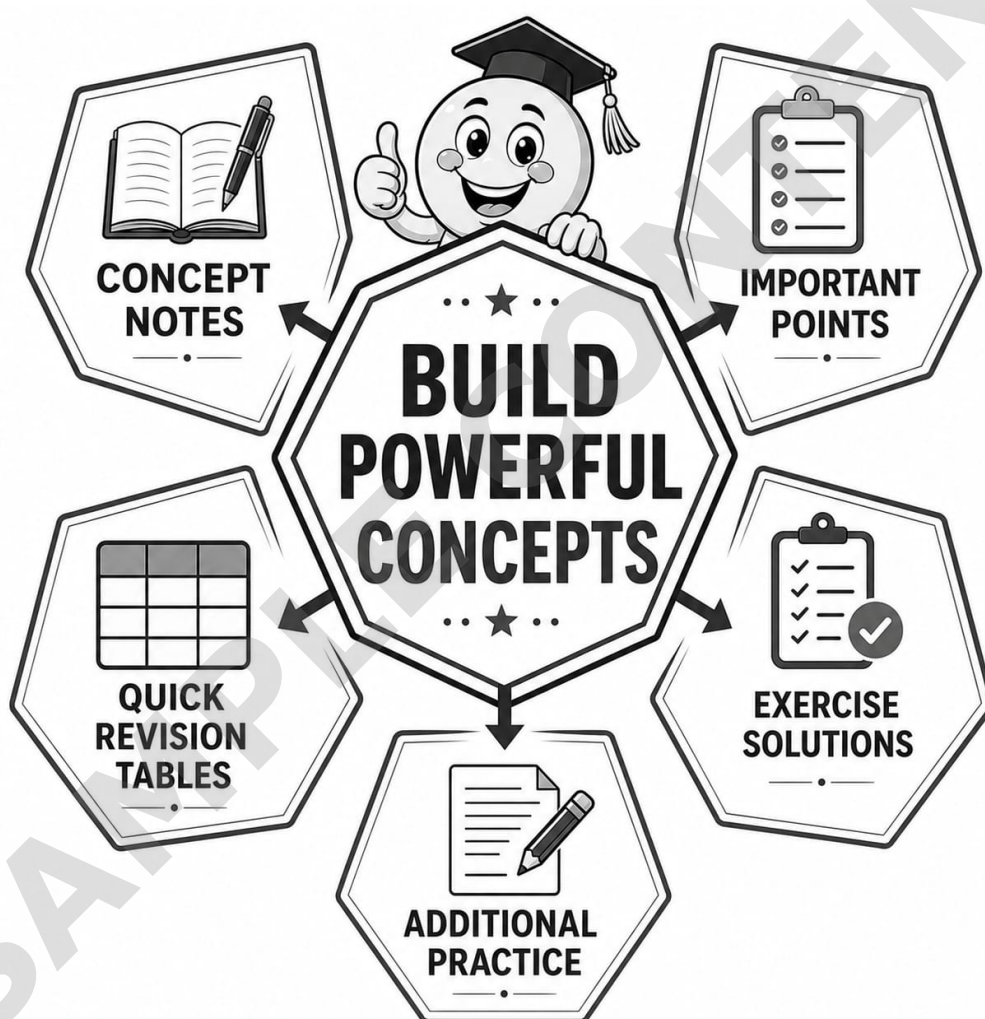


STANDARD SIX

(English & Semi-English Medium)



GENERAL SCIENCE



Preface

It gives us great pleasure to present this General Science book for Standard Six to students, parents, and teachers. This book has been prepared with the singular goal of making the study of science simple, systematic, and genuinely effective for young learners.

The content of this book is aligned with the prescribed syllabus, ensuring that students cover every concept required for their examinations. Rather than presenting information as isolated facts to memorise, this book focuses on **conceptual understanding** — helping students grasp the "why" and "how" behind every topic, from the characteristics of living organisms to the forces and motion that shape our physical world.

Every chapter follows a consistent, thoughtfully designed structure. The **Concept Notes** break down each topic into clear, digestible points. **Quick Revision** tables and flowcharts allow for rapid recall before tests and examinations. Complete **Textbook Exercise Solutions** give students confidence that they have addressed every question in the prescribed syllabus accurately. Finally, an extensive **Additional Practice** section — spanning multiple question formats such as multiple choice, fill in the blanks, true or false, matching, and short and long answers — gives students the rigorous practice needed to excel.

We have made every effort to keep the language simple and accessible for English and Semi-English medium students, while maintaining the academic depth expected at this level. We sincerely hope this book supports students in building not just good grades, but a genuine curiosity about the world of science.

— *Sanskriti Publications*

DISCLAIMER

This book has been prepared purely for educational and learning purposes, to support students in understanding and revising the General Science syllabus for Standard Six. Every effort has been made to ensure that the content, explanations, and solutions provided in this book are accurate and reliable.

