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# **Практикум для студентов III курса ЛХФ Часть 1. Plants**

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# PLANTS

## UNIT 1

### 1.1. Прочитайте интернациональные слова и определите их значение:

variety, centimeter, jungle, tundra, organism, characteristic, group, classify, type, adapt, basic, plan, membrane, photosynthesis, organelle, plastid, reproductive, chloroplast, structure, system, mineral, transport, primitive.

### 1.2. Выполните задания.

Name different types of plants.

List the traits that are common to all plants.

### 1.3. Прочитайте и переведите текст.

#### Survey of the Plants

Plants exist in great abundance on earth, covering much of the land with a thick carpet of green. Plants also come in a variety of shapes, sizes, and colours. Some plants are only a few centimeters long; others are as tall as a twenty-story building. If you take a fifteen-year-old mahogany tree, for example, it is about fifteen metres tall. After fifty years, it is about thirty metres. It goes on growing until it is 150 years old. Some plants change colours in autumn; others stay green all the year long. Plants grow in almost every kind of environment that exists on earth. You can find plants in the hot, wet environment of a jungle, as well as in the cold, dry environment of a tundra.

The plant kingdom includes organisms as different as a tiny moss and a giant redwood. However, approximately 285,000 species of plants share a number of traits. These shared traits distinguish plants from other types of organisms. Although plants are very diverse, some plants have similar characteristics, and they can be grouped according to these characteristics. Scientists group - or classify - plants to understand better the similarities and differences among many types of plants.

A plant can be described as a multicellular, photosynthetic organism that is adapted to live on land. Some exceptions, such as aquatic plants, are descended from land plants. They have become adapted again to a water environment. Plants also share other characteristics. For instance, the bodies of plants have the same basic plan. A plant is made up of both an aboveground, photosynthesizing part and an underground, absorbing part. Plants cannot move from place to place, although some plant parts can move. For example, the leaf of a Venus's flytrap can close like a trap and catch an insect. Rafflesia flower growing in the forest on the island of Borneo is the largest flower in the world. It can catch and eat insects.

On a smaller scale, the cells of plants also show several similarities. Plant cells are eukaryotic, and a cell wall surrounds the cell membrane. The cell walls stiffen the cells and provide support for the plant. Plant cells also contain small membrane - enclosed organelles called plastids. One type of plastid is a chloroplast, in which photosynthesis occurs. Also, the reproductive cells of plants have a characteristic structure. In all plants the female gamete - or egg - is large and stationary, and the male gamete is small. The large size of the egg is mostly due to storage of nutrients. The fertilized egg develops into an embryo which is protected by the parent plant.

One of the ways scientists classify plants is by whether they have an internal "plumbing" network, called a vascular system. This system consists of a network of tubes within the plant. Water, minerals, and nutrients are transported through these tubes to all parts of the plant. These tubes also provide support for a plant. The plants that lack vascular tissue, the nonvascular plants, include mosses and liverworts. Vascular plants include ferns, conifers, and flowering plants, as well as a variety of primitive plants.

Plants can also be grouped by whether they produce seeds. Conifers and flowering plants are among the seed-bearing. Mosses and ferns do not produce seeds.

#### **1.4. Запомните слова и выражения:**

plant	растение
aquatic plant	водное растение
flowering plant	цветковое растение
seed-bearing plant	семянное растение
environment	окружающая среда
moss	мох
redwood	красное дерево
species (pl. species)	вид, род, порода
to share a number of traits	иметь ряд общих свойств
to distinguish from	отличать от чего-либо
multicellular organism	многоклеточный организм
leaf	лист, листва
Venus's flytrap	дионея, венерина мухоловка
rafflesia	раффлезия
eukaryotic cell	клетка с ядром
to stiffen	придавать жесткость, укреплять
to provide support	обеспечивать поддержку
enclosed organelle	закрытый органоид
plastid	пластида
male (female) gamete	мужская (женская) гамета
storage of nutrients	хранение питательных веществ
fertilized egg	оплодотворенная яйцеклетка

to develop into an embryo	развиться в зародыш
vascular tissue	сосудистая ткань
network of tubes	сеть сосудов
liverwort	печеночник
fern	папоротник
conifer (coniferous)	хвойное дерево (хвойный)
to produce seeds	давать семена

**1.5. Найдите в тексте (упр. 1.3) эквиваленты следующих выражений:**

разнообразие формы, размера и цвета; жаркая, влажная среда джунглей; холодная, сухая среда тундры; царство растений; крохотный мох; гигантское красное дерево; виды растений; происходить от наземных растений; закрываться как ловушка; органоиды, называемые пластидами; материнское растение

**1.6. Подберите антонимы (b) к прилагательным (a):**

<i>a</i>	<i>b</i>
cold	great
dry	hot
similar	giant
small	wet
tiny	long
short	diverse

**1.7. Заполните пропуски в предложениях, пользуясь информацией текста (упр. 1.3):**

1. There are a lot of ... on earth, covering much of the land with a thick carpet of green.
2. Plants can grow almost everywhere, even in the hot, wet ... of a jungle and in the cold, dry ... of a tundra.
3. All plant... share a number of traits.
4. A plant is a ..., photosynthetic organism.
5. It has both an aboveground, photosynthesizing part and an underground.... part.
6. Some plant parts can move, other ones can catch ....
7. The structure of plant... is the same in different species.
8. Photosynthesis occurs in a ....
9. The egg has a large size mostly due to storage of....
10. An ... develops from the fertilized egg and it is protected by the parent plant.
11. ... system consists of tubes that transport water, minerals, and nutrients within the plant.
12. The examples of nonvascular plants are ... and ....
13. Conifers and flowering plants produce ..., mosses and ferns do not.

