

Chapter 2: Diversity in the Living World

Worksheet 2: Case Study Questions — Set A

Name: _____

Date: _____

Class: 6 Section: _____

Marks: _____ / _____

Case Study 1: Manu's Kitchen Garden

Manu's mother maintains a kitchen garden at home. One day, she was digging out radish from the soil to cook for dinner. She told Manu that radish is a kind of root that grows underground and stores food for the plant.

1. What type of root is a radish — taproot or fibrous root?

2. What type of venation would you expect in the leaves of a radish plant?

3. Name one other plant that has the same type of root as radish.

Case Study 2: Raj and Sanjay's Argument

Raj argues with his friend Sanjay that the Gudhal (hibiscus) plant is a shrub. Sanjay is not immediately convinced and wants to check the features of the plant before agreeing.

1. What questions can Sanjay ask Raj to clarify whether hibiscus is really a shrub?

2. Based on the features of a shrub, is hibiscus correctly classified?

3. Name one other example of a shrub, other than hibiscus.

Case Study 3: The Mountain Goat and the Plains Goat

During a school project, students were shown pictures of a mountain goat and a goat found in the plains. They noticed that although both are goats, they look somewhat different from each other.

1. What similarities would you expect between a mountain goat and a plains goat?

2. What differences might you observe between them, and why?

3. What term is used for such special features that help animals survive in their region?

Case Study 4: Alex and Maya's Classroom Discussion

During a discussion in class, Alex shared that he saw cactus plants with thick, fleshy stems in the deserts of Rajasthan. Maya shared that she saw deodar trees with a conical shape in the Himalayas of Himachal Pradesh.

1. How does the thick, fleshy stem of the cactus help it survive in the desert?

2. How does the conical shape of the deodar tree help it survive in the mountains?

3. Why do cactus and deodar trees look so different from each other?

Case Study 5: Camels of Two Deserts

Kashi, who is from Rajasthan, shared with his classmates that camels in his region excrete small amounts of urine, have dry dung, and do not sweat much. His classmate mentioned that camels of Ladakh look quite different from the camels of Rajasthan.

1. How does producing less urine and not sweating help camels of the hot desert?

2. List two differences between camels of the hot desert and camels of the cold desert.

3. Why do camels of the cold desert need longer hair while hot desert camels do not?

Answer Key — Worksheet 2 — Set A

Case Study 1: Manu's Kitchen Garden

1. A radish has a taproot, since it is a single main root that grows straight down and stores food.
2. Radish leaves would show reticulate venation, since plants with taproots generally have reticulate (net-like) venation.
3. Mustard, hibiscus, or chickpea are examples of plants with a taproot, similar to radish.

Case Study 2: Raj and Sanjay's Argument

1. Sanjay can ask about the height of the plant, whether the stem is hard or soft, and whether the branches arise close to the ground or higher up the stem.
2. Yes, hibiscus has a hard, woody stem with branches arising close to the ground and moderate height, matching the features of a shrub.
3. Rose is another example of a shrub.

Case Study 3: The Mountain Goat and the Plains Goat

1. Both are goats with four legs used for movement, and both eat plants such as grass and leaves.
2. The mountain goat may have thicker fur and stronger legs suited for climbing rocky slopes, while the plains goat may have shorter fur since it lives in warmer, flatter regions. These differences are adaptations to their different habitats.
3. Such features are called adaptations.

Case Study 4: Alex and Maya's Classroom Discussion

1. The fleshy stem stores water, helping the cactus tolerate the hot and dry conditions of the desert where water is scarce.
2. The conical shape and sloping branches allow snow to slide off easily, preventing damage from heavy snowfall.
3. They look different because they have developed different adaptations to survive in very different environments — hot desert versus cold mountains.

Case Study 5: Camels of Two Deserts

1. These features help the camel lose very little water from its body, allowing it to survive many days without drinking water.
2. Camels of the hot desert have one hump and longer legs with wide hooves, while camels of the cold desert have two humps and comparatively shorter legs; cold desert camels also grow longer hair.
3. Longer hair helps cold desert camels survive the freezing winters of Ladakh, a need that hot desert camels of Rajasthan do not have.

