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**АНГЛИЙСКИЙ ЯЗЫК:
ПРОФЕССИОНАЛЬНАЯ СФЕРА ОБЩЕНИЯ**

Учебное пособие

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Содержание

Введение.....	4
Unit 1. Agronomy	5
Unit 2. Forestry	25
Unit 3. Horticulture	43
Unit 4. Agrochemistry and Soil Science.....	60
Unit 5. Ecology and Nature Management	78
Unit 6. Biology.....	95
Заключение	115
Список использованных источников.....	116
<i>Приложение 1. Общие рекомендации к переводу специальных текстов</i>	<i>117</i>
<i>Приложение 2. Фразы для краткого изложения (реферирования) текста</i>	<i>121</i>
<i>Приложение 3. Фразы для составления презентации</i>	<i>122</i>
<i>Приложение 4. Единицы измерения и условные обозначения в английском языке</i>	<i>123</i>

Введение

Учебное пособие предназначено для студентов всех форм обучения направлений подготовки 05.03.06 Экология и природопользование, 06.03.01 Биология, 06.03.02 Почвоведение, 35.03.01 Лесное Дело, 35.03.03 Агрохимия и агропочвоведение, 35.03.04 Агрономия, 35.03.05 Садоводство.

Целью пособия является развитие профессиональной иноязычной коммуникативной компетенции обучающихся, имеющей своей основной целью развитие навыков и умений в сфере профессионального общения. Пособие направлено на развитие таких умений как чтение, перевод, реферирование профессиональной литературы, а также профессиональных коммуникативных умений.

Пособие состоит из шести разделов, каждый из которых включает оригинальные тексты, словарь к текстам, комплекс упражнений, образцы коммуникативных ситуаций диалогической и монологической речи.

Материал текстов носит предметно тематический (профессиональный) характер. Содержание учебных текстов ориентировано на последние достижения в изучаемой сфере, непосредственно затрагивает профессиональные интересы обучающихся, предоставляет им возможность для профессионального роста.

В приложениях представлены общие требования к переводу специальных текстов, фразы для реферирования текста и составления презентации, единицы измерения и условные обозначения в английском языке.

Unit 1. Agronomy

Text 1: My Future Profession

Vocabulary

- taxonomy – таксометрия, систематика
- to acquire – приобретать, овладевать
- sound – глубокий
- biotic – относящийся к жизни, биологический
- to cause – быть причиной, вызывать
- to meet demand – удовлетворить требование
- concern – значение, важность, дело
- propagation – распространение
- fertilizers application – применение удобрений
- to obtain – получать
- high yields – высокие урожаи
- to develop – развивать; development – развитие
- crop cultivation – выращивание сельскохозяйственных культур
- system of crop rotation – система севооборота
- to increase – повышать
- soil fertility – плодородие почвы
- scientific expertise – научная экспертиза
- crop protection – защита растений
- acquiring practical skills – приобретение практических навыков
- equipment – оборудование
- highly - qualified specialist – высококвалифицированный специалист
- scientific research work – научно-исследовательская работа
- to participate in scientific conferences – принимать участие в научных конференциях

I am a full-time student of the Perm State Agro - Technological University. I am a first - year student of the Institute of basic and applied Agroecobiotechnologies and Forestry. In 4 years I will get the Bachelor`s degree. My specialization is agronomy. I think that my specialty is very important nowadays. The agronomist's task is to provide proper conditions for obtaining high yields. Agronomist should creatively develop the technology of crop cultivation and system of crop rotation and must think about the increasing of soil fertility.

The aim of the plant sciences programme is to help with wide demand for scientific expertise in the development of crop and plant production methods and farming systems. The plant science is a combination of other sciences such as genetics, physiology, biochemistry, cell biology, molecular biology, cytology, taxonomy and statistics.

The students of Agrobiotechnologies department acquire a deep knowledge in the basic physical, chemical and physiological aspects of crop growth and production. The aim of crop protection is to protect crop plants from lack and losses caused by biotic agents.

Much attention is paid to acquiring practical skills by future specialists. Our University has excellent facilities for this: the experimental agricultural farm and different laboratories with modern equipment.

The department staff includes highly - qualified specialists: Doctors of science, Professors, Candidates of science, senior Lecturers. The students of our faculty have real opportunities for scientific research work. Every year they participate in scientific conferences, write scientific papers based at the last achievements of Russian and foreign sciences. Researchers in agronomy often

work in close cooperation with scientists from disciplines such as biology, chemistry, biochemistry, soil microbiology, ecology, mineralogy, entomology, plant genetics and engineering in order to improve productivity and reduce environmental problems.

The graduates of our department can work successfully in different enterprises of Agro-Industrial Complexes, agrochemical laboratories, scientific institutes or as agronomists on state farms.

1) Insert the right word from the text.

1. Researchers in agronomy often work in close cooperation with scientists from disciplines such as ... in order to improve productivity and reduce environmental problems.

2. The aim of the ... is to help with wide demand for scientific expertise in the ... of crop and plant production ... and ... systems.

3. The aim of crop protection is to protect ... from at lack and ... caused by ... agents.

2) Work with a partner. Answer the questions.

1. What institute do you study at?

2. What general and special subjects have you got this term?

3. What is your favorite subject?

4. Why did you choose a profession of an agronomist?

5. Do you like to study at Agro -Technological University?
Why/Why not?

3) Make a presentation and tell about your study according to the plan:

- My place of study
- My future specialty (Why did you choose a profession of an agronomist)
- Advantages and disadvantages of my specialty (an agronomist)

Text 2: Agronomy as a Branch of Agriculture

Vocabulary

- animal husbandry – животноводство
- plant breeding – растениеводство
- horticulture – садоводство
- to face – сталкиваться с ч-л
- a crucial role – решающая роль
- to improve the quality – улучшить качество
- adaptability – адаптивность
- to rely on – полагаться на
- domesticated species – одомашненные виды
- large-scale monoculture – крупномасштабная монокультура
- irrigation – орошение, полив
- to maintain – поддерживать
- organic agriculture – органическое земледелие
- fertilizers – удобрения
- technological improvements – технологические улучшения

Agriculture plays a vital role in the economy of every nation. Agriculture is the key development in the rise of human civilization. Agriculture developed over the centuries and each innovation caused changes in the human life. The word «agriculture» means «in fields». The study of agriculture is known as agricultural science. Agriculture is divided into four main branches: agronomy, animal husbandry, plant breeding and horticulture. Agriculture is a basic part of economy in the world of today. It has the main contribution to the Gross Domestic Production (GDP). Agriculture is the world's most important industry. It provides us with almost all our food. Food is the most important farm product.

Agronomy is the branch of agriculture that deals with the development and practical management of plants and soils to produce food, feed, and fiber crops. The term "agronomy" represents the disciplines of soils, crops, and related sciences. Agronomy is not a new field.

Agronomy is an international discipline. Many of the problems, faced by societies around the world are universal in nature, and require international cooperation. A major problem facing the world is that of how best to use the land resources, the questions of how much and which land should be saved for food and fiber production and which land should be used for nonagricultural uses.

Agronomists play a crucial role in assessing land quality to assure an environmentally friendly use of land. The goal of today's production agronomists is to improve the quality, adaptability, and yield of our most important crops. Farming generally relies on techniques to expand and maintain the lands suitable for raising domesticated species. Plants usually require some form of irrigation. In the developed world, industrial agriculture based on large-scale monoculture has become the dominant system of modern farming, although there is growing support for organic agriculture.

Modern agronomy, plant breeding, pesticides and fertilizers, and technological improvements have sharply increased yields from cultivation, but at the same time have caused widespread ecological damage and negative human health effects.

(<https://timesagriculture.com/what-is-agronomy-history-principles-importance-complete-overview/>)

1) Ask 10 questions to the text above (alternative, general, special, tag question). Work with the partner, answer the questions.

2) Are the statements true or false?

- 1) The word «agriculture» means «in fields».
- 2) Agronomy is the branch of economy that deals with the development and practical management of plants and soils to produce food, feed, and fiber crops.
- 3) Agriculture is divided into four main branches: agronomy, animal husbandry, plant breeding and gardening.
- 4) Agronomy is a national discipline. Many of the problems, faced by societies around the world are local in nature, and require national cooperation.
- 5) Farming generally relies on techniques to expand and maintain the lands suitable for raising domesticated species.
- 6) Agronomists play a crucial role in assessing technological improvements to assure an environmentally friendly use of land.
- 7) Modern agronomy, plant breeding, pesticides and fertilizers, and technological improvements have sharply reduced yields.

3) Complete the table with the words: *carrot, cattle, corn, cucumber, digger, drill, game, hoe, hog, millet, oats, orange, plum, poultry, roller, rye, sheep, apple, apricot, artichoke, banana, barley, beet, binder, broccoli.*

crops	
vegetables	
fruits	
animals	
machinery	

4) Retell the text.

Text 3: Plants as the Source of Food

Vocabulary

- plant kingdom – растительное царство
- photosynthesis – фотосинтез

- carbon – углерод
- oxygen – кислород
- timber – древесина
- to sow – сеять
- seeds – семена
- to obtain – получать
- cereals (cereal grains) – зерновые культуры
- to feed livestock – кормить домашний скот
- forage crops – кормовые культуры
- alfalfa – люцерна
- be divided into – делить на
- barley – ячмень
- millet – просо
- oats – овес
- rye – рожь
- sorghum – сорго
- wheat – пшеница
- root crops – корнеплоды
- pulses – бобовые
- oil-bearing crops – масленичные культуры
- sugar-bearing crops – сахароносные культуры
- sugarcane – сахарный тростник

Plants - grass, flowers, and trees - grow everywhere: high in the mountains, far out in the ocean and in many deserts and polar regions. Plant kingdom includes familiar organisms such as trees, shrubs, herbs, and ferns. Over 350,000 species of plants have been estimated to exist. Some are so small, that we see them only with a microscope; some are very large. Life is impossible without plants. We breathe the oxygen which comes from plants, we eat the food which also comes from plants or from animals that eat plants. The photosynthesis and carbon fixation conducted

by land plants are the ultimate source of energy and organic material in nearly all ecosystems. It is vitally important for human beings, animals and most other organisms, who are aerobic, relying on oxygen.

Many thousand years ago man built houses and made useful things from timber which he got from trees. He made his clothing from plants too. Plants also give beauty. People like to look at flowers, at fields of grain, they like to be in the forest. Man began to change plants about 10,000 years ago, when he began to grow the first food plants. The first farmers saw that there were good plants and not so good plants. They sowed the seeds of good plants and grew new plants from them. In this ways man developed the basic food crops of the world.

Much of human nutrition depends on plants. Most food has its origin in plants. Some food is obtained directly from plants. Much of the human diet comes in the form of cereals. Other plants or plant parts that are eaten include fruits, vegetables, legumes, herbs, and spices. Many plants provide important medicines. Many plants and plant parts are eaten as food and around 2,000 plant species are cultivated for food. Some crops are used only to feed livestock. These forage crops include alfalfa, clover and many grasses. Forage crops are important because they make commercial livestock production possible. Major food crops can be divided into eight groups. The first group is cereal grains. The chief grains are barley, corn, millet, oats, rice, rye, sorghum, and wheat. The second group is root crops. Like cereal grains, root crops are grown throughout the world. The leading root crops are potatoes, beets, sweet potatoes, carrots. The six remaining groups of major food crops are: pulses (beans and peas); fruits and vegetables; oil-bearing crops (soybeans and coconuts); sugar-

bearing crops (sugarcane, sugar beets); nuts; cocoa beans, coffee, and tea.

(<https://www.scientificworldinfo.com/2018/07/importance-of-food-in-our-daily-life.html>)

1) Fill in the blanks with words and word combinations from the text.

1. Much of human nutrition depends on
2. Much of the human diet comes in the form of
3. Like cereal grains, are grown throughout the world.
4. ... are important because they make commercial livestock production possible.
5. Other plants or plant parts that are eaten include... .

2) Correct the factual mistakes according to the text.

1. Man began to change plants about 100,000 years ago, when he began to grow the first food plants.
2. Over 35,000 species of plants have been estimated to exist.
3. Many plants and plant parts are eaten as food and around 1,000 plant species are cultivated for food.
4. Major food crops can be divided into six groups.
5. The first group is root crops.
6. The second group is fruits and vegetables.

3) Write the words in the correct order, make up sentences.

1. potatoes, the, beets, leading, crops, are, sweet potatoes, root, carrots.
2. plants, life, without, impossible, is.
3. grow, in the mountains, in the ocean, and, far out, in, deserts, high, and, everywhere, polar regions, plants, many.
4. crops, pulses, fruits, food, and, vegetables, oil-bearing crops, are, sugar-bearing crops, nuts, cocoa beans, coffee, and, tea, major, root crops, cereals.
5. Forage, alfalfa, clover, include, and, grasses, many, crops.

Text 4: Grain Crops

Vocabulary

- sowing – посев
- bread crops – хлебные культуры
- machine harvesting and processing – машинная уборка и переработка урожая
- density – плотность
- winter hardiness – зимостойкость
- time of maturity – время созревания
- resistance – устойчивость
- shattering and lodging – осыпание и полегание
- winter wheat – озимая пшеница
- silt and clay loams – ил и суглинки
- acid soil – кислая почва
- sandy soil – песчаная почва

Agronomically, field crops are most often grouped according to the way in which they are used. The most common agronomic classification divides field crops into the following six groups.

Cereals or grain crops. A cereal is a grass grown for its edible grain. Grain crops are mainly used as bread crops and as concentrates in feeding livestock. They are well adapted to machine harvesting and processing. The most important grain crops are wheat, corn, barley, oats, rye, rice.

Wheat is the most important grain crop. From the earliest time wheat has played an important role as a human food.

The origin of wheat is unknown, but everybody knows that this grain crop is connected with the development of civilization. There exist different classifications of wheat varieties. The most common classifications of wheat are those based on the time of sowing, as spring and winter wheat; on the colour of the grain, as

red and white wheat; on the density of the grain, as hard and soft wheat; on the products for which they are grown, as bread and macaroni.

In selecting a wheat variety one must know some important characteristics: a) time of maturity, b) winter hardiness, c) disease and insect resistance, d) shattering and lodging, e) quality and yield.

The best quality wheats are produced in areas, where the winters are cold and the summer comparatively hot. It is grown in the temperate regions. Wheat is best adapted to fertile medium or heavy-textured soils that are well drained. Silt and clay loams generally produce the highest wheat yields.

Rye seems to be rather a new crop as compared with wheat and barley. Specialists consider rye to have been found first as a weed in wheat in central Europe. Then it was separated from the wheat and used as a new crop.

Soil requirements of rye are not as exacting as those of other small grains. It is more productive on infertile, sandy, or acid soils than wheat, oats, or barley. Rye can be grown successfully on sandy soils, but it grows best being sown in a well-prepared, firm seedbed.

There exist both winter and spring varieties of rye. However, the latter are less productive than the former and are grown to only a limited extent. Spring rye should be sown at the time spring wheat is seeded, i.e., when the ground can be worked. The time of seeding winter rye will depend on the use to be made of the crop.

The usual depth of seeding is from 1/2 to 2 inches. The depth will vary with the type of soil and season. Rye is harvested in the same manner as other small grains.

(<https://aridagriculture.com/2017/09/30/agronomic-classification-of-agriculture-crops/>)

1) Answer the questions

1. What are the most common classifications of wheat?
2. Is the time of maturing the only characteristic in selecting a wheat variety?
3. Can wheat be grown successfully on clay loams?
4. When is wheat ready for combining harvesting?
5. What rye varieties are more productive?
6. On what soils can rye be successfully grown?
7. What does the depth of seeding rye depend on?
8. What does the time of seeding winter rye depend on?
9. How is wheat/ rye harvested?

2) Translate the following sentences. State if the underline words are nouns or verbs.

1. Any change in the rate of seeding will influence the yield.
2. These varieties of wheat yield more under the climatic conditions of our region.
3. This farm produces mostly cereals, while the produce of the neighboring farm is vegetables.
4. The amount of farm produce should be increased.
5. Water these plants abundantly and you will get good results.
6. In our country irrigation is practiced on a large scale in areas, which suffer from the deficiency of water.

3) Match the two parts of the sentences.

- | | |
|--|---|
| 1. Sufficient moisture must be provided | a) to secure uniform and prompt germination. |
| 2. When wheat is sown by broadcasting | b) are supposed to cause lodging of plants. |
| 3. Great amounts of nitrogen in the soil | c) should be from 2 to 3 inches. |
| 4. The depth of seeding in a dry soil | d) more seed is required. |
| 5. The rate of seeding | e) depends on climate and soil conditions as well as on the quality of seeds. |

4) Are the statements true or false?

1. Rye was found first as a weed in wheat in central Europe.
2. Soil requirements of rye are very exacting.
3. Spring varieties of rye are more productive than winter
4. ones.
5. The usual depth of seeding rye is from 1/2 to 2 inches.
6. The depth of seeding does not depend on the type of soil and season.
7. There are two varieties of rye-winter and spring.

5) Translate into Russian.

1. Пшеница требует хорошо подготовленную, мягкую пахню без сорняков.
2. Время и метод подготовки пахни зависят от многих условий.
3. Пшеница обычно убирается при помощи комбайна.
4. При выборе сорта пшеницы учитываются следующие характеристики: время созревания, устойчивость к болезням и насекомым, качество и урожайность.
5. Пшеница плохо приспособлена к теплому и влажному климату.
6. Рожь более продуктивна на неплодородной, песчаной или кислой почве, чем пшеница и овес.
7. Яровая рожь обычно сеется в то же время, что и яровая пшеница.
8. Семена должны быть посажены глубже на песчаной почве и в сухой сезон.
9. Рожь обычно убирается таким же способом, что и другие зерновые культуры.