### **1.8. Образуйте множественное число имен существительных:**

a plant, a size, a leaf, a species, a shape, a type, a body, a place, a part, a cell, a trait, a seed, a tube, an egg, an embryo, a characteristic, an organelle, a similarity, an organism, a difference.

### **1.9. Раскройте скобки, употребляя существительные в единственном или множественном числе.**

You might be surprised to learn that ... (aspirin) was originally derived from ... (plant). Today, aspirin is synthesized in ... (laboratory). But for ... (century), people steeped willow ... (branch) in ... (water) and used this ... (preparation) to treat rheumatism, toothaches, ear-aches, and other ... (problem). In 1899 ... (scientist) found that an extract of willow ... (branch), called salicin, could be used to produce a more potent pain ... (reliever), acetylsalicylic ... (acid) - or aspirin. Without the chemical extracted from willows ... (scientist) might never have invented aspirin. Today, aspirin is used to treat more than 40 ... (illness). It is most commonly used as a ... (painkiller) and to reduce ... (fever).

### **1.10. Укажите, являются ли данные утверждения истинными или ложными в соответствии с содержанием текста (упр. 1.3).**

1. Plants can grow in all kinds of environment that exist on earth.
2. There is no great variety of plant shapes and sizes.
3. Some plants change colours in autumn.
4. Scientists group plants according to similar characteristics.
5. Aquatic plants are adapted to live on land.
6. Plants can not grow in the cold environment of a tundra.
7. Plants can easily move from place to place.
8. The female gamete is small, and the male gamete is large.
9. Nonvascular plants include mosses and liverworts, whereas vascular plants include ferns, conifers, flowering plants, and some primitive plants.
10. Conifers and flowering plants produce seeds; mosses and ferns are not seed-bearing.

### **1.11. Укажите, какие из данных предложений характеризуют:**

**а) растения; б) клетки растений:**

1. They cover much of the land with a thick carpet of green.
2. Some of them change colours in autumn, others stay green all the year long.
3. They are eukaryotic, and a cell wall surrounds the cell membrane.
4. You can find them in almost every kind of environment that exists on earth.
5. Scientists classify them according to similar characteristics.
6. They contain small membrane - enclosed organelles called plastids.
7. Some of them have vascular system, others lack vascular tissue.
8. Their bodies have the same basic plan: an aboveground, photosynthesizing part and an underground, absorbing part.

**1.12. Пользуясь фразами для выражения мнения, обсудите в парах следующие проблемы.**

1. Kinds of environment in which plants can grow.
2. Traits that distinguish plants from other types of organisms.
3. Structure of a plant cell.
4. Difference between vascular and nonvascular plants.

Фразы для выражения мнения:

I (don't) think	Я (не) думаю
I (don't) believe	Я (не) считаю
In my opinion	По моему мнению
I dare say	Осмелюсь утверждать, что
I am far from thinking that	Я далек от того, чтобы думать, что
It's no exaggeration to say that	Не будет преувеличением сказать, что
I am sorry to say that	К сожалению, я должен сказать, что

**1.14. Подготовьте краткий пересказ текста (упр.1.3).**

## UNIT 2

**2.1. Прочитайте интернациональные слова и определите их значение:**

organ, function, produce, form, projection, effective, erosion.

**2.2. Выполните задания.**

List major functions of a root.

Try to describe the structure of a root.

**2.3. Прочитайте и переведите текст.**

### Root Structure and Function

The root is the simplest organ of a plant, but it has several important functions. In most plants, a root anchors the plant in the ground. If you have ever tried to pull a weed out of the ground, you know how strong a hold roots can have. Also, a root absorbs water and minerals from soil and then transports them upward to the rest of the plant. A third function of the root is storage of food. Plants often produce more food than they can use. This excess food is often stored in roots in the form of sugars or starches. Beets, carrots, and radishes are a few examples of roots that store food.

The first root to appear when a seed germinates is a primary root. In dicots, this root grows down into the soil and becomes both strong and thick. This mature root in a dicot is called a taproot. A carrot is an edible taproot. Some plants in dry areas have taproots almost 20 metres long. These long roots enable the plants to reach deep sources of water and to survive during hot, dry weather.

As the plant grows, the taproot develops little side branches called secondary roots. These roots help hold the plant more firmly in the ground and increase the root's surface area for absorbing water. A taproot and its smaller secondary roots make up a taproot system.

