

UNDERSTANDING SCIENCE OF **LIFE**

Learn Invent and Forever Explore

5



Series Consultant
Anita Pereira

Editing
REEM Editorial



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Contents

Chapter	Page	Description	Values Learnt
1. Reproduction in Plants	7	Describes various kinds of reproduction in plants.	The student will understand how plants reproduce in various ways and will learn about the different ways of farming.
2. Adaptations among Animals	15	Describes the ways in which animals adapt to their habitats.	The student will be aware of different ways in which animals adapt to their habitat and also learn about some special adaptations.
3. Our Body – Skeletal And Muscular System	21	Describes the skeletal system and the muscular system of the human body.	This chapter will make the student realize what an amazing skeletal and muscular system the human body has.
4. Our Body – Nervous System And Sense Organs	29	Describes the nervous system and the sense organs of the human body.	An interesting chapter which teaches the student about our nervous system and our sense organs.
5. A Healthy Life – Being Disease Free	39	Describes how diseases are caused and how to prevent them.	The student will learn about the measures that need to be taken to stay away from diseases. The student will also learn to differentiate between communicable and non-communicable diseases.
6. Safety And First Aid	47	Describes the safety rules that should be followed on the road, at school and at home.	The student will learn the safety rules that need to be followed on the road, at school and at home. The student will also learn about first aid.
7. Air And Water	53	Describes the atmosphere and water.	A chapter which will teach the student about the atmosphere which has five layers. The student will also learn about water and how it is purified.

Chapter	Page	Description	Values Learnt
8. Matter, Solutions And Changes	61	Describes Matter, Solution; physical and chemical changes.	The student will understand that matter exists in three states. The student will also learn about solutions through simple experiments.
9. Soil Erosion And Its Prevention	70	Describes formation of Soil, soil erosion and measures to prevent it.	The student will learn about how soil is formed. The student will also learn about soil erosion and how to prevent it.
10. Rocks And Minerals	76	Describes different layers of the earth; Also describes rocks and minerals.	Another important chapter where the student will learn about the different layers of Earth. The student will also learn about the different kinds of rocks and minerals found on Earth.
11. Machines – Simple And Complex	82	Describes Simple and Complex machines.	A very important chapter where the student will learn that the different machines that he sees around him can be simple and complex.
12. Materials – Their Properties and Uses	89	Describes different materials; also explains about the properties of materials.	The student will appreciate the fact that the materials that he uses come from living and non-living things.
13. Exploring The Sky Above	97	Describes about outer space and the various phenomena that we see in the sky.	An important chapter where the student will learn interesting facts about outer space and also about the amazing phenomena that take place there.

Chapter	Page	Description	Values Learnt
14. Our Environment – Pollution Prevention	103	Describes the environment, greenhouse effect and global warming and also about Air, Soil and Water pollution.	The student will learn about Air, Soil and Water pollution and their causes, effects and preventive measures. The student will also understand about greenhouse effect and global warming.
15. Natural Calamities In Our Vicinity	113	Describes earthquakes, tsunamis, volcanoes, droughts, and floods.	The student will be made aware about natural calamities like earthquakes, tsunamis, volcanoes, droughts and floods and how to be careful when these disasters take place.
Evaluate Yourself	121		
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Adaptations Among Animals



Backtrack

- Can you name some animals and birds?
- What is the young one of a hen, dog and cow called?



Up Ahead

- Adaptations of Animals according to Habitat
- Adaptation Methods
- Some Special Adaptations

PUT ON YOUR THINKING CAP

Most of the animals that you see are vertebrates. Vertebrates are animals with backbones. They can be grouped into five types namely fishes, amphibians, reptiles, birds and mammals. But you would be surprised to know that they constitute only 5% approximately, of the animal world! All the rest are invertebrates. Invertebrates consist mostly of different kinds of bugs, worms and some small animals.

A large area which provides the animals staying in it with food, shelter etc. is called its **habitat**. Just as plants cannot thrive outside their habitats, animals too cannot survive in a habitat which is not suitable to their needs. Fishes cannot survive without water nor can a polar bear live in a warm climate. The reason is that each animal **species**¹ is born with typical body parts which are suitable to a particular climate and atmosphere.

Adaptations of Animals According to Habitat

Forests, deserts, oceans, mountains are some of the habitats present on this earth. We shall now learn a little about each habitat and also about the animals staying in it.

