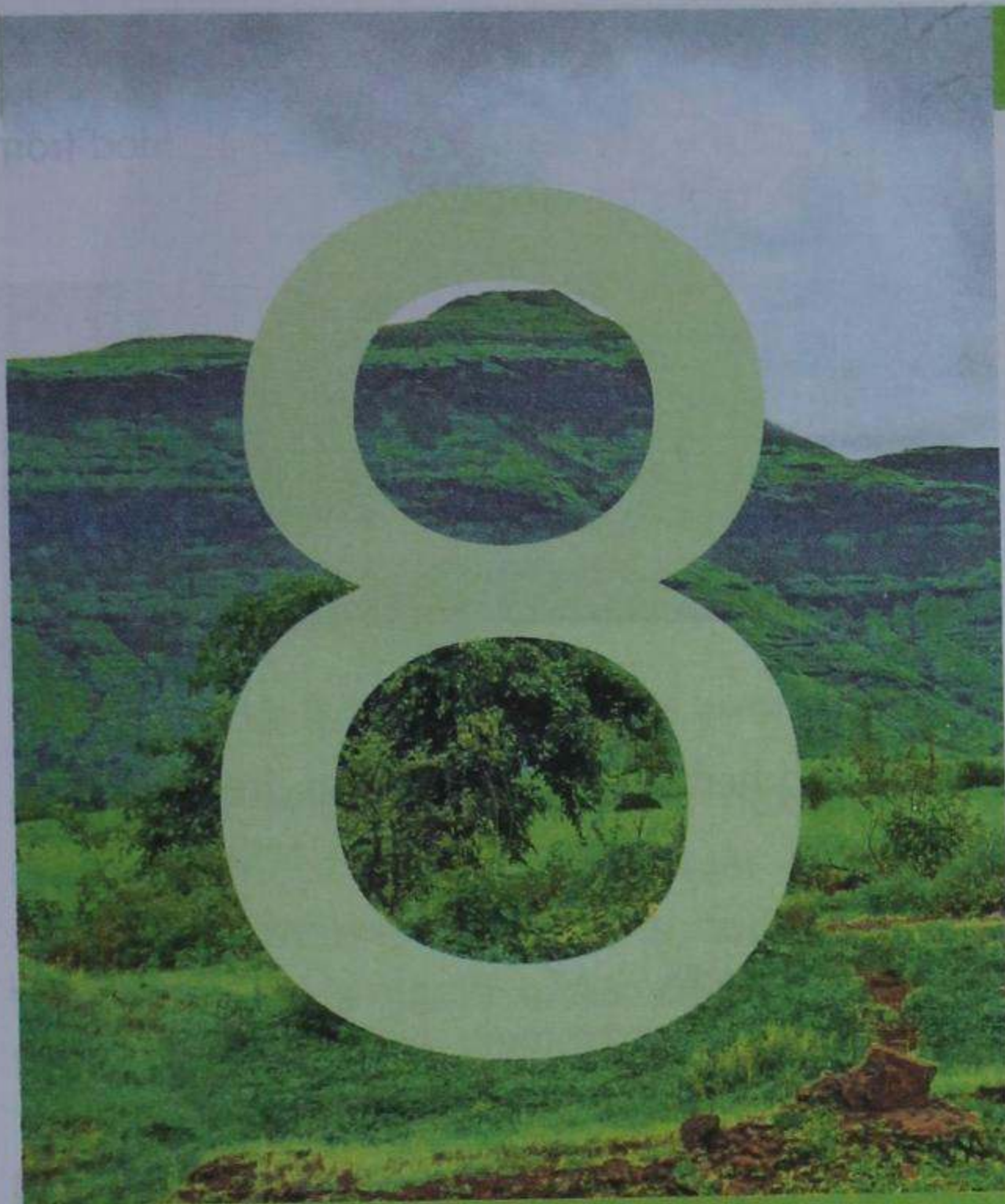




LEARNING OBJECTIVES

After completing this chapter you will be able to

- conclude that earth is a unique planet.
- distinguish between biotic and abiotic components.
- identify and differentiate between producers, consumers and decomposers.
- describe the flow of energy in nature.
- describe the interdependence between plants and animals.
- state the ways in which plants and animals are useful to human beings.
- identify the major causes of water, air, and noise pollution.
- describe how to conserve our environment.



Our Environment

OUR EARTH

Our earth is one of the eight planets that move around the sun and is a part of the **solar system**.

Each planet in the solar system travels in its own path or orbit. Some planets are nearer to the sun than the earth. Some planets are farther away. Mercury is the **closest** to the sun and Neptune is the **farthest**. Mercury receives the maximum solar heat and is so hot that no plant or animal would be able to survive there. On the other hand, Neptune is the coldest. It is not possible for any living organism to survive in such extreme freezing cold conditions. Earth is a unique planet because it is at the right distance from the sun and it has all the conditions necessary for the survival of living organisms.

Earth—the unique planet to have conditions necessary for supporting life

The earth is perhaps the only planet in the solar system that has life on it. Let us see how earth

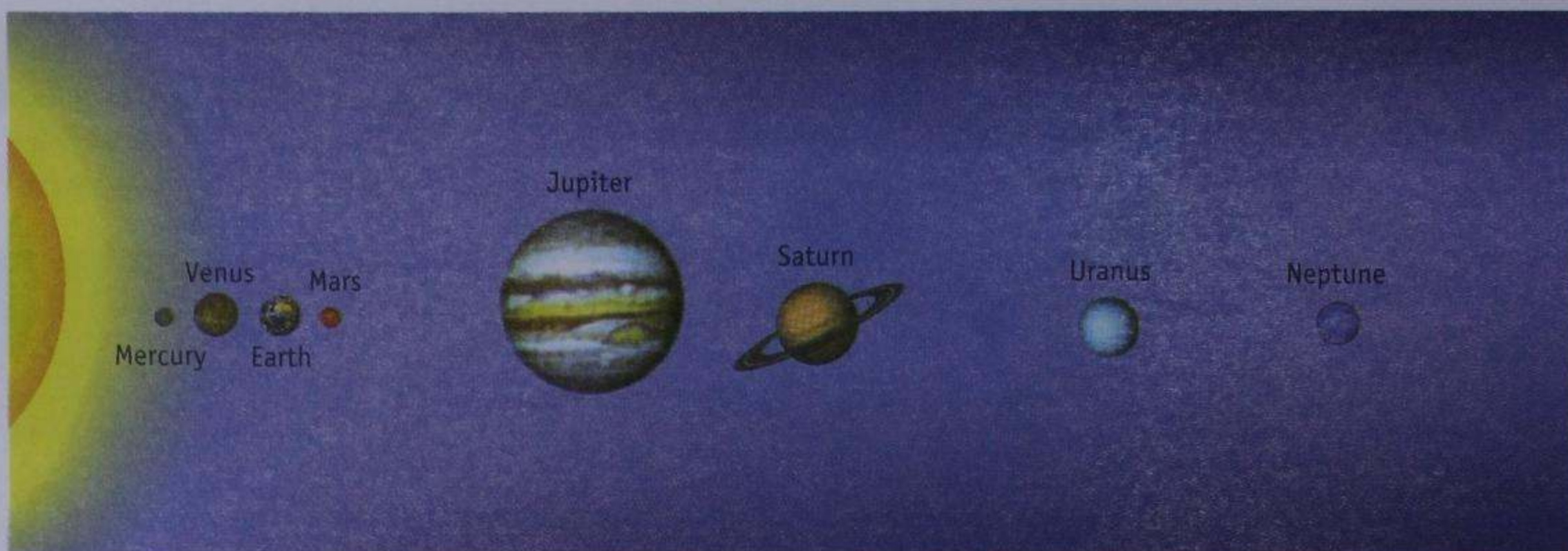


Fig. 8.1 The solar system

provides all those conditions which are essential for the sustenance of life.

OPTIMUM DISTANCE FROM THE SUN

The distance between the sun and the earth is such that the earth receives just the right amount of solar energy. So, it is neither too hot nor too cold. The light from the sun makes the earth's land and water warm enough to sustain life.

PRESENCE OF OXYGEN, CARBON DIOXIDE, NITROGEN, OZONE AND OTHER GASES

All living organisms need **oxygen** for respiration. Burning cannot take place without oxygen. **Carbon dioxide** is used by plants for photosynthesis. **Nitrogen** present in the air is converted by certain microorganisms into nitrogen compounds. Plants use these nitrogenous compounds as fertilizers. Nitrogen also controls burning. **Ozone**, an allotropic form of oxygen prevents the ultraviolet rays of the sun from reaching the earth. All these gases and some other gases which make the sustenance of life possible, are present on the earth.

Air also helps to maintain the right temperature on the earth. It absorbs a lot of solar heat and does not let days get too hot. It also does not allow the heat of the earth to

escape and hence protects us from freezing cold nights.

PRESENCE OF WATER

Water which is extremely essential for living organisms is present in abundance on the earth. All the life processes such as digestion, blood circulation, excretion and so on, taking place in living organisms, need water. Water is also required by plants when they make their food through photosynthesis.

GRAVITATIONAL FORCE

The mass of the earth is such that it exerts right gravitational force which is sufficient to hold its atmosphere in place. If the gravitational force of the earth was of a smaller value, then all the gases on the earth would have escaped into outer space.

PRESENCE OF MINERALS

Carbon, hydrogen, oxygen and nitrogen are essential elements required by living organisms. They are present in sufficient amounts in various usable forms. The soil also contains minerals and nutrients required for the growth of plants.

Inside the earth

Earth is made up of three layers. The outermost

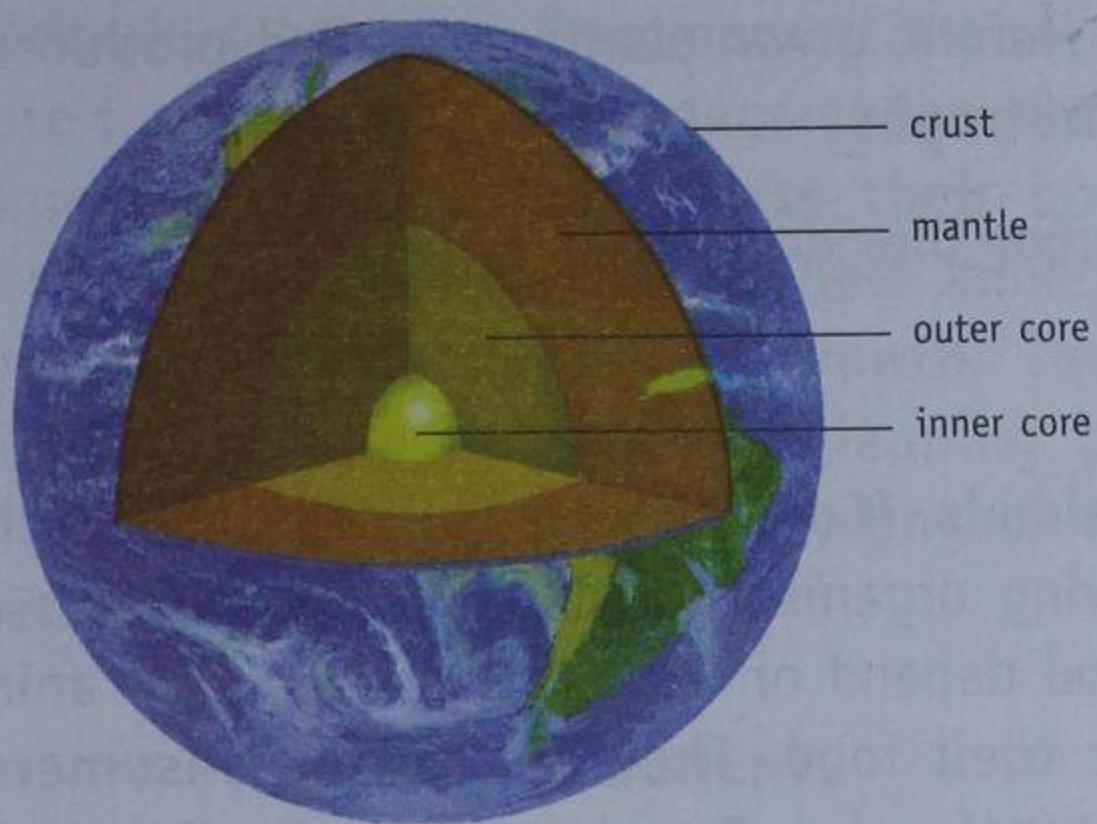


Fig. 8.2 The layers of the earth

solid layer is called **crust**. The next layer is **mantle** which consists of a layer of molten rocks. The innermost layer is **core** which is separated into a liquid **outer core** and a solid **inner core** (Fig. 8.2).