In monocots, such as grass and corn, the primary root is usually short-lived, and the root system does not develop from this root. Instead, numerous long, thin roots grow from the stem and spread out through the soil. These roots and their side branches are fibrous (fine) roots. No single root is more prominent than the others in a fibrous root system.

Fibrous roots do not grow as deep as taproots. However, they do grow rapidly at a shallow depth and cover a fairly large area. Fibrous roots absorb water and dissolved minerals very efficiently because the total surface area of the root system is quite large. One scientist estimated the surface area of the roots of a single rye plant. Including the roots' hairlike projections, the surface area added up to 639 square metres - larger than the area of a basketball court. Fibrous roots also help hold soil particles together and, as a result, are effective in preventing soil erosion. Some plants have thick fibrous roots that store food just as taproots do. The sweet potatoes that people eat are an example of these fleshy fibrous roots.

#### **2.4. Запомните слова и выражения:**

root	корень
primary root	первичный корень
secondary root	вторичный корень
taproot	главный (стержневой) корень
fibrous (fine) root	волокнистый корень
to anchor the plant	удерживать, закреплять растение
to pull out a weed	вытянуть сорняк
to store excess food	накапливать излишки пищи
soil	почва
sugar	сахар
starch	крахмал
to germinate	прорасти
dicot (dicotyledon)	двудольное растение
monocot (monocotyledon)	однодольное растение
mature	зрелый
stem	стебель, ствол
to reach deep sources	достигать глубинных источников
to develop side branches	давать боковые ответвления
to increase the surface area	увеличить площадь поверхности
to spread out	распространяться
to be prominent	выступать, выдаваться



dissolved minerals	растворённые минералы
to estimate	подсчитывать, оценивать
to add up to	составлять, сводиться к чему-либо
to prevent soil erosion	предотвращать эрозию почвы

**2.5. Переведите слова, обращая внимание на суффикс *-like* в значении «похожий», «подобный»:**

hairlike, grasslike, treelike, needlelike, scalelike, sugarlike, rootlike, stemlike, lifelike.

**2.6. Составьте смысловые пары из глаголов (a) и существительных (b) и употребите их в собственных предложениях:**

**Образец:** A root anchors the plant in the ground.

<i>a</i>	<i>b</i>
anchor	sources
pull out	soil erosion
absorb	plant
store	minerals
reach	weed
cover	area
prevent	food

**2.7. Заполните пропуски в предложениях, пользуясь информацией текста (упр. 2.3).**

1. A ... has several organs which perform different functions.
2. A root... the plant in the ground.
3. A root also ... water and minerals from soil.
4. It... them upward to the rest of the plant.
5. The excess food is often stored in roots in the form of... or....
6. Only a few roots can ... food.
7. When a seed gets into the soil it may....
8. Long roots can reach deep ... of water.
9. That helps them ... during hot, dry weather.
10. Fibrous roots do not... as deep as taproots.

**2.8. Пользуясь текстом (упр. 2.3), выберите термины к следующим определениям.**

1. The simplest organ of a plant.
2. The first root to appear.
3. The type of plant that has a strong and thick root.
4. The mature root in a dicot.
5. The type of plant that has numerous long thin roots growing from the stem.
6. Roots in monocots.

7. The substance that fibrous roots absorb very efficiently.
8. Plant organ directly connected with a root.

**2.9. Образуйте степени сравнения имен прилагательных и наречий:**

deep	thin	dry	effective
simple	firmly	long	rapidly
many	hot	short	prominent
strong	cold	large	important
much	early	small	shallow
thick	often	little	efficiently

**2.10. Переведите фразы, обращая внимание на союзы *both... and*, *as... as*, *than*, *not as... as*, *neither ... nor* и артикль *the... the*:**

both strong and thick, both thin and small, both hot and dry; as deep as taproots, as much as they can use, as important as other functions; more food than they can use, more firmly than a primary root, more prominent than other fibrous roots; not as simple as a root, not as much as they can store, not as effective as a taproot; the simpler the better, the deeper the stronger, the drier the hotter, to grow in neither cold nor warm regions, to work neither rapidly nor efficiently, neither liquid nor gaseous substance

**2.11. Раскройте скобки, употребляя имена прилагательные и наречия в необходимой степени сравнения.**

1. The root grows (thick) with age and helps support the tree.
2. In trees as large as the coast redwood of California, the water may travel 400 feet from the (low) roots to the (high) leaves.
3. This seems against the laws of nature as the (efficient) suction pump can raise water to only 33 feet.
4. Bryophytes are very small, even the "giants" of this group rarely grow (tall) than 15 centimetres.
5. The ferns are (good) adapted to land than bryophytes.
6. We probably depend (much) on the flowering plants than on another type of plants.
7. In vascular plants the sporophyte is (conspicuous) than in bryophytes.
8. A genus is a (large) group than a species.
9. Species of one genus are (closely) related to each other than to other kinds of plants.
10. All plants in the world may be divided into phyla, which are (far) divided into (small) groups called classes.