However, students, parents, and teachers are encouraged to also refer to the official prescribed textbook and syllabus issued by the relevant education board for complete and authoritative guidance. Despite careful review, some unintentional errors or omissions may remain; these will be gladly corrected in future editions as they are identified. Sanskriti Publications does not claim ownership of any third-party or copyrighted material that may have been referenced solely for educational purposes within this book.

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General Science · Standard Six · Maharashtra State Board

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How to Use This Book

Every chapter in this book follows the same consistent structure, so that once you are familiar with it, you can use each section effectively. Here is a quick guide to help you get the most out of this book:

SECTION	HOW TO USE IT
Learning Outcomes	Read this first — it tells you exactly what you should be able to do by the end of the chapter, so you know what to focus on.
Think About It	These questions are meant to spark curiosity before you start studying. Try to think about them on your own before reading the chapter.
Concept Notes	This is the main explanation of every topic in the chapter, written in simple, clear points. Read this carefully and make sure you understand each idea before moving on.
Important Terms, Key Points & Tips	Highlighted boxes throughout the chapter draw attention to definitions, exam-relevant points, and smart tips that are frequently asked or easily confused.
Quick Revision	Use this table (and any flowcharts) a day or two before your exam for fast, effective recall of the entire chapter.
Textbook Exercise Solutions	These are complete, accurate answers to every question from your prescribed textbook exercise. Attempt the questions yourself first, then check your answers here.
Additional Practice	A large bank of extra questions — MCQs, fill in the blanks, true/false, scientific reasons, short and long answers, matching, and diagram-based questions — to test and strengthen your understanding further.

A suggested study routine: Read the Concept Notes thoroughly, note down the Important Terms and Key Points, attempt the Textbook Exercise Solutions on your own before checking them, and finally work through the Additional Practice questions to test yourself. Use Quick Revision for last-minute recall before your exam.

1 Characteristics of Living Organisms

Nutrition • Growth & Development • Diversity • Response to Stimuli • Excretion • Reproduction & Germination

LEARNING OUTCOMES

- Identify the key characteristics that distinguish living organisms from non-living things.
- Explain how organisms obtain nutrition and why food is essential for growth and development.
- Describe the processes of respiration, excretion and reproduction in plants and animals.
- Recognise how living organisms respond to stimuli and show movement.
- Trace the stages of germination and the life cycles of a mosquito and a frog.

THINK ABOUT IT

1. A toy car moves when you push it, and a plant cannot move from one place to another — yet only the plant is called "living". What makes the plant different from the toy car?
2. Why do you think a seed needs water and air to germinate, but not soil?
3. Germs are too small to see with our eyes. How do we know that they still grow and reproduce?

CONCEPT NOTES

■ Introduction

- We see many living and non-living things around us.
- Living organisms differ from non-living things because they show certain characteristics.
- A puppy grows with time, but its collar, leash and toys do not grow.
- This indicates that growth is an important characteristic of living organisms.
- Example: Puppy grows with time.
- Example: Collar, leash and toys do not grow.

Key Point: Growth is an important characteristic of living organisms.

■ Living Organisms Need Food

- Every living organism requires food.
- Food provides energy to living organisms.
- Food helps in growth and development.
- Different living organisms obtain food in different ways.
- Plants prepare their own food through the process of **photosynthesis**.

- Animals depend on plants and other animals for their food.
 - Plants make their own food using sunlight, air and water.
 - Animals cannot make their own food. They depend on plants or other animals.
 - Food is essential for every living organism. It provides energy and helps in growth and development.
-

IMPORTANT TERM Photosynthesis — the process by which plants prepare their own food using sunlight, air and water.

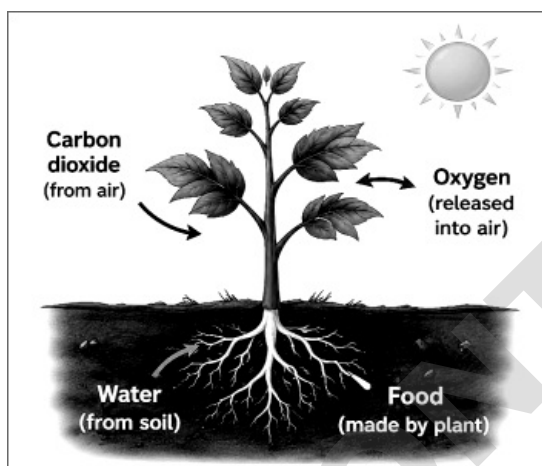


Fig. 1.1: Plants prepare food using sunlight, water and carbon dioxide

■ Growth and Development

- Growth means increase in size, height and weight of an organism.
 - All living organisms grow.
 - Growth in animals occurs only for a specific period of their life.
 - Growth can be observed in all organs of animals.
 - Development means progress in body structure, intelligence, working capacity and skills.
 - Plants continue to grow throughout their life.
 - Growth in plants can be observed in increase in girth of trunk, length of branches and length of roots.
 - Some plant organs grow only for a limited period.
 - Example: Increase in size of leaves occurs for a limited period.
-

IMPORTANT TERMS Growth — increase in size, height and weight. | **Development** — progress in body structure, intelligence and skills.

