4. Evolution

4.1 The concept of evolution

4.2 The stages of evolution of animals

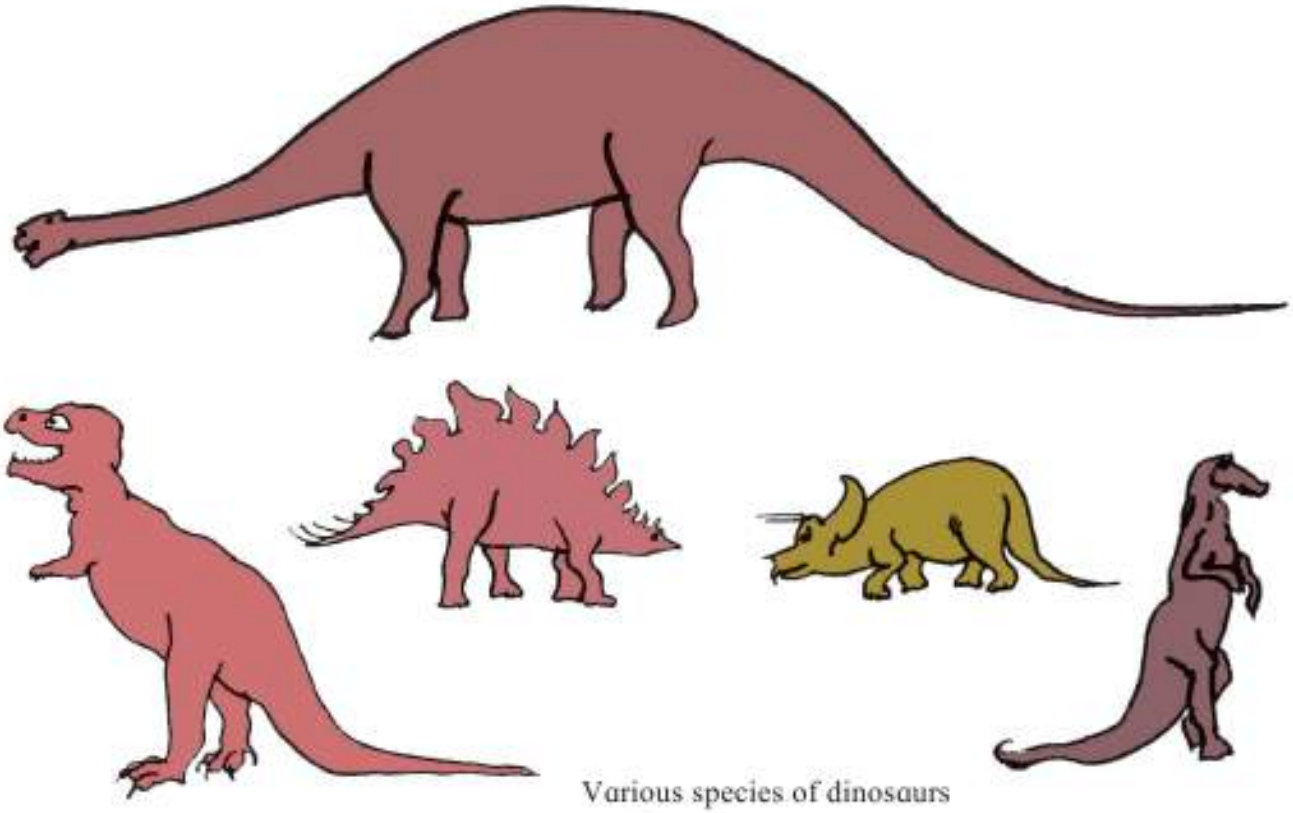
4.3 Apes

4.1 The concept of evolution

The word 'evolution' is generally understood to mean 'gradual and continuous change'. Evolution in the plant and animal world can be explained in the following manner: In the process of survival by adapting to environmental changes, certain internal physical changes occur in some animals of a species. Over a period of time, these internal changes become inherited characteristics seen in all following generations. Thus, a new species with characteristics different from the original may be created. Such a species is usually more evolved than the original one. Sometimes, the original species dies out or becomes extinct. Sometimes, more than one species evolve from the original one. The first scientist to give us a systematic explanation of the concept of evolution was Charles Darwin.

Species which are capable of adapting to environmental changes are able to survive. The ones that cannot do so, become extinct in the process of evolution.

In ancient times, there were many species of a type of animal called dinosaur. 'Deinos' in Greek means 'terrible' and 'sauros' means 'lizard' or reptile. Dinosaur means a 'terrible lizard'.



Various species of dinosaurs

Some of these dinosaurs were enormous in size. It appears that these species of enormous dinosaurs suddenly became extinct. Some sudden natural disaster or environmental change is believed to be responsible for their extinction. Fossils of dinosaurs with wings have been discovered. It is believed that some species of two-legged and winged dinosaurs evolved into birds.

Skeleton of a dinosaur

A reconstructed picture of a dinosaur with wings

4.2 The stages of evolution of animals

We have learnt in the previous lesson that life on earth began with unicellular organisms known as protozoa. These unicellular organisms gave rise to multicellular living things. The multicellular organisms evolved gradually and various classes of plants and animals came into being.

