually …
4. Open-pit mines are used when the ore is of low grade, meaning that the amount of metal per cubic meter or kilogram of rock is … , and disseminated, meaning that the metals are distributed throughout large volumes of rock rather than being concentrated in ...
5. Instead of being stockpiled and used to restore the original topography, however, the overburden is used to fill ...
6. Although mountaintop mining is an inexpensive method of mining coal in mountainous areas, the filling of valleys can have …
7. Alluvial mining is a form of surface mining used to recover heavy minerals such as gold from sand and gravel beds, including stream beds, known as …
8. In some cases these deposits can be removed … by agitating the sand and gravel in simple pans.
9. A more sophisticated and efficient way of separating placer minerals from the sand and gravel is …
10. As sand and gravel is shaken in the sluice box, lighter sand grains are … and heavier metals are ...
11. Dredges are used in other large-scale alluvial …

Exercise 8. Make dialogues. Discuss different kinds of mining, their characteristic features, their advantages and disadvantages.

TEXT 6 (A). HEAVY MACHINERY.

Exercise 1. Listen to the text twice and do the following tasks:

Heavy machinery is needed in mining for exploration and development, to remove and stockpile overburden, to break and remove rocks of various hardness and toughness, to process the ore and for reclamation efforts after the mine is closed. Bulldozers, drills, explosives and trucks are all necessary for excavating the land. In the case of placer mining, unconsolidated gravel, or alluvium, is fed into machinery consisting of a hopper and a shaking screen or trommel which frees the desired minerals from the waste gravel. The minerals are then concentrated using sluices or jigs. Large drills are used to sink shafts, excavate stopes and obtain samples for analysis. Trams are used to transport miners, minerals and waste. Lifts carry miners into and out of mines, as well as moving rock and ore out, and machinery in and out of underground mines. Huge trucks, shovels and cranes are employed in surface mining to move large quantities of overburden and ore. Processing plants can utilize large crushers, mills, reactors, roasters and other equipment to consolidate the mineral-rich material and extract the desired compounds and metals from the ore.

Exercise 2. Define whether the following statements are true or false.

1. Heavy machinery is needed in mining for exploration and development, to remove and stockpile overburden, to break and remove rocks of various hardness and toughness, to process the ore and for reclamation efforts after the mine is closed.
2. Bulldozers, drills, explosives and trucks are not necessary for excavating the land.

3. In the case of placer mining, unconsolidated gravel, or alluvium, is fed into machinery consisting of a hopper and a shaking screen or trommel which prevents to free the desired minerals from the waste gravel.
4. The minerals cannot be concentrated using sluices or jigs.
5. Large drills are used to sink shafts, excavate stopes and obtain samples for analysis.
6. Lifts are used to transport miners, minerals and waste.
7. Trams carry miners into and out of mines, as well as moving rock and ore out, and machinery in and out of underground mines.
8. Huge trucks, shovels and cranes are employed in surface mining to move large quantities of overburden and ore.
9. Processing plants cannot utilize large crushers, mills, reactors, roasters and other equipment to consolidate the mineral-rich material and extract the desired compounds and metals from the ore.

Exercise 3. Find the right answer.

1… is needed in mining for exploration and development, to remove and stockpile overburden, to break and remove rocks of various hardness and toughness, to process the ore and for reclamation efforts after the mine is closed.

a) scooters;

b) heavy machinery

c) helicopters

2. Bulldozers, drills, explosives and trucks are all necessary for …

a) excavating the land

b) transporting miners, minerals and waste;

c) carrying miners to and out of mines

3. In the case of…, unconsolidated gravel, or alluvium, is fed into machinery consisting of a hopper and a shaking screen or trommel which frees the desired minerals from the waste gravel.

a) quarring;

b) surface mining;

c) placer mining

4. Huge trucks, shovels and cranes are employed in … to move large quantities of overburden and ore.

a) surface mining;

b) room and pillar mining;

c) subsurface mining

Exercise 4. Answer the following questions:

1. What is heavy machinery needed in mining for?
2. What machines are necessary for excavating the land?
3. What is fed into machinery consisting of a hopper and a shaking screen or trommel which frees the desired minerals from the waste gravel in the case of placer mining?
4. What is the usage of large drills in mining?
5. Where are trams and lifts used?
6. What carries miners into and out of mines?

7. Where are huge trucks, shovels and cranes employed in surface mining?
8. Where can large crushers, mills, reactors, roasters and other equipment to consolidate the mineral-rich material and extract the desired compounds and metals from the ore be utilized?