**2.12. Ответьте на вопросы по тексту (упр. 2.3).**

1. What are the three major functions of a root?
2. In what form do roots store excess food?

3. What does a primary root in dicots become like? What is it called?
4. How long may taproots in dry areas be? Why are they as long as that?
5. What are secondary roots necessary for?
6. What makes up a taproot system?
7. Does the root system develop from the primary root in monocots? Why?
8. What are fibrous roots like?
9. Why can they absorb water and dissolved minerals very well?
10. Why are fibrous roots effective in preventing soil erosion?

**2.13. Укажите, являются ли данные утверждения истинными или ложными в соответствии с содержанием текста (упр. 2.3).**

1. The root is the most complex organ of a plant.
2. In most plants, a root anchors the plant in the ground.
3. A root absorbs water and minerals and transports them to the rest of the plant.
4. The mature root in a dicot is called a taproot.
5. Long roots enable the plants to survive during cold weather.
6. A taproot and its smaller secondary roots make up a taproot system.
7. In monocots the primary root is usually long-lived.
8. No single root is more prominent than the others in a fibrous root system.
9. The total surface area of the fibrous root system is very small.
10. Some plants have thick fibrous roots that can not store food as taproots do.

**2.14. Укажите, какие из данных предложений характеризуют:**

**а) первичный корень; б) вторичные корни; с) волокнистые корни:**

1. It appears as soon as a seed germinates.
2. They help hold the plant more firmly in the ground.
3. In dicots it is both strong and thick.
4. These are long, thin roots in monocots.
5. They let the plant reach 20-metre deep sources of water.
6. They do not grow as deep as taproots.
7. They help increase the surface area for absorbing water.
8. They grow rapidly at a shallow depth and cover a large area.

**2.15. Пользуясь фразами для выражения согласия/несогласия, обсудите в парах следующие проблемы.**

The root is an important part of a plant.

Difference between taproots and fibrous roots.

Surface area of the fibrous root system.

Фразы для выражения согласия (несогласия):

Yes, indeed

Да, в самом деле

I (don't) think you are right	Я думаю, что Вы (не) правы
I think so too	Я тоже так думаю
I think you are mistaken / wrong	Я думаю, что Вы ошибаетесь
Certainly / Sure	Конечно/ Несомненно
I (don't) agree	Я (не) согласен
I disagree	Я не согласен

**2.16. Заполните таблицу, пользуясь информацией текста (упр. 2.3).**

Types of roots	Properties	Function peculiarities
Primary root		
Taproot		
Secondary roots		
Fibrous roots		

**2.17. Подготовьте краткий пересказ текста (упр. 2.3).**

**2.18. Найдите необходимую информацию и подготовьте мини доклад на одну из предложенных тем:**

- Most of plants can't live without a root.
- Primary and secondary tissues of a root.
- Vegetative reproduction of plants by root.

## UNIT 3

**3.1. Прочитайте интернациональные слова и определите их значение:**

information, modify, mass, result, section, gas, atmosphere.

**3.2. Выполните задания.**

- List major functions of a stem.
- Name the structural parts of a stem.

**3.3. Прочитайте и переведите текст.**

### Stem Structure and Function

The stem of a plant has several important functions. It carries water and minerals to the leaves and the flowers. The stem also transports food between the leaves and the roots. In addition, the stem supports the aboveground parts of a plant.

Examination of a bare woody stem will give you a great deal of information about stems. At the tip of the woody stem and along the side there are several structures called buds. The outer layers of a bud are called bud

scales, which are modified leaves that form a protective covering. If you were to peel away the bud scales, you would find a soft mass of green tissue. This tissue is called the shoot apex. In this part of the bud, cell division occurs and new tissues are produced. New leaves of the plant can form at the shoot apex.

Not all buds are the same. The bud at the shoot tip of the woody stem is called a terminal bud. It usually develops before other buds form. Growth at the terminal bud results in the lengthening of the stem. Leaves and flowers can also arise from the terminal bud. Buds growing along the sides of stem are called lateral buds. New branches, as well as leaves and flowers, develop from lateral buds.

Each growing season, the terminal bud opens, and the bud scales drop off, leaving a ring of marks around the stem. Notice these bud-scale scars on the stem in the picture. By measuring the length of the stem between the bud-scale scars, you can find out how much the stem grew in length each growing season. Buds are dormant between growing seasons.

A node is the place on a stem where a leaf or a bud arises. The section of the stem between nodes is called an internode. At a node, you can see a leaf scar, the point where a leaf was once attached. Leaf scars can be shaped somewhat like half-moons. If you look closely at leaf scars, you will see tiny spots called bundle scars. These scars are the ends of bundles of vascular tissue that ran from the stem to the leaf stalk.

In many places on the surface of a woody stem, the bark has small, round openings. These holes are called lenticels. Their function is to allow the exchange of gases, such as water vapor, between the atmosphere and the tissue of the stem.

