7 Things Around Us

Prior Knowledge

In the previous classes, I have learnt that

- All things around us can be grouped into living and non-living things.
- There is immense diversity of living things on the Earth.
- Living things are natural.
- Non-living things are either natural or man-made.

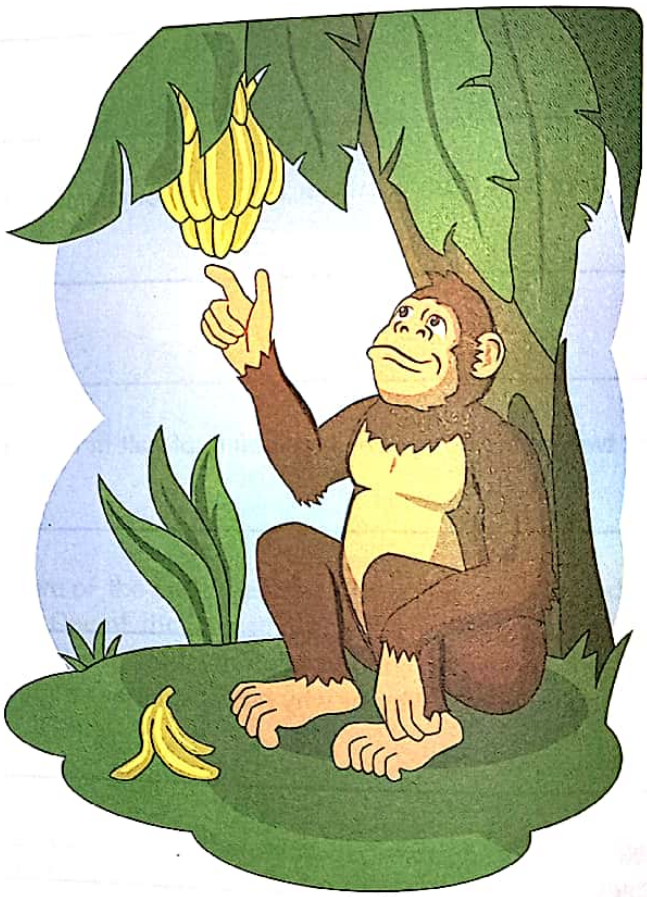
Learning Objectives

In this chapter, I will learn about:

- Characteristics of living things
- Habitat
- Biotic and abiotic components

Let's Get Going

Look at the given pictures. Mention three characteristics that are common to both the monkey and the banana plant.



1. _____
2. _____
3. _____

As studied in previous classes, things around us can be broadly grouped as **living things** and **non-living things.** Human beings, plants and animals are living things. Clouds, rocks, soil, chair and table are a few examples of non-living things.

Let us learn about the characteristics of living things and how do these characteristics make them different from non-living things.

CHARACTERISTICS OF LIVING THINGS

Characteristics of living things are as follows.

Structural Organization

Living things have a definite structural organization (Fig. 7.1).

All living things are made up of millions of cells.

The smallest unit of living things that is able to function independently is called a **cell.** For example, red blood cells.

A group of similar cells that perform the same function is called a **tissue.** For example, skin tissues.

A group of tissues that perform a particular function is called an **organ.** For example, stomach.

A group of organs that work together to perform a particular life process is called an **organ system.** For example, digestive system.

A living thing made up of one or more organ systems is called an **organism.** For example, human beings.