6) Complete the table with the information and discuss with the partner.

	varieties	type of soil	time of seeding	depth of seeding
wheat				
rye				

Text 5: Carrots and Potatoes

Vocabulary

- to penetrate – проникать
- hindrance – помеха, препятствие
- storage – хранение
- desirable – желательный
- row – ряд
- seedling – саженец
- to expose – оставлять незащищенным
- loss of moisture – потеря влаги
- stoppage of growth – остановка роста
- softening of the root – размягчение корня
- tuber crop – клубневая культура
- stem – стебель
- to blossom – цвести
- nitrogen – азот
- muck – навоз
- weed – сорняк
- to come up – всходить

Crops known as root crops are cultivated for their enlarged nutritious roots. The most widely grown root crops are vegetable crops used as human food. They are carrots, radishes, beets and others. Carrots are an important vegetable because of recognition of their vitamin value.

Soil for carrots should be of good texture, deep, fertile and well drained. The roots should be able to penetrate and develop evenly and become well-formed without hindrance. For an early crop a rather sandy soil is best. Carrots for summer use are sown in spring as soon as the ground is dry enough to work. For winter storage a good time to sow the seed is in late spring, as the roots of medium size are much more desirable than the larger ones that result from early sowing.

Cultivation should begin as soon as the rows can be seen. The seedlings are delicate, grow slowly at first, and cannot

compete with weeds. Cultivation during dry weather helps to prevent the development of soil cracks along the row which expose the roots to dry wind and cause loss of moisture, stoppage of growth and softening of the root.

Carrots for winter storage are usually left in the ground until just before freezing weather. The usable period for carrots from a good common storage extends to late winter or early spring. Some varieties store better than others. They should not be left in a warm place even for a few days. Carrots store well under conditions that are cool and moist with moderate or little circulation of air.

The most important tuber crop, cultivated throughout the world is potatoes. A tuber is not a root, it is a short thickened underground stem. It is grown in most countries of the world. In addition to its extensive use as food potato is used both in agriculture as livestock feed and in industry.

Soils preferred are drained sandy loams well supplied with organic matter and available plant food. Potato is known to be tolerant of soil acidity.

The best planting date should provide cool, moist conditions when the plants are blossoming and setting tubers, and relatively short days in the growing season for maximum tuber development.

It is because of the economy of the seeding material that most seed tubers are cut into pieces. However, the cut seed is not better than whole tubers and cutting adds to labour cost.

The depth of planting varies with the soil type and the equipment used. Potatoes should be grown in a planned crop rotation to keep the soil fertile and reduce crop loss from insects and diseases. The rotation for potatoes depends on the crops grown in the area.

The highest potato yield and the best quality are obtained when the potato crop follows alfalfa and planted on the same land only once in six or seven years. Complete fertilizer is generally

used in commercial potato - producing regions, although sometimes nitrogen may not be necessary on muck soils.

Weed control is also very important. A number of early-season annual weeds can be controlled by herbicides applied immediately after planting, before the potatoes come up. The tubers should be clean, mature and free from injury, when ready to store.

(<http://landoy-rootcrops.blogspot.com/2009/07/root-crops.html>)

1) Answer the questions to the text.

1. How are potatoes used?
2. What are the most widely grown root crops used as human food?
3. What soils do potatoes/carrots require?
4. What are the disadvantages of cutting seed tubers?
5. Why should potatoes be grown in a planned crop rotation?
6. Is nitrogen necessary on muck soils?
7. When should herbicides be applied?

2) Match the two parts of the sentences.

1. The temperature in potato storage should be low enough	a. they are primarily utilized as human food.
2. There is a number of disadvantages in using cut seed tubers	b. to prevent sprouting.
3. Well-grained friable soil high in organic matter	c. high labour cost of cutting being one of them.
4. Though potatoes are known to be used extensively as livestock feed and in industry	d. high temperatures accompanied by abundant rainfall.
5. Heavy vegetative growth and small tubers result from	e. usually produces the least yields of tubers.

3) Complete the sentences and translate them.

1. Carrots (хранится) well under cool and moist conditions.
2. Two to four pounds of (семя) are sown to the acre.
3. As a rule, the best (урожай) of roots are obtained in sandy loams.
4. When the soil is low in organic matter, the growing of green manure crop may be (желательно).
5. The soil recommended is the one that is (плодородная), deep and of a texture which is easy (работать).

4) How can you describe climate, growth, land, harrowing, variety using following words:

	cool, humid, slow, high, dry
	good, slow, heavy, rank, low
	grass, well, slice, best, plowed
	desired, medium, light, rough, combine
	spring, early-maturing, ripe, hardly, even

5) Find out the paired conjunctions in the following sentences, translate them.

1. Carrots are mostly grown in areas where the climate is neither too hot nor too dry.
2. Both cut tubers and whole ones can be used for planting.
3. The yield of root crops is not so high in our region as it is in the south.
4. The coarser is the seed the deeper it should be sown.
5. Microelements are as important as primary elements.

Text 6: Forage Crops

Vocabulary

- leguminous – бобовые
- shades – оттенок

- green-manure crops – сидеральная культура
- cover crops – покровная культура
- to turn under – запахивать
- to maintain – сохранять, поддерживать
- to increase – повышать
- soil improvement – улучшение почвы
- hay – сено
- lime – известь

Forage crops are the crops used as feed for animals in a fresh or preserved form. Forage crops including grasses, legumes and some other crops are cultivated and used for hay, pasture and silage.

Alfalfa is a leguminous plant of great value for forage purposes. Cotton alfalfa is the most widely grown variety. It is characterized by flowers of blue and purple shades and by high, narrow crowns. Alfalfa also improves the land, increasing its fertility. It is grown very often as a soil-improving crop.

Soil-improving crops are grown for the purpose of improving conditions of the soil for the growth of succeeding crops. The terms «Green-manure crops » and «Cover crops» are sometimes used. Green-manure crops are those grown especially for soil improvement and turned under while they are still green. Cover crops are those which are grown for protection of the soil as well as for soil improvement. Green-manuring is one of the oldest methods used to maintain or to increase crop production. Common alfalfa is the most extensively grown variety for hay and seed.

Alfalfa is grown successfully under a wide range of climatic conditions, varying from extremely low winter temperatures to very high summer temperatures. But it is a dry hot climate that is most suitable.

Alfalfa is adapted to a wide range of soil conditions. It is grown well on clays, loams, sandy soils and even on muck soils if sufficiently well drained. Lime is essential to successful alfalfa growing on acid soils. On heavy clays alfalfa succeeds best in a dry summer, but on light soils it will succeed best with a considerable summer rainfall.

(<https://stoplearn.com/pasture-and-forage-crops/>)

1) Complete the sentences with words: green-manuring, hay, purpose, shade, cover crops

1. Alfalfa is usually used for forage...
2. The crops grown for protection of the soil and for soil improvement are called ...
3. Alfalfa has the flowers of blue and purple...
4. ...is one of the oldest methods of maintaining increasing crop production.
5. About eighty per cent of the crop is made into...

2) Translate the sentences paying the attention to the -ing words.

1. There is a great number of experiments showing that manure is effective in reducing and water losses.
2. Several factors must be considered in determining the rate of planting crops.
3. Alfalfa improves the land, increasing its fertility.
4. As alfalfa is very sensitive to acid soil conditions, it responds to liming better than most other crops.
5. The most important soil constituent determining its properties and fertility is humus.

3) Translate into English.

1. Люцерна имеет стержневую корневую систему.

2. Люцерну используют для различных целей.
3. Известкование необходимо, если почва кислая.
4. Люцерна хорошо растет при широком разнообразии климатических условиях.
5. Сидеральные культуры выращиваются для улучшения почвенного плодородия.
6. Сухой жаркий климат лучше всего подходит для выращивания люцерны.
7. Люцерна должна скашиваться в правильное время.

Unit 2. Forestry

Text 1: My future profession

Vocabulary

- forestry management – управление лесным хозяйством
- to do surveying – выполнять геодезические работы
- to provide study and expertise – проводить обучение и экспертизу
- blueprint – чертёж, светокопия
- geologic data – геологические данные
- drawing tools – инструменты для рисования
- design software – программное обеспечение для проектирования
- hydraulic or transportation systems – гидравлические или транспортные системы
- safety and sanitation standards – стандарты обеспечения безопасности жизнедеятельности и санитарии
- to conform to – соответствовать ч-л
- construction standards – строительные стандарты
- to follow regulations – соблюдать правила
- to have a negative impact on – оказывать негативное влияние
- to be in charge of – быть ответственным за
- sewage systems – канализационные системы
- culvert – водопропускная труба
- loading docks – погрузочные доки
- harbor – гавань
- logging company – лесозаготовительная компания

I am a full-time student of the Perm State Agro - Technological University. I am a first - year student of the Institute of basic and applied Agroecobiotechnologies and Forestry. My specialization is forestry. In 4 years I will get the Bachelor`s degree. My future specialty is a forest engineer.

A forest engineer is a type of civil engineer. A forest engineer needs a solid foundation in civil, mechanical and forest engineering. Forest engineers plan and design various projects that affect forests, including forestry management, construction of roads and forestry projects. These engineers also do surveying, manage projects and give advices during construction works.

Forest engineers make sure that the natural environment is protected. A forest engineer may provide study and expertise when roadways are planned for wooded areas.

A forest engineer needs to have at least a bachelor's degree or a professional degree. Analyzing survey reports, reading maps, drawings and blueprints, interpreting aerial photography and other geologic data is part of the job for a forest engineer.

Other skills that are learned at the University include how to use drawing tools and design software to plan and design hydraulic or transportation systems that conform to construction standards. Safety and sanitation standards have to be met. Everything about a project must follow regulations and the forest engineer is in charge of ensuring that each project does.

I think that my specialty is very important nowadays. A forest engineer should to protect natural environment because there are many structures that have a negative impact on forests. Forest engineers are in charge of planning and directing the construction of water and sewage systems, culverts, bridges, loading docks and campsites. They also may be in charge of planning railroads, roads, airports, harbors, dams, irrigation projects and power plants on or near forested land. Structures, machines and operations for forestry and wood product manufacturing also are overseen by forest engineers. The graduates of the forestry department can work for logging companies, at the special construction laboratories, wood product manufacturing and enterprises, farms, scientific institutions.

1) Insert the right word from the text.

1. Forest engineers plan and ... various projects that affect forests, including ... , construction of ... and forestry projects.
2. Analyzing ... , reading maps, drawings and ... , interpreting aerial photography and other ... is part of the job for a forest engineer.
3. A forest engineer should to protect ... because there are many structures that have a ... on forests.
4. Forest engineers also may be in charge of planning ... , roads, airports, ... , dams, ... and power plants on or near forested land.
5. The graduates of the forestry department can work for ... companies, at the special ... laboratories, ... product manufacturing and enterprises, farms, ... institutions.

2) Work with a partner. Answer the questions.

1. What institute do you study at?
2. What general and special subjects have you got this term?
3. What is your favorite subject?
4. Why did you choose a profession of a forest engineer?
5. What does a forest engineer do?
6. Do you like to study at Agro -Technological University?
Why/Why not?

3) Make a presentation and tell about your study according to the plan:

- My place of study
- My future specialty (why did you choose a profession of a forest engineer)
- Advantages and disadvantages of my specialty (a forest engineer)

Text 2: Plant Formation and Their Environment

Vocabulary

- natural formations – природные формации (зоны)
- grassland – степь
- ice sheet – ледники
- slope – наклон, склон
- foliage – листва
- deciduous forest – лиственный лес
- to drop – бросать (сбрасывать листву)
- oak – дуб
- maple – клён
- coniferous forest – хвойный лес
- grasses – травы
- vegetation – растительность
- to thrive – цвести
- to munch – жевать
- treeless area – безлесая территория
- to surround – окружать
- precipitation – осадки
- humidity – влажность
- mosses – мхи
- tough vegetation – жесткая растительность

Many elements make up a plant's environment. One of the most important is weather. Sunlight, temperature, rain and snow affect the growth of plants. The environment of the plant also includes the soil and the other plants and animals that live in the same area. All these factors make up natural formations. Botanists classify the world into five natural plant formations or vegetation regions. These are forest, grassland, tundra, desert, and ice sheet. Climate, soil, the ability of soil to hold water, and the slope, or angle, of the land all determine what types of plants will grow in a particular region.

Different types of **forests** can be found all over the world. Forests are areas with trees grouped in a way so their leaves, or foliage, shade the ground. Forests can be found just about anywhere trees can grow, from below sea level to high in the mountains. One way to classify different types of forests is by the type of trees a forest has. Deciduous forests have trees with green leaves that change color in the fall and drop altogether in the winter. Trees that are common in deciduous forests are oak and maple. Evergreen forests have trees with leaves that stay green all year long. Sometimes forests are classified by the type of leaves on their trees. Trees in broad-leaved forests have wide, flat leaves. Tropical rain forests are a type of broad-leaved forest. Coniferous forests have trees with cones and needles instead of leaves. Some coniferous forests have the tallest, largest, and oldest trees in the world. Many forests are mixed, meaning they have both broadleaf and coniferous trees. Southward, with higher moisture and temperature forests grow across the continent. That is taiga. Forests cover a third of the land here and consist of both needleleaf and broadleaf trees.

The next formation is **grasslands**, where we may find many grasses. They are the most typical plants there. Most of the grasslands are used for agriculture. Farmers grow there such grains as barley, oats, wheat etc. The soil is rich here.

Climate plays a role in the type of grassland you get. In cool, mild climates, grasslands are dominated by tough vegetation, such as oats, that thrives all year. Some of these grasses are so tough and hardy that they are considered weeds. In warmer climates, seasonal vegetation survives better. Temperate grasslands exist where there are seasonal variations in temperature over the course of the year: hot summers and cold winters. Different grasses thrive in different temperatures here.

Tropical grasslands are called savannas. They do well in weather that is warm year-round and usually pretty dry. Grasslands are important for milk and dairy production; dairy cows are happiest, and most productive, in areas in which they can munch on grass all day.

The third formation is the **tundra**. It is a cold, dry and treeless area that surrounds the Arctic ocean near the North Pole. The vegetation here is poor. The plants grow in groups, which protects them from cold and wind.

Tundra is an area where tree growth is difficult because of cold temperatures and short seasons. Vegetation in tundra is limited to a few shrubs, grasses, and mosses. Scientists estimate roughly 1,700 different species live in the tundra, which isn't much compared to forests and grasslands. The ground is often too cold for plants to set down roots, and without plants, few animal species can survive. There are two types of tundra: alpine tundra and arctic tundra. The weather in alpine tundra is cold, snowy, and windy. Arctic tundra has a bare landscape and is frozen for much of the year. Here, the tundra can include permafrost, or soil that is permanently frozen.

Still another formation is **desert**. It covers about a fifth part of the earth's land. Some deserts have almost no plant life. The temperature there is very high. Deserts have almost no precipitation, or rainfall. Deserts usually have really high daytime temperatures, low nighttime temperatures, and very low humidity. But some plants can live in desert regions. They do not grow together and so they get water and minerals from a large area. Desert soil is often sandy, rocky, or gravelly. Plant life is highly specialized to adapt to these coarse, dry conditions, with long roots, small leaves, stems that store water, and prickly spines that discourage animals from touching or eating them.

An **ice sheet** is a large stretch of glacier ice that covers the land all around it for more than 50,000 square kilometers. The interesting thing about this vegetation region is that there really isn't any vegetation there at all.

Ice sheets are important research sites for scientists. By looking at layers in the ice, scientists can keep track of different levels of pollution or volcanic gases in the atmosphere. The Antarctic ice sheet is a record of Earth's atmospheric changes. Scientists are also studying ice sheets to measure the rate of melting ice.

Plant formations and their environment are natural resources which man always used and uses now. We must preserve forests, grasslands and soil. Thus the knowledge of the ecology of the natural plant formations and their structure becomes very important.

(<https://education.nationalgeographic.org/resource/vegetation-region/>)

1) Ask 8 questions to the text above (alternative, general, special, tag-question). Work with the partner, answer the questions.

2) Are the following statements true or false? Correct the false ones.

1. Sunlight, temperature, rain and snow affect the growth of plants.
2. Scientists are also studying forests to measure the rate of melting ice.
3. Deserts usually have really low daytime temperatures, high nighttime temperatures, and very low moisture.
4. Desert soil is often fertile, sandy, rocky.
5. Forests are areas with trees grouped in a way so their leaves, or foliage, shade the ground.

6. Broadleaf forests have trees with leaves that stay green all year long.
7. Most of the grasslands are used for agriculture because the soil is poor here.
8. Grasslands are unimportant for milk and dairy production; cows can munch on grass everywhere all day.
9. Vegetation in tundra is limited to a few shrubs, grasses, and mosses.
10. The ground in open area is often too cold for plants to set down roots, and without plants, few animal species can survive.

3) Complete the sentences with suitable words.

1. Botanists classify the world into five natural : forest, ... , tundra, ... , and ice sheet.
2. ... is an area where tree growth is difficult because of cold ... and ... seasons.
3. There are two types of tundra: ... tundra and ... tundra.
4. Ice sheets are important for scientists.
5. An ice sheet is a large stretch of that covers the land all around it for more than 50,000 square kilometers.
6. Plants do not grow together and so they get ... and ... from a large area.
7. ... covers about a fifth part of the earth's land.
8. In cool, mild climates, ... are dominated by ... vegetation, such as oats, that thrives all year.
9. exist where there are seasonal variations in temperature over the course of the year: hot summers and cold winters.
10. ... forests have trees with green leaves that change color in the fall and drop altogether in the winter.
11. ... forests have trees with cones and needles instead of leaves.

12. ... covers a third of the land here and consist of both needleleaf and broadleaf trees.

4) Fill in the table and retell the text.