### 3.4. Запомните слова и выражения.

woody stem	древесный ствол
tip	верх, верхушка
bud	почка
terminal bud	верхушечная почка
lateral bud	боковая почка
bud scale	почечная чешуя
longitudinal section	продольное сечение
outer layer	внешний слой
to form a protective covering	образовывать защитное покрытие
shoot apex	вершина побега
cell division	клеточное деление
to result in	приводить к ч.-л., иметь следствием
to arise	возникать, появляться
growing season	сезон роста
dormant	находящийся в состоянии покоя, спящий
to measure the length	измерить длину
node	узел, утолщение

internode	междоузлие
bud-scale scar	рубец от почечной чешуи
leaf scar	листовой рубец
bundle scar	рубец от пучка сосудов
leafstalk	стебелек листа
bark	кора
lenticel	чечевичка, пора в коре
exchange of gases	газовый обмен
water vapor	водяной пар

### 3.5. Подберите антонимы (*b*) к словам и словосочетаниям (*a*):

a	b
shorten	outer
inner	drop off
close	lengthen
attach	longitudinal section
huge	soft
underground	open
cross section	aboveground
hard	tiny

### 3.6. Составьте смысловые пары из существительных (*a*) и глаголов (*b*) и употребите их в собственных предложениях:

a	b
leaves	result
buds	produce
cell division	transport
growth	form
flowers	be shaped
bud scales	develop
leaf scars	occur
stem	arise
tissue	drop off

### 3.7. Заполните пропуски в предложениях, пользуясь информацией текста (упр. 3.3).

1. The ... supports the aboveground parts of a plant.
2. There are ... at the tip of the stem and along the side.
3. ... are modified leaves that form a protective covering.
4. The bud at the shoot tip is called ....
5. ... grow along the sides of a stem.
6. Buds are ... between growing seasons.

7. The place on a stem where a leaf or a bud arises is a ....
8. An ... is the section of the stem between nodes.
9. The bark of a woody stem has ... in many places.

**3.8. Заполните пропуски в предложениях формой глагола *to be* в Present, Past или Future Simple:**

1. Plants ... producers of vast quantities of food and oxygen.
2. In the early history of the earth, land ... a harsh, forbidding environment.
3. The first land plants that evolved from aquatic green algae ... in danger of drying out, because water ... not immediately available as it was to algae that lived in water.
4. The two main kinds of seed-bearing plants ... gymnosperms and angiosperms.
5. A gymnosperm seed ... "naked" because it lacks a protective fruit covering.
6. Unlike most gymnosperms, ginkgoes ... deciduous, this means the leaves are shed each year.
7. In a few years this tree ... more than fifteen metres in height.
8. Although the tree's roots ... not very strong already, they could still support the trunk.
9. The flower ... the organ that helps ensure the successful reproduction of flowering plants.
10. The odour and colourful petals of this flower ... two important factors for a good sale next spring.
11. Ferns are restricted to habitats that ... wet for at least part of growing season.

**3.9. Задайте различные типы вопросов к предложениям.**

**Образец:** *Palms, bamboos, and bananas are large monocots with woody stems.*

- a. Are palms, bamboos, and bananas large monocots with woody stems?*
- b. Are palms, bamboos, and bananas monocots or dicots?*
- c. What kind of plants are palms, bamboos, and bananas?*
- d. Palms, bamboos, and bananas are large monocots with woody stems, aren't they?*
- e. Palms, bamboos, and bananas are not dicots, are they?*
1. Most large woody plants, as well as fleshy fruit and vegetables, are dicots.
2. The ginkgo is a tall tree with unusual fan-shaped leaves.
3. Monocots are generally small plants that do not develop woody tissue.
4. The Patagonian cypress is the monarch of the southern Andes Mountains.
5. That plant was tolerant of damp soil and it flourished beside the marsh.

6. After the ice age the first tree seedlings were of elms, ashes and maples.
7. Numerous species of cycads were abundant when dinosaurs dominated the earth.
8. Camomile tea will be a good medicine for your little child.
9. Rose flowers will always be popular with the women.
10. A tiny seed will be a giant tree in thirty or forty years.

**3.10. Заполните пропуски в предложениях формой глагола *to have* в Present, Past или Future Simple.**

1. About 285,000 species of plants ... some common traits.
2. A plant... an aboveground and an underground part.
3. A year ago the spruce behind the fence ... a great deal of cones.
4. A large tree ... millions of root tips; most of them are thinner than a piece of string.
5. In a month the cherry-trees ... the next year buds already formed.
6. Ferns ... a transport system to carry materials through their roots, stems, and leaves.
7. Sphagnum moss ... a slightly antiseptic quality.
8. It was windy in November, but the maples in the city park still ... a few brown leaves in their branches.
9. Deciduous trees will shed their leaves soon, but conifers still their needles.
10. Horsetails commonly grow in damp areas, and they ... a wide distribution.

**3.11. Ответьте на вопросы по тексту (упр. 3.3).**

1. What are the most important functions of a stem?
2. What can one see at the tip and along the sides of a stem?
3. What are bud scales?
4. In which part of the bud are new tissues produced?
5. What kinds of buds do you know?
6. What is the difference between a terminal bud and lateral buds?
7. Can you find out how much the stem grew in length during the growing season? How?
8. What is the difference between a leaf scar and a bundle scar?
9. What kind of function do lenticels fulfill?