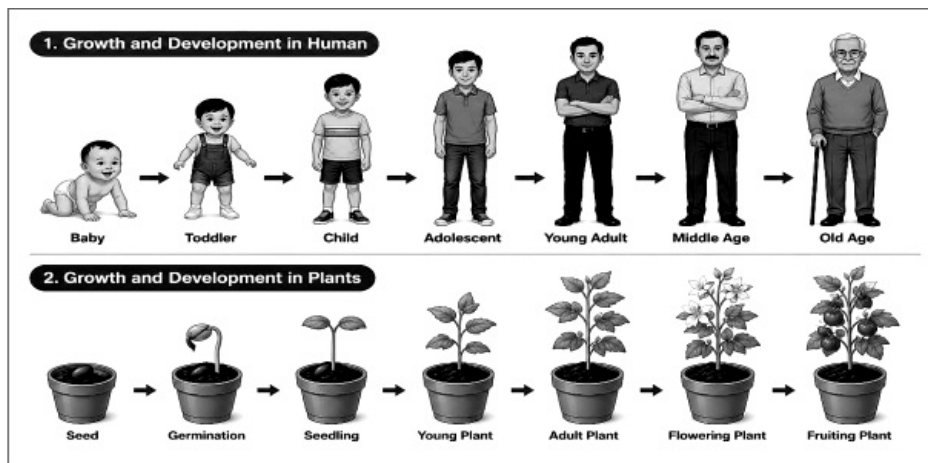


Fig. 1.2: Growth and development in humans and plants

SANSKRUTI SMART TIP

Remember it this way — **Growth** is what you can *measure* (size, height, weight), while **Development** is what you can *observe as improvement* (skills, intelligence, capability). Animals stop growing after a certain age, but plants keep growing throughout their life — this comparison is a favourite one-mark question.

▪ Diversity Among Living Organisms

- Living organisms vary greatly in size.
- Some organisms are very large.
- Some organisms are very small.
- Some organisms are microscopic and cannot be seen with naked eyes.
- Regardless of size, all living organisms require air, food and water.
- Food provides energy required for growth.
- Examples: Elephant, House Lizard, Ant, Bacteria.

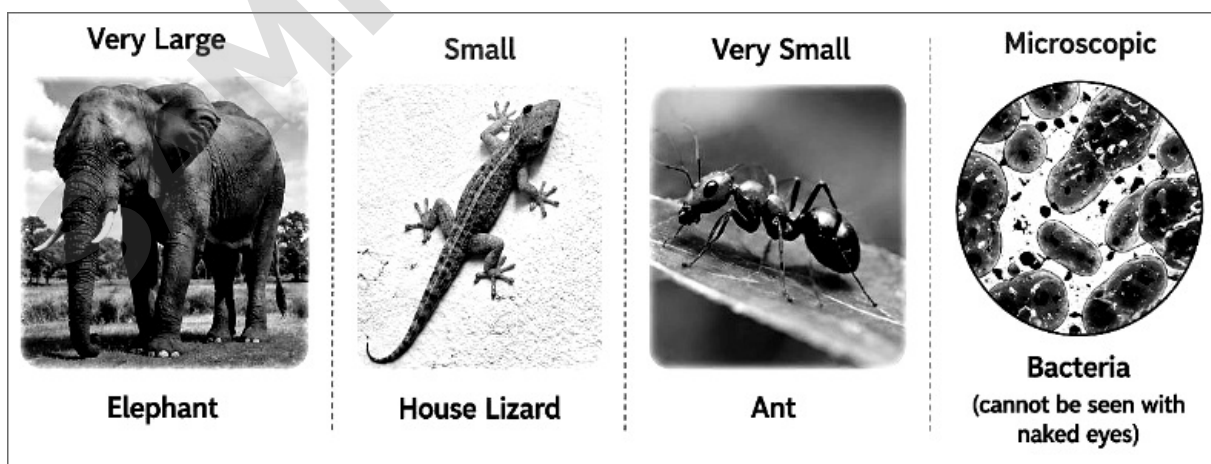


Fig. 1.3: Living organisms range from the microscopic to the very large

▪ Response to Stimuli

- The ability of a living organism to sense its surroundings is called a **stimulus**.
- The action shown by an organism due to the stimulus is called **response or reaction**.
- Living organism sense changes in their surroundings and show actions or reaction is called **response to stimuli**.
- Earthworms move away from sunlight.
- Animals change their behaviour when they sense danger.
- Animals respond immediately to different stimuli.
- Roots grow towards water.
- Branches grow towards sunlight.
- Plants respond to weather, temperature and injury.