Parts of the earth

The entire earth including air around it can be divided into three spheres, namely, lithosphere, hydrosphere and atmosphere.

- ❖ **Lithosphere:** It is the outer solid layer of the earth covered with soil and rocks. It is a rich source of minerals and provides essential nutrients for the growth of plants. All living beings depend on plants for their food.
- ❖ **Hydrosphere:** About seventy per cent of the earth's surface is water and most of it is

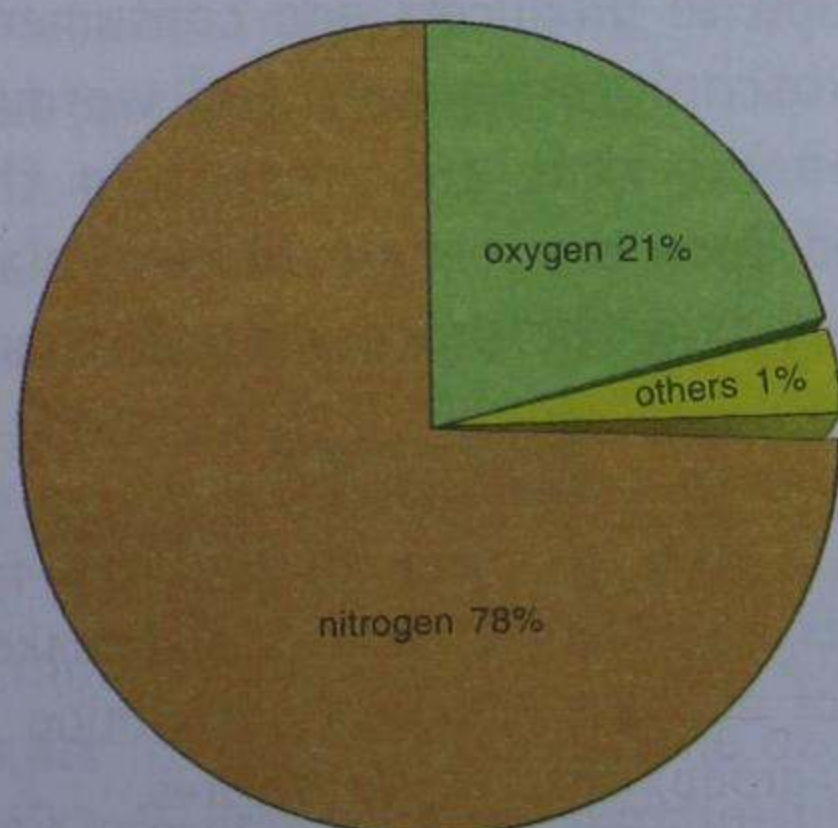


Fig. 8.3 Composition of air

Table 8.1 Percentage of gases in air

GAS	PERCENTAGE
Nitrogen	78%
Oxygen	21%
Argon	0.9%
Carbon dioxide	0.03%
Water vapour	up to 0.04%

present in oceans. Only a small portion of the earth's water is fresh water, generally found in rivers, lakes, groundwater and also in the form of ice that covers the north and south poles. The part of the earth that contains water is called the hydrosphere.

- ❖ **Atmosphere:** The lithosphere and hydrosphere are covered by a mixture of gases. This mixture of gases forms the atmosphere. It has nitrogen, oxygen, argon, a small amount of carbon dioxide, water vapours and other gases (Fig. 8.3).

Biosphere

The habitable parts of the earth, that is, lithosphere, hydrosphere and atmosphere where living beings exist is called **biosphere** (Fig. 8.4).

Biosphere extends 11 km deep into the sea and some 10 km up into the air from the soil.

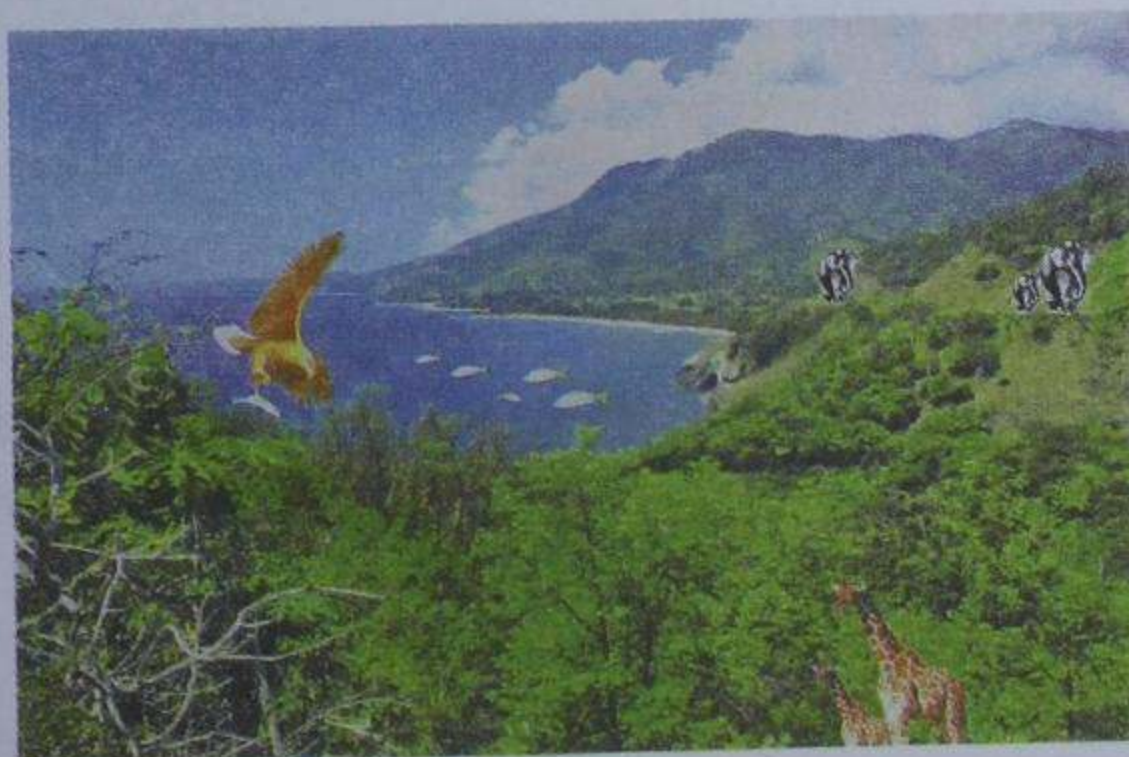


Fig. 8.4 Biosphere: Habitable crust of the earth—lithosphere, hydrosphere and atmosphere

ENVIRONMENT

The word 'environment' basically means surroundings. In fact, everything that surrounds and affects the life of an organism forms a part of its environment. Our environment includes variety of living and non-living things present around us. For example, the environment of a fish in a pond includes living things, such as insects, fishes and plants, and non-living things like water, gases, minerals and rocks. The environment has three interactive components, namely, **biotic**, **abiotic** and **cultural**.

BIOTIC COMPONENTS

Biotic components of our environment includes all living organisms, namely plants, animals, and microorganisms. Microorganisms or microbes (*micro* means small, *bios* means life) include organisms like viruses, bacteria, protozoa, algae and fungi. Biotic components could be divided into three groups, namely producers, consumers and decomposers.

Plants (Producers)

All animals directly or indirectly depend on plants for their food supply. All green plants have a green pigment called chlorophyll in them. Green leaves prepare food in the presence of sunlight using water and carbon dioxide (Fig. 8.5), by the process of photosynthesis.

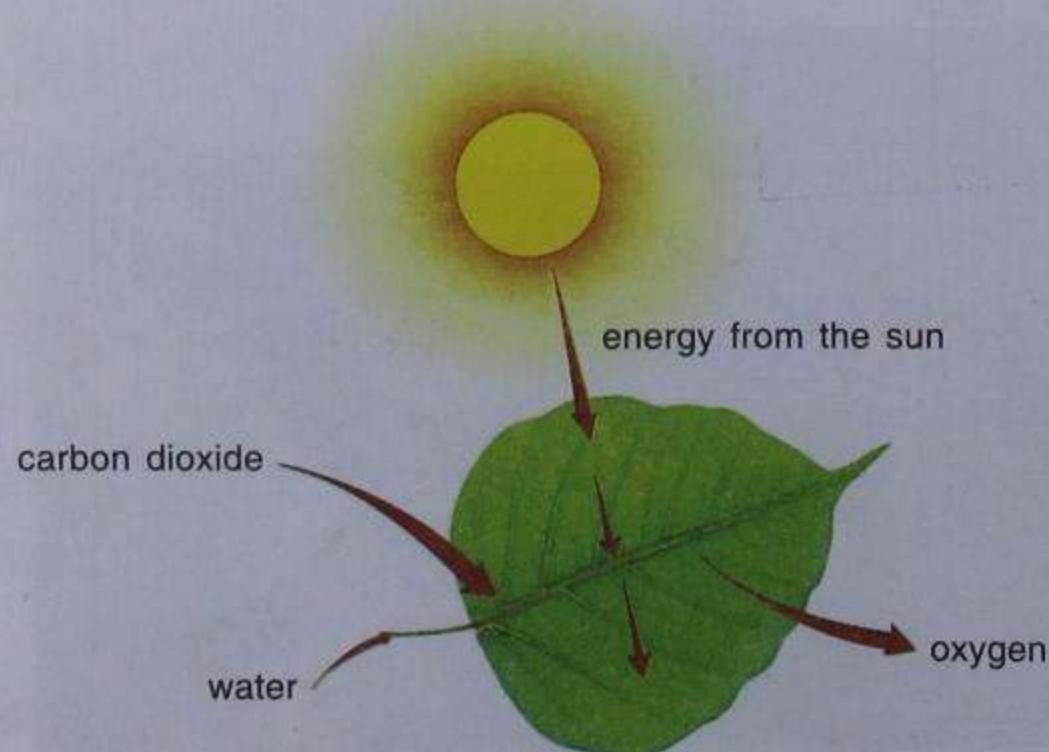
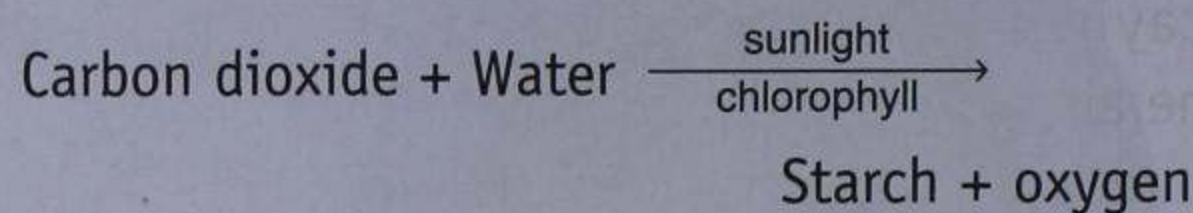


Fig. 8.5 Green plants prepare their own food by photosynthesis.

Therefore, green plants are called **producers** or **autotrophs**.



Animals (Consumers)

Living organisms that cannot make their own food depend on either plants or other animals for their food. They are called **consumers** or **heterotrophs**. Based on their feeding habits, consumers can be of many types.