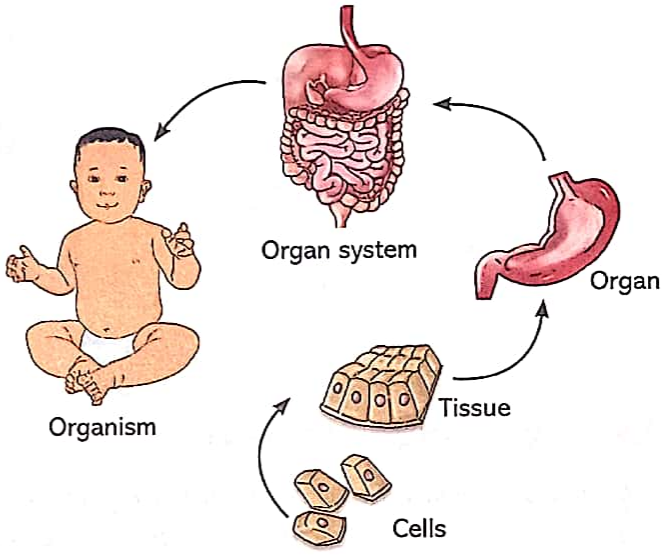


Fig. 7.1 Structural organization in humans

Depending on the number of cells, livings things are classified into two groups—unicellular and multicellular organisms.

Living things made up of a single cell are called **unicellular organisms.** *Amoeba and Paramoecium* are **unicellular organisms.** In these organisms, all life processes are carried out by a single cell.

Living things that are made up of several cells are called **multicellular organisms.** Human beings, dogs and houseflies are multicellular organisms.

Living Things Need Food

All living things need food for their survival. Food helps organisms to grow and provides energy to do various activities.

Plants can make their own food by a process called **photosynthesis.** So, plants are called **producers** or **autotrophs.**

Animals (including human beings) depend on plants and other organisms for their food. Therefore, animals are called **consumers** or **heterotrophs.** Non-living things and dead organisms do not need food.

Living Things Grow

All living things grow. Life begins from a single cell. The cell grows, enlarges in size and then divides to form new cells. The size of an organism increases with the increase in the number of cells. The growth of an organism occurs in different stages. A seed grows into a sapling and then into a large tree (Fig. 7.2). Animals and human beings grow from an infant stage to an adult stage (Fig. 7.3). Growth in living things is irreversible.

My Dictionary

Sapling: A young plant

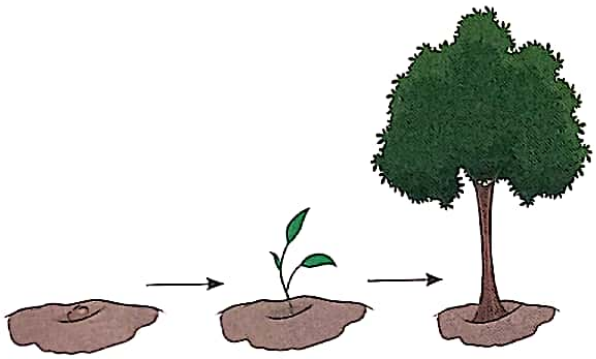


Fig. 7.2 Growth in plants

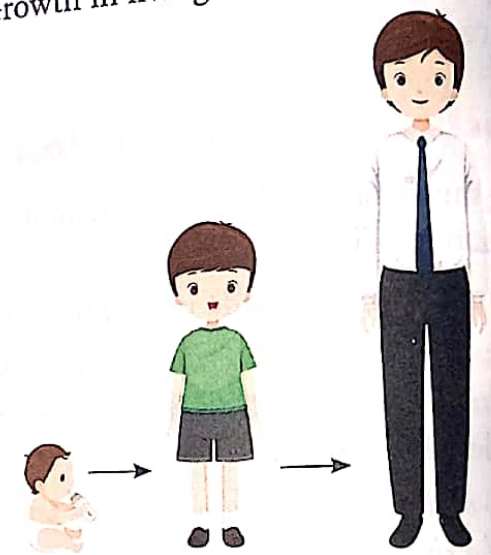


Fig. 7.3 Growth in human beings

Living Things Respire

The process by which living things utilize oxygen to release energy stored in the food eaten by them is called **respiration.**

Respiration and breathing are different. Breathing is a part of respiration.

