

Class 6 Science – Chapter 2

Diversity in the Living World

Curiosity – NCERT Science

Chapter at a Glance

Our world has a huge variety of plants and animals. They differ in their size, shape, roots, leaves, movements and the places where they live. This variety of living things is called **biodiversity**.

Scientists group living things according to their similarities and differences. This makes them easier to study and understand.

1. Biodiversity

Biodiversity means the variety of different living things found in a particular place.

Example: A park may have different trees, flowers, birds, butterflies, insects and other animals.

2. Grouping Plants

Plants can be grouped by looking at their stems, leaves, roots and seeds.

A. Plants Based on Size and Stem

Type	Easy Meaning	Examples
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Trees	Tall plants with thick, hard stems. Their branches are usually higher from the ground.	Mango, Neem, Banyan
Shrubs	Medium-sized plants with hard but thinner stems. Branches usually grow close to the ground.	Rose, Hibiscus
Herbs	Small plants with soft and green stems.	Mint, Tomato, Basil
Climbers	Plants with weak stems that need support to grow upward.	Money plant, Bean plant
Creepers	Plants with weak stems that spread along the ground.	Pumpkin, Sweet potato

B. Leaf Venation

Leaf venation is the arrangement or pattern of veins on a leaf. Veins carry water and nutrients through the leaf.

Reticulate Venation

The veins form a network or web-like pattern.

Examples: Hibiscus, Mango, Rose

Real leaf showing reticulate venation

Real leaf showing a network-like venation pattern.

Parallel Venation

The veins run almost parallel to one another.

Examples: Grass, Wheat, Banana

Real leaf showing parallel venation

Real leaf showing parallel venation.

C. Types of Root Systems

Taproot System

A taproot system has one main root. Smaller roots grow from the main root.

Examples: Mustard, Hibiscus, Radish, Mango

Taproot system diagram

Fibrous Root System

A fibrous root system has many thin roots of almost similar size growing from the base of the stem.

Examples: Grass, Wheat, Onion

Fibrous root system

Remember This Relationship

Usually Seen Together	Example
Parallel venation + Fibrous roots	Grass, Wheat
Reticulate venation + Taproot	Rose, Mango

Note: These are usual patterns used for basic classification.

D. Cotyledon

A **cotyledon** is the first seed leaf or one of the first pair of leaves present inside a seed. It helps provide food to the young plant.

Monocots and Dicots

Feature	Monocot	Dicot
Cotyledons	One	Two
Leaf venation	Usually parallel	Usually reticulate
Root system	Usually fibrous	Usually taproot
Examples	Rice, Wheat, Maize	Gram, Chickpea, Sunflower

3. Grouping Animals

A. Based on Movement

Movement	Examples
Flying	Birds, butterflies, many insects
Walking/Running	Dog, Cat, Cow
Swimming	Fish
Crawling	Snake, Earthworm

B. Based on Habitat

Habitat Type	Meaning	Examples
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Terrestrial	Living mainly on land	Cow, Ant, Horse
Aquatic	Living in water	Fish, Dolphin, Whale
Amphibian	Able to live on land and in water	Frog

4. Adaptations

An **adaptation** is a special feature or ability that helps a living thing survive in its surroundings.

- **Cactus:** Its thick, fleshy stem stores water and helps it survive in dry places.
- **Deodar:** Its sloping branches help snow slide down more easily.
- **Mountain animals:** Thick fur can help them stay warm.
- **Duck:** Webbed feet help it push against water while swimming.

Duck's Webbed Feet

A duck has skin joining its toes. This is called a **webbed foot**. It works like a paddle and helps the duck swim.

Webbed feet adaptation in birds

Webbed feet help water birds move efficiently through water.

5. Habitats

A **habitat** is the natural home or surroundings where a plant or animal lives.

- **Sea turtle:** Ocean
- **Camel:** Desert

- **Rhododendron:** Mountains

6. Protecting Biodiversity

Human activities such as cutting forests, pollution and construction can damage natural habitats.

When habitats are damaged, plants and animals may lose their homes and food. This can reduce biodiversity.