- ❖ Animals that eat only plants are called **herbivores** or **primary consumers**, for example, deer, horse, elephant and so on.
- ❖ Animals that eat other living animals which eat primary consumers, are **carnivores** or **secondary consumers**, for example, tiger and leopard. Some carnivores feed on dead animals. These are called **scavengers** (Fig. 8.9). Vulture and eagle are scavengers.
- ❖ Those animals that eat secondary consumers, are called **tertiary consumers**, for example, snake and owl.
- ❖ Some consumers eat both plants and animals. They are called **omnivores**. Bear, crow, cockroach and human beings are omnivores.

Microorganisms (Decomposers)

In addition to producers and consumers, there are microscopic organisms and worms called **decomposers** that are present in the soil. They feed upon the remains of dead plants and animals and in the process break them down

ACTIVITY 1

Plan a visit to a zoo. Observe the food habits of different animals and make a list of at least 5 animals belonging to each group, that is, herbivores, carnivores and so on.

into simple substances. Decomposers are called nature's scavengers. They decompose dead, decaying organisms and release their body minerals into the environment. These minerals are reused by plants for their growth. Thus, decomposers help not only in cleaning the environment but also in the recycling of the minerals.

ABIOTIC COMPONENTS

Abiotic components of our environment include light, temperature, air, water, humidity and soil. Life would not sustain without these components. Let us read about them.

Light

Sun is the primary source of light on the earth. Not only does light serve as a source of energy, it also influences plant life in a number of other ways. In the presence of sunlight green plants are able to make food. Light influences closing and opening of stomata, germination of seeds, flowering and so on. Light may determine the types of plants and animals found in a particular area.

The behaviour of certain animals is also influenced by light. Most of the common animals that you see around can tolerate bright light and move about freely during the day. However, earthworms, termites and cockroaches cannot stand intense light. They lead a nocturnal (active at night) life.

Air

Almost all living organisms need oxygen of the air for their survival. Plants take in carbon dioxide from the air and use it to make food. Nitrogen of the air is converted into nitrates by the microorganisms present in the soil. These nitrates are used by the plants. The ozone layer of the air protects us from harmful ultraviolet radiations from the sun.



Fig. 8.6 Herbivores eat plants.



Fig. 8.7 Carnivores eat flesh.



Fig. 8.8 Omnivores eat both plants and animals.



Fig. 8.9 Scavengers mainly eat dead bodies of animals.

Air helps in regulating the temperature on the earth. Moving air is called wind. Wind helps in the pollination of flowers and dispersal of seeds. Wind increases the rate of transpiration and plays a role in the distribution of rain over a region.

Water

Water is the most abundant natural resource on the earth's surface. It is extremely important for

living organisms since all the chemical reactions which occur in the body need water as the medium. Green plants need water to prepare food.

The amount of water in a geographical region affects the kind of plants and animals found there. For example, desert regions which have a scarcity of water have less vegetation, whereas the Western Ghats and the hills of Assam, which receive heavy rainfall, are covered with dense evergreen forests.

There is a continuous cycling of water from air to land and sea, and then back to the atmosphere through evaporation, transpiration, riverflow and rainfall.

Soil

Life on land depends on the soil. Plants growing on land get water and minerals for growth, from the soil.

Soil is home to a variety of living organisms like bacteria, fungi, worms and insects. Type of soil at a place determines the vegetation growing there. For example, dense vegetation is found at places where soil is loamy but deserts do not support plant life because of the sandy soil.

Temperature

There is a wide variation in temperature on the earth's surface. Most organisms have a specific range of temperature in which they can live comfortably. Organisms can usually survive between 0 °C and 50 °C. However, there are certain exceptions to this. Some bacteria can survive at temperatures as low as -240 °C and as high as 120 °C.

The main climatic zones of the earth are differentiated primarily on the basis of prevailing temperatures. Thus, the very hot and winterless zone is the **tropical zone**, the hot zone with a cool winter is the **subtropical**

zone, and a zone with a warm summer and a pronounced winter is the **temperate zone**. The zone with a short summer and a long severe winter is the **alpine zone**. The distribution of animals and plants over the earth depends on the temperature range prevailing in different places.

Did you know?

Some animals like lizards, snakes and frogs remain underground and sleep throughout winter. This is called **hibernation**.

Some desert animals, like snakes and rats, remain in a state of sleep throughout summer. This is called **aestivation**.

CHECK YOUR PROGRESS 1

Write True or False.

1. The gas which prevents the entry of ultraviolet rays to the earth is ozone.
2. Omnivores eat both plants and animals.
3. Dense vegetation is found in deserts.
4. The very hot and winterless zone of the earth is called the tropical zone.

CULTURAL COMPONENTS

Human beings are also part of the environment. All activities of human beings have a great impact on the environment. Today we do not live in a natural environment as we have modified it to suit our needs. It would not be wrong to say that we live in a **man-made environment** or a **socio-cultural environment**. Ongoing researches and new inventions have made our life more comfortable but at the same time it has caused problems for the environment. We have read about how water, air and land are getting polluted because of various human activities. We are not only getting affected physically but mentally as well.

INTERACTIONS WITHIN BIOTIC COMPONENTS AND FLOW OF ENERGY

Biotic components are linked with each other primarily by food. Only green plants can trap solar energy and prepare food. Thus, solar energy is converted into chemical energy of food. Some energy gets stored in plants while rest is used by them. When plants are eaten by herbivores, energy stored in plants is transferred to herbivores. Again herbivores use some energy for their activities and store a part of it in their body. This stored energy is transferred to carnivores when they eat the herbivores. Thus, energy passes from producers to herbivores and then to carnivores as one organism eats the other.

A series of organisms which are linked with each other through a process of eating and being eaten form a food chain. All food chains start with producers, and energy is transferred through these chains. The energy flows only in one direction. A typical food chain is shown in Figure 8.10.

Most consumers have more than one source of food. Frogs eat caterpillars and grasshoppers. Snakes eat frogs as well as lizards, mice and rats. Rats are also eaten by hawks. Thus, a plant or animal may belong to several food chains.

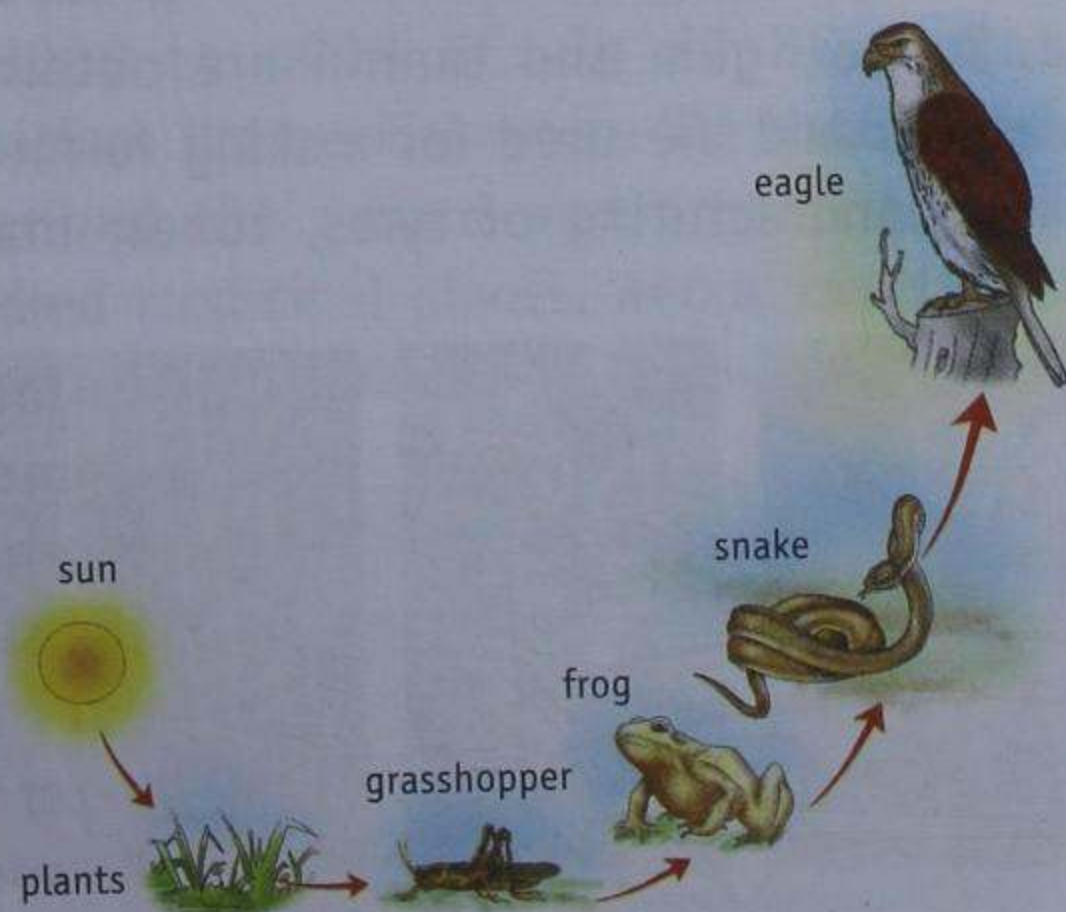


Fig. 8.10 A food chain

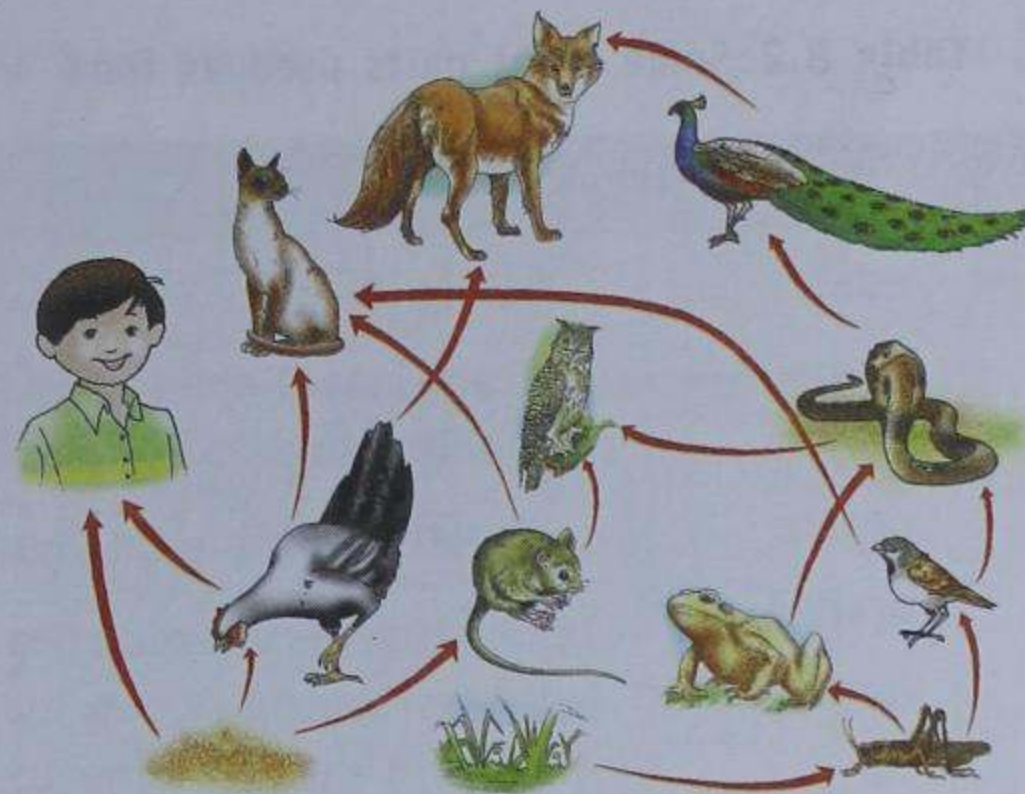


Fig. 8.11 Many food chains are interconnected to form a food web.