Chapter 2: Diversity in the Living World

Worksheet 2: Case Study Questions — Set B

Name: _____ Date: _____

Class: 6 Section: _____ Marks: _____ / _____

Case Study 1: Observing the Duck and the Pigeon

During a nature walk, students observed a duck swimming in a pond and a pigeon walking on the ground nearby. Their teacher asked them to look closely at the feet of both birds.

1. What difference would you observe in the feet of the duck compared to the pigeon?

2. Which activity can the duck perform using its webbed feet that the pigeon cannot?

3. What does this difference in feet tell us about the habitats of the two birds?

Case Study 2: Fish and Goat — Different Ways to Move

Sagar observed a fish swimming gracefully in a pond and later saw a goat walking and jumping around in his neighbour's field. He wondered why these two animals move so differently.

1. Which body part does the fish use to move, and which body part does the goat use?

2. Why does the fish have a streamlined body?

3. Would a goat be able to survive if it lived permanently in water like a fish?
Why or why not?

Case Study 3: Cutting Down of Forests

As the population in a town grows, people want more comfortable lives, and large areas of nearby forests are being cut down to build houses, roads, and factories.

1. How can cutting down forests affect the plants and animals living there?

2. How can this affect the biodiversity of the region?

3. Suggest one way in which this challenge can be addressed.

Case Study 4: Rhododendrons in Two Regions

Maya shared that the rhododendrons she saw in the Shola forests of the Nilgiris were of shorter height with smaller leaves. Pema, who is from Sikkim, said that the rhododendrons in the mountains near her home were much taller.

1. Why are the rhododendrons in the Shola forests shorter with smaller leaves?

2. What does this tell us about how the same species of plant can look in different regions?

3. What is the general term used for such region-specific survival features?

Case Study 5: Comparing Two Types of Seeds

In a science class, students were given two types of seeds — wheat and kidney beans — and asked to examine the roots and leaf venation of the plants that grow from them.

1. What type of root and venation would you expect in a wheat plant?

2. What type of root and venation would you expect in a kidney bean plant?

3. How many cotyledons would you expect to find in a wheat seed compared to a kidney bean seed?

Answer Key — Worksheet 2 — Set B

Case Study 1: Observing the Duck and the Pigeon

1. The duck has webbed feet, where skin joins the toes together, while the pigeon has separate, clawed toes without webbing.
2. The duck can swim and paddle easily in water using its webbed feet, which the pigeon cannot do as effectively.
3. It shows that the duck is adapted to an aquatic habitat while the pigeon is adapted mainly to a terrestrial habitat.

Case Study 2: Fish and Goat — Different Ways to Move

1. The fish uses fins to move in water, while the goat uses its legs to walk and jump on land.
2. A streamlined body reduces resistance from water, helping the fish swim efficiently.
3. No, a goat is not adapted to live in water; it does not have fins or a streamlined body suited for swimming, and it depends on grass found on land for food.

Case Study 3: Cutting Down of Forests

1. It destroys the habitat of plants and animals, causing loss of their homes, food, and other resources, which can lead to a decline in their population.
2. It can reduce the biodiversity of the region as many species may no longer be able to survive there.
3. Planting more trees, creating protected forest areas, and raising awareness about biodiversity conservation can help address this challenge (any reasonable suggestion is acceptable).

Case Study 4: Rhododendrons in Two Regions

1. Their shorter height and smaller leaves are adaptations that help them survive the heavy winds found on mountain tops.
2. It shows that even the same species can develop different features depending on the environmental conditions of the region it grows in.
3. Such features are called adaptations.

Case Study 5: Comparing Two Types of Seeds

1. Wheat is a monocot, so it would have a fibrous root system and parallel venation in its leaves.
2. Kidney bean is a dicot, so it would have a taproot system and reticulate venation in its leaves.
3. A wheat seed would have a single cotyledon (monocot), while a kidney bean seed would have two cotyledons (dicot).