<i>Plant formation</i>	<i>Main features</i>
<i>forest</i>	
<i>grassland</i>	
<i>tundra</i>	
<i>desert</i>	
<i>ice sheet</i>	

Text 3: Studying Forest Ecology

Vocabulary

- canopy – полог леса, сомкнутый лесной покров
- to determine – определять
- to influence – влиять
- surrounding environments – окружающая природная среда
- deforestation – вырубка леса, обезлесение
- detrimental – наносящий ущерб, вредный
- livelihood – средства к существованию
- to be wipe out – быть уничтоженным
- to replant – пересаживать
- sustainable forestry – рациональное/экологическое лесопользование
- a holistic approach – целостный подход
- riparian habitats – прибрежные местообитания
- gene pools – генофонды
- diversity of native species – разнообразие местных видов

Forest ecology is an important topic. Since trees are a natural beauty and they provide support for the larger ecosystem

contained under their canopy. What is more important than having protection and special care to better save our forests for the future generations.

The study of forest ecology is complex. It studies the structure of the forest as well as how it grows and functions as an ecosystem. Many scientists believe that the structure of the canopy will determine and influence the way forests work. Many forests and surrounding environments have been destroyed in the process of deforestation. It is important to understand why, how and what can we do to improve the situation.

Deforestation is a large problem in many areas of the country. The search for wood is detrimental to the livelihood of the forest. Often, when forests are wiped out, they are not replanted, which destroys an entire habitat for animals and microorganisms. The human effect on forest ecology is quite profound.

Ecological principle of sustainable forestry means that foresters must protect, maintain and when necessary restore the aesthetics, vitality, structure and functions of the natural processes of the forest ecosystem and its components at all landscape and time scales. This includes a holistic approach to research and management planning with long-term objectives, such as:

- to protect or restore surface and groundwater quality and quantity, including aquatic and riparian habitats
- to maintain or improve natural processes of soil fertility, productivity and stability
- to keep balance and diversity of native species and their gene pools
- to safeguard rare, threatened, and endangered species and habitat
- to preserve ancient forests

- to assess, reduce and eliminate adverse environmental impacts of forest management

Integrated ecological, social, and economic principles must conserve forests and maintain their productivity now and into the future without degrading the environment.

(<https://www.saralstudy.com/blog/the-importance-of-trees/>)

1) Ask 7 questions to the text above (alternative, general, special, tag-question). Work with the partner, answer the questions.

2) Use the words preserve, human, deforestation, principles, canopy to complete the sentences below.

1. ... is a large problem in many areas of the country.
2. The ... effect on forest ecology is quite profound.
3. Foresters must ... ancient forests.
4. Many scientists believe that the structure of ... the will determine and influence the way forests work.
5. Integrated ecological, social, and economic ... must conserve forests and maintain their productivity.

3) Write the words in the correct order.

1. is, ecology, an important, forest, topic
2. canopy, trees, provide, ecosystem, provide, contained, under, their, support for
3. generations, it, important, to, and, save, protect, forests, future, is, for, the
4. complex, the, ecology, study, of, forest, is
5. deforestation, surrounding, forests, and, environments, have, destroyed, in, the, process, of, many, been.

Text 4: Tree Structure

Vocabulary

- the green matter – хлорофилл

- no longer perform – больше не выполняют
- cluster of tubes – скопление сосудов
- this makes it possible – это позволяет
- stem (trunk) – ствол
- root – корень
- deterioration – ухудшение, повреждение, разрушение
- heartwood – ядровая древесина
- sapwood – заболонь
- coniferous (needleleaf) – хвойный
- deciduous (broadleaf) – лиственный
- crown – верхушка, крона дерева
- derive – получать, извлекать
- nutrition – питание
- nutrient – питательное вещество
- transpiration – транспирация (выделение избыточного количества водяного пара растениями)
- to digest – усваивать, перерабатывать
- bark – кора;
- respiration (breathing) – дыхание
- to deteriorate – ухудшать(-ся), разрушать(-ся)
- to cut – рубить, валить (лес, деревья)
- cutting – валка, рубка леса
- clear cutting – сплошная рубка
- circle – круг
- to encircle – окружать
- to split – расщеплять, раскалывать
- specific gravity – удельный вес, собственный вес

Trees are woody plants, growing with a single stem. They are the largest members of the plant world. Trees may be said to consist of three parts:

1. the roots which hold the tree in place and take up from the soil water and certain mineral substances needed for the trees' growth;

2. the trunk or stem which supports the crown and supplies it with water and food from the roots;
3. and the crown. In this part the most important processes are taking place.

The materials upon which a tree feeds are derived from the soil and the air. The roots of a tree absorb water from the soil and with it the necessary nutrition and elements of the soil. The amount of water taken up by the roots is usually much larger than is required in the chemical processes which go on in the leaves. The tree gives away this unused water by a process known as transpiration. In the leaves the food necessary for the trees' growth is manufactured. The raw food materials which reach the tree through the roots and the leaves are digested in the leaves. Then they are sent to all living parts of the roots, stem and crown.

The trees' breathing is done through the leaves and the bark. Respiration is the factor supplying the energy with the aid of the green matter in the leaves. The energy is supplied by sunlight. The plant takes up carbon dioxide gas. The carbon is used to elaborate the organic compounds. The carbon assimilation is a most important biochemical process. The air would deteriorate rapidly if plants did not take up carbon dioxide and give off oxygen.

The earlier structure of wood is known as heartwood and the outer, later sections as sapwood. The difference is in the moisture content and ageing. Heartwood is found in all species of coniferous trees such as pine, fir, spruce, larch and in certain deciduous trees, for example, in oak, ash, elm, poplar.

A tree grows in three directions: trunk and branches grow upward, roots grow downward, and all grow laterally, that is in diameter. As with all living things, trees are made up of cells, and growth occurs by means of cell division. Trees grow from the top

and in diameter, the side growth is also called secondary growth. Wood has layers of growth which appear as circles around the centre. They are actually elongated cells and cluster of tubes. This makes it possible to split the wood vertically. Wood varies in weight and in specific gravity. Trees, being plants, fall into the botanical classification system of taxonomic groups - divisions, classes, orders, families, genera, and species. Trees as well as other plants are referred to most precisely by scientific names, which are composed of their genus and species.

(<https://kids.britannica.com/students/article/tree/277422>)

1) Are the statements true or false?

1. Trees are woody plants, growing with a double stem.
2. Trees consist of four parts: the roots, the trunk, the crown, sapwood
3. Wood varies in weight and in specific gravity.
4. A tree grows in two directions: upward and downward.
5. The carbon assimilation is a most important biochemical process.

2) Ask 10 questions to the text above (alternative, general, special, tag-question). Work with the partner, answer the questions.

3) Complete the sentences with suitable words.

1. The roots hold the tree ... and ... from the soil water and certain mineral ... needed for the trees' growth.
2. The trunk or stem supports the ... and supplies it with water and ... from the
3. In crown the most important ... are taking place.
4. The roots of a tree ... water from the soil and with it the necessary nutrition and elements of the soil.

5. The tree gives away ... water by a process known as
6. In the ... the food necessary for the trees' growth is
7. The materials which reach the tree through the roots and the leaves are digested in the leaves.
8. Trees grow from the ... and in diameter, the is also called secondary growth.
9. Wood has ... of growth which appear as ... around the centre.
10. The difference is in the ... content and

4) Draw a picture (a mind map) of a tree and retell the text.

Text 5: Plants of the Temperate Forest

Vocabulary

- temperate forests – леса умеренного пояса
- dome-shaped foliage – куполообразная листва
- beech – бук
- aspen – осина
- birch – береза
- elm – вяз
- poplar – тополь
- ornamental trees – декоративные деревья
- shrub – куст
- elongated acorn – удлиненный желудь
- a cup-shaped shell – раковина в форме чашки
- railway sleepers – железнодорожные шпалы
- uncultivated land – неводеланная земля
- straight-trunk trees – деревья с прямыми стволами
- coppices – перелески
- submontane – предгорный
- mountainous sparse woods – горные редколесья
- with deep furrows – с глубокими бороздами

- plywood – фанера
- particle panels – панели из древесностружечных материалов

Temperate forests have just two layers of vegetation. The tallest trees have their foliage generally about 15-30 meters above ground and a layer of shrubs and smaller trees underneath. The main trees living in this biome are beeches, sycamores, oaks, aspens, walnut trees, lime trees, chestnut trees, birches, elms.

Beeches can reach up to 40 mt tall and have a large, dome-shaped foliage. They prefer clayey and airy soils, in wet areas, away from harsh winter frost. They are common in Central and Western Europe, where they are largely used to make timber. They are not only extremely useful (furniture, parks, railway sleepers, cellulose), but also commonly used as ornamental trees.

Oaks are trees or shrubs that can reach up to 40 mt tall. Oaks can live to 500 - 1000 years of age. Their fruits are elongated acorns, protected at the base by a cup-shaped shell. Oaks are used to make timber, stairs, parks, furniture, casks and railway sleepers.

Aspens are medium-size trees than can reach up to 25 metres tall. They grow quickly. They like warm and sunny areas. They can be grown on uncultivated land. They are very resistant to industrial waste, and actually grow well in town.

Lime trees are beautiful, straight-trunk trees that can reach up to 30 m tall. There are a variety of lime trees. Wild lime trees can be found in coppices, bushes, sunny slopes and rocks, along riverbanks, in the mountain and submontane areas of Central Europe. Lime trees are often used to shade town streets, to decorate parks and gardens.

Birches come from Europe and the south-east of Asia. They grow well in sandy and peaty soils. Silver birches are widespread

in Europe. They love the sun, they grow alone or in small groups in hilly and mountainous sparse woods, along with broad-leaved and coniferous trees. In the wild state, they can grow even on dry and bare, preferably acid, soils, with enough water, and can tolerate the cold quite well. They are used as ornamental trees for their decorative colour of their bark and leaves.

Elms come from North-Africa, Europe and south-western Asia. They can reach up to 30 m tall. Their foliage is hemispherical, their branches are thin and pale brown, their flowers are small and red. Their bark is grey-brown with deep furrows, their leaves are oval with a pointed end.

Poplars trees have begun to be grown to make timber. Poplars are perfect to fulfil these purposes. They grow very tall. They can be used in many different ways (plywood, particle panels, cellulose paste, toothpicks, matches, etc.). Poplar groves find their ideal location along the river`s banks since they need plenty of light and soils that are fairly loose, airy and that can be irrigated.

(<https://abrokenbackpack.com/types-of-trees/>)

1) Correct the factual mistakes in the sentences below.

1. The tallest trees have their foliage generally about 150-200 meters above ground.
2. Aspen can reach up to 40 meters tall and have a large, dome-shaped foliage.
3. Elms come from south-Africa, Europe and north-western Asia.
4. Oaks are medium-size trees than can reach up to 25 meters tall.
5. Lime trees can live to 500 - 1000 years of age.

2) *Can you identify the trees?*

1. These trees are perfect to fulfil to make timber. They grow very tall. They can be used in many different ways. Their ideal location is along the river`s banks. They need plenty of light.

2. These trees can reach up to 30 m tall. Their foliage is hemispherical, their flowers are small and red.

3. These trees can reach up to 40 mt tall and have a large, dome-shaped foliage. They prefer clayey and airy soils. They are not only extremely useful, but also commonly used as ornamental trees.

4. These trees grow well in sandy and peaty soils. They love the sun, they grow alone or in small groups. They are used as ornamental trees for their decorative colour of their bark and leaves.

5. These trees can live to 500 - 1000 years of age. Their fruits are elongated acorns. They are used to make timber, stairs, parks, furniture, casks and railway sleepers.

6. These trees grow quickly. They like warm and sunny areas. They can be grown on uncultivated land. They are very resistant to industrial waste, and actually grow well in town.

7. These trees are beautiful, straight-trunk trees that can reach up to 30 m tall. These trees can be found in sunny slopes and rocks, along riverbanks, in the mountain. They are often used to shade town streets, to decorate parks and gardens.

3) *Fill in the table and retell the text.*

<i>trees</i>	<i>main features</i>
<i>poplar</i>	
<i>oak</i>	
<i>aspen</i>	
<i>lime tree</i>	
<i>birch</i>	

Unit 3. Horticulture

Text 1: My future profession

Vocabulary

- horticultural science – наука о садоводстве
- environment enhancement – улучшение окружающей среды
- arboriculture – лесоводство
- arboreta – древесина
- gardening tools – садовые инструменты
- design software – программное обеспечение для проектирования
- gene banks – банки генов
- genomics – геномика
- plant breeding – селекция растений
- nursery – питомник
- floriculture – цветоводство

I am a full-time student of the Perm State Agro - Technological University. I am a first - year student of the Institute of basic and applied Agroecobiotechnologies and Forestry. My specialization is horticulture and landscape design. In 4 years I will get the Bachelor`s degree. My future specialty is a horticulturist.

Horticultural science exists to build and maintain human knowledge, skills and biological resources in support of horticulture industry and environment enhancement. Environmental or urban horticulture supports activities like home gardening, landscaping, arboriculture, and interior decorating with plants. Urban parks, gardens and street trees are considered essential for creating a good living environment in communities around the world. Another field of horticultural science with great

environmental and commercial importance involves the collection, preservation, organization, characterization and improvement of horticultural plant genetic resources.

A horticulturist needs to have at least a bachelor's degree or a professional degree. Much attention is paid to acquiring practical skills by future specialists. Our University has excellent facilities for this: the experimental agricultural farm and different laboratories with modern equipment. The department staff includes highly - qualified specialists: Doctors of science, Professors, Candidates of science, senior Lecturers. The students of our faculty have real opportunities for scientific research work. Other skills that are learned at the University include how to use gardening tools and design software to plan a landscape design of parks and gardens.

I think that my specialty is very important nowadays. Horticultural scientists explore and explain the many contributions of plants to a healthy environment for human life and well being. Horticultural science must be deemed an essential life science. Plant exploration, botanical gardens and arboreta, gene banks, genomics and plant breeding are the domain of many people employed in horticulture. A horticulturist should to protect natural environment.

The graduates of this specialization can work in agricultural enterprises for the production of vegetable growing, fruit growing, nursery, floriculture; in scientific institutions engaged in testing plant varieties and plant protection departments; enterprises engaged in landscape design, design and landscaping of both the urban environment and private territories; firms for breeding and seed production of vegetable, fruit, ornamental and forest crops; companies that provide professional care for garden and indoor plants.

1) Insert the right word from the text.

1. Environmental or ... horticulture supports activities like home ... , landscaping, ... , and ... decorating with plants.
2. Another field of ... science with great ... and commercial importance involves the collection, ... , organization, characterization and ... of horticultural plant ... resources.
3. Plant ... , botanical gardens and arboreta, ... banks, genomics and ... breeding are the domain of many people ... in horticulture.
4. The graduates of this ... can work in scientific institutions ... in testing plant ... and plant ... departments; companies that provide professional ... for garden and ... plants.
5. ... parks, gardens and street trees are considered ... for creating a good living ... in communities around the world.

2) Work with a partner. Answer the questions.

1. What institute do you study at?
2. What general and special subjects have you got this term?
3. What is your favorite subject?
4. Why did you choose a profession of a horticulturist?
5. What does a horticulturist do?
6. Do you like to study at Agro -Technological University?
Why/Why not?

3) Make a presentation and tell about your study according to the plan:

- My place of study
- My future specialty (why did you choose a profession of a horticulturist)
- Advantages and disadvantages of my specialty (a horticulturist)

Text 2: Horticultural Products

Vocabulary

- significant ways — важные способы (зд. значительным образом)

- respiring – дышащий
- juiced – выжатые соки
- sliced – нарезанные ломтиками
- pureed – протертые в пюре
- fermented – ферментированные
- frozen – замороженные
- preserved – консервированные
- canned – консервированные в жестяной банке
- dried – сушеные
- perennial vine fruits – многолетние плоды виноградной

ЛОЗЫ

- edible – съедобный
- annual plants – однолетние растения
- perennial plants – многолетние растения
- cut flowers – цветы для среза
- potted ornamental plants – декоративные растения в

горшках

- bedding plants – растения для открытого грунта
- turf and ornamental grasses – газонные и декоративные

ТРАВЫ

- for establishing fruit orchards – для создания фруктовых

садов

- crop production units – растениеводческие комплексы
- horticultural cropping systems – системы возделывания

садовых культур

- labour requirements – требования к рабочей силе
- protected cultivation – защищенное культивирование
- glasshouse – парник

Like the other divisions of plant agriculture, horticulture is practised across cool temperate to tropical latitudes and over a wide range of elevations and climatic conditions. However, it differs from agronomy in a number of significant ways – although it must be recognized that some crops can be classed as both horticultural or agronomic depending on use.

Horticultural products include all products, raw or processed, that arise from the horticultural industry. Products from horticultural industry that go to market still respiring (fresh produce) are clearly horticultural products. When juiced, sliced or pureed, fermented, frozen, preserved, canned, dried, irradiated, or used in an ornamental construct they remain a horticultural product.

But it is necessary to know what crops are appropriately assigned to horticultural industry. It is generally accepted that horticultural crops include: tree, bush and; perennial bush and tree nuts; vegetables (roots, tubers, shoots, stems, leaves, fruits and flowers of edible and mainly annual plants); aromatic and medicinal foliage, seeds and roots (from annual or perennial plants); cut flowers, potted ornamental plants, and bedding plants (involving both annual or perennial plants); cultivated or gathered mushrooms; honey; trees, shrubs, turf and ornamental grasses propagated and produced in nurseries for use in landscaping or for establishing fruit orchards or other crop production units.

Horticultural cropping systems are intensive in terms of investment, labour requirements and other inputs and are often confined to smaller parcels of high quality land. Protected cultivation (e.g., glasshouses or plastic tunnels) and irrigation are common. The products of horticultural enterprise usually have a much higher per unit value than crops grown in less intensive systems.

(<https://www.ishs.org/defining-horticulture>)

1) Complete the sentences with the suitable words.

1. It is generally accepted that horticultural crops include ...
2. The products of usually have a much higher per unit value than crops grown in less
3. Products from that go to market still ... are clearly horticultural products.
4. Horticulture is practised across cool ... to tropical
5. Horticultural products can be

2) Write 5 questions, work with the partner and answer the questions.