How can we help?

- Plant and protect trees.
- Keep water and surroundings clean.
- Reduce waste and pollution.
- Protect forests and wildlife.
- Use natural resources carefully.
- Teach others about the importance of nature.

Project Tiger

Project Tiger is a Government of India conservation programme started to help protect tigers and their habitats.

Sacred Groves

Sacred groves are patches of forest protected by local communities because of cultural or religious beliefs.

They can provide safe places for many plants, animals and other living organisms.

Question and Answer Session

1. What is biodiversity?

Answer: Biodiversity means the different kinds of plants, animals and other living things found in a place.

2. How can we group plants based on their size and stem?

Answer: We can group them as trees, shrubs, herbs, climbers and creepers by looking at their size, stem and growth pattern.

3. What is leaf venation?

Answer: Leaf venation is the pattern made by the veins in a leaf.

4. What are the two main types of leaf venation?

Answer: The two main types are **reticulate venation**, in which veins form a network, and **parallel venation**, in which veins run almost side by side.

5. What are the two main types of root systems?

Answer: They are the **taproot system** and the **fibrous root system**.

6. What is the difference between monocot and dicot seeds?

Answer: A monocot seed has one cotyledon, while a dicot seed has two cotyledons.

7. How are leaf venation and root type usually related in plants?

Answer: Plants with parallel venation usually have fibrous roots. Plants with reticulate venation usually have taproots.

8. What is an adaptation?

Answer: An adaptation is a special feature that helps a living thing survive in its surroundings.

9. Give an example of a plant adaptation.

Answer: A cactus has a thick, fleshy stem that can store water. This helps it live in dry desert areas.

10. What is a habitat?

Answer: A habitat is the natural place where a plant or animal lives.

11. What are the two main types of habitats?

Answer: The two main types are **terrestrial habitats**, found on land, and **aquatic habitats**, found in water.

12. What is an amphibian?

Answer: An amphibian is an animal that can live both in water and on land. A frog is an example.

13. How do camels in hot deserts differ from camels in cold deserts?

Answer: Camels living in hot deserts have features that help them deal with heat and loose sand. The Bactrian camel of cold deserts has two humps and features suited to colder, mountainous regions.

14. Why is it important to protect biodiversity?

Answer: Biodiversity keeps nature balanced and provides homes, food and resources for many living things. Protecting it helps plants and animals survive.

15. What is Project Tiger?

Answer: Project Tiger is an Indian conservation programme that works to protect tigers and the places where they live.

16. What are sacred groves?

Answer: Sacred groves are small forest areas protected by local communities because they have cultural or religious importance.

17. How do sacred groves help biodiversity?

Answer: They protect natural areas where many plants and animals can live safely. Thus, they help conserve biodiversity.

18. What is the scientific method?

Answer: The scientific method is a step-by-step way of observing, asking questions, testing ideas and using evidence to find answers.

19. Why do scientists group plants and animals?

Answer: Grouping helps scientists study living things easily and notice their similarities and differences.

20. How can human activities harm biodiversity?

Answer: Cutting forests, polluting water and destroying natural areas can take away the homes and food sources of plants and animals.

21. What is a dicot plant?

Answer: A dicot plant is a plant whose seed has two cotyledons.

22. What is a monocot plant?

Answer: A monocot plant is a plant whose seed has one cotyledon.

23. Give an example of a plant with parallel venation.

Answer: Grass is an example of a plant with parallel venation.

24. Give an example of a plant with reticulate venation.

Answer: Mango is an example of a plant with reticulate venation.

25. What type of root system does grass have?

Answer: Grass has a fibrous root system.

26. What type of root system does a mango tree have?

Answer: A mango tree generally has a taproot system.

27. What is a nature walk?

Answer: A nature walk is a walk outdoors in which we observe plants, animals and other things found in nature.

28. Why should we not pluck leaves and flowers during a nature walk?

Answer: We should not pluck them because plants are living things. Leaving them undisturbed helps protect nature.

29. What is a scrapbook?

Answer: A scrapbook is a book in which we can collect pictures, information and other materials about a topic.