The process of taking in oxygen and giving out carbon dioxide is called **breathing.**

During respiration, oxygen (breathed in) reacts with food and breaks it down to release energy stored in the food. Carbon dioxide produced during respiration is breathed out. Thus, respiration is an essential feature of all living things.

Different organisms have different organs for respiration. Most terrestrial animals respire with the help of lungs. Fish respire through **gills**. Earthworms breathe through their **moist skin**. Insects such as grasshoppers breathe through tiny holes called **spiracles** present at the sides of their body (Fig 7.4). Plants respire through tiny holes called **stomata** (singular: stoma) that are present on the underside of their leaves (Fig. 7.5).

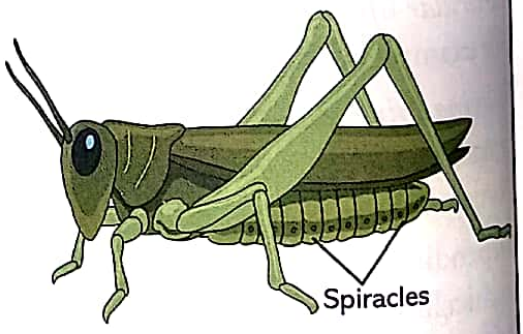


Fig. 7.4 Spiracles in a grasshopper

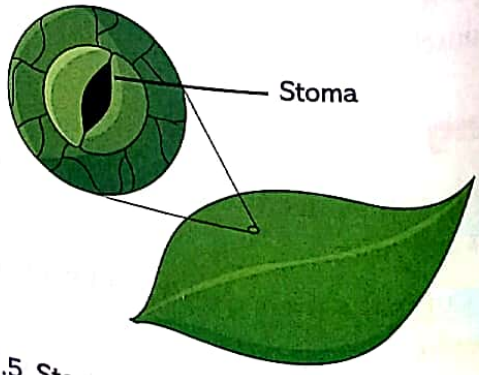


Fig. 7.5 Stoma present on the underside of a leaf

Living Things Move

Except plants, most living things move. Animals move from one place to another in search of food, shelter and to escape from being hunted by predators. Plants remain fixed to the soil. However, parts of plants such as leaves, stems and roots show certain movements. For example, roots of a plant grow towards gravity (**geotropism**), while the stem grows towards the light (**phototropism**).

Fig. 7.6 Phototropism: Stem grows towards light

Living Things Respond to Stimuli

Reacting to a change in the surroundings is called a ***response****. Change around us that makes us respond to it is called a stimulus (plural: stimuli).* All living things respond to stimuli. For example, touch-me-not or *Mimosa* plant (Fig 7.7) immediately closes its leaves when touched. Animals respond to stimuli such as heat, cold, touch, smell and sound.

Fig. 7.7 *Mimosa* plant folds its leaves when touched

Living Things Reproduce

The process by which living things produce young ones of their own kind is called **reproduction.** Most plants reproduce through seeds. Animals reproduce either by giving birth to young ones or by laying eggs.

Remember

Animals that lay eggs are called oviparous, whereas animals that give birth to young ones are called viviparous.

Fig. 7.8 Human family

Fig. 7.9 Ostrich with nestlings and eggs

Living Things Excrete

The process of getting rid of waste by living things is called **excretion.**

These waste products have to be removed regularly as they can be harmful if allowed to accumulate in the body. Animals excrete wastes such as undigested food, carbon dioxide formed during respiration, urine and sweat from the body. Lungs, skin and kidneys are some of the body organs that help in excreting waste products.

Real World

Plants such as eucalyptus, lemon and tulsi produce waste in the form of essential oils. These essential oils are very useful to human beings due to their medicinal properties.

Plants excrete in the form of secretions such as gum, rubber and resins and excess water as water vapo

Living Things have a Lifespan

All living things take birth, grow into adults, become old and finally die. *The time of an organism fro its birth to death is called* **lifespan** *and this entire process is called the* **life cycle** *of an organism.*

Fig. 7.10 Living things have a definite lifespan

Differences between Living Things and Non-living things

All living things show some common characteristics. Non-living things do not show any of these characteristics. Table 7.1 lists some differences between living and non-living things.