Text 3: Similarities Between a Garden and a Park

Vocabulary

- outdoor planned space – открытое планируемое пространство
- to set up – устанавливать
- artificial materials – искусственные материалы
- to be endowed with – быть наделенным ч-л
- creek – ручей
- large-scale garden – крупномасштабный сад
- to assist in maintaining the environment – помогать в сохранении окружающей среды
- consumable crops – потребительские культуры
- beautification – благоустройство
- for ornamental or recreational purposes – в декоративных или рекреационных целях
- indigenous plants – местные растения
- dog designated areas – места, отведенные для собак
- kids play arenas – детские игровые площадки
- recreation facilities – места отдыха

- walking trails – пешеходные маршруты
- authority – органы власти
- government body – государственный орган
- federal agencies – федеральные агентства

A garden is an outdoor planned space, that is set aside for cultivation of plants and flowers. The main reason for setting up a garden could either be for consumption or beauty. Gardens are either made of artificial or natural materials or both. Gardens contain flowers and plants mostly. The act of gardening is an activity that involves planting and maintaining the flowers and plants within a given space. Gardens can be endowed with additional features such as ponds, fountains, artificial and natural waterfalls or even creeks. A large-scale garden that is used for food production is referred to as a farm. Gardens are important to the environment as they assist in preventing climate change in different ways. One of the major ways involve the use of carbon from the air. Increased carbon in the air results in air pollution which causes global warming. Gardens through their composition of plants and trees assist in maintaining the environment. One plant can go a long way in saving our planet.

Gardens are usually private in nature. Most gardens are built within home owner's back or front yards. Gardens are used for two main reasons; either ornamental or food consumption purposes. Consumable crops can be planted within gardens for small families. Landscaped gardens are used for beautification.

A park is a natural, artificial or semi-natural public area set aside for ornamental or recreational purposes. Some larger parks are used for conservation of wildlife and indigenous plants. Parks may consist of grassy regions, landscapes, rocky areas, trees, buildings, recreational centres, sports facilities, swimming pools, soccer pitches, dog designated areas and kids play arenas. Here

you can find monuments and fountains within parks. Parks, in addition to the flowers and plants contain children play facilities, walking trails, rivers, recreation facilities, soccer pitches, kids playing centers and so much more. Some parks can be large with thousands of square miles of natural areas, comprising of mountains, rivers, wildlife and vegetation. These vast areas have park entry fees. These larger parks can also have designated regions for hiking and skiing.

Parks are public in nature and are meant to be used by the general population. Parks are mostly used for recreational or ornamental purposes. This is because they contain sports centers, walking trails, playing centers and picnic grounds.

Gardens are in general much smaller than parks. Parks could range from a couple of square miles to several thousands of square miles. Gardens are controlled by owners of the homes or land. Parks are controlled by the relative authority or government body. The federal agencies are in charge of National Park Services, Forest Services and all related resources. State Agencies control the state parks and large Game Preservation Parks. The local agencies are in charge of the smaller parks within towns and cities. Public parks and recreation are provided at all levels of government: federal and local.

(<http://www.differencebetween.net/science/nature/difference-between-garden-and-park/>)

1) Agree or disagree with the following statements (True or False).

1. A garden is an indoor planned space, that is set aside for cultivation of plants, flowers and trees.
2. Parks are private in nature and are meant to be used by the general population.
3. Parks are mostly used for recreational or ornamental purposes.

4. Some parks have entry fees.
5. Gardens are used for three main reasons; either ornamental or food consumption purposes and recreation facilities.
6. Consumable crops can be planted within gardens for food production.
7. Landscaped gardens are used for beautification.
8. Parks and gardens can be endowed with additional features such as ponds, fountains, artificial and natural waterfalls or even creeks.
9. A large-scale park that is used for food production is referred to as a farm.

2) Discuss in groups similarities between a garden and a park.

- Both parks and gardens have plants and flowers.
- Both parks and gardens are often used for ornamental purposes.
- Both require maintenance and proper planning to meet their purpose.

3) Fill in the table and retell the text.

<i>Basis of comparison</i>	<i>Garden</i>	<i>Park</i>
<i>Type</i>		
<i>Use</i>		
<i>Control</i>		
<i>Constituents</i>		
<i>Size</i>		

4) Write the national flower of the country: hop, thistle, poppy, tulip, lotus, chrysanthemum, rose, edelweiss, daisy, shamrock, cornflower, daffodil

1. The national flower of England is ...
2. The national flower of Germany is ...

3. The national flower of Holland is ...
4. The national flower of Egypt is ...
5. The national flower of Ireland is ...
6. The national flower of China is ...
7. The national flower of Switzerland is ...
8. The national flower of Japan is ...
9. The national flower of Scotland is ...
10. The national flower of Italy is ...
11. The national flower of Ukraine is ...
12. The national flower of the Czech Republic ...

5) Read and guess (write down) the names of the flowers (*chrysanthemum, primrose, morning glory, snowdrop, poppy, daffodil*).

1. It is one of the earliest spring flowers. It grows wild in some countries in Europe and America but you can find
2. lots of them in China. The flowers look like stars.
3. It is as white as snow and appears in forests and gardens when there is still snow there. The little flower is a native flower of Europe.
4. It is a climbing plant with blue or purple blossoms. Their green leaves look like small green hearts. It opens early in the morning but when the hot sun appears in the sky, it closes. The blossoms are like bells. It has a sweet smell and can grow wild.
5. These flowers are bright or yellow. They look like cups. They often grow wild in mountains.
6. This flower appears early in spring. The blooms are usually white or yellow. The plant has got long leaves and a sweet pleasant smell. It has been a favourite flower in many gardens.
7. It is one of the oldest flowers. It has been grown in Japan for nearly two thousand years. This lovely flower can be white, yellow, purple or rose.

6) Draw a park or a garden of your dream and describe it.

Text 4: Common Gardening Tools

Vocabulary

- gardening tools – садовые инструменты
- hand trowel – ручная лопатка
- pruning shears – секатор
- garden gloves – садовые перчатки
- rakes – грабли
- digging shovel – лопата для копания
- spading fork – вилы для перекапывания
- wheelbarrow – тачка
- hose – шланг
- spray nozzles – распылительные насадки
- weeder – полольщик сорняков, корнеудалитель
- garden hoe – сапка

A gardening is hard work. Technically to garden all you need is seeds, soils, sun, water and gardening tools. There are many gardening tools. What you'll need will be determined by what you grow, where you grow it, and how you grow it.

Hand Trowel A hand trowel is a must have tool. Use it to dig, turn up the earth, or pull up leaves. A hand trowel is actually the first garden tool recommended for urban gardeners.

Pruning Shears A lot of cutting and trimming jobs can be handled with a good pair of pruning shears. They are essential for harvesting herbs, fruits, and vegetables. They're also great for cutting thick stems and small branches. They're great for cutting down plants for the compost pile.

Garden Gloves You may not think of these as a tool, but gloves are an indispensable item in gardening. Gloves not only

protect your hands from getting dirty but also protect you from injury. If you have to deal with thorny branches or prickly plants, gloves will protect your hands and wrists from scratches, scrapes, and splinters. They even make touchscreen garden gloves now, which are perfect if you listen to music or podcasts on a smartphone while you garden.

Rakes are indispensable tools for anyone with a yard. While leaf rakes can be used for a variety of purposes, a bow rake is great to use in the garden. A bow rake can also be used to clear leaves or spread mulch. It's also perfect for leveling soil or breaking up hard garden dirt in the spring. This is must-have for yards, raised beds, or even community garden plots.

Digging Shovel is an extremely useful tool. Not only can you use it to dig holes, it's also great for transporting dirt from a wheelbarrow to your garden without having to dump the whole load. Shovels are also great for stirring compost piles or mixing potting soil before you add it to your containers. If you need to create a garden or level ground, a sturdy shovel is perfect for turning dirt or removing it.

Garden Hoe The blade is perfect for weeding, easily chopping through unwanted growth and clearing it out of your garden beds. You can also use it to spread compost in tight spaces. The type of hoe and the size and shape of the blade will be determined by the type of gardening you do. If you're dealing with large areas of dirt or vegetable gardens, you may need a wider hoe. For flower gardens, a delicate blade may work better.

Spading Fork Usually it has four sturdy tines perfect for loosening hard dirt and lifting soil. It's also nice to mix fresh compost into established beds. It's called a spading fork because there are some scenarios where it works better than a traditional

spade since it's perfect for raking out weeds or breaking up clumps of dirt in tight spaces in already established gardens.

Wheelbarrow A wheelbarrow or a garden cart will make a lot of jobs so much easier. Move dirt, compost, even piles of leaves effortlessly across your property. They're also great for transporting new seedlings to garden bed.

Hose + Spray Nozzles A garden hose will be the best way to water your plants. An adjustable spray nozzle not only help you control the water so you aren't wasting any water between your garden beds, but they also help you control the way the water is delivered. Many spray nozzles have adjustable spray patterns, allowing you to mist newly planted seeds and seedlings while soaking established plants like tomatoes or flower bushes that need lots of water in the heat of summer.

Weeder Weeds are the bane of an gardener's existence and can be a major pain to remove. There are a few handy tools to use to battle weeds in your garden. The first is a hand weeder, which some call a dandelion digger. It's designed to help remove weeds with a tap root, with the tines penetrating the soil to easily pull the weed out.

(<https://bettergardeners.com/common-gardening-tools-and-their-uses/>)

1) Translate the following word combinations: *to dig, to turn up the earth, to pull up leaves, cutting and trimming, compost pile indispensable item, thorny branches or prickly plants, to garden bow rake, for leveling soil, breaking up hard garden dirt, to be must-have for, wheelbarrow, for stirring compost piles, for mixing potting soil, to spread compost in tight spaces, a delicate blade, sturdy tines, loosening hard dirt and lifting soil, established beds, a spading fork, perfect for raking out weeds, breaking up clumps of dirt in tight spaces, established gardens, a*

garden cart, piles of leaves, effortlessly, for transporting new seedlings, adjustable, to deliver, seedlings, while soaking established plants, the bane of a gardener's existence, to battle weeds in your garden, a dandelion digger, to remove weeds with a tap root, to pull the weed out.

2) Work with a partner. Answer the questions below, based on information in the text.

1. What gardening tools do you know?
2. What gardening tools do you use in your work?
3. For what do you use a hand trowel / pruning shears / wheelbarrow / weeder / garden hoe?

3) Fill in the table and retell the text.

<i>Garden tools</i>	<i>Main features and functions</i>
<i>hand trowel</i>	
<i>pruning shears</i>	

Text 5: Pollination

Vocabulary

- pollination – опыление
- pollen – цветочная пыльца
- pollen grains – пыльцевые зерна
- anther – пыльник, пыльниковый мешок
- ovary – завязь
- stigma – рыльце
- stamen – тычинка (мужской генеративный орган цветка, цветкового растения)
- filament – тычинковая нить
- female gamete – женская гамета
- carpel or pistil – плодолистик или пестик

- inconspicuous – неприметный, неяркий
- allogamy – аллогамия; перекрёстное оплодотворение; перекрёстное опыление
- abiotic or biotic agents – абиотические или биотические агенты
- rubbing – трение, натирание
- diversity of wildlife – разнообразие дикой природы
- to affect on – влиять на
- reproduction – воспроизводство

Pollination is the transfer of pollen grains from the anther to the ovules of the ovary. The female sex organ of a flower is the pistil, which has an outer sticky end called the stigma and an enlarged base called the ovary. The male sex organs of a flower are called stamens. Each stamen is composed of a slender stalk or filament at the top of which there is a bag like anther, which produces pollen grains.

Self-pollination takes place when the pollen from one flower pollinates the same flower or other flowers of the same plant. Self-pollination is a form of pollination which can occur when a flower has both the male and the female gametes, that is the stamens and the carpel or pistil. Most plants that self-pollinate have small, inconspicuous flowers. Plants that follow self-pollination process often have the same lengths of the stamens and carpels.

Cross pollination is also known as allogamy. Cross pollination occurs when pollen grains are transferred to a flower from a different plant. The plants that undergo cross pollination often have taller stamens than their carpels. The process of cross pollination requires the help of abiotic or biotic agents like wind, water, insects, birds, bats, snails and other animals as pollinators.

Bees are one of the most well-known and important types of pollinator, both in agriculture (gardening) and natural ecosystems. The bee collects the pollen by rubbing against the anthers. The pollen collects on the bee's body and legs. As the bee flies from flower to flower, some of the pollen grains are transferred onto the stigma of other flowers.

It is clear that the conservation of bees and other pollinators is an urgent issue. Human activities are destroying the diversity of all wildlife, and having an affect on our own food supply. Clearly a balance between the biodiversity of natural environments and a system of sustainable agriculture is needed. The importance of native pollinators in the reproduction of flowering plants is just beginning to be understood.

(<https://www.sciencelearn.org.nz/resources/77-pollination-and-fertilisation>)

1) Insert the right word from the text.

1. The ... sex organ of a flower is the pistil.
2. The ... sex organs of a flower are called stamens.
3. ... takes place when the pollen from one flower pollinates the same flower.
4. ... occurs when pollen grains are transferred to a flower from a different plant.
5. The process of cross pollination ... the help of abiotic or biotic agents like ..., ..., ..., ...,
6. ... are one of the most well-known and important types of
7. The importance of ... pollinators in the ... of flowering plants is just beginning to be understood.

2) Find grammar mistakes in the sentences and correct them.

1. Most plants that self-pollinate has small, inconspicuous flowers.

2. The pollen collect on the bee's body and legs.
3. Human activities destroys the diversity of all wildlife.
4. Each stamen is compos of a slender stalk.
5. The bee collect the pollen by rubbing against the anthers.
6. As the bee fly from flower to flower, some of the pollen grains are transfer onto the stigma of other flowers.
7. It is clear that the conservation of bees and other pollinators are an urgent issue.

3) Ask 10 questions to the text above (alternative, general, special, tag-question). Work with the partner, answer the questions.

Unit 4. Agrochemistry and Soil Science

Text 1: My Future Profession

Vocabulary

- chemical treatment – химическая обработка
- fertilizers application – применение удобрений
- crop rotation - севооборот
- to raise yields – повысить урожаи
- crop – сельскохозяйственная культура
- to improve quality – улучшить качество
- rapid development – быстрое развитие
- forestry – лесное дело
- environmental science – наука об окружающей среде
- to acquire deep knowledge – приобретать глубокие знания
- research – исследование
- enterprise – предприятие

I am a first year student of the Perm State Agro Technological University. My specialty is agrochemistry and soil science. I think that my specialty is very important. Agrochemistry is a scientific basis for *chemical treatment* of agriculture. It works out the most rational ways of *fertilizers applications* and *crop rotations* aiming to *raise yields* of different *crops* and *to improve their quality*. Agrochemistry studies interactions of fertilizers, soil and plants.

Soil is a fundamental part of the environment and the basis for life. Soil science is the study of soil including soil formation and classification, physical, chemical, biological, and fertility properties of soils, and these properties in relation to the management of soils.

The importance of soil as a natural resource has long been recognized by people and along with water and atmosphere, soil

acts as the life support system of our planet Earth. Although the scientific study of soil started with the rapid development of agriculture, it is now considered as a fundamental subject with applications in agriculture, engineering, forestry, and environmental sciences.

Students of my specialty *acquire deep knowledge* in different aspects of chemistry, mathematics, economics, management, etc. But my main subjects are soil protection, soil management, ecology, fertilizers applications, agrochemical *research*, etc.

Graduates of the agrochemistry and soil science department work at the special agrochemical laboratories, agricultural enterprises, farms, scientific institutions.

1) Insert the right word from the text.

1. I am a first year student of the Perm State ... University.
2. My specialty is
3. Agrochemistry is a scientific basis for ... of agriculture.
4. Agrochemistry studies interactions of ..., ..., and
5. Soil acts as the ... system of our planet Earth.
6. Agrochemistry works out the most rational ways of
7. The scientific study of soil started with the rapid development of
8. Soil is now considered as a ... with applications in agriculture, ..., ..., and environmental sciences.
9. Students of my specialty ... in different aspects of chemistry.
10. Graduates of the agrochemistry and soil science department work at the special ..., ..., ..., scientific institutions.

2) Match questions with suitable responses. Learn and act out the dialogue.

Questions	Answers
1. What subjects will you study?	a) They can work at the special agrochemical laboratories, agricultural enterprises, farms, scientific institutions.
2. Haven't seen you for ages! What are you doing here in Perm?	b) My main subjects will be soil protection, soil management, ecology, fertilizers applications, agrochemical research.
3. I congratulate you on getting to the university and wish you success in your studies.	c) This year I entered the Perm State Agro Technological University.
4. What specialty did you choose?	d) I think that my specialty is very important. Agrochemistry is a scientific basis for chemical treatment of agriculture.
5. Why did you choose this specialty?	e) I'll study agrochemistry and soil science. I have a particular interest in this field of knowledge.
6. Where can graduates of the agrochemistry and soil science department work?	f) Thanks a lot.

Text 2: What is Soil

Vocabulary

- rock – горная порода, камень
- debris from plants – остатки растений
- decomposition – разложение, гниение
- tiny – очень маленький, крошечный
- to maintain fertile, healthy ground – поддерживать плодородную и здоровую почву
- to cause disruption – вызвать нарушение, сбой

- to constitute a living system – представлять собой живую систему
- to sustain plant life – поддерживать жизнь растений
- grassland – пастбище
- silt – ил
- to form large cracks – образовывать большие трещины
- to damage to plant roots – наносить вред корням растений
- proper cultivation – зд. правильная обработка
- to retain moisture – сохранять влагу
- to become waterlogged – заболачиваться

Soil, the loose material that covers the land surfaces of Earth and supports the growth of plants. In general, soil is a combination of inorganic and organic materials. The inorganic components of soil are principally the products of *rocks* and minerals that have been gradually broken down by weather, chemical action, and other natural processes. The organic materials are composed of *debris from plants* and from the *decomposition* of the many *tiny* life forms that inhabit the soil.

The study of different soil types and their properties is called soil science or pedology. Soil science plays a key role in agriculture, helping farmers to select and support the crops on their land and *to maintain fertile, healthy ground* for planting.