Exercise 5. Complete the following sentences.

1. Heavy machinery is needed in mining for …
2. Bulldozers, drills, explosives and trucks are all necessary for excavating the ...
3. In the case of placer mining, unconsolidated gravel, or alluvium, is fed into machinery consisting of a hopper and a shaking screen or trommel which frees …
4. The minerals are then concentrated using …
5. Large drills are used to sink shafts, excavate stopes and obtain samples for …
6. Trams are used to transport miners, minerals and …
7. Lifts carry miners into and out of mines, as well as moving ...
8. Huge trucks, shovels and cranes are employed in surface mining to move …
9. Processing plants can utilize large crushers, mills, reactors, roasters and other equipment to consolidate the mineral-rich material and extract the desired…

TEXT 6 (B). ORE MILLS.

Exercise 1. Listen to the text twice and do the following tasks:

Ore mills generate large amounts of waste, called tailings, which are perhaps their largest environmental burden. For example, 99 tonnes of waste are generated per tonne of copper, with even higher ratios in gold mining. These tailings can be toxic. Tailings, which are usually produced as a slurry, are most commonly dumped into ponds made from naturally-existing valleys. These ponds are secured by impoundments (dams or embankment dams). In 2000 it was estimated that 3,500 tailings impoundments existed, and that every year, 2 to 5 major failures and 35 minor failures occurred; for example, in the Marcopper mining disaster at least 2 million tons of tailings were released into a local river. Subaqueous tailings disposal is another option. The mining industry has argued that submarine tailings disposal (STD), which disposes of tailings in the sea, is ideal because it avoids the risks of tailings ponds; although the practice is illegal in the United States and Canada, it is used in the developing world.

Exercise 2. Define whether the following statements are true or false.

1. Ore mills generate large amounts of waste, called tailings, which are perhaps their smallest environmental burden.
2. For example, 99 tonnes of waste are generated per tonne of copper, with even higher ratios in gold mining.
3. These tailings cannot be toxic.
4. Tailings, which are usually produced as slurry, are most commonly dumped into ponds made from naturally-existing valleys.
5. These ponds are secured by impoundments (dams or embankment dams).
6. In 2000 it was estimated that 3,500 tailings impoundments existed, and that every year, 2 to 5 major failures and 35 minor failures occurred.

7. In the Marcopper mining disaster at least 2 million tons of tailings were released into the air.
8. The mining industry has argued that submarine tailings disposal (STD), which disposes of tailings in the sea, is ideal because it avoids the risks of tailings ponds; and this practice is legal in the United States and Canada.

Exercise 3. Answer the following questions:

1. What do ore mills generate?
2. What constitutes the largest environmental burden?
3. How much waste is generated per tonne of copper?
4. Can these tailings be toxic?
5. Are tailings, which are usually produced as a slurry, most commonly dumped into ponds made from naturally-existing valley?
6. How are these ponds secured?
7. When was it estimated that every year 2 to 5 major failures and 35 minor failures occurred?
8. How many tons of tailings were released into a local river in the Marcopper mining disaster?
9. What is subaqueous tailings disposa?
10. Is submarine tailings disposal (STD), which disposes of tailings in the sea, ideal because it avoids the risks of tailings ponds?

Exercise 4. Complete the following sentences.

1. Ore mills generate large amounts of waste…
2. For example, 99 tonnes of waste are generated per tonne of copper, with even higher ratios in …
3. These tailings can be ...
4. Tailings, which are usually produced as a slurry, are most commonly dumped into ponds ...
5. These ponds are secured by impoundments (…).

6. In 2000 it was estimated that 3,500 tailings impoundments existed, and that every year, 2 to 5 major failures and 35 minor failures …
7. The mining industry has argued that submarine tailings disposal (STD), which disposes of tailings in the sea, is ideal because it avoids the risks of …

TEXT 7 (A). UNDERGROUND MINING METHOD.