**3.12. Укажите, являются ли данные утверждения истинными или ложными в соответствии с содержанием текста (упр. 3.3):**

1. The stem absorbs water and minerals from soil.
2. One of the main functions of a stem is to transport food between the leaves and the roots.



3. Bud scales are the inner layers of a bud.
4. Having peeled away the bud scales, one can find a soft mass of green tissue, called the shoot apex.
5. Leaves and flowers can arise from both terminal and lateral buds.
6. Buds continue growing between growing seasons.
7. An internode is a section of a stem between nodes.
8. At leaf scars one can see bundle scars.
9. The bark of a woody stem has small round openings, called bud-scale scars.
10. Lenticels provide the exchange of gases between the atmosphere and the tissues of the stem.

**3.13. Пользуясь фразами для выражения пояснения и дополнения, обсудите в парах следующие проблемы.**

Changes that occur in the stem of a woody plant, as it grows.

Types of buds and their role in stem development.

Scars that appear on the stem.

The function of lenticels.

Фразы для выражения пояснения и дополнения:

I mean to say that

Этим я хочу сказать, что

In other words

Другими словами

As I have already mentioned

Как я уже упомянул

I have forgotten to say that

Я забыл сказать, что

I hope you remember that

Я надеюсь, что Вы помните, что

You probably know that

Вероятно, Вы знаете, что

**3.14. Расположите пункты плана в логической последовательности на основании содержания текста (упр. 3.3).**

1. The structure of a bud.
2. Lenticels.
3. Major functions of a stem.
4. Buds during and between growing seasons.
5. Terminal and lateral buds.
6. A node.

**3.15. Пользуясь планом, полученным в упр. 3.14, подготовьте краткий пересказ текста (упр. 3.3).**

**3.16. Подготовьте рассказ на предложенную тему:**

Speak on the topic: «I have chosen the job of a forester because...». Highlight a few points that make this job attractive to you. Use the following phrases:

- to like working outdoors;

- to travel across the countryside because of the job;
- to plant trees and watch them grow;
- to improve the appearance and health of trees;
- to see the results of the work gradually;
- to have attractive surroundings full of living trees, bushes and grass;
- to remain fit and healthy.

## UNIT 4

### **4.1. Прочитайте интернациональные слова и определите их значение:**

identify, energy, molecule, material, base, type, parallel, central.

### **4.2. Выполните задания.**

Describe the major function of the leaves.

Name the forms of the leaves.

### **4.3. Прочитайте и переведите текст.**

#### **Leaf Structure**

Leaves vary in shape, size, and arrangement on a plant. You can identify many plants just by studying their leaves. But whether a leaf is needle-shaped, as in pine trees, or broad and flat, as in maple trees, almost all leaves have the same important function. A leaf is a plant's food-manufacturing site, the place where photosynthesis occurs. The structure of a leaf allows it to capture the sun's energy and build complex molecules from raw materials.

The leaves of most dicots have two main parts, a blade and a petiole. The flattened blade is the main part of the leaf. The petiole is a slender stalk that attaches the blade to a stem. In many dicot leaves, the petiole continues into the leaf blade to form the midrib of the blade. A midrib is a major vein that runs down the middle of a blade. Other leaves have several large ribs - or major veins - that branch out through the blade from the petiole. Ribs help support a leaf. All the veins of a leaf contain xylem tubes and phloem tubes. Xylem tubes supply leaf cells with water and minerals. Phloem tubes transport manufactured food from the leaf to other parts of the plant.

Unlike dicot leaves, most monocot leaves do not have petioles. The leaf blade narrows toward the base of the leaf. The blade attaches directly to the stem. Instead of having a branching network of veins, most monocots have veins that run nearly parallel to each other. Although dicot and monocot leaves differ in appearance, both types of leaves manufacture food for the plant.

Decot leaves can be either simple or compound. If a leaf consists of a single blade, it is a simple leaf. The leaf edge can be indented in various ways. If the leaf blade is divided into two or more bladelike parts, the leaf is compound. Each part of a compound leaf is called a leaflet. Telling a simple leaf apart from a leaflet is often difficult. However, a bud forms at the base of a leaf where the

petiole joins the stem. A bud never forms at the base of a leaflet.

Compound leaves grow in two distinct patterns: pinnate and palmate. Pinnately compound leaves have leaflets attached along a single midrib. Leaves of ash trees are an example of pinnately compound leaves. The leaflets of palmately compound leaves radiate from a central point, like the fingers of a hand. The structure of some leaves enables them to carry out special functions other than photosynthesis. Some plants, called succulents have thick, fleshy leaves which store water or food. An onion plant is one type of succulent. The onion bulb is made up of food storage leaves, which are attached to a very small stem. When you eat an onion, you are eating leaves.