Food chains are interconnected to form a **food web** (Fig. 8.11).

INTERACTIONS BETWEEN BIOTIC AND ABIOTIC COMPONENTS

The study of the interaction and the relationship between living and non-living things in the environment is called **ecology**. Though the primary link between various biotic components is food they are also interdependent for carbon dioxide, oxygen, nitrogen, recycling of minerals and so on.

Plants need carbon dioxide to prepare food by the process of photosynthesis which is given out by the animals during respiration. On the other hand, animals need oxygen for respiration and this oxygen is given out by plants during photosynthesis.

We have already learnt how scavengers recycle minerals. They decompose dead and decaying organisms and release their body minerals into the environment. These minerals are reused by plants for their growth. So, biotic and abiotic components of the environment are always interacting.

INTERDEPENDENCE OF PLANTS AND ANIMALS

Dependence of human beings on plants

- ❖ We consume either some parts of plants, or

Table 8.2 Some plant parts used as food

PLANTS	PART USED AS FOOD
mint	leaves
onion	fleshy leaves and modified stem
potato	modified stem
orange	fruit
tomato	fruit
carrot	root

the entire plant as food. In fact, all the vegetables and fruits consumed by us are parts of plants (Table 8.2).

- ❖ Even microscopic bacteria and some fungi like yeast and *Penicillium*, are extremely useful to us. Yeast helps in fermentation. *Penicillium* and many other fungi are used for producing antibiotics.
- ❖ We depend on plants not only for food but also for other products like rubber, paper, wood, jute, cotton and so on.
- ❖ Oxygen needed by us for respiration is released by plants during photosynthesis.
- ❖ Plants help in maintaining a balance of gases in nature.

Dependence of other animals on plants

- ❖ Herbivores depend on plants for their food.
- ❖ Animals like birds, monkeys, squirrels and insects like ants, beetles and so on depend on trees for their shelter. Birds use different plant materials to build their nests.
- ❖ Animals also depend on plants for oxygen necessary for respiration.

Dependence of plants on animals

- ❖ Plants depend on animals for pollination and dispersal of seeds.
- ❖ Excreta of animals is decomposed by organisms present in the soil and minerals released are used by plants for their growth

and other purposes.

- ❖ The carbon dioxide released by animals during respiration is used by plants for photosynthesis.

SOME USEFUL PLANTS

Whole animal kingdom depends on plants either directly or indirectly for food. Human beings also depend upon plants for various purposes. The most important necessities of human beings are food, clothing and shelter. These needs are fulfilled to a large extent by plants. Let us read about some useful plants and their products.

Food items

The sources of most food items are plants. Food from plants mainly comes in the form of cereals, pulses, vegetables, fruits and vegetable oil. These food items are rich sources of carbohydrates, fats, proteins, vitamins and minerals (Table 8.3).

Some plant parts are used to add flavour to food rather than for their food value, for example, cinnamon (*dalchini*), clove (*laung*), black pepper (*kali mirch*) and fennel (*saunf*).

Tea leaves and coffee beans are also obtained from plants.

Industrial products

Wood, rubber, gum and tannin are obtained from plants and are used for making furniture and for manufacturing of tyres, tubes, mats,



Fig. 8.12 Rubber, spices and timber are some plant products.

Table 8.3 Some food products from plants

FOOD ITEM	PRODUCT (NUTRIENT)	SOURCES
cereals	carbohydrates	wheat, rice, maize, barley
pulses	proteins	beans, peas, black gram (<i>urad</i>), green gram (<i>moong</i>), bengal gram (<i>channa</i>)
nuts	fats	almond, pistachio, cashew nut
vegetables	minerals and vitamins	carrot, radish—roots, potato—stem, spinach, cabbage, fenugreek (<i>methi</i>) leaves, cucumber, lady's finger—fruit
fruits	minerals, vitamins and sugar	orange, apple, banana, papaya, mango
edible oil	fats	groundnut, mustard, sunflower, soyabean

adhesives and dyes. Paper is also made from plants like bamboo, grasses and so on.

Fibres

We get fibres from cotton, jute and flax. Cotton is extracted from the seed hair of *Gossypium* (cotton plant). Jute is obtained from the stem of *Corchorus* (jute plant) and is used to make clothes, carpets, socks and so on. Flax is obtained from the stem of *Linum*, which is used to make linen clothes.

Medicinal plants

Medicinal plants were known even to earlier civilizations. The Chinese are reported to have used plants for medicinal purposes from as early as 3000 to 4000 BC. In 77 BC, a Roman physician, Dioscorides wrote 'De Material' which described the nature and properties of five hundred medicinal plants. About two thousand years ago, a great Indian physician named,

Charaka studied the medicinal value of plants. *Eucalyptus*, *neem*, *tulsi* and ginger are some of the plants that have medicinal value.

Microorganisms

Certain fungi and bacteria are useful to us in many ways. **Antibiotics** like penicillin are made from some fungi. These antibiotics are used to cure infections and to destroy other microorganisms. Yeast is used to make bread, wine and beer. Some bacteria are used to make cheese and alcohol.

SOME USEFUL ANIMALS

Just as human beings depend upon plants for food, clothing and shelter, they are also dependent upon animals for some of their needs. The animals domesticated by humans for their usefulness are classified into three groups.

Cattle

Cattle includes buffaloes, bullocks and cows. Buffaloes and cows provide us with milk. Bullock is an important animal for farmers. It is used for ploughing the fields, transportation and many other agricultural activities.

Not only are animals useful, their dung is also extremely useful. Dung cakes are used as fuel in the villages. Animal dung is also used

Did you know?

Plywood, used to make furniture, is made by sticking together thin layers of wood.

Crushed stems of sugar cane, commonly known as bagasse is used for making paper.





Fig. 8.13 We get wool from sheep.

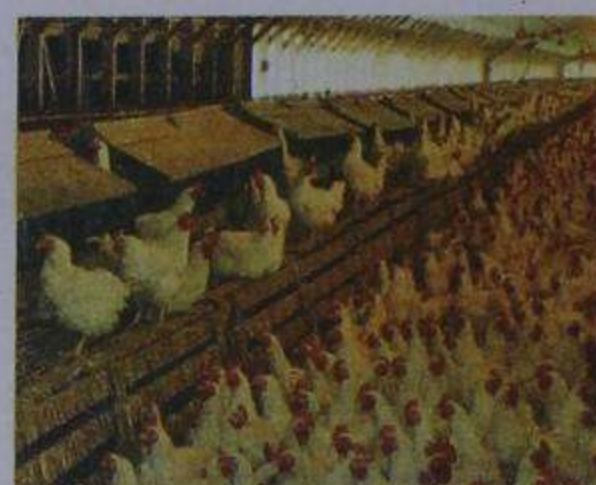


Fig. 8.14 Poultry farming



Fig. 8.15 Honey comb

in 'gobar gas' plants for the production of biogas. The skin of some animals is used to prepare leather.

Sheep and goat

Sheep and goats provide meat, wool and hide. Wool is obtained by shearing (shaving off the hair of sheep either manually or with machine) (Fig. 8.13). The quality of wool varies from breed to breed.

Pashmina wool which is highly soft and warm is obtained from an Indian breed of sheep called Pashmina which is found in Kashmir and nearby Himalayan areas.

Pig

Pigs are domesticated mainly for meat and hide. Their meat is known as pork. The rearing and management of pigs is called **piggery**. Pork should be properly cooked before eating, since it acts as one of the hosts for tapeworm and may contain harmful tapeworm cysts.

Poultry

Hens, ducks, turkey and geese are poultry birds. They are kept for their eggs and meat. The practice of keeping and breeding these birds is called **poultry farming** (Fig. 8.14).

Fish

Besides goat, sheep and poultry, fish are another important source of protein, particularly for people living in coastal areas.

The production and management of fishes is known as **pisciculture**. Fishes are classified into three categories on the basis of their habitat.

- ❖ Freshwater fishes
- ❖ Marine water fishes
- ❖ Estuarine (brackish water) fishes

Catla, Singhi, Rohu are some of the well-known freshwater fishes. *Hilsa*, sardine, salmon, tuna and pomfret are some of the marine fishes.

Besides being a rich source of proteins, fish liver oil is rich in vitamins A, D and E.

Besides these animals there are some insects which are useful for humans.

Honeybee

Honeybees are one of the best known social insects that live and work together in their nest called **hive** (Fig. 8.15). The hive is divided into many compartments called **combs**. There are three types of adults in the colony of honeybees. They are the **queen bee**, **drones** and **workers**.

The queen bee lays eggs. The drones are the male bees. They only fertilize the queen bee. All the work is done by the workers. Workers are female bees that cannot reproduce. They look after the queen and the new larvae that hatch out from the eggs. They make layers of six-sided compartments by their secretion which is waxy in nature. Eggs are laid and food is stored in these compartments. Workers keep the hive cool in summer when it gets too hot, by fanning it with their wings.

HONEY AND NECTAR COLLECTION

The worker bees collect nectar from flowers with the help of their sucking tubes. Both nectar and pollen grains are used for food but it is the nectar that the bees turn into honey. Honey consists of water, sugar, minerals and enzymes. It is a good source of nutrients. The management of honeybees for commercial purposes is called **apiculture**.

Silk moth

Silk moth provides silk yarn. The female silk moth lays eggs from which emerge the worm-like creatures called **caterpillars**. The caterpillar feed on mulberry leaves (Fig. 8.16). The caterpillar has silk glands with the help of which it weaves thread-like structures around its body and forms a **cocoon**. This is the beginning of the pupa stage. Inside the cocoon, the larva undergoes changes. After the pupa stage, larval organs disappear and new adult organs (wings and legs) are formed.

The adult insect comes out of one end of the cocoon. Initially the wings are crumpled. It takes some time before the wings unfold and the moth can fly.

In silk farms, the thread is very carefully unwound from the cocoons. After some chemical treatment it is used for weaving silk yarn. The rearing of the silk moth caterpillars for their silk

thread is called **sericulture**. In India, sericulture centres are located in Karnataka, West Bengal, Andhra Pradesh, Tamil Nadu and Kashmir.

MAN AND THE ENVIRONMENT

Human beings are the only living beings, who can change the environment to suit their needs. Though our life has become more comfortable than before but some of our activities have an adverse effect on our environment. Let us read about it:

- ❖ Uncontrolled growth of human population put tremendous pressure on our natural resources.
- ❖ Number of factories and industries has increased in residential areas. These factories release poisonous gases and other wastes that pollute the air, water and land.
- ❖ Discharge of sewage water into the rivers, ponds and other water bodies causes water pollution.
- ❖ Dumping of chemicals and garbage in water bodies again causes water pollution.
- ❖ Poisonous fumes from vehicles are harmful for both plants and animals.
- ❖ Excessive use of non-biodegradable plastic bags is a threat to the environment.
- ❖ Thoughtless cutting of trees has disrupted the rainfall pattern in many regions.
- ❖ Excessive use of fossil fuel which releases carbon dioxide contributes to the global warming.

Some other activities which are affecting our natural resources are mentioned below:

Deforestation

Cutting down or destruction of forests is called **deforestation**. Some of the reasons for deforestation are:

- ❖ More land is required for making houses and other infrastructure for increasing human population.