IMPORTANT TERMS **Stimulus** — the ability of a living being to sense its surroundings. | **Response** — the way it acts because of that sense (Reaction).



Fig. 1.4: Touch-me-not leaves folding, a climbing vine, and a startled response — examples of response to stimuli

▪ Excretion

- Many life processes occur inside the body of living organisms.
- Waste materials are produced during these processes.
- Removal of waste materials from the body is called **excretion**.
- Animals release carbon dioxide, water vapour, sweat and urine.
- Plants store waste materials in bark and old leaves.
- Waste materials include excess salts, tannins, resin, gum and calcium oxalate crystals.
- When leaves and bark fall, wastes are removed.
- Plants also release sticky substances after injury.
- After drying, these substances form gum.
- Roots also release some waste materials.

Excretion keeps the body clean and healthy by removing harmful waste materials.

EXAM ALERT

The one-line definition of **excretion** given above is one of the most frequently asked 1-mark definition questions from this chapter — make sure you can write it accurately, word for word, in an exam.

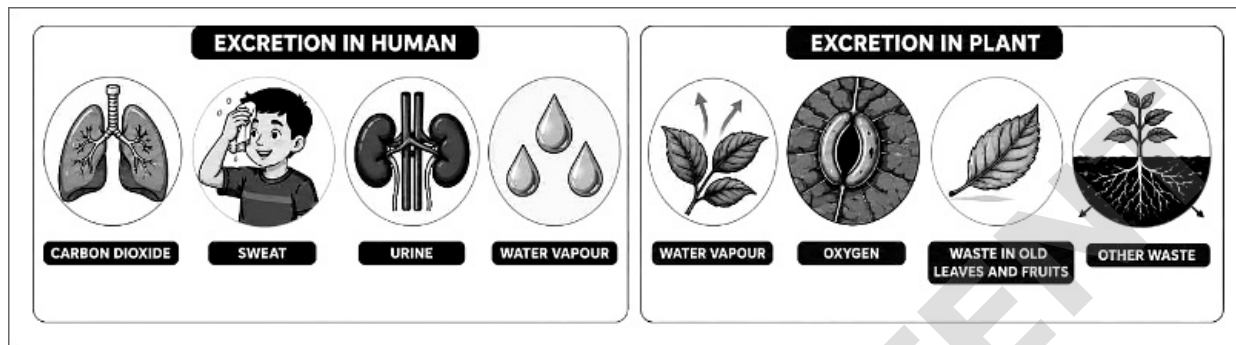


Fig. 1.5: Excretion in humans and in plants

■ Reproduction

- Every living organism produces another living organism similar to itself. This process is called **reproduction**.
- Some animals lay eggs.
- Young ones hatch from eggs.
- Some animals give birth directly to young ones.
- Some organisms can grow into a complete organism from a small part of their body.
- Most plants reproduce through seeds.

IMPORTANT TERM Reproduction — the process by which a living organism produces another organism similar to itself.

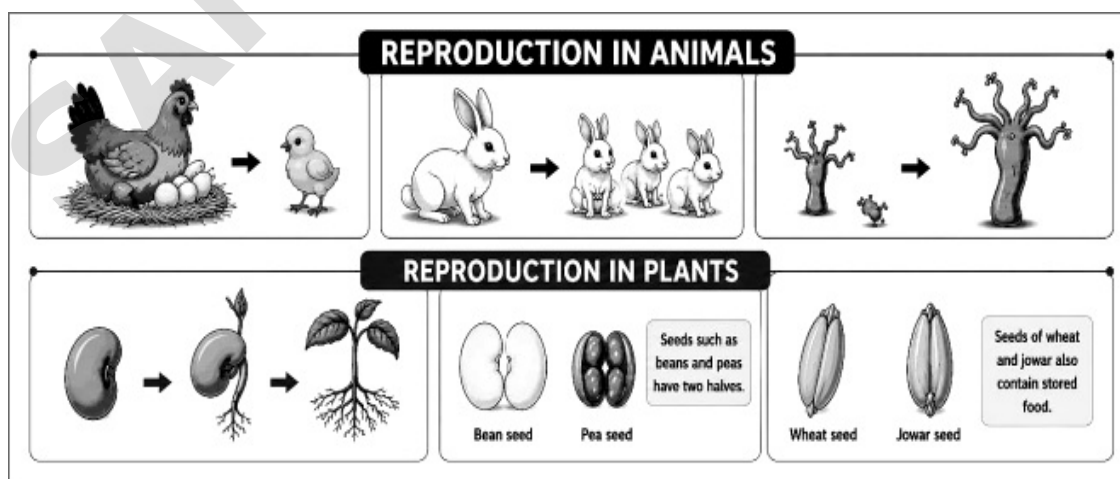


Fig. 1.6: Reproduction in animals and in plants

■ Germination

- The process in which a seed grows into a new plant is called **germination**.
- Germination is the beginning stage of plant growth.
- Continuous growth of plants requires sunlight, moisture and fresh air.
- The seed has stored food inside it. A seed contains a seedling.
- The seedling develops roots and leaves.
- Food required for the seedling is stored inside the seed.
- Seeds such as beans and peas have two halves.
- Seeds of wheat and jowar also contain stored food.
- The seed swells and the seed coat softens.
- The radicle (root) comes out first.
- The shoot grows upwards towards the sunlight.
- Leaves develop and a new plant is formed.
- Sprouting and germination are the initial stages of plant growth.