30. What does "terrestrial" mean?

Answer: Terrestrial means related to or living on land.

Textbook Questions – Pages 23–26

1. Here are two types of seeds. What differences do you find among the roots and leaf venation of their plants?

Easy Answer:

Plant	Root	Leaf Venation
Wheat	Fibrous	Parallel
Kidney bean	Taproot	Reticulate

2. Group the animals according to their habitats.

A – Aquatic	B – Terrestrial	C – Both
Dolphin, Whale	Horse, Sheep, Squirrel, Pigeon, Earthworm	Frog, Crocodile, Tortoise

3. Examine a radish and identify its root type and leaf venation.

Easy Answer: Radish has a **taproot**. Its leaves show **reticulate venation**.

4. Compare a mountain goat and a goat found in the plains.

Similarities:

- Both are goats.
- Both have horns and hooves.

Differences:

- Mountain goats usually have thicker fur.
- Their body and legs are suited to steep, cold places.
- Goats in plains have features better suited to warmer, open areas.

Reason: These differences are adaptations that help the goats live in their different surroundings.

5. Group the animals using a feature other than those discussed in the chapter.

One possible grouping is:

Group 1 – Vertebrates: Cow, Pigeon, Bat, Tortoise, Whale, Fish, Lizard

Group 2 – Invertebrates: Cockroach, Grasshopper

The first group has a backbone, while the second group does not.

6. How can cutting forests affect our surroundings? How can we address this challenge?

Effects:

- Animals may lose their homes.
- Many plants may disappear.
- Biodiversity may decrease.
- Soil erosion can increase.
- The local environment can become hotter and drier.

What we can do:

- Plant and protect trees.
- Save forests.
- Use paper and other resources carefully.

- Reduce waste.
- Protect wildlife habitats.

7. Analyse the flowchart. What can be examples of A and B?

Answer:

A: Mango, Rose or Hibiscus – plants with reticulate venation.

B: Grass, Wheat or Rice – plants with parallel venation.

8. Raj says that Gudhal (Hibiscus) is a shrub. What questions can Sanjay ask?

Easy Answer: Sanjay can ask:

1. How tall is the plant?
2. Is its stem hard or soft?
3. Are there several branches near the ground?
4. What does the main stem look like?

These questions can help decide whether the plant fits the features of a shrub.

9. Find examples for the two groups of plants.

Group A – Dicot plants with taproots: Mango, Rose, Hibiscus

Group B – Monocot plants with fibrous roots: Wheat, Rice, Grass

(a) Similarity in Group A: Their leaves usually have reticulate venation.

(b) Similarity in Group B: Their leaves usually have parallel venation.

10. What is different about the duck's feet? What does the duck use them for?

Easy Answer: A duck has webbed feet. Skin joins its toes together. This makes the foot act like a paddle.

The duck uses its webbed feet to push against water and swim.

Learning Further

Activity 1 – Indian Scientist Working for Biodiversity

Dr. Kamaljit S. Bawa

Dr. Kamaljit S. Bawa is a scientist known for his work related to forests, plants, animals and biodiversity.

He helped establish ATREE, an organisation that works on ecology and environmental conservation.

His work shows us why forests and natural habitats need to be protected.

Activity 2 – Scientists Working for Biodiversity

Dr. Divya Mudappa: Works on rainforest restoration and wildlife conservation, especially in the Western Ghats.

Dr. Vidya Athreya: Studies interactions between people and wildlife, including human-leopard interactions.

Dr. Uma Ramakrishnan: Uses genetic studies to understand and help conserve wildlife such as tigers.

Activity 3 – Protect Local Biodiversity

Some ideas for our group:

- Plant different native plants around the school.
- Keep water available for birds during hot weather.
- Avoid littering.
- Reduce unnecessary plastic use.
- Protect trees and nests.
- Organise a nature walk.
- Tell others why biodiversity is important.

Activity 4 – Biodiversity Scrapbook

Talk to older members of your family or neighbourhood. Ask them about plants and animals that were common earlier but are less common now, and about species that are seen more often today.