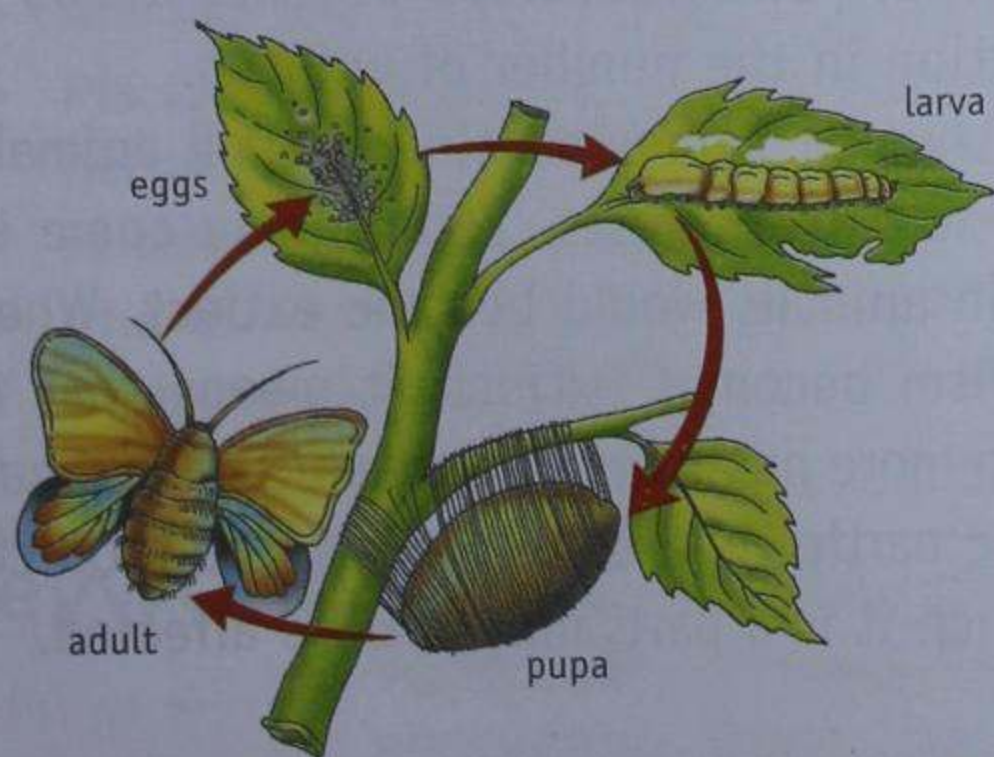


Fig. 8.16 Life cycle of silk moth

- ❖ To obtain raw material for various industries like paper, timber, rubber and wood.

Deforestation leads to soil erosion which results in the loss of the fertile layer of the soil. Deforestation also disturbs the habitat of many wild animals, birds and insects. Loss of habitat may cause extinction of certain animals in the long run.

Deforestation also leads to frequent floods as there are no trees and their roots to absorb rainwater. Deforestation reduces the amount of water transpired as there are less number of trees. As a result, fewer clouds are formed and the rainfall in the region decreases.

Pollution

Pollution is the introduction of unwanted, usually harmful material into an environment. A **pollutant** is a material that harms the environment. Almost all kinds of pollution have been caused by human beings which you have read in the Chapter 7.

Air pollution is caused by fumes and gases released by the exhausts of vehicles and factories. The quantity of gases like carbon dioxide, carbon monoxide, sulphur dioxide and oxides of nitrogen in the air is quite high. These gases in the air dissolve in water vapour to form acid. The mixture of acid and rainwater that falls on the earth is called **acid rain**. This



Fig. 8.17 Plants damaged by acid rain

harms living organisms as well as historical monuments (Fig. 8.17).

The ozone layer of the atmosphere which acts as a protective layer to prevent the entry of harmful ultraviolet rays is becoming thinner. This is happening due to the use of certain chemicals like chlorofluorocarbons in hair sprays, refrigerators and jet planes.

Certain harmful wastes that are disposed off on land causes **land pollution**. These wastes include glass bottles, plastic bags, cans, paper and other organic waste. Some of these waste like paper and organic waste which can be decomposed by the action of bacteria are called **biodegradable waste**. Other waste which cannot be decomposed are called **non-biodegradable waste**. Excessive use of chemical fertilizers, pesticides and insecticides also leads to land as well as water pollution. Water pollution is also caused by the release of sewage and chemicals from factories into water bodies.

There is another kind of pollution—**noise pollution** which is displeasing and disrupts the balance in nature.

Destruction of wildlife

When plants in an area are destroyed, the animals that depend upon them are also destroyed. Hunting of animals for bones, food, skin, hide or for fun or for sports, which is a very cruel and senseless activity leads to a reduction in the number of animals.

If human beings continue to kill animals for their selfish interests, a time may come when certain animals would become extinct. When an organism becomes extinct, it means that there are no more members of that particular organism on the earth. As a consequence, the food chain, of which it is a part, may also be affected.

CONSERVATION OF THE ENVIRONMENT

If we continue to destroy the environment at

this rate, soon a situation may arise when human beings themselves may get destroyed. Let us all take certain positive steps to save our environment. It is never too late. Each one of us can contribute to protect our environment in our own ways.

- ❖ Plant a tree in your neighbourhood and look after it.
- ❖ Avoid using plastic bags; instead carry a cloth bag for shopping.
- ❖ Play music at a low volume.
- ❖ Avoid wastage of water.
- ❖ Travel by public transport or use car pools.

CHECK YOUR PROGRESS 2

Fill in the blanks.

1. _____ leads to frequent floods as rainwater is not absorbed by roots of trees.
2. _____ pollution is caused by fumes and gases from vehicles and factories.
3. Tea leaves and coffee beans are obtained from _____.
4. Wool is obtained by _____ which means shaving off the hair of sheep.
5. The management of honeybees for commercial purposes is called _____.

Now you know

- ▶ Earth is a unique planet in the solar system. Correct distance from the sun, presence of oxygen, water and minerals and an atmosphere which protects living things from harmful radiations and has a combination of gases that support life makes earth a living planet.
- ▶ Earth is composed of three parts namely lithosphere, hydrosphere and atmosphere.
- ▶ Plants, animals and microorganisms constitute biotic components of the environment.
- ▶ Organisms are grouped as producers, consumers or decomposers depending upon their food habits.
- ▶ The non-living things like light, temperature, soil or air are the abiotic components of the environment.
- ▶ Consumers are either herbivores, carnivores or omnivores. Decomposers help in recycling of nutrients.
- ▶ The unidirectional flow of energy in the form of food is called a food chain. Interconnected food chains form a food web.
- ▶ Plants and animals are dependent upon each other for their survival.
- ▶ Plants provide us with cereals, pulses, nuts, fruits, vegetables, spices and other things. Some plants produce seeds that yield edible oil. Cotton, jute and flax are fibre-yielding plants.
- ▶ Wood, rubber and gum obtained from plants are used in various industries. Some plants have medicinal values.
- ▶ Animals are domesticated for many purposes, some of them being food, fibre and skin.
- ▶ Pisciculture is breeding and rearing of fish which is a rich source of protein. Honeybees collect nectar from flowers to produce honey. The management of honeybees for commercial purposes is called apiculture. The rearing of silk moth caterpillars for silk thread is called sericulture.
- ▶ The activities of human beings are leading to a depletion of natural resources and are creating an imbalance in the environment.

Keywords

FOOD WEB	complex feeding relationships that contains several food chains
PRODUCER	green plant that prepare food through the process of photosynthesis
SCAVENGER	organism that feeds on dead and decaying animals

Exercises

A. Tick the most appropriate answer.

- The part of the earth which is made up of water is called
 - biosphere.
 - hydrosphere.
 - atmosphere.
 - lithosphere.
- Which of the following belongs to the abiotic components of the earth?
 - Only plants
 - Both plants and animals
 - Air, water and soil
 - Plants, animals and microorganisms
- Animals depend on plants for
 - food alone.
 - shelter alone.
 - carbon dioxide.
 - food and oxygen.
- The dead and decaying plants and animals are acted upon by
 - consumers.
 - decomposers.
 - producers.
 - herbivores.
- Sulphur dioxide and other gases given out by industries cause
 - rain.
 - flood.
 - acid rain.
 - none of these
- The production and management of fishes is called
 - breeding.
 - agriculture.
 - shearing.
 - pisciculture.
- Which of the following is a primary consumer in the following food chain?
Green plants → Grasshopper → Frog → Snake → Eagle
 - Green plants
 - Eagle
 - Grasshopper
 - Snake



B. Fill in the blanks.

- _____ is the study of interaction between living organisms and their environment.
- Plants, animals and microorganisms constitute the _____ components of an environment.
- Green plants which make their own food are called _____.
- _____ are carnivores that feed on dead animals.
- Microorganisms which bring about decomposition of dead plants and animals are called _____.
- The flow of energy in the form of food is only in _____ direction.
- Food chains are interconnected to make a _____.
- Introduction of unwanted, harmful material into an environment leads to _____.

C. Find the odd one out. Give reasons.

- lion, cow, leopard, tiger
- deer, goat, vulture, horse
- bear, rat, crow, human
- tea, coffee, cocoa, milk

D. Give reasons for the following.

1. Animals in a food chain are consumers.
2. Consumers depend on producers in a food chain.
3. Deforestation should be checked.
4. Air pollution is harmful to us.
5. We should not use too many fertilizers and insecticides.



E. Differentiate between the following.

1. Hydrosphere and atmosphere
2. Producers and consumers
3. Consumers and decomposers
4. Food chain and food web

F. Write short answers.

1. What is environment?
2. What is biosphere?
3. What are the various components of the biosphere?
4. Why are plants called producers?
5. What kind of organisms are first level consumers?
6. Write one function of antibiotics.



G. Answer in detail.

1. How does the correct distance of the earth from the sun make it a living planet?
2. How do plants depend upon animals?
3. How are animals dependent upon plants?
4. How are carnivorous animals dependent upon plants?
5. Why are scavengers and decomposers important for the environment?
6. Why do all food chains start with plants?
7. Rearrange this food chain in the correct order: Mouse → Snake → Grain → Owl
8. What is a food web? Give an example.
9. Write a short note on the dependence of human beings on plants.
10. What is poultry farming? Name three poultry birds.
11. How can we get silk from silk moth?
12. Write five products each that we receive from plants and animals.
13. Write five human activities which are leading to an imbalance in nature.
14. After visiting a picnic spot why must you always carry the rubbish home?
15. How does air pollution cause acid rain?
16. Define water pollution and noise pollution.

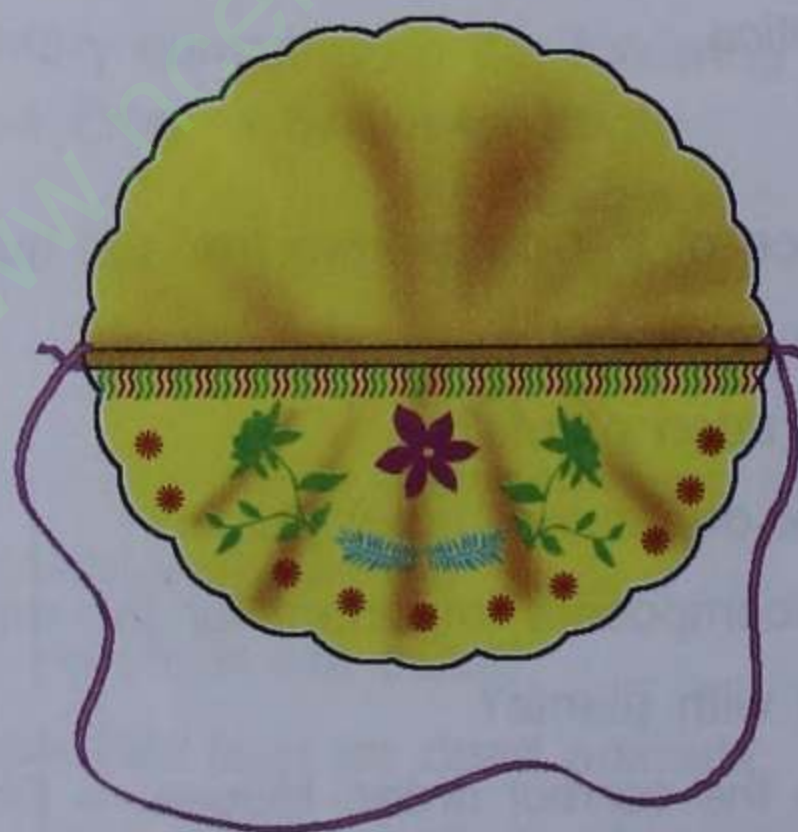
Fun to do

1. Find out those parts of your school that experience the most air pollution. Cut four pieces of waxed paper into four inch squares. Label the squares as A, B, C and D. Spread some petroleum jelly over each square of waxed paper. Put the squares in places where no one will touch them for one week. Put one near a door. Put one inside your classroom. Put one inside a big room or hall. Put one outside, near the gate of your school. Collect the squares after one week. If you have a magnifying glass, use it to look at the squares. Describe how each square looks. Which square looks the dirtiest? How do you explain any difference observed?
2. Do a project on the animals which have become extinct. What are the reasons for their extinction? Also collect information about the organisms which are on the verge of getting extinct.