Exercise 1. Read the text and do the following tasks:

Underground modes of access include drift, slope, and shaft mining, and actual mining methods include longwall and room and pillar mining. Drift mines enter horizontally into the side of a hill and mine the coal within the hill. Slope mines usually begin in a valley bottom, and a tunnel slopes down to the coal to be mined. Shaft mines are the deepest mines; a vertical shaft with an elevator is made from the surface down to the coal. In room and pillar mining, the most common type of underground coal mining, coal seams are mined by a "continuous miner" that cuts a network of "rooms" into the seam. As the rooms are cut, the continuous miner simultaneously loads the coal onto a shuttle or ram car where it will eventually be placed on a conveyor belt that will move it to the surface. "Pillars" composed of coal are left behind to support the roof of the mine. Each "room" alternates with a "pillar" of greater width for support. Using this mining method normally results in a reduction in recovery of as much as 60 percent because of coal being left in the ground as pillars. Removing support during retreat mining can lead to roof falls, so the pillars are removed in the opposite direction from which the mine advanced: hence the term "retreat mining."

Exercise 2. Find synonyms in the text:

a) admittance
b) subterranean
c) breadth
d) contrary
e) breakdown
f) general
g) synchronous
h) persistent
i) ceiling
j) amount;

Exercise 3. Find antonyms in the text:

Exclude upright
Artificial
Narrow
Constant
Effectual
Flat
Add
In front of
Floor.

Exercise 4. Translate the following word combinations into Ukrainian:

- Drift mines
- Slope mines
- Shaft mines
- Under special circumstances
- To be more efficient than

Exercise 5. Put 10 questions to the text.

TEXT 7 (B). ENVIRONMENTAL ISSUES WITH MINING.

Exercise 1. Listen to the text twice and do the following tasks:

Environmental issues can include erosion, formation of sinkholes, loss of biodiversity, and contamination of soil, groundwater and surface water by chemicals from mining processes. In some cases, additional forest logging is done in the vicinity of mines to increase the available room for the storage of the created debris and soil. Besides creating environmental damage, the contamination resulting from leakage of chemicals also affects the health of the local population. Mining companies in many countries may be required to follow environmental and rehabilitation codes; however, in many areas regulation is not enforced, and mining companies have encouraged self-policing.In 1992 a Draft Code of Conduct for Transnational Corporations was proposed at the Rio Earth Summit by the UN Centre for Transnational Corporations (UNCTC), but the Business Council for Sustainable Development (BCSD) together with the International Chamber of Commerce (ICC) argued successfully for self-regulation instead.This was followed up by the Global Mining Initiative which created of the International Council on Mining and Metals, an industry organization which works to self-regulate the mining industry internationally. The mining industry has provided funding to various nonprofit groups, which have been subsequently less inclined to fight for the rights of indigenous people.

Exercise 2. Define whether the following statements are true or false.

1. Environmental issues can include erosion, formation of sinkholes, and contamination of soil, groundwater and surface water by insects.

2. In some cases, additional forest logging is done in the vicinity of mines to decrease the available room for the storage of the created debris and soil.

3 The contamination resulting from leakage of chemicals also affects the health of the local population.

4. Mining companies in many countries may be required to follow environmental and rehabilitation codes.

5. In 1992 a Draft Code of Conduct for Transnational Corporations was proposed at the Rio Earth Summit by the UN Centre for Transnational Corporations (UNCTC).

6. This was followed up by the Global Mining Initiative which created of the International Council on Mining and Metals, a business organization which works to self-regulate the mining industry internationally.

7. The mining industry has provided funding to various nonprofit groups, which have been subsequently more inclined to fight for the rights of indigenous people.

Exercise 3. Answer the following questions:

1. What aspects can environmental issues include?
2. Why is additional forest logging done in the vicinity of mines in some cases?
3. What is the influence of the contamination resulting from leakage of chemicals?
4. What may mining companies in many countries be required to follow?
5. When was a Draft Code of Conduct for Transnational Corporations proposed at the Rio Earth Summit by the UN Centre for Transnational Corporations (UNCTC)?
6. What organizations argued successfully for self-regulation instead?
7. What is the Global Mining Initiative and what is its function?
8. What has the mining industry provided to various nonprofit groups, which have been subsequently less inclined to fight for the rights of indigenous people?

Exercise 4. Complete the following sentences.

1. Environmental issues can include erosion, formation of sinkholes, loss of biodiversity, and contamination of soil, groundwater and surface water by ...

2. In some cases, additional forest logging is done in the vicinity of mines to increase …

3. Besides creating environmental damage, the contamination resulting from leakage of chemicals also affects …

4. Mining companies in many countries may be required to follow …

5 In many areas regulation is not enforced, and mining companies …

6. In 1992 a Draft Code of Conduct for Transnational Corporations was proposed at the … Summit by the UN Centre for Transnational Corporations (UNCTC).