Forests

The forests cover approximately 31% of the earth's land surface. It is a fascinating habitat for various kinds of animals who make it their home in different ways. Wild animals like tigers, lions, etc. live in caves, while the birds and monkeys dwell on trees. You can also see small animals like rabbits and rats **scurrying**² into their burrows. African lions have a **tan**³ coat which **blends**⁴ with the background. This helps it in going unnoticed while **stalking**⁵ its prey.



¹ **species**: a group of animals or plants that are similar

² **scurrying**: to go or move quickly ³ **tan**: yellowish brown; light brown

⁴ **blend**: to have no clear separation ⁵ **stalking**: to proceed through an area in search of prey





On a chart, paste pictures of different specimens of the monkey family on one half and the cat family on the other half. In class the next day, check as to which student's chart has the maximum number of animals.

Water

Almost **two-thirds** of the Earth's surface is covered by water bodies. The salty seas and oceans are full of many varieties of fishes like dolphins, sharks, whales, octopuses, jellyfishes and many more. Their bodies are adapted to living inside water. Yet, there are some kinds of fishes and shrimps which can survive only in a freshwater habitat.

Deserts

Almost one third of the total land surface is covered by deserts. The animals found in deserts are lesser when compared to the ones found in other habitats. The main reason for this could be the **scanty**⁵ rainfall that they receive.

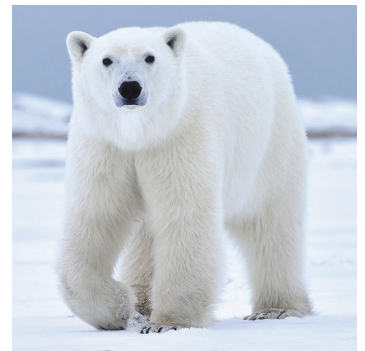
Animals like camels, rattlesnakes, etc. survive in deserts due to their special body parts which have been adapted to suit the environment. Most of the animals are **nocturnal** which means that they sleep throughout the day and become active at night. Sandstorms create many problems in deserts. Camels fortunately have a thin membrane on each eye along with extra long eyelashes which protects their eyes from the sand.



Polar Regions

Both the Arctic and the Antarctic regions are extremely cold. The polar bear, penguins and seals survive in these regions because of the ice and snow. They cannot live in any other surroundings as they have adapted themselves to this particular habitat.

Polar bears have white fur which helps them blend with the colour of the snow and thus save them from predators. The layer of fat beneath their skin along with this thick layer of fur helps them in staying warm.



Adaptation Methods

Both vertebrates and invertebrates differ in their body-coverings, mobility and breathing mechanisms. These specialties help them in adapting to their habitats.

⁵ **scanty**: barely sufficient



Find out about an animal which has three hearts. Also check what the three hearts are meant for.

Body parts

Depending on their habitat, different animals have different body coverings and body-parts. **Insects** have tiny hard scales covering their bodies. These scales not only help the delicate internal organs but also protect them against parasites, fungi, **insecticides**⁶ etc.

Reptiles are covered with dry hard scales which control the body from losing water. Some reptiles like turtles and tortoises have a hard shell into which they withdraw their head and feet, whenever they sense danger.

Fishes have flexible, overlapping scales which are fixed in a row. Their bodies are streamlined for swimming and living inside water. The scales give protection to the fish underwater apart from helping them to glide smoothly.

Birds are covered with feathers of different types which not only help them in staying warm but also help them to fly. Some feathers also protect the birds from the rain and cold.

Mammals of different types have different body coverings; the wool on the sheep and the bear's fur keep them warm in cooler conditions. Others have hair and bristles which serve the same purpose.



Scoop

Have you ever heard about a snake acquiring a new skin and shedding its old one? This process is called 'Moulting'



Movement

You must have noticed that not every animal moves in the same way.

Insects like ants and beetles walk while mosquitoes and butterflies fly.

Reptiles like snakes slither, lizards and crocodiles crawl on their belly while tortoises walk with the help of their feet.

Fishes swim with their fins which not only serve to **navigate**⁷ but also help in maintaining their balance.

Birds fly with their wings. Most of the birds have hollow bones which help in making the skeleton lighter and thus easier for flying. On the ground, birds can walk or hop for short distances too.

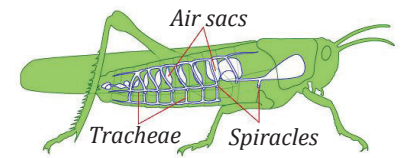
⁶ **insecticide:** substance used to kill insects ⁷ **navigate:** to move



Most of the **mammals** walk with the help of their two **hind**⁸ legs and two **forelegs**⁹. Human beings are exceptional as they use only their two legs for walking, running, jumping etc., while their hands are free for various other purposes.