Soils vary widely from place to place. Many factors determine the chemical composition and physical structure of the soil at any given location. The different kinds of rocks, minerals, and other geologic materials from which the soil originally formed play a role. The kinds of plants or other vegetation that grow in the soil are also important. In some cases, human activity such as farming or building *has caused disruption*. Soils also differ in color, texture, chemical makeup, and the kinds of plants they can support.

Soil actually *constitutes a living system*, combining with air, water, and sunlight *to sustain plant life*. The essential process of photosynthesis, in which plants convert sunlight into energy, depends on exchanges that take place within the soil. Without soil there would be no vegetation-no crops for food, no forests, flowers, or *grasslands*. To a great extent, life on Earth depends on soil.

The various types of soil may be found over the surface of the earth.

Clay soils. They are characterized by the presence of considerable quantities of clay and *silt*. Air and water cannot move freely in them. Clay soils should not be cultivated when they are wet. During hot dry seasons clay soils dry and *form large cracks* which may *do much damage to plant roots*. These soils are heavy and need *proper cultivation* and management.

Sandy soils. These soils have an open texture. They are very porous and do not *retain moisture*. They are light. Sandy soils are poor in plant nutrients. Organic matter has to be applied constantly to keep up their fertility.

Loams. Loam soils have advantages of both clay and sandy soils. Loams are easy in cultivation, well supplied with air, and prevent from *becoming waterlogged*. These soils are very good for farming.

Peat soils. Peat soil is formed by the accumulation and decomposition of organic materials under the waterlogged environment where there is lack of oxygen. They are fertile and should be used for many crops. These are soils with high organic matter content.

1) Complete the following sentences with appropriate words and word phrases.

<i>human activity</i>	<i>determine</i>	<i>inorganic</i>	<i>living system</i>	<i>forests</i>
<i>flowers</i>	<i>crops for food</i>	<i>soil science</i>	<i>pedology</i>	<i>debris</i>
<i>from plants</i>	<i>decomposition</i>		<i>physical</i>	<i>texture</i>
<i>chemical makeup</i>	<i>surface</i>			

1. The study of different soil types and their properties is called ... or
2. Soil is a combination of ... and organic materials.
3. The organic materials are composed of ... and from the ... many tiny life forms.
4. ... such as farming or building has caused disruption.
5. Many factors ... the chemical composition and ... structure of the soil at any given location.
6. Soil actually constitutes a ... , combining with air, water, and sunlight.
7. Without soil there would be no vegetation - no..., no...,
8. Soils also differ in color, ... , ... , and the kinds of plants.
9. The various types of soil may be found over the ... of the earth.

2) Fill in the blanks with the following words: loams, sandy (2), clay, peat (2).

1. ... soil contains little or no silt or clay.
2. ... are easy in cultivation, well supplied with air.
3. ... soils are very porous and do not retain moisture.
4. ... soils are heavy and need proper cultivation.
5. ... soil is formed by the accumulation and decomposition of organic materials under the waterlogged environment.
6. ... soils high in organic matter content.

3) Answer the questions.

1. What is soil?
2. How is the inorganic matter formed?
3. How is the organic matter formed?
4. What does soil material consist of?
5. What are the characteristics of clay soils?
6. Can air and water move freely in clay soils?

7. What is the texture of sandy soils?
8. Why are loams very good for farming?
9. Are peat soils fertile?

4) Speak about different types of soil.

Text 3: Crop Rotation

Vocabulary

- crop rotation – севооборот
- to enhance soil fertility – повысить плодородие почвы
- to combat pests and diseases – бороться с вредителями и болезнями
- varying nutrient requirements – различные потребности в питательных веществах
- depletion of nutrients – истощение питательных веществ
- legumes – бобовые
- to enrich the soil – обогатить почву
- barnyard manure – навоз, органическое удобрение
- deep rooted – глубоко-укореняемый
- brassica – капуста
- to retrieve nutrients – извлекать питательные вещества
- cover crops – покровные культуры
- subsequent crop – последующая культура
- primary crop – основная культура
- to stabilize slopes – стабилизировать склоны
- to improve water retention – улучшить удержание воды
- to suppress weeds – подавлять сорняки

Crop rotation is a system of growing different kinds of crops one after another on the same land. Continuous growth of the same crop has been found to result in the loss of organic matter from the soil. Crop rotation helps return nutrients to the soil

without synthetic inputs. This technique aims *to enhance soil fertility, combat pests and diseases*, and optimize crop yield.

Different crops have *varying nutrient requirements*. Some crops are heavy nitrogen feeders, while others may have a higher demand for phosphorus or potassium. By rotating crops with different nutrient needs, farmers can prevent the *depletion of specific nutrients* in the soil.

For instance, *legumes*, like peas or soybeans, play a crucial role in nutrient cycling by forming symbiotic relationships with nitrogen-fixing bacteria, *enriching the soil* with biologically available nitrogen. For this reason, a legume is considered to be a better nitrogen fixer when two or more crops come between applications of *barnyard manure*.

Deep-rooted crops, such as certain grains or *brassicas*, can help *retrieve nutrients* from deeper soil layers, making them available for *subsequent crops*.

Cover crops, strategically planted during intervals when the *primary crop* is not in production, benefits to the agroecosystem. They serve as green manure and contribute organic matter to the soil upon decomposition. This added organic matter enhances soil structure and microbial activity. In addition, the root systems of cover crops help prevent soil erosion, *stabilize slopes*, and *improve water retention*. Cover crops like clover or winter rye *suppress weeds*, and add organic matter to the soil when they are incorporated.

Though the proper rotation is of great importance in farming, this practice alone is unlikely to produce maximum yields. For the highest yields to be obtained both crop rotation and fertilization are to be used.

1) Fill in the blanks with words and word combinations from the text.

1. Crop rotation is a system of ... one after another on the same land.

2. Crop rotation aims to enhance ... , combat ... and ... , and optimize crop yield.

3. By rotating crops with different nutrient needs, farmers can prevent ... in the soil.

4. ..., like ... or ... , play a crucial role in nutrient cycling by forming symbiotic relationships with nitrogen-fixing bacteria.

5. Deep-rooted crops, such as ... or ... , can help retrieve nutrients from deeper soil layers.

6. The root systems of ... help prevent soil erosion, stabilize slopes, and improve water retention.

7. Cover crops like ... or ... suppress weeds, and add organic matter to the soil when they are incorporated.

8. For the highest yields to be obtained both ... and ... are to be used.

2) Agree or disagree with the following statements (True or False).

1. Continuous growth of the same crop has been found to result in the loss of organic matter from the soil.

2. Nitrogen in the soil may be provided by legumes included in the rotation.

3. Legume is not considered to be a better nitrogen fixer.

4. Cover crops, such as certain grains or brassicas, can help retrieve nutrients from deeper soil layers.

5. Proper crop rotation is one of the essential factors of good farm management.

6. Deep-rooted crops like clover or winter rye suppress weeds, and add organic matter to the soil when they are incorporated.

7. The growing of legumes in the rotation does not help to increase the nitrogen content of the soil.

3) Answer the questions to text.

1. What is crop rotation?
2. What is the aim of crop rotation?
3. Why are legumes included in the rotation?
4. What crops would enrich the soil with nitrogen?
5. What examples of crop rotation can you give?
6. Can the proper rotation alone provide the highest yield?
7. What is the influence of legumes on the crop following it in rotation? (deep-rooted crops, cover crops)

Text 4: Beneficial Effects of Proper Rotation

Vocabulary

- to conserve the soil – беречь почву
- to be unfavorably affected – подвергнуться неблагоприятному воздействию
- tith – обработка почвы, вспашка
- resistant crops – устойчивые культуры
- temporary labour – временная работа
- uniformly – равномерно
- to suffer losses – терпеть убытки
- harvest time – время сбора урожая
- maintenance of fertility – поддержание плодородия
- sod crops – дерновые культуры
- to intersperse – разнообразить, вкрапливать
- crop residues – растительные остатки
- straw – солома
- stubble – жниво

Proper crop rotation is one of the essential factors of good farm management. Continuous growing of a crop is likely to produce good effect for a few years, but well-planned rotations are best over a long period of time because they *conserve* and improve the soil.

The physical condition of the soil is known *to be unfavorably affected* by growing cultivated crops for many years. However, if grasses and legumes are included in the rotation, the *tilth* is considerably improved.

Various crops differ in the kind and amount of nutrients they take from the soil that is why crop rotation helps to maintain the proper nutritional balance in the soil. Most weeds and pests are believed to be controlled by crop rotation. Diseases and insect usually attack certain crops, and they cannot develop during the periods when *resistant crops* are grown.

With crop rotation labour is distributed more *uniformly*, as peak work periods on farms growing different crops come not at the same time. Many grain growers have *suffered losses* because *temporary labour* was not available at *harvest time*. Finally, the risk of poor production is usually greater with one crop than when several crops are grown.

The advantages of crop rotation. Many advantages may be given for the use of a properly planned crop rotation scheme. Different crops require different amounts of plant nutrients. A diversity of crops is of value in the *maintenance of fertility*.

The use of a cultivated crop in the rotation helps in weed, insect, and disease control. Without a rotation, weedy plants, insects and diseases tend to become more numerous, since there is less check to their continued increase in population.

Rotations that include *sod crops* help in the control of erosion. The sod greatly slows the movement of water and may *be interspersed* with cultivated areas to prevent erosion. *Crop residues* may be returned to the soil to aid in the maintenance of organic matter. It is desirable that *straw* produced on the farm be returned in the manures. *Stubble* and other crop residues may be plowed under to advantage on most farms.

1) Answer the questions to text.

1. What are the beneficial effects of proper crop rotation?
2. Why are well-planned rotations best over a long period of time?
3. Why do many grain manufactures suffer losses during harvesting?
4. What is the role of stubble and plant residues?
5. How do sod crops help in the control of erosion?

2) Say what new information you have learnt about crop rotation.

Text 5: Fertilization

Vocabulary

- fertile – плодородный
- fertility – плодородие
- to fertilize – удобрять, вносить удобрение
- fertilizer – удобрение
- manure – навоз
- to remove nutrients – удалять питательные вещества
- application – применение
- perennials – многолетние растения
- long-season annuals – однолетние растения с длинным вегетационным периодом
- broadcast application – широкополосное внесение (разбрасывание) удобрений
- top dressing – поверхностное внесение, подкормка
- side dressing – боковая подкормка (междурядная)
- injury – повреждение
- to cause lodging – вызывать полегание растений
- late maturity – позднее созревание

- susceptibility – восприимчивость
- leaching – выщелачивание
- conversion – изменение
- row crops – пропашные культуры
- evenly – равномерный
- to distribute by plowing – распределять при вспашке
- lime – известь
- soil acidity – кислотность почвы

The use of *fertilizers* and *manures* is one of the common methods of increasing yields. As crops *remove nutrients* from the soil the latter may become deficient in some elements. *Application* of commercial fertilizers is to improve soil fertility and to ensure better quality of the crops to be grown.

Fertilizers are usually classified according to the food element which forms their main constituent. So, they may be grouped as nitrogenous fertilizers, phosphoric fertilizers, potassic fertilizers. To be effective, fertilizers should be applied where and when the plant needs them. Single yearly applications are insufficient for some crops, being unnecessary for others. To make repeated applications throughout the season is of great use in case of *perennials or long-season annuals*.

There are various methods of fertilization. *Broadcast application* means spreading the material uniformly over the soil surface, usually before the crop is planted. Sometimes the fertilizer is placed directly over the growing crop, which is known as *top dressing*. When plants are subject to *injury* fertilizers can be put alongside the plants as a *side-dressing*.

Sometimes a mixed fertilizer containing two or more fertilizer elements is to be applied, the time of placement being highly essential. Mixtures with low amount of nitrogen are usually applied to the soil before or during planting, followed by a

top dressing or side-dressing with a liquid or granulated nitrogen fertilizer. Winter cereals usually receive a top dressing in the spring. *Row crops*, such as corn, receive a side dressing after the plants made some growth. With many crops nitrogen is applied several times during the growing season because it is known to be subject to *leaching* and *conversion* to unavailable forms.

But one should not forget that too much nitrogen tends to *cause lodging, late maturity*, poor seed development in some crops, and greater *susceptibility* to certain diseases.

Phosphate fertilizers are effective when they are applied before the crop is sown, so that they can be worked into the soil and be *evenly distributed by plowing*. *Lime* used to correct *soil acidity* can be applied at any time of the year and to a crop at any stage of growth.

1) Fill in the blanks using appropriate words from the text.

1. The use of ... and ... is one of the common methods of increasing yields.

2. ... of commercial fertilizers is to improve soil fertility and to ensure better quality of the crops to be grown

3. Fertilizers may be grouped as ... fertilizers, ... fertilizers, ... fertilizers.

4. The method of spreading fertilizers uniformly over the soil surface is called

5. When plants are subject to injury fertilizers can be put alongside the plants as a

6. Broadcasting, top dressing and side-dressing are known as different methods of

7. ... crops, such as ... , receive a side dressing after the plants made some growth.

8. Fertilizers are classified their main food element.

9. Too much ... tends to cause lodging, late maturity, poor seed development in some crops.

10. ... fertilizers are effective when they are applied before the crop is sown, so that they can be worked into the soil.

2) Agree or disagree with the following statements (True or False).

1. Fertilizers may be grouped as nitrogenous fertilizers, and phosphoric fertilizers.

2. Fertilizers should be applied where and when the plant needs them.

3. Single yearly fertilizers application is of great use in case of perennials or long-season annuals.

4. Fertilizers can be placed directly over the growing crop, which is known as side-dressing.

5. Perennial crops often receive fertilizers several times during the season.

6. Corn is usually given top dressing in early spring.

7. With many crops nitrogen is applied several times during the growing season.

8. Potassic fertilizers are usually applied before the crop is sown.

3) Speak about methods of fertilizers application.

Text 6: Soil in Organic Farming

Vocabulary

- organic farming – органическое земледелие
- cover crops – покровные культуры
- compost – сохранение еды
- manure – разработка продукции
- to hold nutrients – удерживать питательные вещества

- decomposing plant materials – разлагающиеся растительные материалы
- buildup of diseases – накопление заболеваний
- sod – дерн
- to deprive disease-causing organisms – лишить болезнетворных организмов
- root damaging nematodes – повреждающие корни нематоды
- planting dates – сроки посадки
- pests – вредители
- cash crops – товарные культуры
- subsequent – последующий
- soil tilth – обработка почвы

Healthy soil is the basis of *organic farming*. Regular additions of organic matter in the form of *cover crops*, *compost*, or *manure* create a soil that is biologically active, with good structure and capacity *to hold nutrients* and water (note that any raw manure applications must occur at least 120 days before harvest). *Decomposing plant materials* will activate a diverse pool of microbes, including those that break down organic matter into plant-available nutrients as well as others that compete with plant pathogens in the soil and on the root surface.

Rotating between crop families can help prevent the *buildup of diseases* and nematodes that overwinter in the soil. Rotation with a grain crop, or preferably a *sod* that will be in place for one or more seasons, *deprives disease-causing organisms* of a host, and also contributes to a healthy soil structure that promotes plant growth.

The same practices are effective for preventing the buildup of *root damaging nematodes* in the soil, but keep in mind that certain grain crops are also hosts for some nematode species.

Rotating between crops with late and early season *planting dates* can reduce the buildup of weed populations.

Organic growers must attend to the connection between soil, nutrients, *pests*, and weeds to succeed. Unlike *cash crops*, which are grown for immediate economic benefit, cover crops are grown for their valuable effect on soil properties and on *subsequent* cash crops.

Cover crops help maintain soil organic matter, improve *soil tilth*, prevent erosion and assist in nutrient management. They can also contribute to weed management, increase water infiltration, and may help control insects and diseases.

1) Give the English equivalents.

Хозяин для некоторых видов нематод, чередование культур, поддерживать органические вещества почвы, улучшить обработку почвы, сократить накопление сорняков, способствовать борьбе с сорняками, бороться с насекомыми и болезнями.

2) Put the words above into the appropriate sentences below.

1. Healthy soil is the basis of
2. Regular additions of organic matter in the form of ... , ..., or ... create a biologically active soil.
3. ... between crop families can help prevent the buildup of diseases and nematodes.
4. Organic growers must attend to the connection between soil, nutrients, ..., and ... to succeed.
5. Cover crops help maintain soil organic matter, improve ..., prevent ... and assist in nutrient management.

3) Agree or disagree with the following statements (True or False).

1. Rotating between crop families can help prevent the buildup of diseases and nematodes.

2. Cover crops are grown for immediate economic benefit.

3. Cash crops are grown for their valuable effect on soil properties.

4. Rotating between crops can increase the buildup of weed populations.

5. Raw manure applications must occur at least 120 days before planting.

6. Cover crops contribute to weed management, may help control insects and diseases.

7. Rotation with cover crops deprives disease-causing organisms of a host.

Unit 5. Ecology and Nature Management

Text 1: My Future Profession

Vocabulary

- nature management – природопользование
- human pressures – человеческое давление
- to deliver ecosystem services – предоставлять экосистемные услуги
- environmental science – наука об окружающей среде
- to preserve and protect species – сохранять и защищать виды
- harmful actions – вредное воздействие
- to interact with – взаимодействовать с
- impact – влияние
- to improve quality – улучшить качество
- environmental impact assessment – оценка воздействия на окружающую среду
- legal aspects of environmental management – правовые основы охраны окружающей среды
- government natural resource agencies – государственные агентства природных ресурсов
- environmental protection departments – отделы охраны окружающей среды
- enterprise – предприятие

I am a first year student of the Perm State Agro Technological University. My specialty is ecology and *nature management*. I think that my specialty is very important. The *human pressures* on ecosystems have increased dramatically. These pressures decrease ecosystem function and capacity *to deliver ecosystem services*.

Ecology is a branch of biology, and is the study of organisms, the environment and how the organisms interact with

each other and their environment. Ecologists also study *the impact* humans have on the nature so these specialists can recommend ways to *preserve and protect species* and ecosystems and to minimize *harmful actions*.