7. The Business Council for Sustainable Development (BCSD) together with the International Chamber of Commerce (ICC) argued successfully for …

8. This was followed up by the Global Mining Initiative an industry organization which works to self-regulate the mining industry …

9. The mining industry has provided funding to various nonprofit groups, which have been subsequently less inclined to fight for…

TEXT 8 (A). MINE COMPLETION.

Exercise 1. Read the text and do the following tasks:

Mine completion and relinquishment is the final stage of a mine life. Mining lease relinquishment can only happen when the economically mineable resource has been exhausted and successful mine closure has been achieved. The aim should be to ensure the site does not leave long-term environmental or social liabilities and ultimately enables the operator to relinquish responsibility for the site's management. Completion is the stage when a company is absolved of all further responsibility for the site. Furthermore, mining companies should be able to demonstrate:

• replacement of the mineral resource asset with sustainable benefits to the community

• attainment of completion criteria to stakeholders' satisfaction, including government.

Responsibility for management following mine closure and lease relinquishment will depend on what is required, who owns the land and is responsible for managing it, and any legal aspects.

Exercise 2. Find synonyms in the text:

completion – successful – responsibility – implementation – benefits – approach – to undertake – relinquishment;

Exercise 3. Find antonyms in the text:

Asset – rehabilitation – closure – to maintain — to generate –- trust – to provide – advantage - location.

Exercise 4. Translate the following word combinations into Ukrainian:

- Mine relinquishment
- Mineable resource
- Legal aspects
- further responsibility
- sustainable benefits
- attainment of completion criteria

Exercise 5. Put 10 questions to the text.

TEXT 8 (B). PLANNING IN MINING.

Exercise 1. Read the text and do the following tasks:

Critical to the operation is the collection of relevant social and environmental data which can assist the decision-making process through the operational life and into closure. A sound pre-mining database will usually be used to set the license conditions for water, flora and fauna and also become the ‘closure criteria to be met’ at the end of a mining operation. Environmental data collected as part of the feasibility phase can be presented to meet the approval process. It is important to continue collection of vital data and enlarge the database to cover the spatial and temporal variations observed in nature. These data will enable an operation to incorporate natural variations into the setting of trigger values that could indicate environmental harm may be occurring from the operation. Social data will inform the development of the appropriate community and other stakeholder engagement strategy.

Exercise 2. Define whether the following statements are true or false.

1. Environmental data collected as part of the practicability can be presented to meet the approval process.
2. It is important to continue collection of vital data and expand the database to cover the spatial and civic variations observed in nature.
3. Social data will inform the development of the appropriate community and other stakeholder engagement strategy.
4. Critical to the operation is the collection of unusual social and environmental data.

Exercise 3. Translate the following word combinations into Ukrainian:

- A decision-making process Slope mines
- An operational life
- Cumulative impacts

- A post-mined landscape
- Rigorous segregation
- Environmental protection
- Mine contractors
- Potential impacts

Exercise 4. Give synonyms to the following words:

- relevant
- closure criteria
- approval process
- spatial and temporal variations
- trigger values
- incorporate natural variations
- feasibility phase

Exercise 5. Put 10 questions to the text.

TEXT 9 (A). SUB-SURFACE MINING.

Exercise 1. Read the text and do the following tasks:

Sub-surface mining consists of digging tunnels or shafts into the earth to reach buried ore deposits. Ore, for processing, and waste rock, for disposal, are brought to the surface through the tunnels and shafts. Sub-surface mining can be classified by the type of access shafts used, the extraction method or the technique used to reach the mineral deposit. Drift mining utilizes horizontal access tunnels, slope mining uses diagonally sloping access shafts and shaft mining consists of vertical access shafts. Other methods include shrinkage stope mining which is mining upward creating a sloping underground room, long wall mining which is grinding

a long ore surface underground and room and pillar which is removing ore from rooms while leaving pillars in place to support the roof of the room. Room and pillar mining often leads to retreat mining which is removing the pillars which support rooms, allowing the room to cave in, loosening more ore. Additional sub-surface mining methods include Hard rock mining which is mining of hard materials, bore hole mining, drift and fill mining, long hole slope mining, sub level caving and block caving

Exercise 2. Define whether the following statements are true or false.