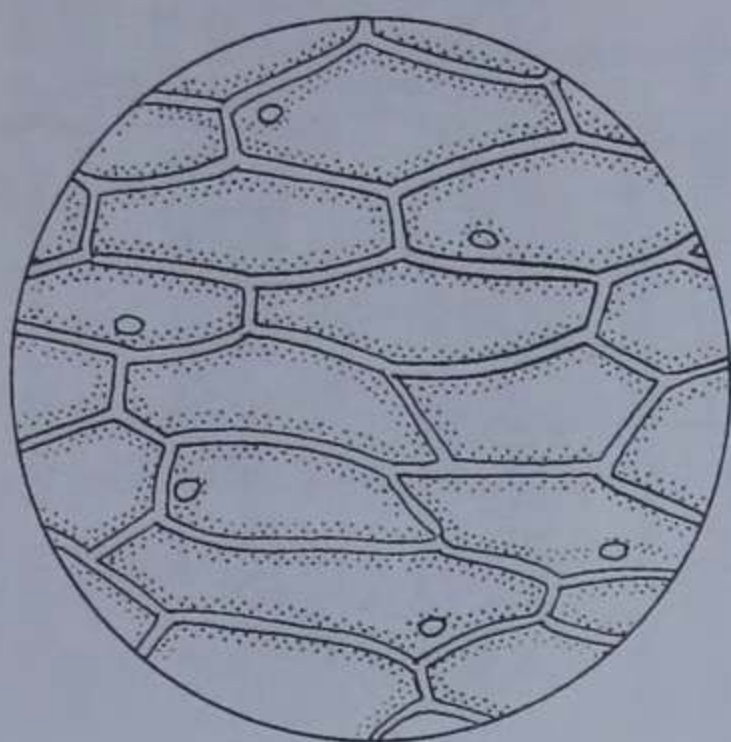
3. Making use of waste

Make a 'pouch' with paper plates.

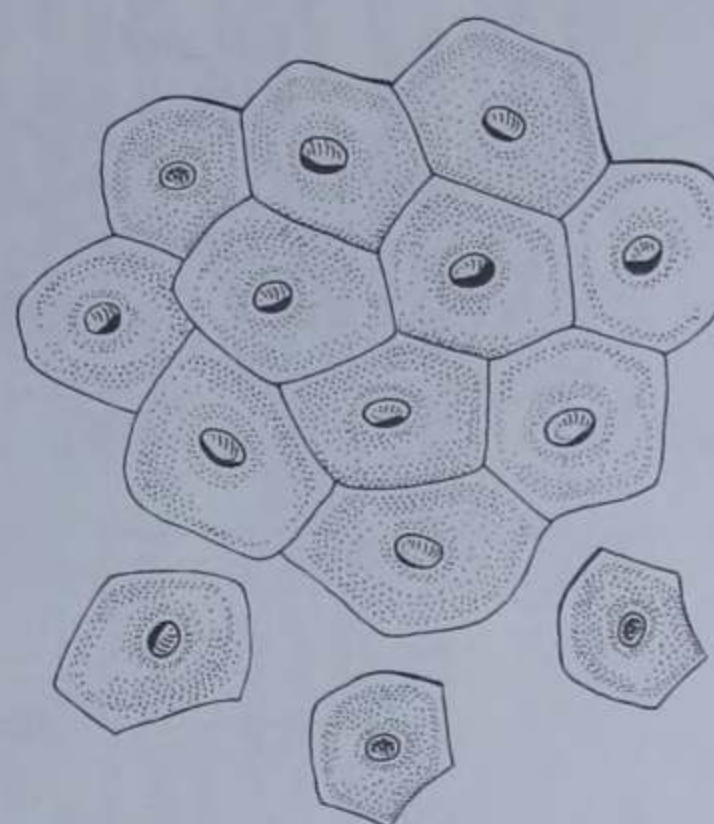
- ◆ Paint and decorate two paper plates and allow them to dry.
- ◆ Cut one plate (as shown) and add a fringe with crepe paper.
Cut out flowers from an old greeting card and glue them to the plate.
- ◆ Staple the two plates from the sides or glue them together.
- ◆ Decorate the plates with crayons, glitter, sequins or beads. Attach a long ribbon to form the string of your 'pouched bag'.