Table 7.1 Differences between living and non-living things

S. No.	Characteristic	Living things	Non-living things
1.	Structural organization	Made up of cells	Not made up of cells
2.	Need for food	Need food to stay alive	Do not need food
3.	Growth	Grow	Do not grow
4.	Respiration	Respire	Do not respire
5.	Movement	Move on their own	Do not move on their own
6.	Response to stimuli	Respond to stimuli	Do not respond to stimuli
7.	Excretion	Excrete and get rid of wastes	Do not excrete
8.	Reproduction	Reproduce new offspring	Do not reproduce new offspring
9.	Birth and death	Take birth, grow and finally die	Do not take birth and die

Knowledge Check

State whether the following statements are true or false. Correct the false statements.

1. A group of cells forms an organ.
2. Plants can be called consumers as they consume the nutrients from the soil.
3. Growth is reversible.
4. Both plants and animals respire.
5. Every living organism responds to stimuli.

HABITAT

The natural place where an organism lives and reproduces is called its **habitat.** The habitat provides food, air, water and shelter to the organisms. Different animals and plants live in the same habitat.

Plants and animals that live on land are said to be in **terrestrial habitat.** Deserts, forests, grasslands and mountains are a few terrestrial habitats. Plants and animals living in water are said to be in **aquatic habitat.** Ponds, lakes, rivers, seas and oceans are a few aquatic habitats.

Components of a Habitat

A habitat has two components—biotic and abiotic.

Living things such as plants and animals are called **biotic components.**

Non-living things such as air, water, soil and sunlight are called **abiotic components.**

Biotic components

Plants, animals, scavengers and decomposers make up the biotic component of a habitat.

Plants: Plants are called **producers** as they make their own food by a process called **photosynthesis.**

Leaves of most plants contain a green pigment, chlorophyll. Chlorophyll enables plants to make their own food using sunlight, water and carbon dioxide (Fig. 7.11).

The process by which plants make their own food using carbon dioxide and water in the presence of sunlight and chlorophyll is called ***photosynthesis.***

Animals: As studied in Chapter 1, animals feed on plants or other animals to obtain energy. Based on the food habits, animals can be classified as—herbivores, carnivores and omnivores.

Animals that feed only on plants are called **herbivores.** Cow, horse and deer are a few examples of herbivores.