1. Sub-surface mining involves digging tunnels or shafts into the earth to reach buried ore deposits.
2. Ore and waste rock are brought to the surface through the water.
3. Sub-surface mining can be classified by the type of access shafts used, the extraction method or the technique used to reach the mineral deposit.
4. Drift mining utilizes vertical access tunnels.
5. Slope mining uses horizontally sloping access shafts.
6. Shaft mining consists of vertical access shafts.
7. Shrinkage stope mining is grinding a long ore surface underground.
8. Long wall mining is mining upward creating a sloping underground room.
9. Room and pillar mining is removing ore from rooms while leaving pillars in place to support the roof of the room.
10. Hard rock mining is mining of hard materials.

Exercise 3. Match the following terms with their definitions.

a) Room and pillar mining b) shrinkage stope mining c) long wall mining d) hard rock mining e) drift mining f) slope mining g) sub-surface mining h) shaft mining

1. Digging tunnels or shafts into the earth to reach buried ore deposits.
2. Mining that utilizes horizontal access tunnels
3. Mining that uses diagonally sloping access shafts
4. Mining that consists of vertical access shafts.

5. Mining upward creating a sloping underground room.

6 Grinding a long ore surface underground

7. Removing ore from rooms while leaving pillars in place to support the roof of the room.

8. Mining of hard materials.

Exercise 4 Answer the following questions:

1. What procedures does sub-surface mining consist of ?
2. What are ores and waste rock brought to the surface through?
3. How can sub-surface mining be classified?
4. What kind of mining utilizes horizontal access tunnels?
5. What is the work principle in slope mining?
6. What does shaft mining consist of ?
7. What is the difference between shrinkage stope mining and long wall mining?
8. What method of mining uses removing ore from rooms while leaving pillars in place to support the roof of the room?
9. What are some other methods of mining?

Exercise 5. Complete the following sentences.

1. Sub-surface mining consists of digging tunnels or shafts into …
2. Ore, for processing, and waste rock, for disposal, are brought to the surface through …
3. Sub-surface mining can be classified by the type of access shafts used, the extraction method or the technique used to reach ...
4. Drift mining utilizes horizontal access …
5. Slope mining uses diagonally sloping access …
6. Shaft mining consists of … access shafts.

7. Shrinkage stope mining is mining upward creating a sloping underground …
8. Long wall mining which is grinding a long ore surface …
9. Room and pillar mining often leads to retreat mining which is removing the pillars which support rooms, allowing the room to cave in, loosening more ...
10. Hard rock mining which is mining of hard …

TEXT 9 (B). TUNNELS

Exercise 1. Read the text and do the following tasks:

Since the dawn of civilization, people have been building tunnels for accessing tombs or underground quarries, or in the hill slopes for allowing the flow of water from porous rocks. Romans were skilled tunnel builders, who made several kilometers long underground passages using the work of slaves.

Modern construction of tunnels started in the 1760's in England, when channels were constructed for inner transport. In 1825, the opening of the Stockton Rail Way and Darlington, England, founded a new era in transports. The knowledge got through making the channel tunnels was soon applied in digging railway tunnels. By then, most of the work was done manually, and the dug material was removed using horses. For constructing long tunnels, wells were made along the route, so that work could be started in several places, reducing the time for ending the project. The world's longest tunnel (54 km) connects the Japanese islands Honshu and Hokkaido. It consists of a larger railway tunnel and two smaller road tunnels, also employed for maintenance, draining and ventilation.

The EuroTunnel (under the English Channel) is 50 km long and each of its twin tunnels are 7.6 m wide. It was built with an average speed of 12 cm per minute.

Exercise 2. Translate the following word combinations into Ukrainian:

- tombs
- underground quarries
- porous rocks
- work of slaves
- inner transport
- digging railway tunnels
- twin tunnels

Exercise 3. Put 10 questions to the text.

Exercise 4. Answer the following questions:

1. When did people start building tunnels?
2. Who were the most skilled tunnel builders?
3. When did modern construction of tunnels start?
4. When was the opening of the Stockton Rail Way and Darlington?
5. What is the length of the EuroTunnel?

Exercise 5. Retell the text.

TEXT 10 (A). UNDERGROUND BUILDINGS.

Exercise 1. Read the text and do the following tasks:

Some underground buildings are stereotypical bunkers designed to protect people, computer systems and data, and physical objects such as paper documents, photographs, and films. Most underground buildings, however, are attractive, comfortable structures that serve many different functions. Economy is one of the primary reasons for placing all or part of a building below ground. Because of the mass of surrounding earth, these buildings typically use 50–80 percent less energy

for heating and cooling. As a result, they require smaller, less expensive heating and cooling equipment.