For four years of study, students of my specialty master a wide range of natural-science, socio-economic, and professional disciplines. Among them are chemistry, landscape science, nature management, *environmental impact assessment*, *legal aspects of environmental management*, climatology, geophysics, and many other disciplines.

Graduates of ecology department can work for environmental consulting companies, *government natural resource agencies*, *environmental protection departments* of industrial *enterprises*. Others can work in management positions or hold academic positions at universities.

1) Find synonyms and arrange them in pairs.

1. to increase	a. subjects
2. to minimize	b. to decrease
3. environmental protection	c. to enhance
4. important	d. ecological preservation
5. to interact with	e. influence
6. to deliver	f. to get better
7. lawful aspects	g. essential
8. environmental management	h. legal aspects
9. to improve	i. to cooperate with
10. impact	j. disappear
11. disciplines	k. catastrophe
12. disaster	l. contamination
13. pollution	m. to supply
14. harmful	n. damaging
15. to become extinct	o. environmental control

2) Complete the following sentences according to the text:

1. I am a first year ... of the Perm State ... University.
2. My specialty is
3. The human pressures on ... have increased
4. Ecology is the study of organisms, ... and how the organisms ... with each other and their environment.
5. Ecologists also study the impact ... have on the natural world so these specialists can recommend ways to ... potentially ... actions.
6. For ... years of study, students of my specialty master a wide range of ... , socio-economic, and professional
7. ... of ecology department can work for ... consulting companies, government natural resource agencies, ... protection departments of industrial enterprises.

3) Answer the following questions.

1. Where do you study?
2. Why did you choose this specialty?
3. Why is it important to solve ecology issues?
4. What is ecology?
5. What does ecology study?
6. What subjects do the students of ecology department study?
7. Where can graduates of ecology department work?

Text 2: Plants and Environment

Vocabulary

- environment – окружающая среда
- conservation – сохранение
- protection of soil – защита почвы
- to release oxygen – выделять кислород

- to absorb carbon dioxide – поглощать углекислый газ
- to provide nutrients – обеспечить питательными веществами
- threat – угроза
- fossil fuels – топливо
- air purifier – очиститель воздуха
- to prevent landslides – предотвратить оползни
- to keep intact – сохранить нетронутым
- species extinction – исчезновение видов
- wellbeing of plants – благополучие растений
- favorable environmental conditions – благоприятные условия окружающей среды
- humidity – влажность
- average annual rainfall – среднегодовое количество осадков

Plant formations and their *environment* are natural resources which man always used and uses now. Animals and man will not live without plants because the cycle of nature links them. Plants also play a very important part in *conservation* and *protection of soil*, water and animals.

Plants improve the environment in many ways, like *releasing oxygen* into the atmosphere, *absorbing carbon dioxide*, *providing nutrients* to animals, and regulating the water cycle — all things we need to sustain life on Earth.

One of the biggest *threats* to the Earth is the high amount of carbon within the atmosphere from *fossil fuels* and manufacturing. But through photosynthesis, plants help reduce the amount of carbon in the atmosphere. Undoubtedly, plants are natural *air purifiers*.

Water absorbed by the plants' roots is released as a water vapor through some small pores under the leaves. Plants also help

stabilize bodies of water such as rivers, lakes and streams. Plant roots improve soil stability, *prevent landslides*, and *keep* these ecosystems *intact*.

Trees serve as shelter for animals against predators, and that is why habitat loss is considered one of the reasons for *species extinction*.

Plants are considered primary producers and they provide food for both humans and animals. So directly or indirectly, all animals rely on plants to survive. It is important that we don't take the *wellbeing of plants* for granted as they are essential for our own survival on earth.

Plants play an essential part in our environment. Because of that, it is important to protect our plants. All plants need *favorable environmental conditions* for their better growth and development. In crop growing climate is the most important environmental factor. Another factor influencing the growth of plants is *humidity* that is why the *average annual rainfall* is a very essential characteristic of an area. Light is necessary for photosynthesis – the process by which plant food is manufactured. Air is an important environmental factor too. It supplies carbon dioxide for plant growth and oxygen for respiration as well as for chemical and biological processes in the soil.

1) Find in the text the following words and word combinations:

улучшить окружающую среду разными способами, поддерживать жизнь на Земле, регулирование круговорота воды, уменьшить количество углерода, выделяется в виде водяного пара, стабилизировать водоемы, убежище, основные производители, растениеводство, биологические процессы в почве, хищники, потеря среды обитания.

2) Complete the following sentences with the following words.

<i>conditions</i>	<i>oxygen</i>	<i>rainfall</i>	<i>trees</i>	<i>nutrients</i>
<i>roots</i>	<i>threats</i>	<i>carbon</i>	<i>purifiers</i>	<i>habitat</i>
			<i>plants</i>	

1. Environmental ... are very important factors for good plant growth.
2. Animals and man will not live without
3. Soil humidity is influenced by the average annual
4. ... serve as shelter for animals against predators.
6. Plant ... improve soil stability.
7. One of the biggest ... to the Earth is the high amount of ... within the atmosphere.
8. Plants are natural air
9. ... loss is considered one of the reasons for species extinction.
10. Plants release ... into the atmosphere, absorb carbon dioxide, provide ... to animals.

3) Find antonyms and arrange them in pairs.

1. to increase	a. to maximize
2. to minimize	b. to decrease
3. to improve	c. to damage
4. environmental protection	d. to worsen
5. humidity	e. extinction
6. to release	f. to remove
7. favourable	g. environmental damage
8. existence	h. drought
9. purifier	i. bad
10. to keep intact	j. artificial
11. natural	k. pollutant

4) Answer the following questions.

1. What are natural resources which man always used and uses now?
2. What is the role of plants for the environment?
2. What is of the biggest environmental threats the world faces today?
3. How do plants help regulate water resources?
4. Why is it important to protect our plants?
5. What environmental factors are important for plant growth?
3. Why is air necessary for plants?

5) Find in each paragraph the key sentences and make up the plan of retelling the text. Give a short summary of the text.

Text 3: Soil Pollution

Vocabulary

- pollution – загрязнение
- pollutants, syn. contaminants – загрязняющие вещества
- to pose a risk to – представлять опасность для
- acidity of soil – кислотность почвы
- alkalinity of soil – щелочность почвы
- degrading the quality of the soil – ухудшение качества почвы
- fertility – плодородие
- discharge of industrial waste – сброс промышленных отходов
- soil degradation – деградация почвы
- extraction of minerals – добыча полезных ископаемых
- insecticides – инсектициды, средство для истребления насекомых
- to become resistant – стать устойчивым

- decomposition – разложение
- waste disposal – утилизация отходов
- adverse effect on the soil – вредное воздействие на почву
- harmful chemicals – вредные химикаты
- leaching of soil – выщелачивание почвы
- nuclear waste – ядерные отходы
- toxicants – отравляющие вещества
- to induce multiple organ damage – вызвать множественное поражение органов
- waste recycling – переработка отходов
- to preserve natural resources – сохранить природные ресурсы

Soil *pollution* is defined as the presence of toxic chemicals (*pollutants* or *contaminants*) in the soil, in very high concentrations *to pose a risk to* human health and the ecosystem.

Soil contamination can occur because of human activities or because of natural processes. It occurs due to many different activities such as use of pesticides. The presence of excess chemicals will increase the *acidity or alkalinity of soil* and hence *degrading the quality of the soil*, losing its *fertility*.

Soil Pollution Causes

Industrial Pollution

The *discharge of industrial waste* into soils can result in soil pollution. As mining and manufacturing activities are increasing rapidly, *soil degradation* is also increasing. The *extraction of minerals* from the earth is responsible for affecting soil fertility. As a result, the industrial waste stays on the soil surface for a long duration and makes it unsuitable for further use.

Agricultural Activities

The use of *insecticides* and pesticides for a long period can cause soil pollution. Repetitive use can cause insects and pests *to*

become resistant to it. Instead of killing pests and insects, it degrades the soil quality. Insecticides are full of chemicals that are not produced in nature and cannot be broken down. As a result, they seep into the ground after they mix with water and slowly reduce the *fertility of the soil*. Plants absorb many of these pesticides, and after *decomposition* cause soil pollution.

Waste Disposal

Disposal of plastics and other solid waste is a serious issue that causes soil pollution, disposal of electrical items such as batteries causes an *adverse effect on the soil* due to the presence of *harmful chemicals*. Lithium present in batteries can cause the *leaching of soil*.

Acid Rain

It is caused when pollutants present in the air mix with the rain and fall back on the ground. The polluted water could dissolve away some of the essential nutrients found in soil and change the structure of the soil thus making it unsuitable for agriculture.

Heavy Metals

The presence of heavy metals (arsenic, cadmium, chromium, lead, and mercury) in very high concentrations in soils can cause them to become very toxic for human beings. These metallic elements are considered systemic *toxicants* that are known to *induce multiple organ damage*, even at lower levels of exposure.

Nuclear waste can also lead to soil degradation. Illegal nuclear waste disposal and unofficial nuclear *waste recycling* could produce high pollution of water, nuclear and soil. There is need for systematic sustainable nuclear waste management system in order to *preserve natural resources* and to keep clean the life environment.

1) Match appropriate words to the definitions below.

<i>ecology</i>	<i>species</i>	<i>heavy metals</i>	<i>damage</i>	<i>habitat</i>
<i>pollution</i>	<i>destroy</i>	<i>extinct</i>	<i>acid rain</i>	<i>decomposition</i>

1. The scientific study of the natural relations of plants, animals, people to each other and their surroundings.
2. The act of making soil dangerously impure.
3. To cause danger to a living being.
4. A group of plants and animals of the same kind.
5. The natural home of a plant or an animal.
6. To damage so much that it's completely ruined.
7. These elements present in soils in very high concentrations.
8. A kind of animal no longer existing.
9. Pollutants in the air mix with the rain and fall back on the ground.
10. The process of breaking down organic matter.

2) Complete the following sentences with appropriate words.

1. All businessmen must realize the damage these chemicals do to the (environmental / environment).
2. Local government should support the idea of (recycle / 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 soil (to pollute / pollution) people should not use pesticides.
5. The presence of heavy metals in very high concentrations in soils can be (toxic / toxicants) for human beings.

6. If you care about the (protect / protection) of the environment and you want to be healthy, you should minimize potentially (harmful / harmfully) actions.

7. Plants absorb many pesticides, and after (decompose / decomposition) cause soil (pollution / pollutant).

8. The presence of excess chemicals will increase (degrading / degrade) the quality of the soil, losing its (fertile / fertility).

9. The (extract / extraction) of minerals from the earth is responsible for affecting soil fertility.

10. (Environmentalists / Environmental) have spread alarm about clean air and water.

3) Fill in the blanks with the following words.

<i>insecticides</i>	<i>recycle</i>	<i>pollution</i>	<i>disappearing</i>	<i>waste</i>
<i>organization</i>	<i>ecology</i>	<i>danger</i>	<i>cut down</i>	<i>disposal</i>

1. The use of ... for a long period can cause soil pollution.
2. People can ... rubbish instead of throwing it away.
3. ... is very dangerous for people, animals and birds.
4. Many species of animals are
5. Nuclear ... can also lead to soil degradation.
6. Greenpeace is an ... that fights to protect the environment.
7. Many people are concerned about the ... today.
8. The seas and rivers are in
9. People need wood and paper so they ... forests.
10. ... of plastics and other solid waste is a serious issue that causes soil pollution.

4) Answer the following questions.

1. What is soil pollution?
2. What will the presence of excess chemicals in the soil increase?

3. What are the soil pollution causes?
4. Why is the use of insecticides and pesticides harmful?
5. What can lithium present in batteries cause?
6. What is acid rain?
7. What are the consequences of acid rain?
8. What heavy metals are very toxic for human beings?
9. Why is nuclear waste hazardous?

5) *Give a short summary of the text.*

Text 4: Possible Solutions to Soil Pollution

Vocabulary

- long-term consumption – длительное потребление
- sustainable farming practices – устойчивые методы ведения сельского хозяйства
- crop rotation – севооборот
- pest management – борьба с вредителями
- reliance – зависимость
- nutrient depletion – истощение питательных веществ
- predator – хищник
- crop diversification – разнообразие сельскохозяйственных культур
- reforestation – лесовосстановление
- afforestation – лесонасаждение
- deforestation – вырубка леса
- recycling waste materials – переработка отходов
- hazardous substances - опасные вещества
- reusing materials – повторное использование материалов
- generation of waste – образование отходов
- disposal of harmful substances – утилизация вредных веществ

- landfills – свалки
- remediation – исправление
- restoration – восстановление
- removal – удаление
- treatment of pollutants – обработка загрязняющих веществ
- to degrade – уменьшать

Effects of Soil Pollution

Soil pollution affects the health of humans, plants, and animals. When animals or human beings consume these crops or plants the toxic material can pass into their body. *Long-term consumption* of these crops may cause chronic diseases that are untreatable. The soil is an important habitat for different types of microorganisms, birds, and insects. Thus, change in the chemistry of soil can negatively impact the living organisms and can result in the gradual death of many organisms.

Soil pollution is a complicated problem that requires everyone's participation, from individuals to the government. There are a few methods for reducing soil pollution.

Sustainable Farming Practices

One of the key solutions to soil pollution is the adoption of *sustainable farming practices*. This includes practices such as organic farming, *crop rotation*, and integrated *pest management*. Organic farming reduces the *reliance* on synthetic pesticides and fertilizers, minimizing their impact on soil health. Crop rotation helps to prevent *nutrient depletion* and the buildup of pests and diseases in the soil. Integrated pest management involves the use of natural *predators*, *crop diversification*, and cultural practices to manage pests, reducing the reliance on chemical pesticides. One of the best sources of nutrients for the soil is natural manure. It restores the soil's critical nutrients and improves its overall health.

Reforestation and Afforestation

Soil erosion, which is produced by *deforestation*, is one of the major sources of soil pollution. With an ever-increasing population, it is only logical that mankind requires more and more room to expand their civilization. It is frequently accomplished at the expense of soil health. Reforestation of a deforested area should be encouraged to prevent this from happening.

Proper Waste Management And Recycling

Proper waste management is essential in preventing soil pollution. This includes *recycling waste materials*, such as plastics, electronic waste, and *hazardous substances*. Recycling and *reusing materials* help to reduce the *generation of waste* and minimize the *disposal of harmful substances* into the environment. *Landfills* should be properly designed and managed to prevent the leaching of contaminants into the soil and groundwater.

Remediation and Restoration Techniques

Remediation and *restoration* techniques can be employed to clean up contaminated soil and restore its health and fertility. These techniques involve the *removal or treatment of pollutants* to reduce their concentration in the soil. Bioremediation is a commonly used technique that utilizes microorganisms *to degrade* or transform pollutants into less harmful substances. Phytoremediation involves the use of plants to absorb and remove contaminants from the soil.

1) Answer the following questions.

1. What are the negative consequences of soil pollution?
2. What are the effects of soil pollution on human health?
3. How can soil pollution be controlled?

4. What are the environmental remediation processes that can be employed to decrease the negative effects of soil pollution?
5. What do sustainable farming practices include?
6. What is one of the best organic sources of nutrients for the soil?
8. What is the meaning of reforestation?
9. What are the best ways to reduce the generation of waste?
10. What do remediation and restoration techniques involve?

2) Find antonyms and arrange them in pairs.

1. deforestation	a. extinction
2. generation of waste	b. disposal of waste
3. to improve	c. to damage
4. environmental protection	d. to worsen
5. humidity	e. reforestation
6. to release	f. to remove
7. favourable	g. environmental damage
8. existence	h. drought
9. purifier	i. bad
10. to keep intact	j. artificial
11. to provide	k. to absorb
12. natural	l. pollutant

Text 5: Environmental Sustainability

The environmental sustainability of agriculture consists of three components: agricultural production, demand for agricultural products and food policy. There are several gauges of environmental sustainability including the Input and Output Rules.

The Output Rule states that waste emissions of an action should be kept within the assimilative capacity of the local environment without unacceptable degradation of future waste absorptive capacity or the ecosystem services.

The Input Rule for renewables states that harvesting rates of renewables must be within regenerative capacity of the natural system.

The key parameters of agricultural production that impact sustainability are (a) intensiveness of fossil fuel use; (b) application of excessive chemicals to the soil; (c) overharvesting that leaves insufficient residual plant material; (d) intensive water use; and (e) excessive compaction or erosion of topsoils.

Specific sustainability practices are found in the application of polycultural cultivation; steady state fishery production; use of grazing practices that minimize erosion and are compatible with native plant survival; rotational cropping and grazing practices that allow sustaining of carbon, nitrogen and other geochemical cycles.

Worldwide, more than 99.7% of human food (calories) comes from the land. Significant adverse environmental impacts, such as soil erosion, biodiversity loss, and surface water runoff carrying sediment pollution may result from all forms of terrestrial agriculture. In addition, fossil fuel-intensive agriculture causes accumulation of agricultural chemicals in soils and their discharge to surface waters.

The chief chemicals applied are nitrates and phosphates in fertilizers and a host of pesticides and herbicides, most of which have significant toxicity. When these chemicals enter the environment they alter biotic productivity cycles and can affect the metabolism of plants and animals. This metabolic change may induce stunted growth, impaired function and even mortality. As

a consequence loading of extraneous chemicals into the environment is a threat to biodiversity and ecosystem function. There is a critical need to assess fossil energy limits, the sustainability of agriculture, biodiversity implications and the food needs of a rapidly growing world population.

(The source: <http://www.eoearth.org/view/article>)

1) Give the title to each paragraph.

2) Complete the sentences according to the information given in the text.

- 1) The environmental sustainability of agriculture consists of
- 2) The Output Rule states that... .
- 3) The Input Rule states that
- 4) The key parameters of agricultural production that impact sustainability are
- 5) The chief chemicals applied are
- 6) When these chemicals enter the environment they
- 7) As a consequence loading of extraneous chemicals into the environment is

3) Match the adjectives on the left with the nouns on the right.