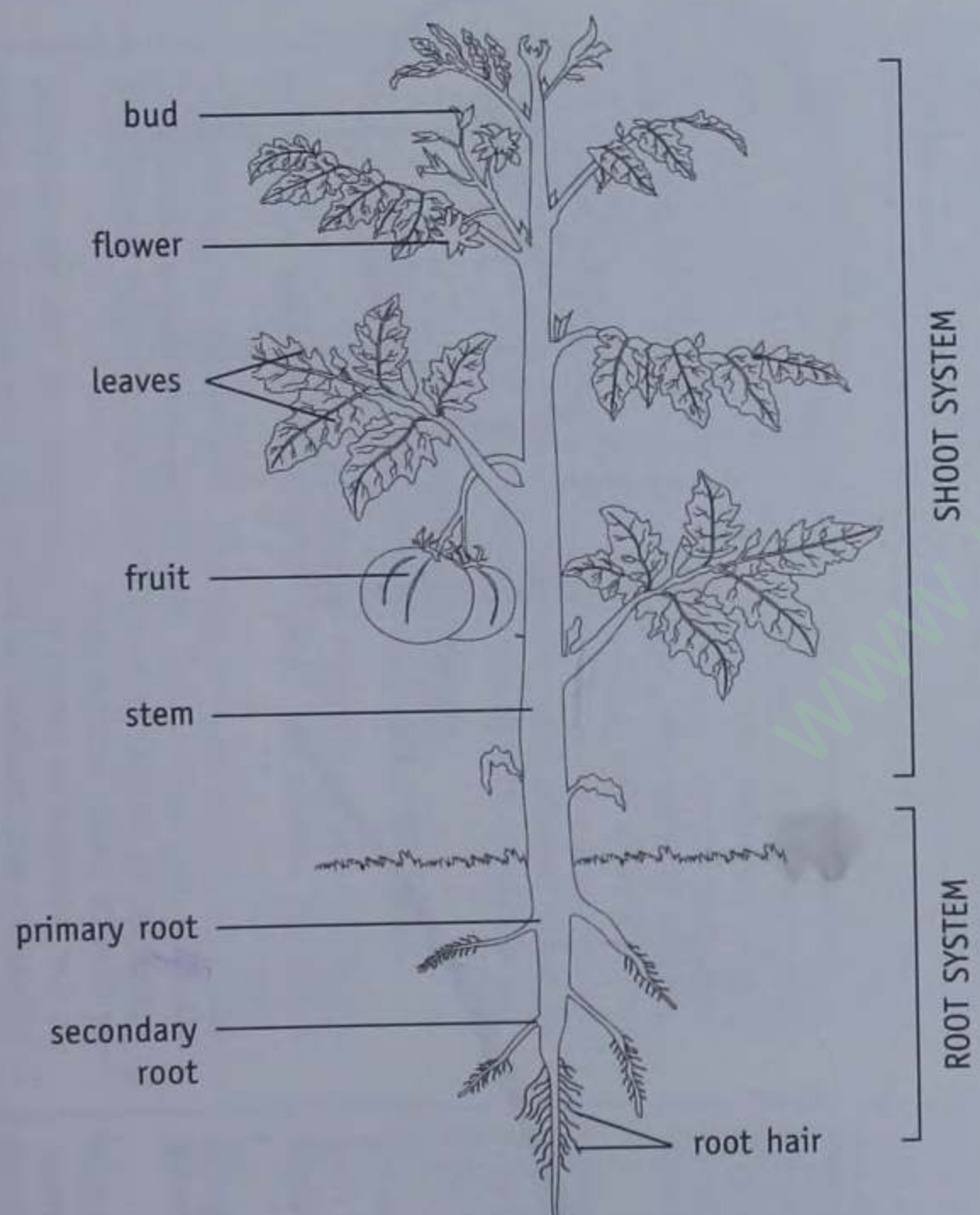
SOME LINE DIAGRAMS



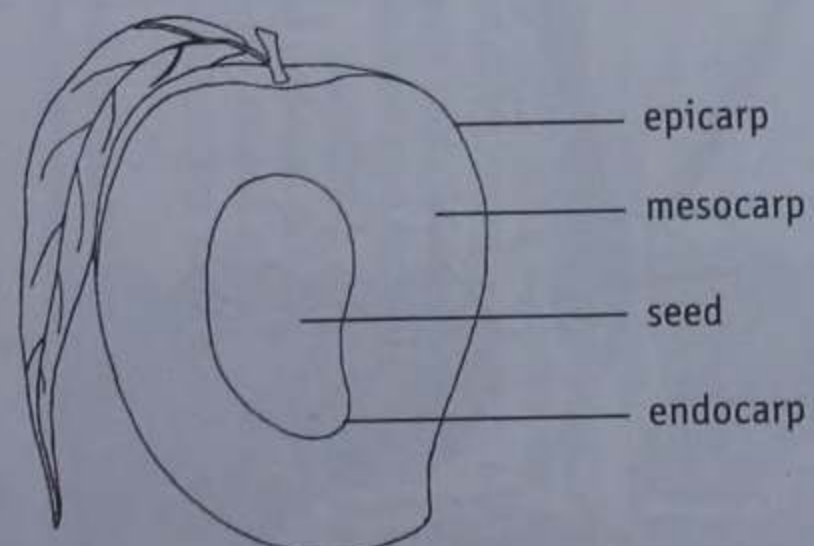
Brick-like cells of an onion peel



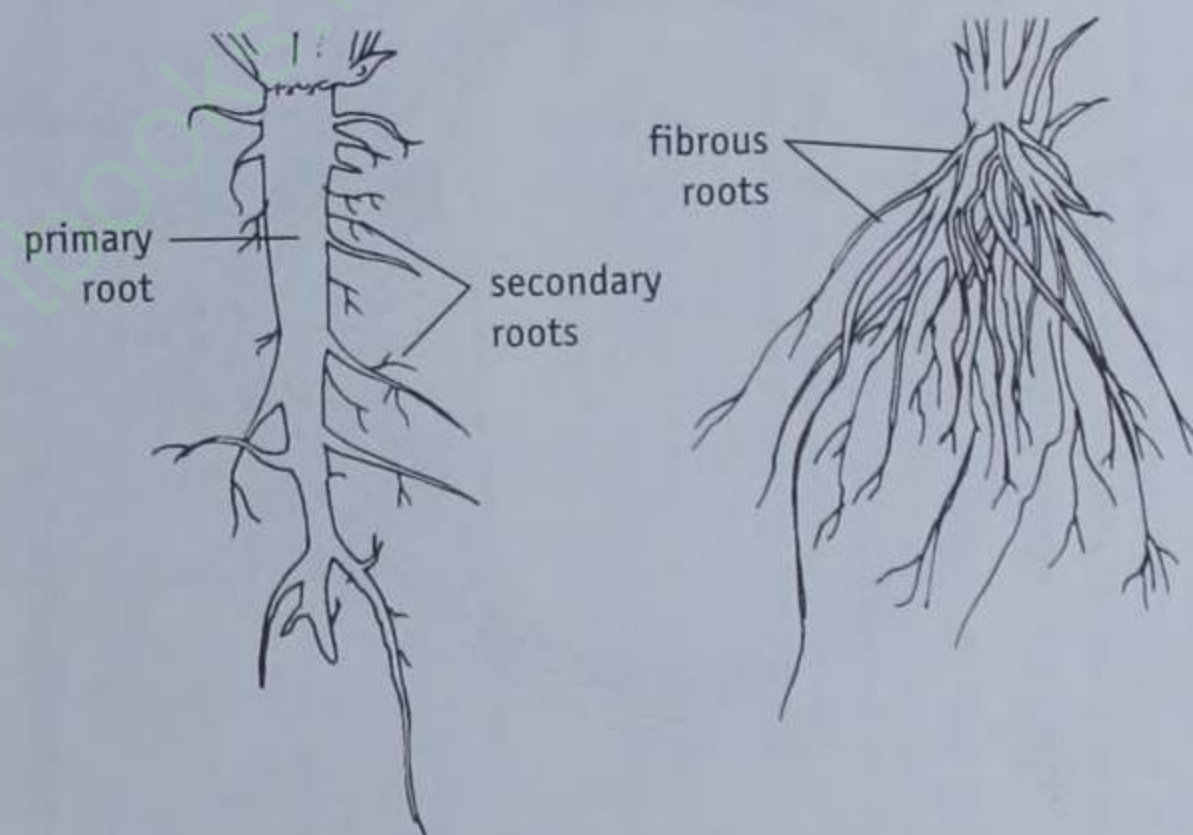
Human cheek cells



Parts of a tomato plant



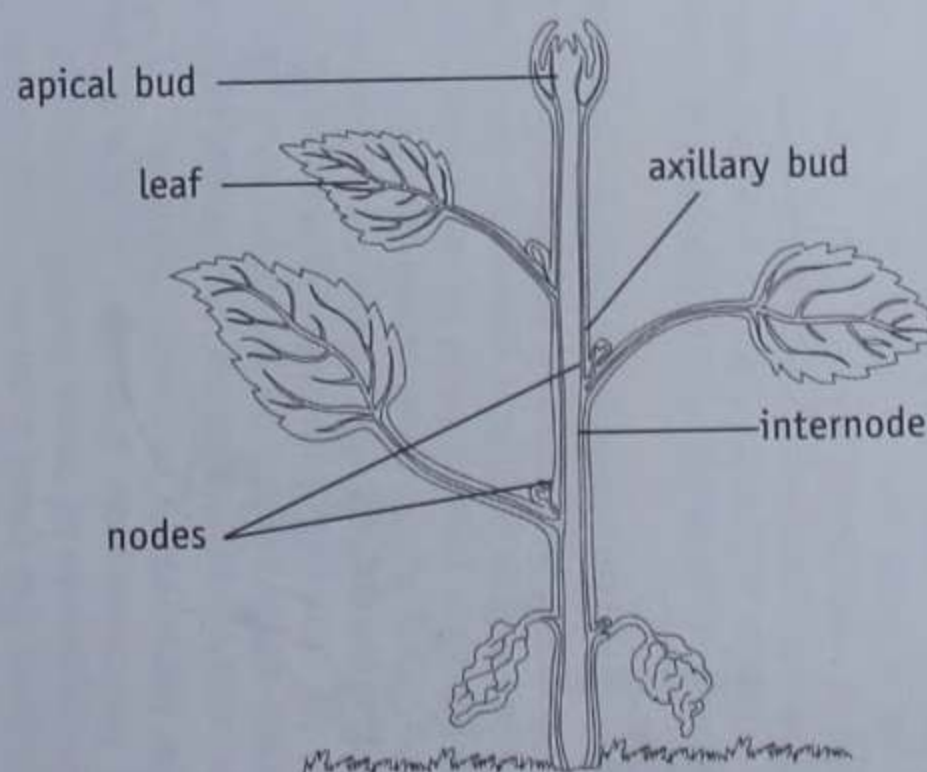
Parts of a fruit



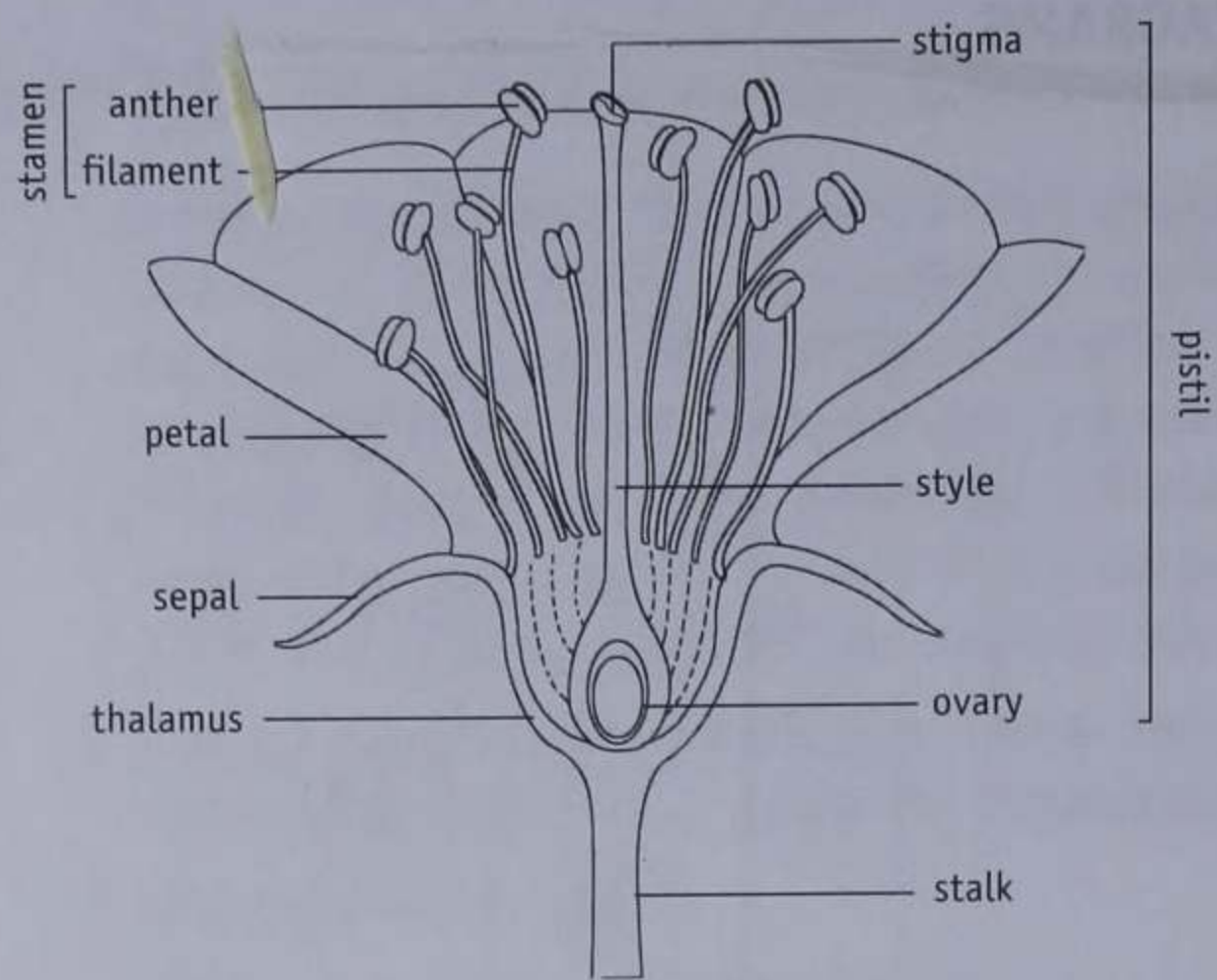
a. Tap root system

b. Fibrous root system