Land conservation is also a significant benefit, particularly in dense urban environments. Underground buildings can be placed closer to property lines and neighboring structures than would be allowable for aboveground buildings. Diminishing the surface footprint of a building creates or preserves open space, provides habitat for local animals, enhances the visual environment, and lets rain fall directly on the living earth.

The idea of underground storage is closely linked to protection against the risks of war. In addition in areas where land is expensive, as in big cities, it might have economic advantages. Yet, in principle, the cost of an underground structure is much higher than for building on the surface, unless of course an existing underground installation is used. The disadvantage is usually that these are a long way from town and still need essential air-conditioning and ventilation equipment. Underground cells were also prepared in ancient India for the preservation of manuscripts.

Exercise 2. Answer the following questions:

1. What are the advantages/disadvantages of underground buildings?
2. Do we have any underground constructions in Kyiv?
3. What is the future of aboveground buildings?
4. What is the idea of underground storage linked to?
5. Is the cost of an underground structure lower than the average one?
6. For what purpose were underground cells constructed in India?
7. Are underground buildings more economically sound then aboveground buildings?
8. Why do these buildings less energy for heating and cooling?
9. What is one of the fundamental reasons for underground buildings construction?

Exercise 3. Translate the following words and word combinations into Ukrainian:

stereotypical bunkers

primary reasons

land conservation

surface footprint

to enhance visual environment

economic advantages

allowable

Exercise 4. Write 10-12 sentences on the topic "Underground mining" expressing your ideas.

TEXT10 (B). SURFACE MINING.

Exercise 1. Read the text and do the following tasks:

Surface mining is done by removing (stripping) surface vegetation, dirt, and if necessary, layers of bedrock in order to reach buried ore deposits. Techniques of surface mining include; Open-pit mining which consists of recovery of materials from an open pit in the ground, quarrying or gathering building materials from an open pit mine, strip mining which consists of stripping surface layers off to reveal ore/seams underneath, and Mountaintop removal, commonly associated with coal mining, which involves taking the top of a mountain off to reach ore deposits at depth. Most (but not all) placer deposits, because of their shallowly-buried nature, are mined by surface methods. Landfill mining finally are sites where landfills are excavated and processed.

Exercise 2. Define whether the following statements are true or false.

1. Surface mining is done by removing (stripping) surface vegetation, dirt, and if necessary, layers of bedrock in order to reach the bottom of the mountain.

2. Techniques of surface mining include: open-pit mining, strip mining, and mountaintop removal.
3. Open-pit mining consists of recovery of materials from an open pit in the ground.
4. Strip mining is gathering building materials from an open pit mine.
5. Quarrying consists of stripping surface layers off to reveal ore/seams underneath.
6. Mountaintop removal, commonly associated with coal mining, which involves taking the top of a mountain off to reach ore deposits at depth.
7. All placer deposits are mined by surface methods.
8. Landfill mining finally are sites where landfills are excavated and processed.

Exercise 3. Match the following terms with their definitions.

a) Landfill mining

b) Mountaintop removal

c) Surface mining

d) Strip mining

e) Open-pit mining

f) Quarrying

1. Removing (stripping) surface vegetation, dirt, and if necessary, layers of bedrock in order to reach buried ore deposits.

2. Recovery of materials from an open pit in the ground.

3. Gathering building materials from an open pit mine.

4. Stripping surface layers off to reveal ore/seams underneath.

5. Coal mining, which involves taking the top of a mountain off to reach ore deposits at depth. 6. Sites where landfills are excavated and processed.

Exercise 4 Answer the following questions:

1. How is surface mining done and what is the purpose of surface mining?
2. How many techniques of surface mining do you know?
3. What does open-pit mining consist of?
4. What is the difference between ope-pit mining and strip mining?
5. What is mountaintop removal commonly associated with? And what does it involve?
6. Why are most placer deposits mined by surface methods?
7. What is landfill mining?

Exercise 5. Complete the following sentences.

1. Surface mining is done by removing (stripping) surface vegetation, dirt, and if necessary, layers of bedrock in order ….
2. Techniques of surface mining include…
3. Open-pit mining which consists of recovery of …
4. Quarrying is gathering building materials from …
5. Strip mining which consists of stripping surface layers off to reveal …
6. Mountaintop removal, commonly associated with coal mining, which involves…
7. Most (but not all) placer deposits, because of their shallowly-buried nature, are mined by …
8. Landfill mining finally are sites where landfills are excavated and …

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