Collect photographs or drawings and write a few lines about each plant or animal.

At the end, write what you think may have caused these changes.

Class 6 Science Chapter 2 Worksheet

Diversity in the Living World

Name: _____

A. Multiple Choice Questions

1. Which of the following is a herb?
(a) Mango (b) Rose (c) Mint (d) Banyan
2. Which type of venation forms a network-like pattern?
(a) Parallel (b) Reticulate (c) Circular (d) None
3. Which plant usually has fibrous roots?
(a) Grass (b) Mango (c) Rose (d) Mustard
4. A plant with a weak stem that needs support is called a:
(a) Tree (b) Shrub (c) Climber (d) Herb
5. Which animal is aquatic?
(a) Horse (b) Dolphin (c) Cow (d) Cat
6. Which animal can live both on land and in water?
(a) Frog (b) Cow (c) Horse (d) Pigeon
7. Which feature helps a duck swim?
(a) Sharp claws (b) Webbed feet (c) Long horns (d) Thick fur
8. A natural home of an organism is called its:
(a) Habitat (b) Venation (c) Cotyledon (d) Stem
9. A seed with two cotyledons is called:
(a) Monocot (b) Dicot (c) Herb (d) Shrub
10. Which of these is an example of biodiversity conservation?
(a) Cutting forests (b) Polluting rivers
(c) Protecting wildlife habitats (d) Destroying nests

B. Fill in the Blanks

1. The variety of living things in an area is called _____.
2. The pattern of veins in a leaf is called _____.
3. Grass generally has a _____ root system.
4. Mango generally has a _____ root system.
5. A plant that grows along the ground is called a _____.
6. Plants with weak stems that need support are called _____.
7. An animal that can live on land and in water is called an _____.
8. The natural home of an organism is called its _____.

9. A seed with one cotyledon is called a _____.
10. A seed with two cotyledons is called a _____.

C. True or False

1. Grass usually has parallel venation.
2. Mango is a climber.
3. Rose is generally treated as a shrub.
4. Fish are terrestrial animals.
5. Frogs can live both in water and on land.
6. A cactus is adapted to dry conditions.
7. Cutting forests can reduce biodiversity.
8. A duck has webbed feet.
9. A monocot seed has two cotyledons.
10. Sacred groves can help protect biodiversity.

D. Match the Following

Column A	Column B
1. Grass	a. Webbed feet
2. Duck	b. Fibrous roots
3. Cactus	c. Network-like veins
4. Hibiscus	d. Water storage
5. Dolphin	e. Aquatic habitat

E. Very Short Answer Questions

1. What is a habitat?
2. What is an adaptation?
3. Name one plant with parallel venation.
4. Name one plant with reticulate venation.
5. Name one animal that lives in water.
6. Name one animal that can live both on land and in water.

7. What is a cotyledon?
8. What is meant by terrestrial?
9. What is meant by aquatic?
10. Why do scientists group living things?

F. Short Answer Questions

1. Write two differences between a taproot and a fibrous root.
2. How is a climber different from a creeper?
3. What is the difference between parallel and reticulate venation?
4. Write two differences between monocot and dicot seeds.
5. How does a cactus survive in a dry region?
6. Why does a duck have webbed feet?
7. How can cutting trees affect animals?
8. How can students help protect biodiversity in their school?

G. Think and Answer

1. Riya sees a plant with soft green stem and small size. Is it more likely to be a herb or a tree? Give a reason.
2. A leaf has veins running almost side by side. What type of venation does it have?
3. A plant has many thin roots of almost equal size. Which root system is this?
4. A frog is found near a pond. Why can it live in both water and on land?
5. A forest is cleared to build houses. Write two possible effects on biodiversity.
6. A duck and a pigeon both have wings. Why are their feet different?

H. Case-Based Question

A group of students went on a nature walk. They saw a mango tree, grass, a rose plant, a butterfly, a frog and a fish near a pond. They carefully observed the living things without damaging them.

Answer the following:

1. Which plant is a tree?
2. Which plant is likely to have fibrous roots?
3. Which plant is likely to have reticulate venation?