IMPORTANT TERM Germination — the process in which a seed grows into a new plant.

Seed → Seed absorbs water → Root comes out → Shoot comes out → Young plant develops

Germination is the first step in the life of a plant.

EXAM ALERT

The sequence of germination — **Seed → Root comes out → Shoot comes out → Young plant develops** — is often asked as a diagram-based or sequencing question. Practice drawing and labelling it.

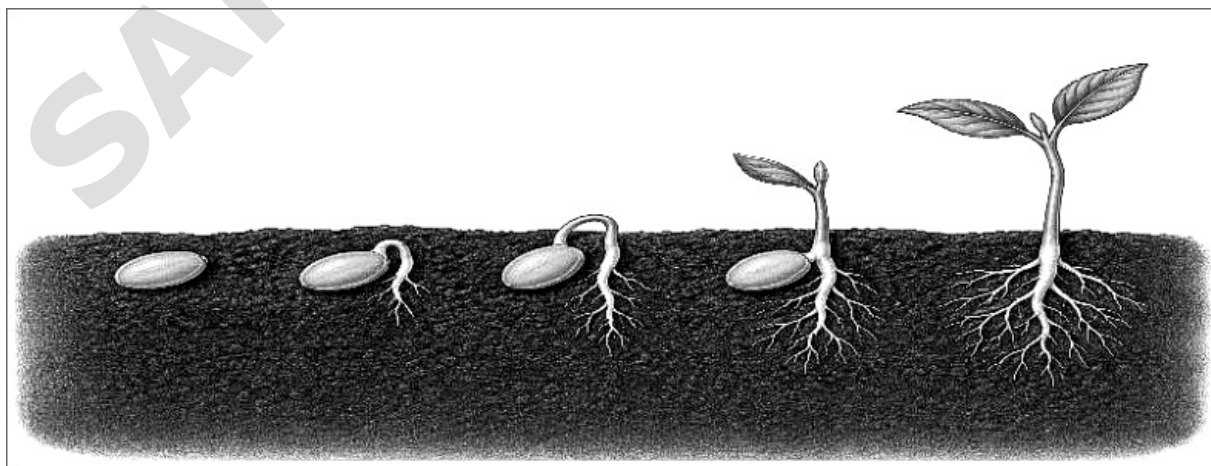
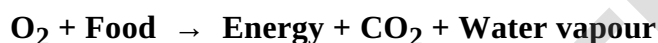


Fig. 1.7: Stages of seed germination

■ Respiration

- Many animals breathe through their nose.
- Taking air into the lungs through the nose is called **inhalation**.
- Releasing carbon dioxide gas and water vapour out is called **exhalation**.
- The process in which the body uses oxygen and food to produce energy is called **respiration**.
- Plants also respire. Respiration occurs within their cells.
- Breathing and respiration are two different processes.
- Some animals do not have a nose or lungs. They take in oxygen by other means.

IMPORTANT TERMS **Inhalation** — taking air into the lungs. | **Exhalation** — releasing carbon dioxide and water vapour out. | **Respiration** — using oxygen and food to produce energy.



SANSKRUTI SMART TIP

Do not confuse **breathing** with **respiration** — breathing is only inhalation and exhalation of air, while respiration is the complete process of using oxygen and food to release energy. This distinction is commonly tested in exams.