Some leaves are modified to catch insects. Some plants have pitcher-shaped leaves that are usually filled with water and digestive enzymes. Stiff downward pointing hairs line the inside of the "pitcher". These hairs allow insects to crawl down into the pitcher but not out again.

The leaves of a few plants produce plants which have small leaves and roots. These tiny plantlets separate from the leaf and fall to the ground where they can take root and form new plants.

#### 4.4. Запомните слова и выражения

pine	сосна
maple	клен
to capture the sun's energy	поглощать энергию солнца
to build complex molecules	создавать сложные молекулы
blade	листовая пластинка
petiole	черешок (листа)
rib	жилка листа
midrib	главная жилка листа
to branch out	ответвляться, отходить
xylem	ксилема, древесные волокна
phloem	флоэма, лубяная ткань
to attach to	прикрепляться, присоединяться к чему-либо
simple leaf	простая листовая пластинка
compound leaf	сложная листовая пластинка
to be indented	иметь очертание
leaflet	листочек, листик; молодой лист
pinnate	перистый
needle	игла
palmate	дланевидный, лапчатый
ash	ясень
to radiate from	расходиться лучами, исходить из (одной точки)

to carry out special functions	выполнять особые функции
succulent	суккулент, мясистое растение
bulb	луковица, луковка
digestive enzyme	пищеварительный фермент
plantlet	всход, росток
to take root	укореняться

**4.5. Составьте смысловые пары из существительных (a) и глаголов (b) и употребите их в собственных предложениях.**

a	b
photosynthesis	support
petiole	run
midrib	transport
ribs	supply
xylem tubes	occur
Phloem tubes	form
bud	attach

**4.6. Вставьте артикль a, an или the, где это необходимо.**

Looked at simply as ... machine, the tree - any tree - is truly remarkable. Powered by energy from ... sun, it manufactures its ... food out of carbon dioxide and water. It is strong enough to split ... rock. Its efficient "plumbing system" raises ... water from far underground to ... highest leaf.

A tree is formed in ... wondrous way. It may start life in ...very small form - perhaps something no bigger than ... little pebble - and yet it may grow more than 300 feet tall It can, if large, produce ... wood for dozens of houses. It may provide man and animals with ... fruit or nuts. It may yield ... turpentine or wood pulp for ... our paper, or ... syrup for pancakes.

Truly ... tree is remarkable, but it is far from being ... machine. A tree is ... living thing, much more complex than any machine man has built. Like most living things, ... tree is made up of many cells. Billions of ... these tiny building blocks are joined together in every tree. Each part of... tree has its own special kind of cell. ... cells inside a leaf are different from those in ... trunk, and both kinds are different from those of ... root. Each of these organs - leaf, trunk and root - plays its part in ... life of... tree.

**4.7. Соотнесите термины (a) с соответствующими определениями (b).**

a	b
1) blade	A) one of the flat green parts of a plant that are joined to its stem or branches
2) bud	B) any of various living but immobile multicellular organisms such as trees or flowers
3) dicot leaf	C) a leaf of grass or a similar plant

4) enzyme	D) the way that green plants make their food using sunlight
5) insect	E) a stalk of a leaf
6) leaf	F) a major vein of a leaf
7) midrib	G) a leaf, consisting of two main parts: a blade and a petiole
8) monocot leaf	H) a leaf that does not have a petiole, but attaches directly to the stem
9) petiole	I) a young flower or leaf before it opens
10) photosynthesis	J) a type of plant with thick and fleshy leaves
11) plant	K) the long thin part of a plant, from which leaves or flowers grow
12) root	L) a small creature such as an ant or a fly, with three pairs of legs and a body divided into three parts
13) stem	M) any of numerous complex proteins that are produced by living cells and that promote specific biochemical reactions
14) succulent	N) the part of a plant or tree that grows under the ground and takes water from the soil

#### **4.8. Ответьте на вопросы по тексту (упр. 4.3).**

1. What is the main function of a leaf?
2. What is the difference between dicot and monocot leaves?
3. What is a midrib?
4. What do all the veins of a leaf contain?
5. How do simple dicot leaves differ from the compound ones?
6. What do pinnately compound leaves attach to?
7. Where do the leaflets of palmately compound leaves radiate from?
8. What other functions can leaves fulfill?
9. How can leaves be modified in order to catch insects?
10. What role do plantlets play in the formation of new plants?

#### **4.9. Расположите пункты плана в логической последовательности на основании содержания текста (упр. 4.3.).**

1. Simple and compound leaves.
2. General information about leaves.
3. Special types of leaves.
4. Structure of dicot leaves.
5. Peculiarities of monocot leaves.
6. Simple and compound dicot leaves.

#### **4.10. Пользуясь планом, полученным в упр.4.9, подготовьте краткий пересказ текста (упр. 4.3.).**

## UNIT 5

### 5.1. Прочитайте интернациональные слова и определите их значение:

biology, massive, secret, method, logical, magnolia, portion, naturalist, period.

### 5.2. Выполните задания

List tree species that grow from seeds.

List tree species that grow from shoots.