Breathing

Animals need oxygen to survive. Different animals have different organs which help them in **inhaling**¹⁰ oxygen. **Insects** have small holes called spiracles along the sides of their body through which air enters.



Fishes breathe in the oxygen that is dissolved in water. They breathe in oxygen and breathe out carbon dioxide through their gills.

Amphibians like frogs breathe in two different ways; they use their lungs while on land and their wet skin while in water. Now, isn't that amazing?

Reptiles, Birds and Mammals breathe through their lungs. The air that the mammals inhale goes into the lungs where gases are exchanged. The oxygen is passed on to all parts of the body and carbon dioxide is **exhaled**¹¹. Whales and dolphins which are mammals come to the surface of water to inhale air. All these different ways of breathing are adaptations to the habitats they live in.

Some Special Adaptations

You had learnt about hibernation (winter sleep), Aestivation (summer sleep), and migration in grade 4. Camouflage is another kind of adaptation that helps animals.

Camouflage

Camouflage makes it difficult to spot animals and thus protect them from their enemies. In this special adaptation, the body coverings of some animals, blends with their surroundings. For example, the Polar Bear has white fur, which matches the colour of snow. The Snowy White Owl's white feathers help it to hide in its habitat.



OLYMPIAD QUESTIONS



1. What helps the polar bear to survive in a cold environment?
a. Thick fur b. fat beneath the skin c. white fur d. its size
A) a and b B) a and d C) d only D) c and d
2. How do insects breathe?
a. Nostrils b. gills c. spiracles d. skin
A) a, b and c B) only c C) d D) a and c

⁸ **hind**: situated at the back ⁹ **foreleg**: front legs ¹⁰ **inhaling**: breathing in ¹¹ **exhaled**: Breathe out



- Vertebrates are animals with a backbone while invertebrates don't have a backbone.
- Vertebrates constitute only 5% of the animal world. All the rest are invertebrates.
- An area which provides the animals staying in it with food, shelter etc is called its habitat.
- Forests, deserts, oceans, mountains are some of the habitats on this earth.
- Both vertebrates and invertebrates differ in their body-coverings, mobility and breathing mechanisms.
- Camouflaging is another way of adaptation.



Wordstock

constitute, habitat, nocturnal, sandstorms, predators, moulting, navigate, spiracles, camouflage



Eureka!

I. Choose the correct answer:

1. Almost _____ of the Earth's surface is covered by water bodies.
a) 1/5th b) 2/3rd c) 3/5th d) 1/2
2. _____ has adapted to its surroundings through camouflage.
a) grasshopper b) dog c) elephant d) wolf
3. All kinds of fishes can survive in the salty seas and oceans.
a) Yes b) No c) Sometimes d) not sure
4. Fins help fishes to
a) breathe b) navigate c) eat d) sleep
5. The hard shell of the tortoise helps it in times of
a) swimming b) sleeping c) eating d) danger

II. Explain briefly in 2-3 lines.

1. What helps the camel face sandstorms in the desert?

2. What is camouflage? Give two examples.



3. Define habitat. Name all the various habitats that you have learnt.

4. How do amphibians breathe on land and in water?

5. Write about the body parts and movement of the birds.



You have read that fishes, amphibians, reptiles, birds and mammals constitute only 5% approximately, of the animal world! Find out the percentage of each species when compared to the rest.

III. Explain in detail.

1. Write about the animals' adaptation in a forest habitat.
2. Write about the adaptation of breathing parts of animals according to their chosen habitats.
3. Write about the body parts of insects, reptiles, birds, fishes and mammals and how it helps them.



On a notebook, start writing about the most common animal around you, a dog or a bird. Explain its habitat in detail and the adaptations it has for living and surviving in that habitat.

MY CHAPTER REPORT

SKILL	SKILL LEVEL	TEACHER			PARENT		
Concept	Able to understand that animals adapt according to habitat	1	2	3	1	2	3
	Able to understand methods of adaptation	1	2	3	1	2	3
	Able to understand some special adaptations	1	2	3	1	2	3
Mental Activity	Able to recall the varieties of animals in different habitats.	1	2	3	1	2	3
	Able to recall different methods of adaptation.	1	2	3	1	2	3
Applications in real life	Able to understand that animals from one habitat cannot survive in another habitat.	1	2	3	1	2	3