1. environmental	a) cultivation
2. assimilative	b) fuel
3. agricultural	c) production
4. fossil	d) capacity
5. rotational	e) cropping
6. polycultural	f) agriculture
7. excessive	g) toxicity
8. significant	h) cycles
9. geochemical	i) chemicals
10. terrestrial	g) sustainability

Unit 6. Biology

Text 1: My Future Profession

Vocabulary

- environmental science – наука об окружающей среде
- human pressures – человеческое давление
- to preserve biodiversity – сохранять биоразнообразие
- to encompass – охватить
- single-celled organisms – одноклеточные организмы
- multicellular organisms – многоклеточные организмы
- interaction – взаимодействие
- to relate to – относиться к
- a wide range of – широкий ряд
- natural resource agencies – агентства природных ресурсов
- environmental protection departments – отделы охраны окружающей среды
- enterprise – предприятие

I am a first year student of the Perm State Agro Technological University. My specialty is biology, which related to environmental monitoring and sustainable development of ecosystems. I think that my specialty is very important. The *human pressures* on ecosystems have increased dramatically. These pressures decrease ecosystem function and capacity *to preserve biodiversity*.

Biology is a natural science discipline that studies living things. It encompasses all levels of living things, from *single-celled organisms* to *multicellular organisms* and their *interaction* in their ecosystems. Biology *relates* to *environmental science* because environmental science is the study of the biological, geological, and chemical processes that form our environment.

Biologists are involved in protecting, managing and monitoring the existing resources of our land including: analysing soil, water and air for chemical pollution, finding ways to clean up pollution, recording and monitoring the plants and animals that share the land we use.

For four years of study, students of my specialty *a wide range of* natural-science, socio-economic, and professional disciplines. My main subjects are chemistry, microbiology, ecology, biomonitoring, biotechnology, introduction to *biodiversity*, basics of virology, and many other disciplines.

Graduates of biology department can work for environmental consulting companies, *natural resource agencies*, *environmental protection departments of enterprises*. Others can work in management positions or hold academic positions at universities.

1) Complete the following sentences according to the text.

1. I am a first year ... of the Perm State ... University.
2. My specialty is
3. The human pressures on ... have increased dramatically.
4. Biology is a natural science ... that studies
5. Biology encompasses all levels of ... , from single-celled organisms to ... and their interaction in their ecosystems.
6. Biology relates to ... because environmental science is the study of the ... , ..., and chemical processes that form our
7. For ... years of study, students of my specialty master a wide range of ... , socio-economic, and professional
8. ... of biology department can work for ... companies, environmental protection departments of

2) Find synonyms and arrange them in pairs.

1. to increase	a. to study subjects
2. to minimize	b. to decrease
3. environmental protection	c. to enhance
4. important	d. ecological preservation
5. to interact with	e. living things
6. to deliver	f. influence
7. to improve	g. to get better
8. impact	h. essential
9. to master disciplines	i. to cooperate with
10. pollution	j. to disappear
11. harmful	k. contamination
12. to become extinct	l. to supply
13. living creatures	m. damaging

3) Match the questions with the answers.

Questions	Answers
1. I have heard you have entered the Perm State Agro Technological University.	a) I am quite well, thank you.
2. Hello! How are you?	b) It's a very good idea.
3. I think about taking the course in Ecology next year too.	c) My specialty is biology, which related to environmental monitoring and sustainable development of ecosystems.
4. What will it give to you?	d) In my opinion, my specialty is very important. The many specialties within biology provide us with information to better understand the world around us. And what's your choice?
5. What specialty have you chosen?	e) Yes, I'll study biology.

Text 2: History of Biology

Vocabulary

- circulation of blood – кровообращение
- causes of disease – причины заболеваний
- Laws of Inheritance – законы наследования
- generation – поколение
- advances – достижения
- to make appropriate rules – установить соответствующие правила
- to shape own evolution - формировать собственную эволюцию

Biology is the study of life and living organisms. For as long as people have looked at the world around them, people have studied biology, they knew and passed on information about plants and animals.

Modern biology really began in the 17th century. Antoni van Leeuwenhoek invented the microscope and William Harvey described the *circulation of blood*. The microscope allowed scientists to discover bacteria, leading to an understanding of the *causes of disease*. All these new knowledge needed to be put into order and in the 18th century the Swedish scientist Carl Linnaeus classified all living things into the biological families (animal, plant, fungi, protist and monera) we know and use today.

In the middle of the 19th century the Austrian monk Gregor Mendel created his *Laws of Inheritance*, beginning the study of genetics that is such an important part of biology today. At the same time, while traveling around the world, Charles Darwin was formulating the central principle of modern biology – natural selection as the bases of evolution.

In the 20th century biologists began to recognize how plants and animals live and pass on their genetically coded information to the next *generation*. Since then, partly because of developments in computer technology, there have been great *advances* in the field of biology, it is an area of ever growing knowledge.

During the past few hundred years biology has changed from concentrating on the structure of living organisms to looking more at how they work or function. We need to understand how our activities affect the environment, how humans must be careful *to make appropriate rules* for the use of our genetic information.

Nowadays biologists are making fantastic discoveries which will affect all our lives. These discoveries have given us the power *to shape our own evolution* and to determine the type of world we will live in. Recent advances, especially in genetic engineering, have dramatically affected agriculture, medicine, veterinary science, and industry, and our world view has been revolutionized by modern developments in ecology. There has never been a more exciting nor a more important time to study biology.

1) Answer the following questions.

1. What is biology?
2. How long have people been studying biology?
3. When did modern biology begin?
4. What did the invention of the microscope allow?
5. Who classified all living things into the biological families?
6. Who created Laws of Inheritance?
7. Who formulated the central principle of natural selection?
8. How did biology develop in the 20th century?
9. How has biology changed during the past few hundred years?
10. What are recent advances in biology?

2) Complete the following sentences with appropriate words.

<i>environment</i>	<i>living organisms</i>	<i>discoveries</i>	<i>microscope</i>
<i>evolution</i>	<i>circulation of blood</i>		<i>genetics</i>
<i>natural selection</i>	<i>important</i>		<i>computer</i>
<i>technology</i>	<i>genetic engineering</i>		<i>exciting</i>

1. Biology is the study of life and
2. Antoni van Leeuwenhoek invented the ... and William Harvey described the
3. The study of ... is an important part of biology today.
4. Charles Darwin formulated the central principle of ... as the bases of evolution.
5. Nowadays because of developments in ... , there have been great advances in the field of biology.
6. We need to understand how our activities affect the
7. Nowadays biologists are making fantastic ... which will affect all our lives.
8. These discoveries have given us the power to shape our own
9. Recent advances, especially in ... , have dramatically affected agriculture, medicine, veterinary science, and industry.
10. There has never been a more ... nor a more ... time to study biology.

3) Match the following sentences.

1.	Biologists began to recognize how plants and animals pass on their genetically coded information to the next generation	A.	for as long as they have looked at the world around them.
2.	Antoni van Leeuwenhoek invented the microscope and William Harvey described the circulation of blood	B.	in the 19th century.
3.	The Austrian monk Gregor Mendel created his Laws of Inheritance	C.	in the 18th century.
4.	The Swedish scientist Carl Linnaeus classified all living things into the biological families	D.	in the 20th century.
5.	Biologists are making fantastic discoveries which will affect all our lives	E.	nowadays.
6.	People have studied biology	F.	in the 17th century.

4) Give a short summary of the text.

Text 3: Aspects of Biology

Biology encompasses diverse branches, including botany, ecology, evolution, genetics, marine biology, medicine, microbiology, molecular biology, physiology, and zoology. Specialists in some branches include:

- molecular biologists and biochemists who work at the chemical level, with the aim of revealing how DNA (deoxyribonucleic acid), proteins, and other molecules are involved in biological processes;
- geneticists who study genes and their involvement in inheritance and development;
- cell biologists who study individual cells or groups of cells, often by culturing them outside organisms. They investigate how cells interact with each other and their environment;
- physiologists who find out how organ systems work in a healthy body;
- pathologists who study diseased and dysfunctional organs;
- ecologists who study interactions between organisms and their environment. Some focus their attention on whole organisms, others study populations, individuals of the same species living together at one location.

There are also biologists who specialize in particular groups of organisms, for example, bacteriologists study bacteria, botanists study plants, and zoologists study animals.

Biologists are employed in many fields including conservation and wildlife management, industry, health care, horticulture, agriculture, zoos, museums, information science, and marine and freshwater biology. In addition, many biologists are employed as teachers, lecturers, or research workers.

1) Match the following sentences.

1.	Molecular biologists and biochemists work at	A.	individual cells or groups of cells, often by culturing them outside organisms.
2.	Geneticists study	B.	how organ systems work in a healthy body.
3.	Physiologists study	C.	the chemical level, with the aim of revealing how DNA (deoxyribonucleic acid), proteins, and other molecules are involved in biological processes.
4.	Cell biologists study	D.	genes and their involvement in inheritance and development.
5.	Ecologists study	E.	diseased and dysfunctional organs.
6.	Pathologists study	F.	interactions between organisms and their environment.

2) Complete the following sentences with appropriate words.

<i>branches</i>	<i>ecologists</i>	<i>organisms</i>	<i>teachers</i>
<i>interactions</i>	<i>biologists</i>	<i>research workers</i>	<i>species</i>
<i>environment</i>	<i>biochemists</i>	<i>attention</i>	

1. Biology encompasses diverse
2. There are also ... who specialize in particular groups of
3. Many biologists are employed as ... , lecturers, or
4. Ecologists study ... between organisms and their environment.
5. Some ecologists study populations, individuals of the same ... living together at one location.

5. Cell biologists investigate how cells interact with each other and their

6. Some ... focus their ... on whole organisms.

7. ... work at the chemical level.

Text 4: Cytology

Vocabulary

- cork – пробка

- surface of bark – поверхность коры

- feature – черта

- to embody – воплощать, олицетворять

- to embrace – охватывать

- inherited information – унаследованная информация

- ball-shaped nucleus – шаровидное ядро

- fibrous – волокнистый

- contents – содержимое

- cavity – полость

- sap – сок растения

Cytology means «the study of cells». Cytology is that branch of life science, which deals with the study of cells in terms of structure, function and chemistry.

Cells were discovered in 1665 by the English scientist and inventor Robert Hooke. Hooke designed his own compound light microscope to observe structures too small to be seen with the naked eye. Among the first structures he examined was a thin piece of cork (the outer *surface of bark* from a tree). It soon became clear that virtually all living things are made of cells, and that these cells have certain *features* in common.

The concept that cells are the basic units of life became *embodied* in a theory called the cell theory, which *embraces* the following main ideas:

- cells form the building blocks of living organisms,
- cells arise only by the division of existing cells,
- cells contain *inherited information* which controls their activities.

The features of a typical animal cell:

- The cell has a cell surface membrane which encloses the cell *contents*.
- The contents consist of a central *ball-shaped nucleus* surrounded by material called cytoplasm.
- The nucleus contains a fibrous material called chromatin.
- This condenses to form chromosomes during cell division.
- Chromatin contains DNA, the material which controls the various activities inside the cell.
- Small dots within the cytoplasm are particles of stored food. Many consist of glycogen, which is a food storage polysaccharide.

Like an animal cell, a typical plant cell has a cell surface membrane, cytoplasm, and a nucleus. However, plant cells differ from animal cells in several ways:

- Most plant cells have a large sap-filled cavity called the vacuole. Sap is a watery fluid containing salts and sugars. The vacuole surrounded by a membrane called the tonoplast.
- The cytoplasm contains starch grains, the food storage products of plants.
- Many plant cells have chloroplasts in the cytoplasm. These contain the pigments used in photosynthesis, the process by which green plants and certain other organisms transform light energy into chemical energy. Chlorophyll, which is green, is the main pigment. Chloroplasts occur only in the parts of plants exposed to light – the green parts. They are absent from underground structures such as roots.

1) Answer the following questions.

1. What is cytology?
2. When were cells discovered?
3. How did Robert Hooke discover cells?
4. What is called the cell theory?
5. What are the main ideas of the cell theory?
6. What is the structure of a typical animal cell?
7. How do plant cells differ from animal cells?
8. What features only animal (plant) cells have?

2) Match appropriate words to the definitions below.

<i>cell</i>	<i>ecology</i>	<i>nucleus</i>	<i>cytoplasm</i>	<i>chlorophyll</i>
<i>cork</i>	<i>biology</i>	<i>microscope</i>	<i>tonoplast</i>	
<i>photosynthesis</i>	<i>pathology</i>	<i>cell biology</i>		

1. _____ is a scientific instrument that makes extremely small things look larger.
2. _____ is the smallest part of a living thing.
3. _____ is the central part of an atom, made up of neutrons, protons, and other elementary particles.
4. _____ is the contents which consist of a central ball-shaped nucleus surrounded by material.
5. _____ is the green pigment in plants.
6. _____ is the outer surface of bark from a tree.
7. _____ is the study of life and living organisms.
8. _____ is the vacuole surrounded by a membrane.
9. _____ is the process by which green plants and certain other organisms transform light energy into chemical energy.
10. _____ is the study of interactions between organisms and their environment.
11. _____ is the study of diseased and dysfunctional organs.
12. _____ is the study of cell structure and function.

Text 5: Microbiology

Vocabulary

- unicellular – одноклеточный
- eukaryotes – эукариоты
- fungus (мн.ч. fungi) – гриб
- protists – протисты
- prokaryotes – прокариоты
- stain – пятно, краска
- dye – краситель
- biodegradation – биоразложение
- contaminant – загрязнитель
- to fight pests – бороться с вредителями
- to remove nutrients – удалить питательные вещества
- toxic compounds – токсичные соединения
- to release – выпускать, освобождать
- spread of disease agents – распространение возбудителей болезней
- digesting waste products – переваривание отходов
- to bind soils into aggregates – связывать почву в агрегаты, наполнители

Microbiology is the study of microorganisms, which are microscopic and *unicellular* organisms. This includes *eukaryotes* such as *fungi* and *protists*, and *prokaryotes*. Viruses, though not classed as living organisms, are also studied.

Microbiology includes virology, mycology, parasitology, bacteriology and other branches. Microbiological procedures usually must be aseptic, and use a variety of tools such as light microscopes with a combination of *stains* and *dyes*, agar plates in petri dishes, biochemical test and running tests against particular growth conditions.

Microbiology is currently a field of active research. Many microbes are responsible for beneficial processes such as

industrial fermentation, antibiotic production and others. Bacteria can be used for the industrial production of amino acids. Microorganisms are beneficial for microbial *biodegradation* of domestic, agricultural and industrial wastes. The ability of each microorganism to degrade toxic waste depends on the nature of each *contaminant*.

Microbiology plays an important role in the agriculture industry because of all the benefits it offers. Microbes help to improve productivity and help *fight pests*. In addition, microbiology increases food security and helps to prevent toxins in agriculture. Microbes, such as bacteria and fungi, *remove nutrients* and water from the soil to make it more fertile. Also, microbes can use carbon dioxide and nitrogen oxide, which would otherwise turn into *toxic compounds*.

Microbes are useful due to their role in the decomposition process, producing nutrients such as nitrogen as well as few other essential chemicals. Thus it would be impossible for plants to survive without microbes. Microbes also prevent toxins from destroying crops. Fungi can *release* toxins when they break down waste products in soil, reducing the toxicity of their environment and allowing them to grow.

Microbes also serve an essential role in preventing the *spread of disease agents* from a natural disaster area by *digesting waste products* that would otherwise be poisonous to other plants. Different soil microbes also play an essential role in improving the soil structure by releasing different chemicals and proteins. Proteins called polysaccharides help *bind soils into aggregates*, improving drainage and supporting plant roots. It leads to a healthier environment for plants and allows workers to use less fertilizer to help achieve optimal growth.

1) Fill in the blank spaces in the following sentences:

1) Microbiology is the study of ... , which are microscopic and unicellular organisms.

- 2) Viruses, though not classed as ... , are also studied.
- 3) Many microbes are responsible for ... such as industrial fermentation, antibiotic production and others.
- 4) ... are beneficial for microbial biodegradation of domestic, agricultural and industrial wastes.
- 5) Microbes help to improve productivity and help fight
- 6) Microbes, such as bacteria and ... , remove nutrients and water from the soil to make it more
- 7) Also, ... can use carbon dioxide and ... , which would otherwise turn into toxic compounds.
- 8) Microbes also serve an essential role in preventing the spread of ... from a natural disaster area.
- 9) Different soil microbes also play an essential role in improving the ... structure by releasing different chemicals and
- 10) Proteins called ... help bind soils into aggregates, improving drainage and supporting

2) Answer the following questions.

- 1) What is microbiology?
- 2) Which branches of microbiology do you know?
- 3) Where are the microbes used?
- 4) What is produced by microorganisms?
- 5) How can we biodegrade different wastes?
- 6) Is microbiology connected with agriculture? How?
- 7) Could microorganisms be useful in fighting pests?
- 8) What proteins called polysaccharides help bind soils into aggregates?

3) Find the appropriate definitions to the following words:
eukaryotes, viruses, antibiotics, enzymes, mycology, microbiologist, prokaryotes

1. Small infectious agents that can replicate only inside the living cells of organisms.
2. Biological scientists who study organisms so small that, generally, they can only be seen with a microscope.
3. Organisms whose cells contain complex structures enclosed within membranes.
4. The branch of biology concerned with the study of fungi.
6. Organisms that lack a cell nucleus or any other membrane-bound organelles.
7. Proteins that catalyze (i.e. increase or decrease the rates of) chemical reactions.
8. Powerful medicines that fight bacterial infections.