### 5.3. Прочитайте и переведите текст.

#### **Most Trees grow from Seeds**

While scientists have discovered many things in the field of biology, yet the growth of plants remains something of a miracle. Who can tell by what power an acorn which has dropped to the ground today will be a massive tree thirty years later? Who knows the secret of how a tiny pine seed can develop into a tree a hundred feet in height, containing enough lumber to build a small house? In general way, however, we understand what takes place, even though we cannot tell why it happens in the peculiar manner characteristic of each species.

Not all trees are produced from seeds. Some, like the white or paper mulberry, grow from shoots. Others, like the pink dogwood, are the results of man-made propagation methods. But most trees, including oak, pine, hickory, and persimmon, grow from seeds.

In the study of how trees grow, it is logical to begin with the seed. So, let us study an oak – beginning with tiny particle of pollen and following it until we finally have a magnificent forest giant. The spark of life which produces an acorn is found in the base of an oak flower. Trees have flowers and most trees belong to one of three groups. Some, like sumach, have male and female flowers on different plants. This class is known as dioecious. Some trees, like the alder or the oak, have both male and female flowers on the same tree but in different clusters. These trees are known as monoecious. Other tree species, as the wild cherry and magnolia, grow perfect flowers, in which both male and female are present in one flower.

The male flower or male portion of a flower produces pollen. The female flower or female part of a flower contains the pistil. This pistil receives the pollen and passes it down the long green tube to the place where the seed is born. The pollen gives the seed its spark of life. When the flower is gone and the pistil has withered and fallen off, the seed appears.

Seeds occur in many forms and in many different kinds of coats, each characteristic of the tree which has given it birth. Some pines have cones, the buckeye has a hard shell, the wild cherry and persimmon seeds are protected by a bitter acid until the seeds are mature enough to carry on the spark of life. Seed and their coats are known by various names. Naturalists call the wild black

cherry a drupe, and the persimmon a juicy berry. The seeds of the apple are contained in a pulpy or fleshy fruit and the ash and maple have samaras. The mulberry is called an aggregate fruit because of its cluster of edible tidbits. The seeds of the nut-tree is known as a nut.

Seeds of some trees are developed in one year and some are developed over a longer period. But when the seeds have finally become ripe and the tree is ready to release them – it releases them in large numbers, for only a few will survive.

#### 5.4. Запомните слова и выражения.

acorn	желудь
white mulberry	шелковица белая, щовкун
paper mulberry	шелковица бумажная
to grow from shoots	вырастать из побегов
to grow from seeds	вырастать из семян
dogwood	кизил
man-made propagation	искусственное воспроизводство
hickory	гикори
persimmon	хурма
pollen	пыльца
sumach	сумах
dioecious	двудомный
monoecious	однодомный
alder	ольха
cluster	кисть, гроздь
wild cherry	черешня
pistil	пестик
to wither	вянуть
cone	шишка
buckeye	американский конский каштан
hard shell	твердая кожура
drupe	косточковый плод
juicy berry	сочная ягода
pulpy (fleshy) fruit	мякотный плод
samara	крылатка
aggregate fruit	сложный плод
nut	орех
to become ripe	созревать
to release in large numbers	сбрасывать в больших количествах

#### 5.5. Найдите в тексте эквиваленты следующих выражений:

крохотное семя сосны, искусственные методы воспроизводства, крохотная частица пыльцы, величественный лесной гигант, искра жизни, мужская (женская) часть цветка, защищен сильной кислотой, различные виды оболочек.

**5.6. Заполните пропуски в предложениях, пользуясь информацией текста (упр.5.3).**

1. Most trees grow from ... .
2. The white or paper mulberry grows from ... .
3. ... trees have male and female flowers on different plants.
4. ... trees have both male and female on the same tree but in different in one clusters.
5. Other tree species grow perfect flowers, in which both ... and ... are present in one flower.
6. The male flower or male portion of a flower produces ... .
7. The ... of the female flower receives the pollen and passes it to the place where the seed is born.
8. The seed appears when the flower is gone and pistil has ... and ... off.
9. The seeds of the ash and maple are known as ... .
10. The mulberry is called an aggregate fruit because of its ... of edible tidbits.

**5.7. Ответьте на вопросы по тексту (упр. 5.3).**

1. Are all trees produced from seeds?
2. What tree species grow from shoots?
3. Do you know any trees that are the results of man-made propagation methods?
4. How are classified according to the location of male and female flowers?
5. How is a seed born?
6. When does a seed appear?
7. What kinds of seed forms and coats do you know?
8. How long does it take tree seeds to become ripe?
9. Will many seeds survive after the tree releases them?

**5.8. Расположите пункты плана в логической последовательности на основании содержания текста (упр. 5.3).**

1. How a seed appears.
2. Growth of plants is a miracle.
3. Different forms and coats of seeds.

**5.9. Восстановите недостающие пункты плана, предложенного в упр. 5.8.**

**5.10. Пользуясь планом, полученным в упр. 5.9, подготовьте краткий пересказ текста (упр. 5.3).**