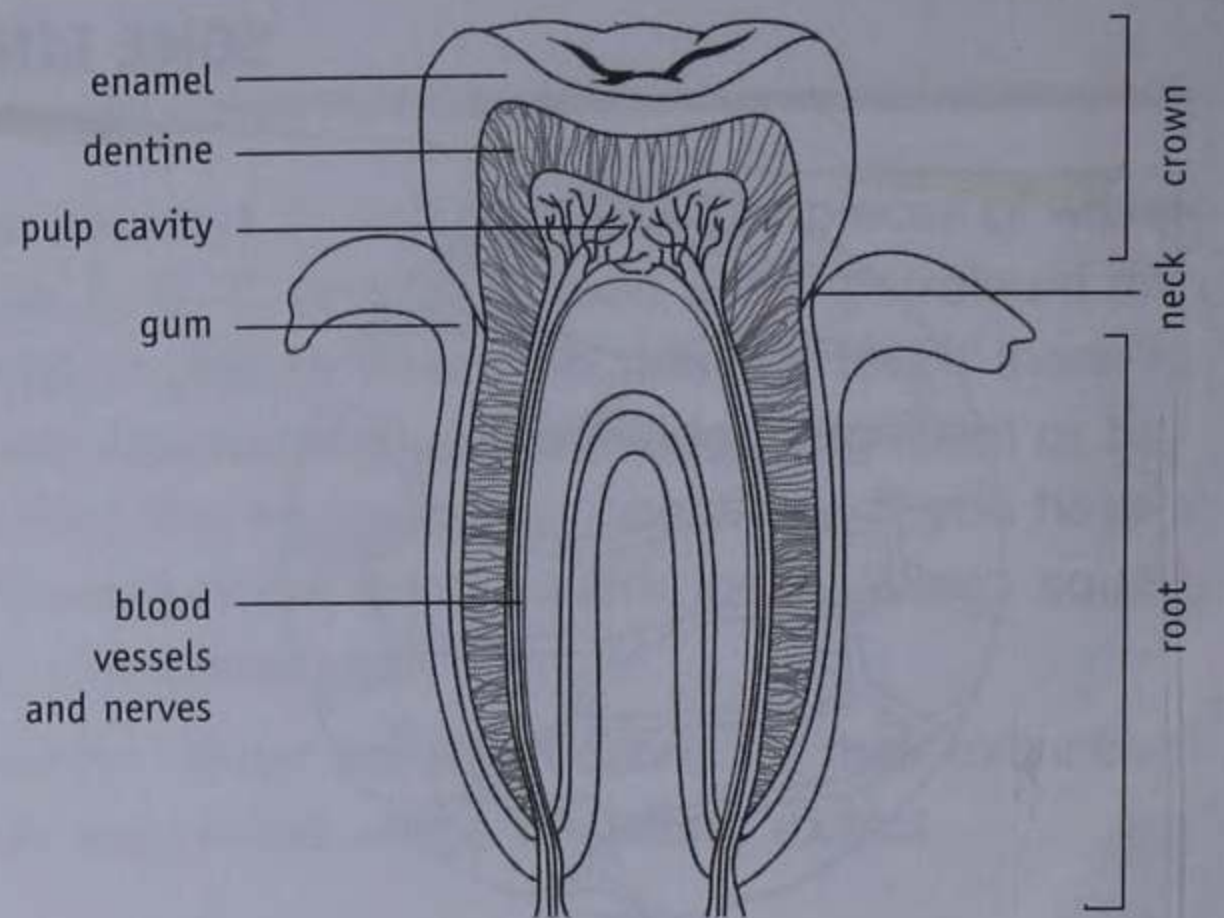
Types of root system



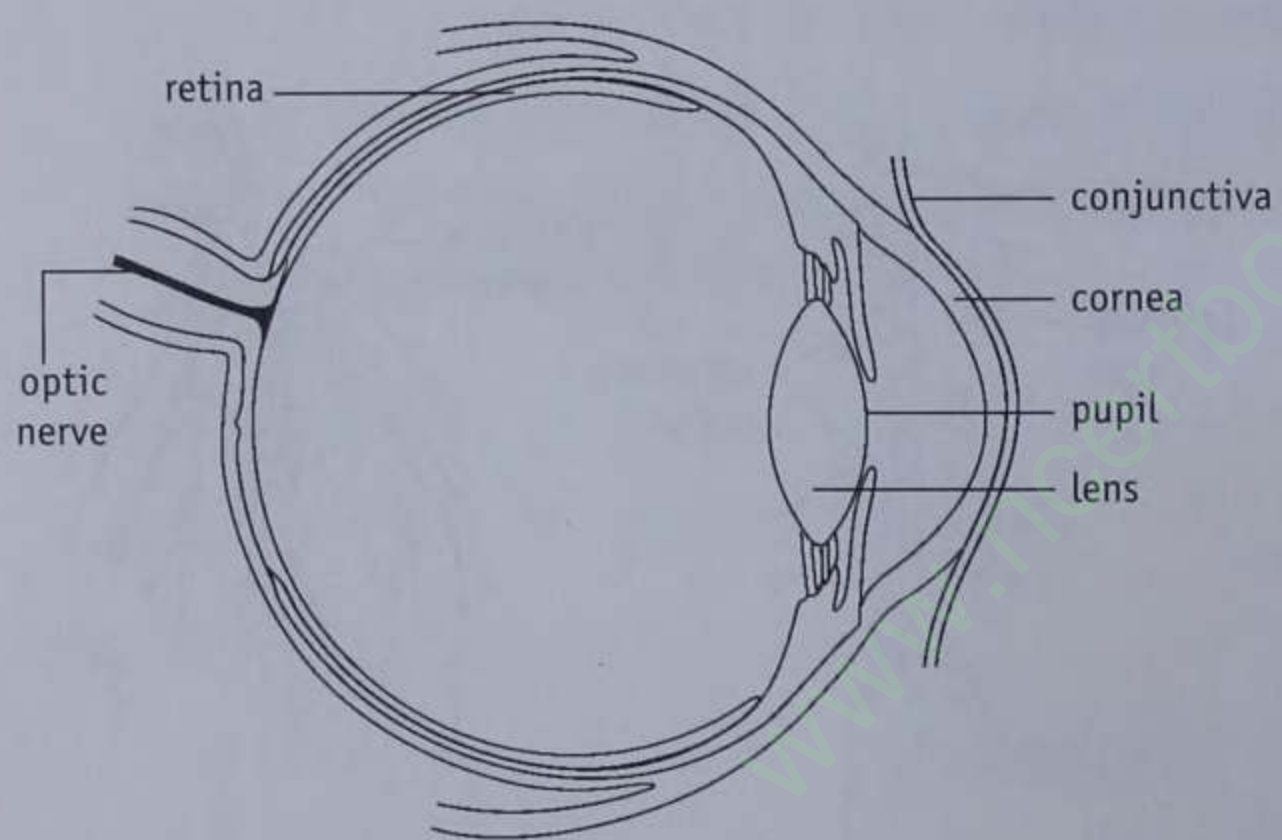
The shoot system



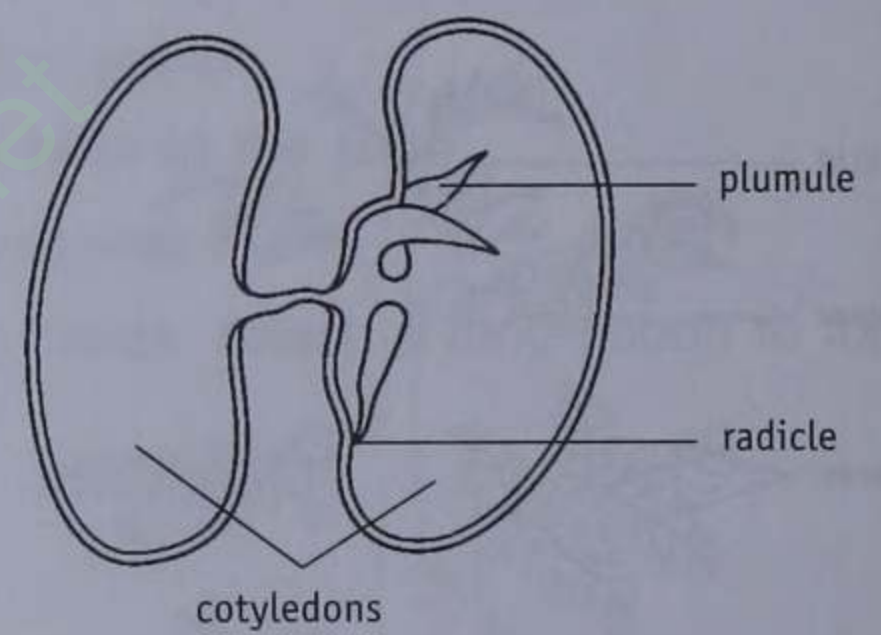
Parts of a flower



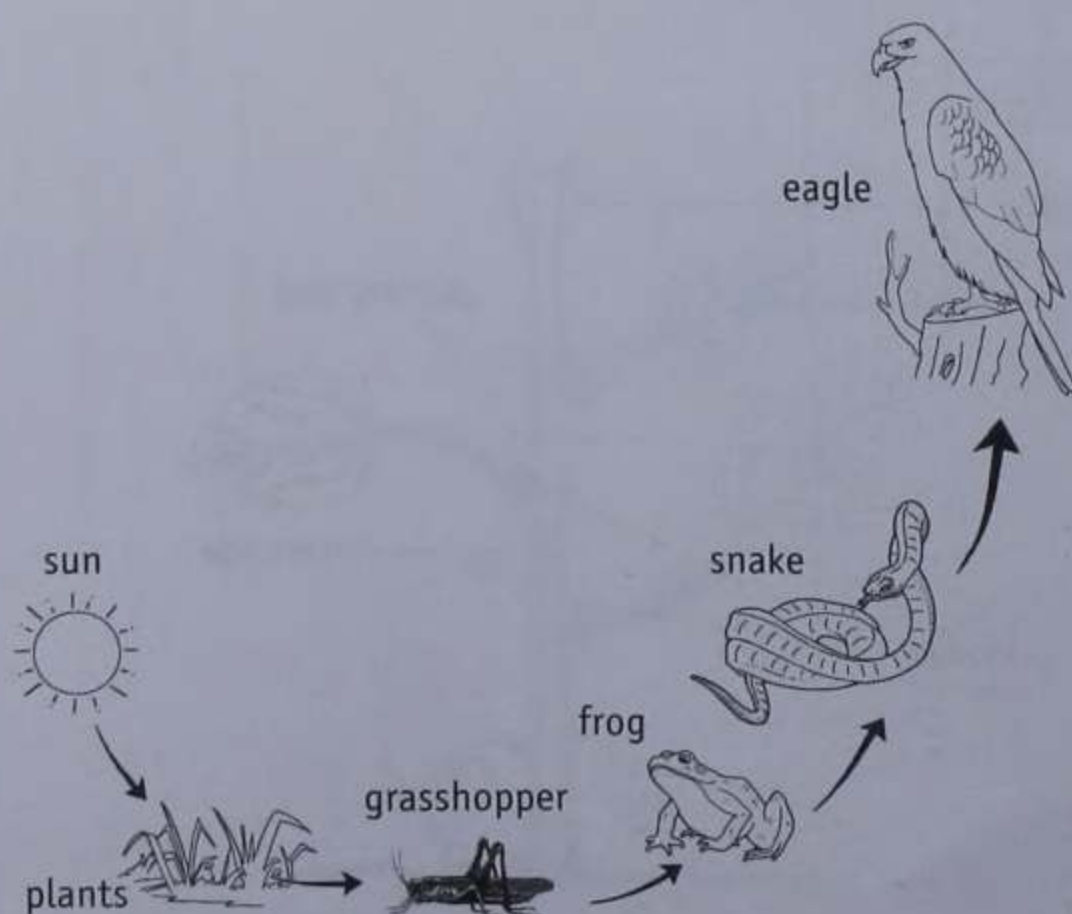
Structure of a tooth



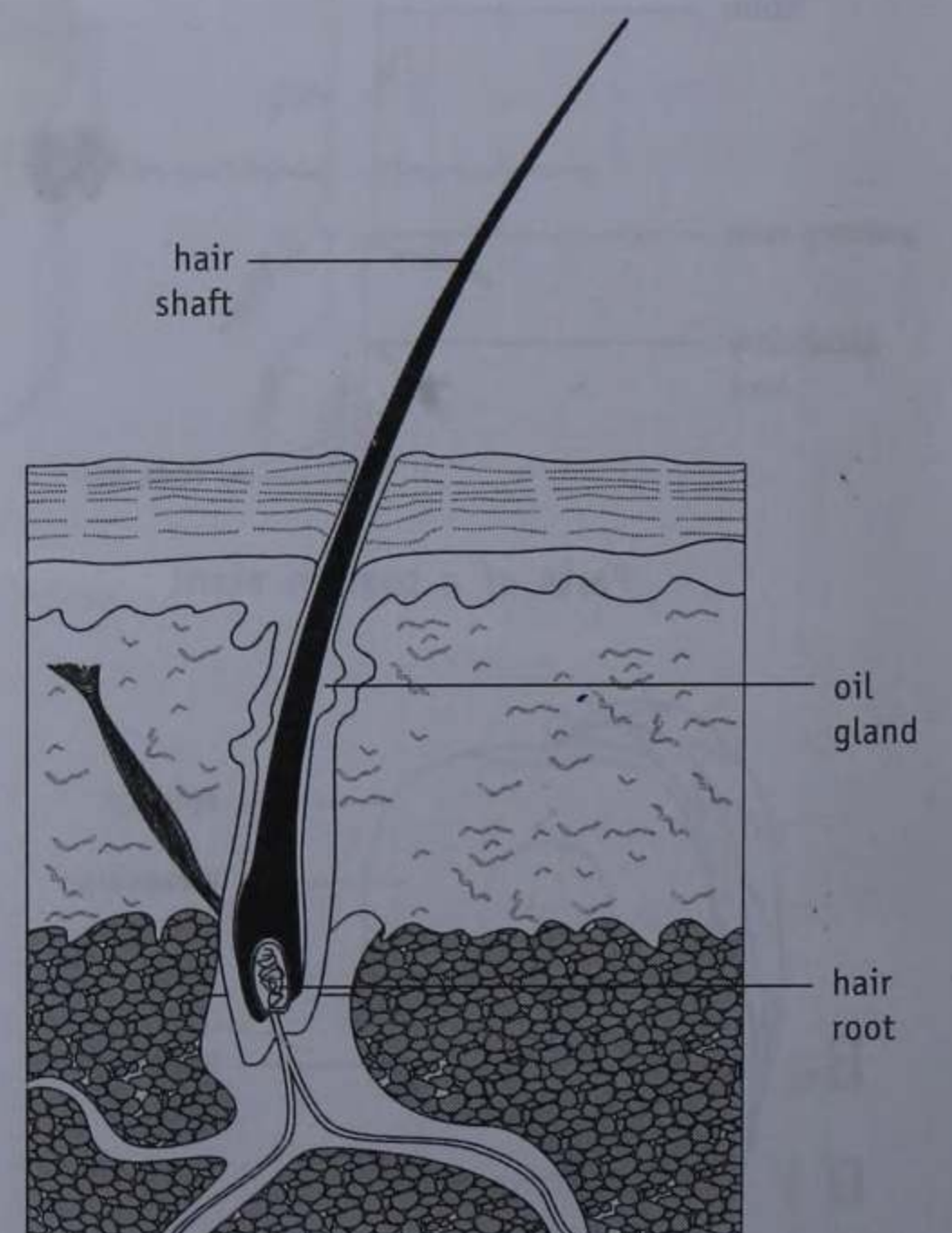
Structure of an eye



Germination of seeds



A food chain



Structure of a hair