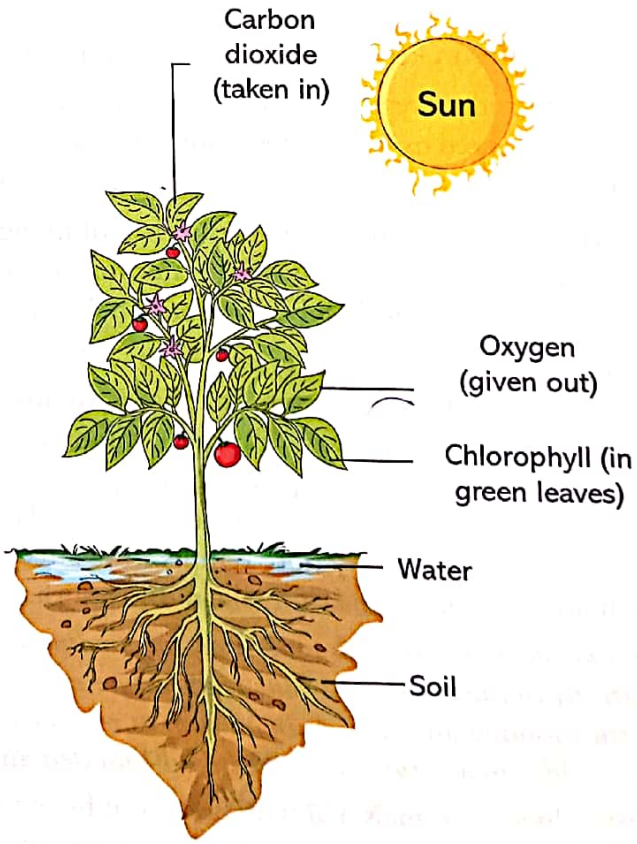


Fig. 7.11 Photosynthesis in a plant

Animals that feed only on flesh of other animals are called **carnivores.** Lion, tiger and leopard are a few examples of carnivores.

Animals that feed both on plants and on flesh of other animals are called **omnivores.** Human beings, bear and crow are a few examples of omnivores.

Scavengers and decomposers: Animals that feed on the bodies of dead plants and animals are called scavengers. Hyena and vultures are **scavengers.** Organisms that feed on the remains of dead plants and animals are called **decomposers.** Bacteria and fungi are decomposers.

Scavengers and decomposers play the following important roles:

- They keep the environment clean by decomposing the bodies of dead plants and animals.
- They recycle nutrients in the environment.

Abiotic components

Non-living things like rocks, soil, air, sunlight, water and temperature make up the abiotic component of the habitat.

Soil: It is the topmost layer of the Earth's crust formed by the weathering of rocks. It provides water, minerals and air to the growing plants. In the absence of soil, there would be no plants and hence, no food for us.

My Dictionary

Weathering: Breaking down of rocks by the action of rainwater, extreme temperatures and biological activities

Sunlight: Plants need sunlight to prepare their own food. All other organisms either depend directly or indirectly on plants for food.

Sunlight helps in keeping animals warm and maintains their body temperature.

Air: Air provides oxygen and carbon dioxide which are important for the survival of living things. Plants and animals need oxygen for respiration. Carbon dioxide, released during respiration, is used by plants for photosynthesis.

Water: Water is essential for the survival of living things. Plants use water during photosynthesis. Human beings and animals need water for carrying out most of their body functions. Oxygen and carbon dioxide gases dissolved in water help aquatic organisms to survive.

Temperature: *The measure of how hot or cold something is is called* **temperature.** Earth is the only planet in the solar system that has a suitable temperature for life to exist. However, temperature on Earth is not same at all places. Some places near the polar regions are extremely cold, whereas places near the equator are very hot. Temperature affects the population of plants and animals in different habitats.

Let's Investigate

Find out the name of some flowers which bloom in the morning and droop in the evening. Also, find out why some flowers bloom at night.

Animals such as mammals and birds, who maintain a relatively constant internal body temperature even when the outside temperature changes, are called ***warm-blooded animals.*** *Animals such as reptiles and fish, whose body temperature fluctuates to match the outside temperature, are called* **cold-blooded animals.**

Warm-blooded animals maintain body heat by burning the food they eat, whereas cold-blooded animals gain most of their body heat from the sun.

Biotic and abiotic components have a close interrelation. Fig 7.12 depicts the interaction amongst various biotic and abiotic components of a habitat.