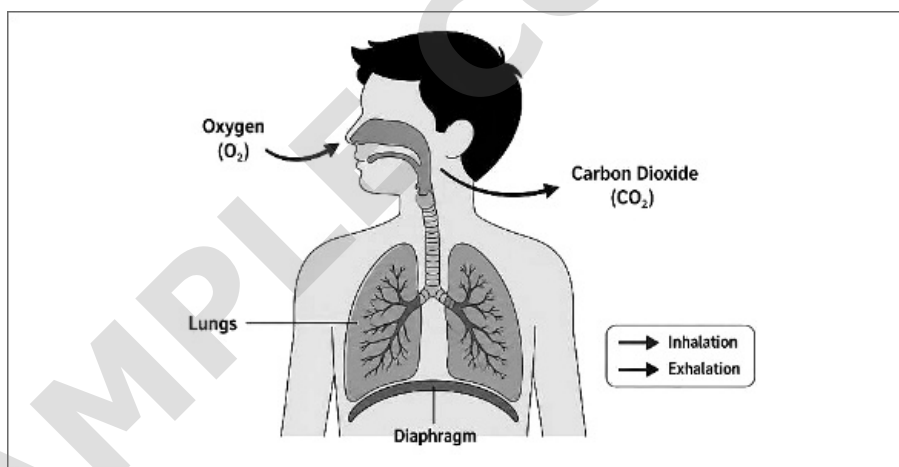


Fig. 1.8: Inhalation and exhalation in humans

■ Growth and Movement

- A broken glass or earthen pot does not return to its original shape.
- Wounds on the body heal with time.
- New shoots come out from the trunks of trees.
- New branches and leaves grow because new cells are formed.
- There are differences in the structure of cells in various parts like bones, muscles and skin.
- The body of all living organisms is made up of cells. Every living cell needs nutrients and oxygen.

- Animals move to obtain food, protection, shelter and as a response to stimuli.
- Plants cannot move from one place to another, but plants show movements.
- Branches grow towards sunlight. Roots grow towards moisture.
- In some plants, leaves fold at night and open in the morning. Buds bloom and petals open.

Hence, plants also show movement and response to stimuli.



Fig. 1.9: Plant movements: leaves folding at night, opening by day, and a bud blooming

▪ Life Cycle of a Mosquito

- Mosquito larvae are found in collected water.
- In a few days, the larvae change into mosquitoes.

Hence, do not allow water to collect.

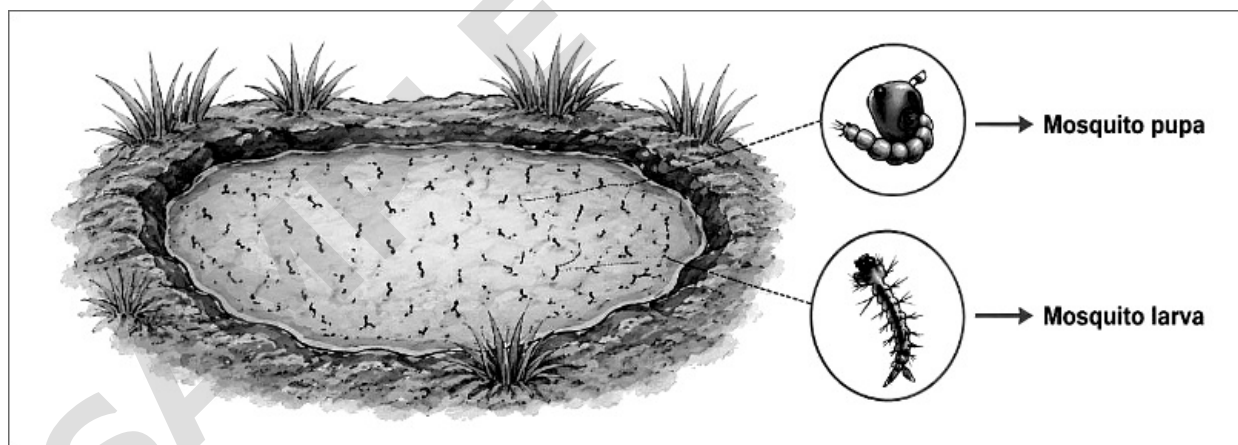


Fig. 1.10: Mosquito larva and pupa develop in stagnant water

▪ Life Cycle of a Frog

- Eggs are laid in water. Eggs look like white foam in clusters.
- Tadpole hatches from the egg. It has gills and breathes through them.
- Two hind legs develop. Later, two front legs develop.
- The tail becomes shorter and disappears. Finally, an adult frog is formed.

IMPORTANT TERM Metamorphosis — the series of changes seen during the life cycle of a frog.

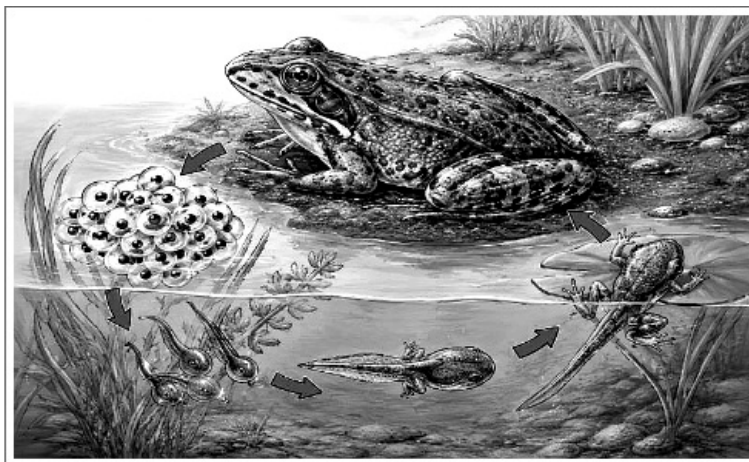
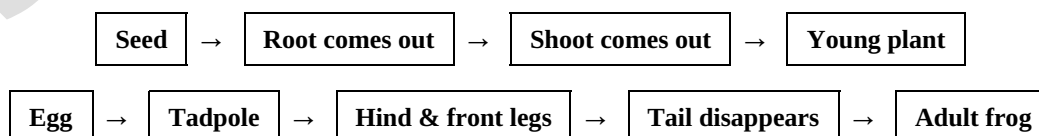