The following are the stages of evolution of animals:

1. Invertebrates : Animals without a backbone are called 'invertebrates', for example, a snail.

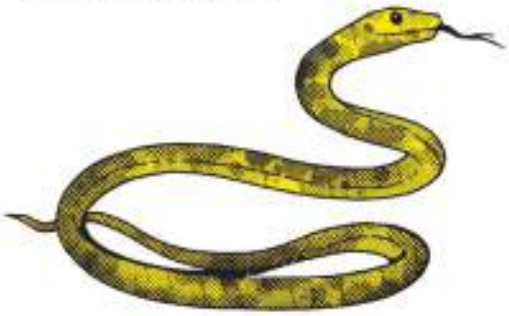
2. Vertebrates : Animals which have a backbone are called 'vertebrates'. Look at the ones given below :

- Aquatic animals : Example, fish.

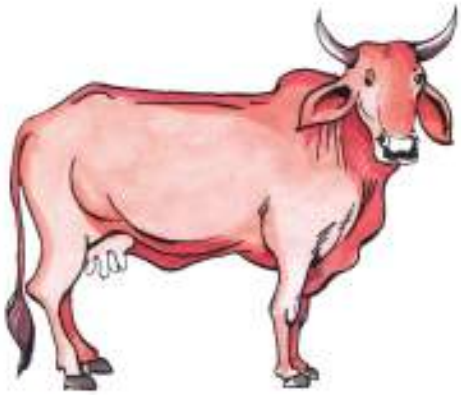
- Amphibians : Animals which live in water and also on land, for example, a frog.

- Birds

- Reptiles : Animals which crawl, for example, a snake.



- Mammals : Example, a cow.



Mammals : Mammals are the most evolved animals among vertebrates. The following are the characteristics of most of the mammals : 1 Growth of the baby in the mother's womb for some time before birth. 2 The baby is fed on the mother's milk for some time after birth.

The platypus and some species of anteater are exceptions to this. They are considered mammals because even though they lay eggs, they suckle their young ones.

A platypus

An anteater

4.3 Apes

Apes are somewhat like humans in appearance. They mostly lived on trees. Those species of apes which continued to live on trees retained their original apelike form. However, in grasslands, some ape species were forced to move around on the ground. These species evolved gradually and in time, gave rise to the human species. This happened first on the African continent. The first human species is called the 'primitive man'. 'Primitive' means 'the first'. In the next lesson, we shall learn more about the evolution of the human species.

Exercises

1. Fill in the blanks.

(a) The first systematic explanation of the concept of evolution was given by ----------.
(Charles Darwin, Willard Libby, Louis Leakey)

(b) ---------- are the most evolved animals among vertebrates.
(Aquatic animals, Amphibians, Mammals)

2. Answer each question in one sentence.

(a) What do we call animals which live in water and also on land?

(b) Where did the first humans appear?

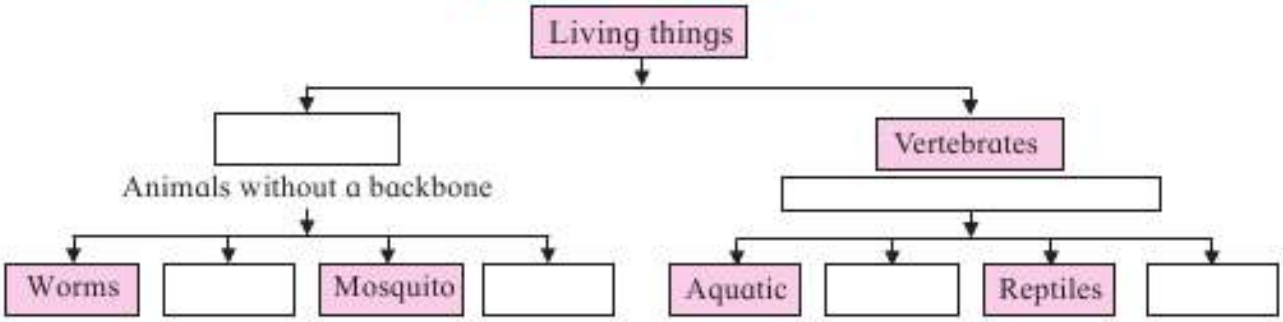
3. Give reasons for the following :

(a) The species of dinosaurs, which were enormous in size, suddenly became extinct.

(b) In the course of time, a new species with characteristics different from the original species is created.

4. Fill in the blanks in the concept chart given below.

Evolution of animals



Activity : Make a model of a dinosaur.

Project : Collect pictures of invertebrates and vertebrates.
Stick them in a notebook and write down their characteristics.

Do you know this?

Charles Darwin
Birth 1809 – Death 1882

In the year 1859, Charles Darwin proposed his theory of evolution in his book 'On the Origin of Species'. Before Darwin, the scientist Carl Linnaeus had introduced his method of classifying animals. He had expressed the opinion that going by the structure of the body, the human species and some ape species appeared to be related. In his first book, Darwin had not expressed any definite opinion about this relationship. In 1871, he published his second book, 'The Descent of Man'. In this book, he drew attention to the fact that even though humans do not have tails, the last bone of their spine is a vestige of a tail. He also noted that some other non-functional or unnecessary structures in the human body, such as the wisdom teeth, are indicators of the process of evolution. He accepted the inference that humans had evolved from tailless apes like the gorilla and the chimpanzee that lived in the jungles of Africa. However, no evidence had been found till then in support of his theory. The necessary evidence became available only in the twentieth century.