Chapter 2: Diversity in the Living World

Worksheet 2: Case Study Questions — Set C

Name: _____ Date: _____
Class: 6 Section: _____ Marks: _____ / _____

Case Study 1: Sacred Groves of India

In many villages across India, there are undisturbed patches of forest called sacred groves. Local communities protect these forests, and no one is allowed to cut trees or harm animals within them.

1. Why are sacred groves important for biodiversity?

2. How do local communities help in protecting sacred groves?

3. What can students do to learn more about sacred groves in their own region?

Case Study 2: The Save Silent Valley Movement

Silent Valley, a moist evergreen forest in the Palakkad district of Kerala, was threatened by a proposal to build a hydroelectric dam across the Kunthipuzha river. Common people, even those who did not live near the forest, launched a movement to save it.

1. What methods did people use to save the Silent Valley?

2. How long did this movement continue, and what was the outcome?

3. Why is it important to protect forests like the Silent Valley?

Case Study 3: Grouping Animals by Habitat

A teacher gave students a list of animals — horse, dolphin, frog, sheep, crocodile, squirrel, whale, earthworm, pigeon, and tortoise — and asked them to group these animals based on where they live.

1. Which of these animals would you group as purely aquatic animals?

2. Which of these animals would you group as purely terrestrial animals?

3. Which animals from the list can live both in water and on land, and what are such animals called?

Case Study 4: Declining Wildlife Populations

The populations of the Bengal Tiger, Cheetah, and Great Indian Bustard have declined in India due to loss of their natural habitats caused by human activities. The Government of India has started several projects to protect these species.

1. What is 'Project Tiger' and when was it initiated?

2. What was the purpose of the 'Cheetah Reintroduction Project'?

3. What step has been taken to protect the Great Indian Bustard?

Case Study 5: A Nature Walk with Dr Raghu and Maniram Chacha

Dr Raghu, a scientist, and Maniram chacha, an expert in mimicking bird calls, took a group of students on a nature walk. The students observed many plants and animals and heard birds chirping in different, unique sounds.

1. Why did Dr Raghu say that different bird chirps are an example of diversity in nature?

2. What instructions did the teacher give the students before the nature walk, and why?

3. What is the importance of activities like a nature walk in understanding biodiversity?

Answer Key — Worksheet 2 — Set C

Case Study 1: Sacred Groves of India

1. Sacred groves are home to many kinds of plants and animals, including numerous medicinal plants, and protect this biodiversity as a community treasure.
2. Local communities protect sacred groves by not allowing anyone to cut trees, harm animals, or disturb the area.
3. Students can find out about and visit sacred groves near their region and talk to elders or local community members about them.

Case Study 2: The Save Silent Valley Movement

1. People used awareness programmes, letters to editors, articles in newspapers, seminars, and petitions and appeals in court.
2. The movement continued for 10 years and was successful in saving the Silent Valley.
3. Such forests contain rich, untouched biodiversity, and protecting them helps preserve many species of plants and animals for the future.

Case Study 3: Grouping Animals by Habitat

1. Dolphin and whale are purely aquatic animals.
2. Horse, sheep, squirrel, earthworm, and pigeon are purely terrestrial animals.
3. Frog, crocodile, and tortoise can live both in water and on land; such animals are called amphibious in habit (frog is a true amphibian).

Case Study 4: Declining Wildlife Populations

1. 'Project Tiger' is a conservation project initiated in 1973 to protect the declining population of the Bengal Tiger.

2. It was initiated in 2022 to restore the population of the Cheetah in India.
3. Its habitats have been declared as Protected areas in the states of Gujarat, Rajasthan and Maharashtra.

Case Study 5: A Nature Walk with Dr Raghu and Maniram Chacha

1. Each bird species has its own unique chirp, showing the wide variety found even within one group of animals like birds, which reflects diversity in nature.
2. The teacher asked students to carry a notebook, a pen and a water bottle, and to observe without disturbing plants and animals, so that they could record observations responsibly and protect nature.
3. Nature walks allow students to directly observe the variety of plants and animals around them, helping them understand and appreciate biodiversity firsthand.