Fig. 1.11: Life cycle of a frog — from egg to tadpole to adult

Quick Revision

TOPIC	KEY POINT
Nutrition	Plants make food by photosynthesis ; animals depend on plants/other animals.
Growth & Development	Growth = increase in size; Development = progress in structure & skills.
Diversity	Living organisms range from microscopic (bacteria) to very large (elephant).
Response to Stimuli	Stimulus = change sensed; Response = action shown due to it.
Excretion	Removal of waste materials from the body.
Reproduction	Producing another organism similar to itself.
Germination	A seed grows into a new plant — root first, then shoot.
Respiration	$O_2 + \text{Food} \rightarrow \text{Energy} + CO_2 + \text{Water vapour}$.
Movement	Animals move fully; plants show movement without changing place.
Life Cycles	Mosquito: larva $\rightarrow$ pupa $\rightarrow$ adult. Frog: egg $\rightarrow$ tadpole $\rightarrow$ adult (metamorphosis).



TEXTBOOK EXERCISE SOLUTIONS

Q1. Suggest the appropriate word for the blanks:

1. Every living organism produces another living organism like itself is called as **Reproduction.**
 2. **Growth** and **reproduction** are the main characteristics of living organisms.
 3. The growth and development of living organisms due to food is called the **nutrition** of living organisms.
 4. The body of living organism is made up of **cells.**
-

Q2. Birds, fish and animals can move and change their position on their own. Shed leaves, as well as vehicles like tractors and bullock carts can also change their position. What are the important differences between these two types of movements?

Answer:

1. Movement in Living Organisms (Birds, Fish, Animals):

1. Movement is self-propelled and voluntary (happens on its own).
2. It occurs to obtain food, protection, shelter, and as a response to stimuli.
3. It is an internal, biological characteristic of living beings.

2. Movement in Non-Living Things (Shed leaves, Tractors, Bullock carts):

1. Shed leaves move due to external natural forces like wind.
 2. Vehicles like tractors need fuel and a driver, while bullock carts require the physical force of animals.
 3. Movement is not self-driven; it entirely depends on external force or fuel.
-

Q3. Germs of many diseases are extremely microscopic. They are so small that they cannot be seen with the naked eye. Do such living organisms reproduce? What do you think? Explain how you decided this.

Answer:

Yes, microscopic disease-causing germs do reproduce.

Explanation:

1. According to the chapter, growth and reproduction are the main characteristics of all living organisms, regardless of their size.
 2. Microscopic organisms need food and air to gain energy and carry out life processes.
 3. Because disease-causing germs spread and multiply rapidly to produce more organisms like themselves, it proves that they reproduce.
-

Q4. Explain that animals like rats, cats and dogs show awareness of their surroundings through their behaviour? Write down your experiences about it and observations of how they behave in different situations.

Answer:

- 1. Sense of Danger:** When a cat or snake approaches a hen and her chicks, they immediately sense the threat and move to protect themselves or run away.
 - 2. Response to Food/Hunger:** Animals change their behaviour when they sense food or feel hungry.
 - 3. Response to Loud Noises:** Sudden loud sounds, such as firecrackers, cause animals and birds to get startled and scatter immediately.
 - 4. Environmental Changes:** Earthworms move away from sunlight toward moist soil, showing awareness of their surroundings.
-

Q5. Make a list of different types of animal movements along with the animals that move in those ways.

Answer:

- 1. Walking and Running:** Dogs, cats, cows, tigers, rats.
 - 2. Flying:** Birds (crows, pigeons), butterflies, flies.
 - 3. Swimming:** Fish, ducks, sea turtles.
 - 4. Jumping / Hopping:** Frogs, squirrels.
 - 5. Crawling / Slithering:** Earthworms, snakes.
-

Q6. Plants respond to stimuli. Write down as many observations and experiences as you can which demonstrate this.

Answer:

- 1. Growth Towards Light:** Plant branches and shoots grow in the direction of sunlight so their leaves receive sufficient light.
 - 2. Root Growth:** Plant roots grow underground in the direction of water and moisture.
 - 3. Touch Response:** The leaves of the Mimosa (Touch-me-not) plant fold and close immediately when touched.
 - 4. Day and Night Movements:** The pairs of leaves on certain trees fold together after sunset and open up again at sunrise.
 - 5. Blooms in Sunlight:** Lotus buds open and bloom into flowers after receiving sunlight.
-

Q7. Turtles stay in water for a long time. Why do they come to the surface repeatedly and poke their heads out of the water? Fish, however, do not try this. Why?