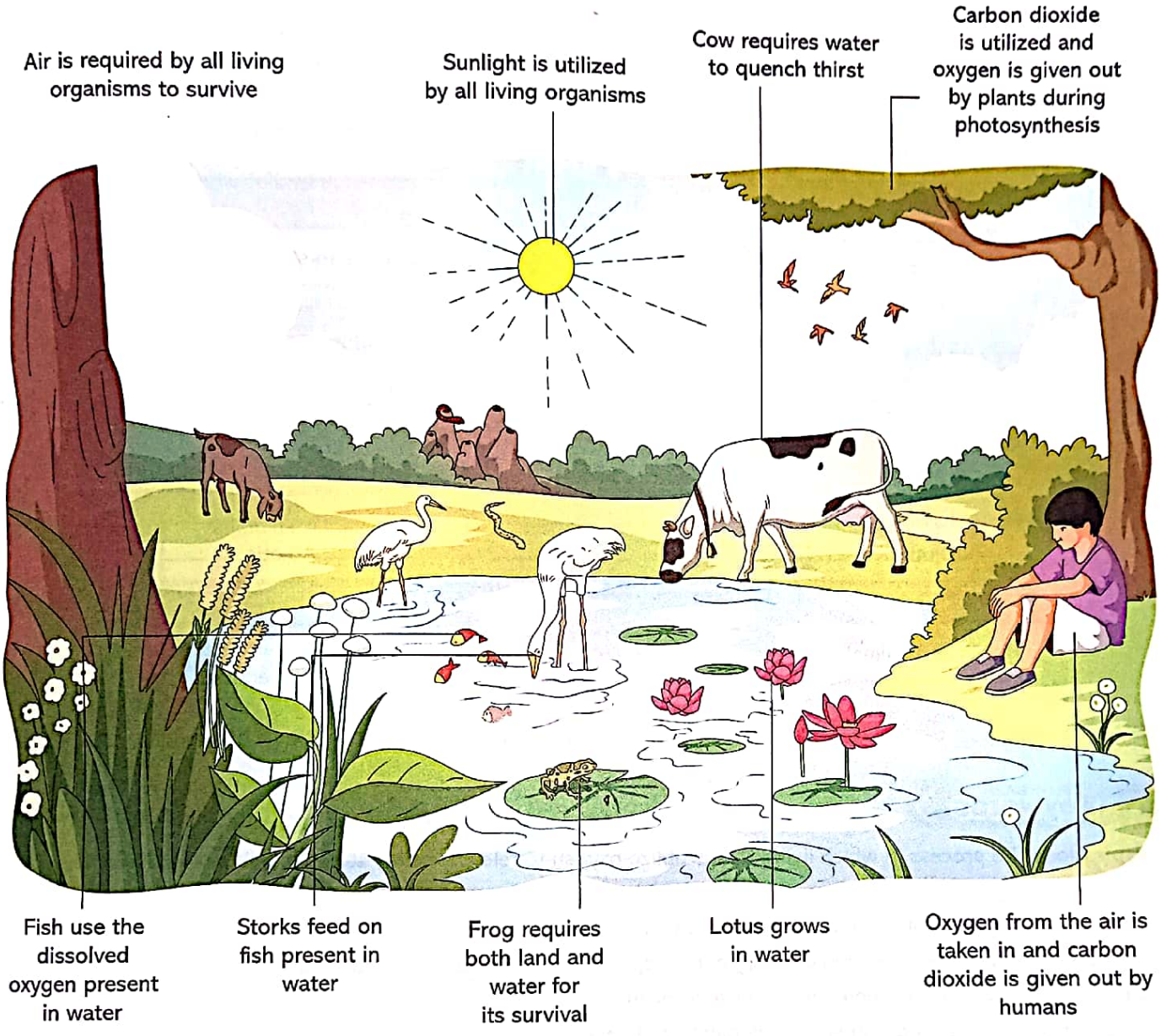


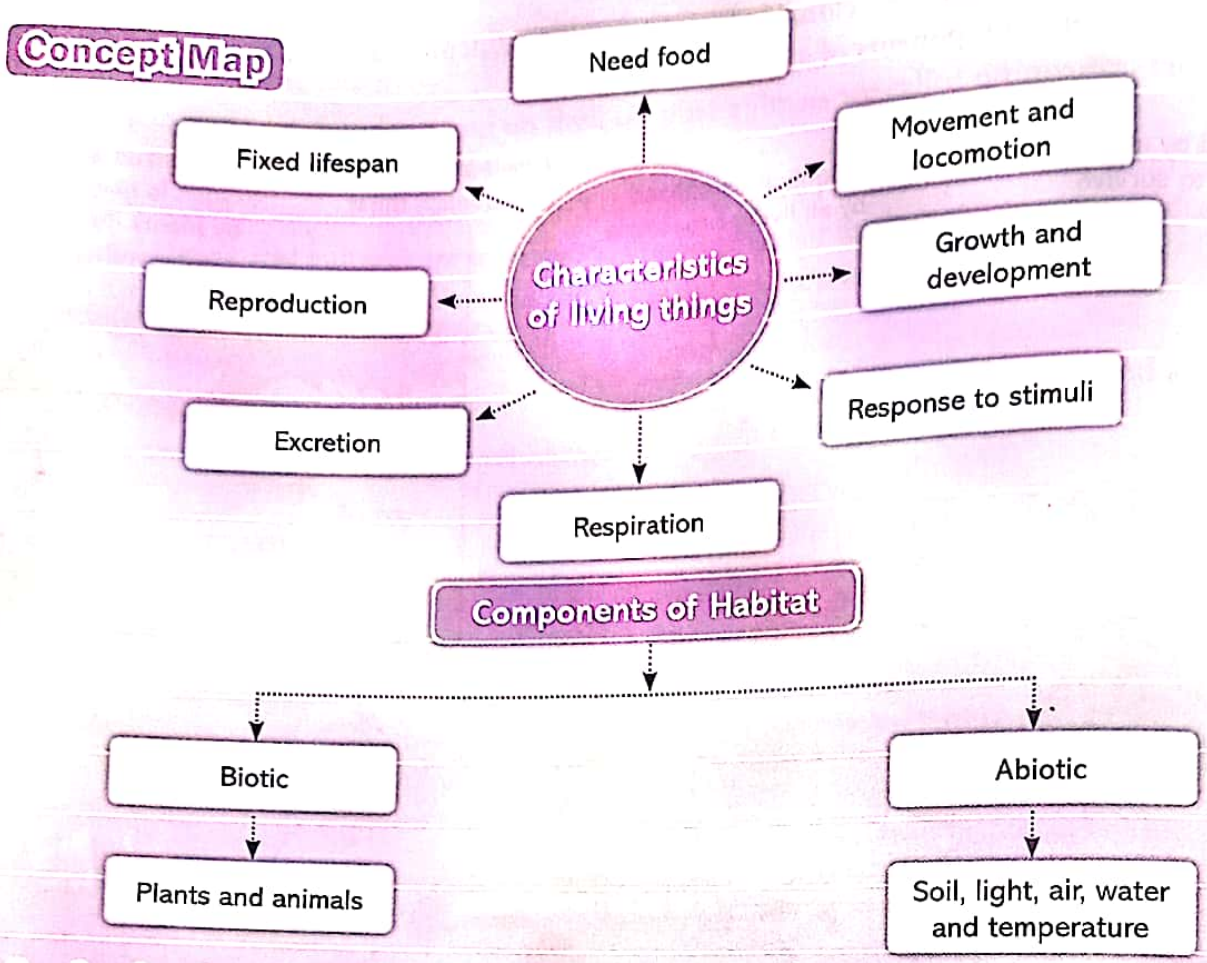
Fig. 7.12 Interaction between biotic and abiotic components

Knowledge Check

State whether the following statements are true or false. Correct the false statements.

1. Both plants and animals respire.
2. Soil is an abiotic component of a habitat.
3. Only animals need water.
4. Animals in a habitat depend only upon the biotic components of that habitat.
5. Temperature does not affect the population of plants and animals in different habitats.

Concept Map



Keywords

Respiration: The process in which living things utilize oxygen to release energy stored in the food eaten by them
Stimulus: Change around us that makes us respond to that
Excretion: The process of getting rid of waste by living things
Reproduction: The process by which living beings produce young ones of their own kind
Habitat: The natural place where an organism lives and reproduces
Biotic components: Living things such as plants and animals
Abiotic components: Non-living things such as air, water, soil, light and heat