Text 6: Agricultural Biotechnology

Vocabulary

- human intervention – вмешательство человека
- yeasts – дрожжи
- molds – плесень
- propagation – размножение, разведение
- to alter – менять
- to tolerate herbicides – зд. выдерживать действие гербицидов
- weed control – борьба с сорняками
- to be resistant to plant diseases – быть устойчивым к заболеваниям растений
- insect pests – насекомые-вредители
- reliable – надежный
- nutritionally-enriched or longer-lasting foods – продукты, которые обогащены питательными веществами или имеют более длительный срок хранения
- saturated fats – насыщенные жиры
- foot and mouth disease – ящур

- rabies – бешенство
- no-till agriculture system – беспашотное земледелие
- reduced tillage – сокращенная обработка почвы
- to preserve topsoil – сохранить верхний слой почвы
- devastating diseases – разрушительные болезни
- to withstand drought conditions – противостоять

засушливым условиям

- to mitigate – смягчать, уменьшать
- food-borne illness – болезни пищевого происхождения

The term Biotechnology consists of two parts. Bio is a Greek word for «life» and technology gives an indication of *human intervention*. Biotechnology is the use of advances in biology for applications in human and animal health, agriculture, environment. Biotechnology is one of the oldest sciences. Six thousand years ago, microorganisms were used to brew beers and to produce wine, bread and cheese. This application of biotechnology is the directed use of organisms for the manufacture of organic products (examples include beer and milk products). In this way, classical biotechnology refers to the traditional techniques used to breed animals and plants, as well as to the application of bacteria, *yeasts* and *molds* to make bread or cheese.

Modern biotechnology came into being during the nineteen seventies. It has been divided into several categories. Green biotechnology is biotechnology applied to agricultural processes. An example would be the selection and domestication of plants via *micro propagation*. Agricultural biotechnology is a range of tools, including traditional breeding techniques that *alter* living organisms to make or modify products; improve plants or animals; or develop microorganisms for specific agricultural uses. Modern biotechnology today includes the tools of genetic engineering.

How is Agricultural Biotechnology being used?

Biotechnology provides farmers with tools that can make production cheaper and more manageable. For example, some biotechnology crops can be engineered *to tolerate specific herbicides*, which make *weed control* simpler and more efficient. Other crops have been engineered *to be resistant to specific plant diseases and insect pests*, which can make pest control more *reliable* and effective, and/or can decrease the use of synthetic pesticides.

Many other types of crops are now in the research and development stages. Advances in biotechnology may provide consumers with *foods that are nutritionally-enriched or longer-lasting*, or that contain lower levels of certain naturally occurring toxicants present in some food plants. Developers are using biotechnology to try to reduce *saturated fats* in cooking oils, reduce allergens in foods, and increase disease-fighting nutrients in foods. They are also researching ways to use genetically engineered crops in the production of new medicines, which may lead to a new plant-made pharmaceutical industry that could reduce the costs of production using a sustainable resource.

In addition to genetically engineered crops, biotechnology has helped make other improvements in agriculture not involving plants. Examples of such advances include making antibiotic production more efficient through microbial fermentation and producing new animal vaccines through genetic engineering for diseases such as *foot and mouth disease and rabies*.

What are the benefits of Agricultural Biotechnology?

The application of biotechnology in agriculture has resulted in benefits to farmers, producers, and consumers. Biotechnology has helped to make both insect pest control and weed management safer and easier. For example, genetically

engineered insect-resistant cotton has allowed for a significant reduction in the use of synthetic pesticides that may contaminate groundwater and the environment.

In terms of improved weed control, herbicide-tolerant soybeans, cotton, and corn enable the use of reduced-risk herbicides that break down more quickly in soil and are non-toxic to wildlife and humans. Herbicide-tolerant crops are particularly compatible with *no-till or reduced tillage agriculture systems* that help *preserve topsoil* from erosion.

Agricultural biotechnology has been used to protect crops from *devastating diseases*. Biotech crops may provide enhanced quality traits such as increased levels of beta-carotene in rice to aid in reducing vitamin A deficiencies and improved oil compositions in canola, soybean, and corn. Crops with the ability to grow in salty soils or better *withstand drought conditions* are also in the works and the first such products are just entering the marketplace. Such innovations may be increasingly important in adapting to or in some cases helping *to mitigate* the effects of climate change.

The tools of agricultural biotechnology have been invaluable for researchers in helping to understand the basic biology of living organisms. For example, scientists have identified the complete genetic structure of several strains of *Listeria* and *Campylobacter*, the bacteria often responsible for major outbreaks of *food-borne illness* in people. This genetic information is providing a wealth of opportunities that help researchers improve the safety of our food supply.

1) Complete the following sentences with appropriate words.

<i>microorganisms</i>	<i>yeasts and molds</i>	<i>manufacture</i>
<i>agricultural</i>	<i>genetic engineering</i>	<i>herbicides</i>
<i>insect pest</i>	<i>weed</i>	<i>devastating diseases</i>

1. Six thousand years ago, ... were used to brew beers and to produce wine, bread and cheese .
2. Classical biotechnology refers to the application of bacteria, ... to make bread or cheese.
3. This application of biotechnology is the directed use of organisms for the ... of organic products.
4. Green biotechnology is biotechnology applied to ... processes.
5. Modern biotechnology today includes the tools of
6. Some biotechnology crops can be engineered to tolerate specific ... , which make weed control simpler and more efficient.
7. Biotechnology has helped to make both ... control and ... management safer and easier.
8. Agricultural biotechnology has been used to protect crops from

2) Are the following statements true or false? Correct the false ones.

1. Biotechnology is one of the modern sciences.
2. The application of biotechnology is the directed use of organisms for the manufacture of organic products.
3. Modern biotechnology came into being during the seventeen nineties.
4. Agricultural biotechnology is a range of tools that alter non-living organisms, or parts of organisms, to make or modify products.
5. Advances in biotechnology may provide consumers with foods that are nutritionally-enriched or longer-lasting.
6. Genetically engineered insect-resistant cotton has allowed for a significant reduction in the use of persistent, synthetic pesticides.

7. Crops with the ability to grow in acid soils are also in the works and the first such products are just entering the marketplace.

8. The tools of agricultural biotechnology have been invaluable for researchers in helping to understand the basic ecology of living organisms.

3) Give a short summary of the text.

Заключение

Организованная учебная деятельность на основе данного учебного пособия предполагает развитие профессиональной иноязычной коммуникативной компетенции обучающихся сельскохозяйственных специальностей.

Показателем качественно организованной работы будет являться достижение запланированного результата в установленные сроки благодаря использованию оптимальных методов и эффективных инструментов.

Применение данного учебного пособия:

- способствует развитию всех компонентов иноязычной коммуникативной компетенции (лексика, грамматика, устная речь, чтение, перевод);

- даёт возможность реализовать личностно-ориентированный, компетентностный, коммуникативный и профессионально-ориентированный подходы, которые и определяют методологическую основу разработки содержания данного пособия;

- позволяет знакомиться с достижениями науки, расширять профессиональный кругозор обучающегося, а также получать актуальные знания о международных достижениях в своей профессиональной области.

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Общие рекомендации к переводу специальных текстов

Технический перевод должен отвечать следующим требованиям:

- наличие унифицированной терминологии (для обозначения того или иного понятия или предмета должен использоваться один и тот же термин на протяжении всего перевода, использование терминов-синонимов не допускается);

- точность перевода (краткость, выразительность, логическая последовательность, объективность, полнота изложения материала оригинала в соответствии с нормами русского технического языка);

- эквивалентность (равенство между исходным и конечным текстами при успешном переводе);

- адекватность (соответствие перевода данным коммуникативным условиям, разговорный жаргон, например, не применим в официальной деловой беседе);

- логичность и четкость изложения (доказательность, аргументированность изложения, тщательный отбор лексики способствуют четкости, ясности изложения).

Нарушения норм перевода получили названия буквальный и дословный переводы.

Буквальным переводом является недостаточно трансформированный перевод. Буквальный перевод сводится к механической подстановке русского слова взамен иностранного, а также слепому сохранению конструкции английского предложения, что приводит к бессмыслице и дезориентации.

От буквального перевода следует отличать *дословный* перевод. Он состоит в передаче структуры предложения без изменения конструкции и без существенного изменения порядка слов. Дословный перевод допустим в тех случаях, когда русское предложение может иметь структуру, аналогичную структуре в предложении на иностранном языке, и дословный перевод не приводит к нарушению грамматических и лексических норм русского языка. Дословным, или приближающимся к дословному, может оказаться перевод научно-технического или специального текста, изобилующего терминами и близкого по своей структуре к грамматическому строю русского языка.

Для успешного перевода научно-технической литературы необходимо следующее: 1) иметь определенный запас слов иностранного языка (в том числе специальной терминологии в определенной области знаний); 2) знать лексические, грамматические и стилистические правила перевода; 3) иметь представление об области знания, к которой относится переводимый текст.

Практические рекомендации по технике перевода научно-технической литературы

Начинают перевод с заглавия (названия текста), так как оно, как правило, выражает основную тему данного текста. Если же перевод заглавия вызывает затруднения, его можно осуществить после перевода всего текста. Прежде чем приступить к переводу, необходимо внимательно прочитать весь оригинальный текст.

В процессе чтения можно отметить карандашом на полях непонятные и сомнительные места, а также незнакомые или не зафиксированные в словарях термины.

Прочтите первое предложение до точки, стараясь уловить его общее содержание. Последовательно выделяйте каждую из его составных частей или предложений (в случае, если предложение сложное), учитывая все признаки окончания предложения.

В выделенном отрезке найдите сначала сказуемое, затем подлежащее, и по месту спрягаемой части сказуемого определите тип предложения или, если спрягаемая часть отсутствует, выясните, с каким оборотом имеете дело.

Первоначальный перевод может быть почти дословным, облегчающим понимание основного смысла текста. Потом подбираются слова и словосочетания, наиболее четко передающие мысль переводимого материала, устанавливается грамматическая связь слов в предложении.

Если после проведенной работы смысл предложения понятен, его редактируют, читают вместе с предшествующей фразой и, убедившись в правильной смысловой связи, переходят к следующему предложению.

По окончании работы необходимо внимательно прочитать весь перевод целиком, внести стилистические поправки, а также окончательно унифицировать терминологию. Убедившись, что перевод

точно передает содержание текста и соответствует нормам русского технического языка, можно считать работу законченной.

Лексико-грамматические особенности перевода научно-технических текстов

Структурно английские терминологические единицы можно разделить на следующие:

- 1) Простые термины типа: oxygen (кислород), resistance (сопротивление), driver (задающее устройство), equipment (оборудование).
- 2) Сложные термины, образованные путем словосложения. Составные части такого термина часто соединяются с помощью соединительного гласного: gas + meter = gasometer

При этом иногда происходит усечение компонентов: turbine + generator = turbogenerator, ampere + meter = ammeter

Словосочетания, компоненты которых находятся в атрибутивной связи, т.е. один из компонентов определяет другой: direct current – постоянный ток, barium peroxide – перекись бария

Трудность перевода препозитивных атрибутивных словосочетаний зависит также от многозначности их компонентов. Одно и то же слово-определение в зависимости от значения определяемого существительного может переводиться по-разному: public man – политический деятель, public opinion – общественное мнение, public scandal – публичный скандал, public property – государственная собственность.

Первый член атрибутивного словосочетания может передаваться на русский язык различными способами:

- прилагательным: emergency meeting – внеочередное (экстренное) совещание, family obligations – семейные обязанности
- существительным в родительном падеже: wage rise – повышение зарплаты, budget increase – увеличение бюджета
- существительным с предлогом: tax proposals – предложения по налогам, terrorist trial – суд над террористом
- придаточным предложением: wage deadlock – тупик, в который зашли переговоры по зарплате

Перевод многочленных словосочетаний типа «существительное + существительное + существительное» предполагает следующие этапы: 1) перевести определяемое существительное (последнее слово группы); 2) проанализировать смысловые связи между членами словосочетания и разбить их на смысловые группы (анализ проводится

слева направо); 3) перевести словосочетание, начиная с определяемого слова и затем последовательно каждую смысловую группу (справа налево).

При переводе терминов мы можем встретиться со следующими моментами:

а) часть терминов, имеющих международный характер, передается путем транслитерации и не нуждается в переводе: - antenna (антенна), feeder (фидер), blooming (блюминг).

б) некоторые термины имеют прямые соответствия в русском языке и передаются соответствующими эквивалентами: hydrogen (водород), voltage (напряжение).

в) известная часть терминов при переводе калькируется, т.е. передается с помощью русских слов и выражений, дословно воспроизводящих слова и выражения английского языка: single-needle instrument (однострелочный аппарат), superpower system (сверхмощная система).

г) нередко случается, что словарь не дает прямого соответствия английскому термину. В этом случае переводчик должен прибегнуть к описательному переводу, точно передающему смысл иноязычного слова в данном контексте: video-gain (регулировка яркости отметок от отраженных сигналов), combustion furnace (печь для органического анализа), wall beam (балка, уложенная вдоль поперечной стены).

Фразы для краткого изложения (реферирования) текста

<p>1. The title of the text (article)</p>	<p>The text (article) is headlined... The headline of the text (article) I have read is...</p>
<p>2. The author of the text (article), where and when the article was published.</p>	<p>The author of the article is... The article is written by... It is published in ...</p>
<p>3. The general topic of the text (article), the aim of it.</p>	<p>The main idea of the text (article) is... The text (article) is about... The text (article) is devoted to ... The text (article) deals with... The text (article) touches upon... The purpose of the text (article) is to give the reader some information on... The aim of the text (article) is to provide the reader with some material (data) on...</p>
<p>4. The contents of the text (article). Some facts, names, figures.</p>	<p>The author starts by telling the reader that... In the first \ second \ third \ next part the author writes (states, stresses, thinks, points out) that... The text (article) describes... According to the text... The author comes to the conclusion that...</p>
<p>5. Your opinion of the text (article).</p>	<p>I found the text (article) interesting (important, of no value, too hard to understand...)</p>

Фразы для составления презентации

Welcoming the audience	Hello everyone. I'd like to welcome you all here today.
Introducing yourself	Let me introduce myself. I'm ... (name) from... university in ... (city).
Introducing your topic / title	What I'd like to present to you today is .. The theme of my presentation is ... As you can see on the screen, our topic today is... I'll be talking about ...
The main content of the presentation	My first point concerns... It should be emphasized that ... It must be remembered that ... I would like to draw your attention to this point ... Let's now take a look at ... OK, so now I'd like to turn to my next point, which is...
Finishing your presentation	That covers just about everything I wanted to say about ... OK. That brings us to the end of my presentation. Thank you for listening. If you have any questions, I will be happy to answer them.

**Единицы измерения и условные обозначения
в английском языке**

Fractions are normally spoken as in these examples:

$1/2$	<i>a (one) half</i>
$1/4$	<i>a (one) quarter</i>
$3/4$	<i>three quarters</i>
$1/5$	<i>a [one] fifth</i>
$2/3$	<i>two thirds</i>
$1/4$ kilometre	<i>a quarter of a kilometre</i>
$1/2$ centimetre	<i>half a centimetre</i>

Complex fractions and expressions of division are usually said with *over*.

$\frac{27}{200}$	<i>twenty-seven over two hundred, twenty-seven divided by two hundred</i>
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Decimals

Decimals are normally spoken as in these examples:

0.36	<i>nought point three six,</i>	<i>zero point three six</i>
5.2	<i>five point two</i>	

Percentages

Percentages are spoken as *per cent*.

16.3%	<i>sixteen point three per cent</i>
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Calculations

Calculations are normally said in the following ways:

$7 + 3 = 10$	<i>seven and three is/are ten (informal)</i>
	<i>seven plus three equals ten (more formal)</i>
$28 - 6 = 22$	<i>six from twenty-eight is/leaves twenty-two (informal)</i>
	<i>twenty-eight minus six equals twenty-two (more formal)</i>
$8 \times 2 = 16$	<i>eight twos are sixteen (informal), eight times two is sixteen (informal, the most common form), eight by two is/equals sixteen (informal), eight multiplied by two equals/is sixteen (more formal)</i>
$27 / 9 = 3$	<i>twenty-seven divided by nine equals three</i>
500 ± 5	<i>five hundred plus or minus five</i>
>300	<i>greater than three hundred</i>

<200	<i>less than two hundred</i>
$3^2 = 9$	<i>three squared is/equals nine</i>
$\sqrt{16} = 4$	<i>(square) root of sixteen is four</i>
$3^3 = 27$	<i>cubed is/equals twenty-seven</i>
$\sqrt[3]{8} = 2$	<i>cube root of eight is two</i>
$2^4 = 16$	<i>two to power of 4 is equals sixteen (two to the fourth power ...)</i>

Units of measurement

Although the metric system is now common in the UK and other English-speaking countries, non-metric units are still used in many contexts, especially in the USA.

Units of length and distance are normally spoken as follows:

3 in, 3"	<i>three inches</i>
2 ft 7 in, 2' 7"	<i>two feet seven inches (or, very informally, two foot seven inches)</i>
3 m (AmE = 3 mi.)	<i>three miles</i>
500 mm	<i>five hundred millimetres (or, more informally, five hundred mm)</i>
1.5 cm	<i>one point five centimetres</i>

Units of area are normally spoken as follows:

11 sq ft	<i>eleven square feet</i>
5 sq m, 5m ²	<i>five square metres</i>
7.25 cm ²	<i>seven point two five square centimetres</i>

Units of weight are normally spoken as follows:

3 oz	<i>three ounces</i>
5 lb	<i>five pounds</i>
300 g	<i>three hundred grams</i>
18.75 kg	<i>eighteen point seven five kilograms</i>

Units of volume, capacity and temperature are normally spoken as follows:

300 cc	<i>three hundred cubic centimetres (or, less formally, three hundred c-c)</i>
3 pt	<i>five pints</i>
3.2 gal	<i>three point two gallons</i>
75 cl	<i>seventy-five centilitres</i>
200 l	<i>two hundred litres</i>
20°C	<i>twenty degrees Celsius</i>
20°F	<i>twenty degrees Fahrenheit (is equivalent to approximately - 6.67°C)</i>

*The Fahrenheit to Celsius formula is temperature in degrees Fahrenheit (°F) - 32) * 5/9.*