4. Which animal is aquatic?
5. Which animal can live in both water and on land?
6. Why should the students avoid plucking leaves and flowers?

I. Assertion and Reason

Choose the correct option:

- A. Both Assertion and Reason are correct, and Reason explains Assertion.
- B. Both are correct, but Reason does not explain Assertion.
- C. Assertion is correct but Reason is incorrect.
- D. Assertion is incorrect but Reason is correct.

1. **Assertion:** Grass usually has fibrous roots.

Reason: Grass is generally a monocot plant.

2. **Assertion:** A duck can swim efficiently.

Reason: Its webbed feet help it push against water.

3. **Assertion:** Forest destruction can reduce biodiversity.

Reason: Forests provide homes and food to many organisms.

4. **Assertion:** All plants are trees.

Reason: Plants can have different sizes and forms.

J. Challenge Questions

1. A plant has parallel venation. What type of root would you expect it to have? Is this always true for every plant? Explain briefly.
2. Why is grouping living things useful for students and scientists?
3. Imagine that a pond in your neighbourhood becomes polluted. How might this affect its living organisms?
4. A desert plant has a thick stem. How can this feature help it?
5. Why is protecting a habitat often better than protecting only one animal species?

Worksheet Answer Key

A. MCQs

1. (c) 2. (b) 3. (a) 4. (c) 5. (b) 6. (a) 7. (b) 8. (a) 9. (b) 10. (c)

B. Fill in the Blanks

1. biodiversity
2. venation
3. fibrous
4. taproot
5. creeper
6. climbers
7. amphibian
8. habitat
9. monocot
10. dicot

C. True or False

1. True
2. False
3. True
4. False
5. True
6. True
7. True
8. True
9. False
10. True

D. Match the Following

- 1 – b
- 2 – a
- 3 – d

4 – c

5 – e

E. Very Short Answers

1. A habitat is the natural place where an organism lives.
2. An adaptation is a feature that helps an organism survive.
3. Grass.
4. Mango.
5. Fish.
6. Frog.
7. A cotyledon is a seed leaf.
8. Living on land.
9. Living in water.
10. To make studying similarities and differences easier.

F. Short Answer – Suggested Points

1. Taproot has one main root; fibrous roots have many thin roots.
2. A climber grows upward using support, while a creeper spreads along the ground.
3. Reticulate veins form a network; parallel veins run almost side by side.
4. Monocot seeds have one cotyledon; dicot seeds have two.
5. Its thick stem can store water and help it survive dry conditions.
6. Webbed feet help it push water and swim.
7. Animals can lose their homes and food sources.
8. Students can plant trees, protect plants, avoid littering and save water.

G. Think and Answer – Suggested Answers

1. It is likely to be a herb because it is small and has a soft green stem.
2. Parallel venation.
3. Fibrous root system.
4. Its body has adaptations that allow it to live in both environments.
5. Animals may lose their homes and food; biodiversity may decrease.
6. Their feet are adapted to different activities. Duck feet are webbed for swimming.

H. Case-Based Answers

1. Mango tree
2. Grass
3. Mango
4. Fish
5. Frog
6. To protect the plants and avoid damaging nature.

I. Assertion and Reason

1. A
2. A
3. A
4. D

J. Challenge Questions – Suggested Answers

1. Parallel venation is usually associated with fibrous roots. It is a useful general pattern for basic classification, but nature can have exceptions.
2. Grouping makes it easier to identify, compare and study living things.
3. Pollution can reduce water quality and harm or kill plants and animals living there.
4. A thick stem can help store water for use during dry periods.
5. Protecting a habitat protects many plants and animals that depend on that place.

Quick Revision

Topic	Remember
Biodiversity	Variety of living things
Reticulate	Network-like veins
Parallel	Veins run side by side
Taproot	One main root

Fibrous root	Many thin roots
Monocot	One cotyledon
Dicot	Two cotyledons
Terrestrial	Lives on land
Aquatic	Lives in water
Adaptation	Feature that helps survival
Habitat	Natural home of an organism