Answer:

1. Turtles:

1. Turtles breathe air using lungs.
2. Since they cannot extract dissolved oxygen directly from water, they must surface repeatedly to inhale oxygen from the air.

2. Fish:

1. Fish breathe through gills instead of lungs.
2. Gills allow them to extract oxygen directly dissolved in water, so they do not need to come to the surface to breathe air.

Q8. The life cycle of a frog is given below in a jumbled order. Give the correct number in the boxes to put them in the proper sequence.



Fig. 1.12: Life cycle of a frog — jumbled stages

Answer:

1. **Box 1:** Sequence No. 2 — Tadpole / Larva (newly hatched tadpole with a tail, no legs yet)
2. **Box 2:** Sequence No. 5 — Adult Frog (fully transformed, tail completely absorbed)
3. **Box 3:** Sequence No. 1 — Eggs (cluster of eggs laid in water)
4. **Box 4:** Sequence No. 3 — Tadpole with hind legs (hind legs developing, tail still long)
5. **Box 5:** Sequence No. 4 — Tadpole with hind and front legs (both pairs of legs developed, tail shortening)

Correct life-cycle order: Box 3 (Eggs) → Box 1 (Tadpole) → Box 4 (Hind legs) → Box 5 (Hind + front legs) → Box 2 (Adult Frog).

Q9. Classify the following into living and non-living groups based on their characteristics: (Stone, butterfly, bicycle, book, fish, air, tree, kite, bus)

Answer:

LIVING ORGANISMS	NON-LIVING THINGS
i. Butterfly ii. Fish iii. Tree	i. Stone ii. Bicycle iii. Book iv. Air v. Kite vi. Bus

Q10. Write answers to the following questions:

(A) What are the effects on the animals when there is a drought and there is no food or water available for them?

Answer:

1. **Lack of Energy:** Without food and water, animals cannot get energy, leading to weakness and stopped growth.
2. **Forced Movement:** Animals are forced to travel long distances or migrate to survive and search for shelter and nourishment.
3. **Health and Survival Impact:** Extended lack of basic necessities causes illness, reduces reproduction, and eventually leads to death.

(B) A tiger cub grows; does it also develop? Explain this statement.

Answer:

1. **Growth:** Increase in the physical size, height, and weight of the tiger cub as time passes.
 2. **Development:** Progress in the cub's body functions, intelligence, skills, and work capacity, such as learning essential survival skills like crawling, running, jumping, and hunting.
 3. **Conclusion:** Yes, as a tiger cub grows physically, it also undergoes development by acquiring new abilities and mental maturity.
-

Additional Practice

A. MULTIPLE CHOICE QUESTIONS

1. A certain plant folds up its leaves the moment it is touched, while a stone kept beside it shows no reaction at all. This tells us that the plant is living because it shows:
(a) Growth (b) Response to stimuli (c) Excretion (d) Reproduction
2. Which pair correctly matches an organism with its correct size category?
(a) Ant — Very Large (b) Elephant — Microscopic (c) Bacteria — Microscopic (d) House Lizard — Very Large
3. During respiration, a living organism uses oxygen and food mainly to:
(a) Store waste (b) Produce energy (c) Absorb water (d) Reproduce
4. Which of the following is an example of excretion in plants?
(a) Sweating (b) Release of gum after injury (c) Formation of urine (d) Exhaling carbon dioxide

Answers

1. (b) Response to stimuli
 2. (c) Bacteria — Microscopic
 3. (b) Produce energy
 4. (b) Release of gum after injury
-
-

B. FILL IN THE BLANKS

1. The two hind legs of a tadpole develop before its _____ legs.
2. In plants, waste materials such as tannins and resin are stored in the bark and _____.
3. A seed contains a young plant called a seedling, along with _____ food.

Answers

1. Front
 2. Old leaves
 3. Stored
-
-

C. TRUE OR FALSE

1. Growth in plants continues throughout their life, while growth in animals occurs only for a specific period.
2. Since plants cannot move from one place to another, they never show any kind of movement.
3. Excretion and reproduction are characteristics shown by living organisms regardless of their size.

Answers

1. True
 2. False. **Explanation:** Plants show movement without changing their place — leaves fold at night, buds bloom, and roots and branches grow towards water and sunlight.
 3. True
-
-

D. GIVE SCIENTIFIC REASONS

1. **A wilted plant kept in water looks fresh again after some time, but a broken toy does not repair itself.**

Answer:

1. The plant is a living organism, and its cells are able to absorb water through the roots.
 2. This absorbed water helps the plant carry out its life processes and regain freshness.
 3. Living organisms show growth and repair, which allows the wilted plant to recover.
 4. The toy is non-living — it cannot absorb water or carry out any life process, so it can never repair itself.
-

2. **We are advised not to allow water to collect in and around our houses.**

Answer:

1. Mosquitoes lay their eggs in collected or stagnant water.
 2. Mosquito larvae hatch and develop inside this water.
 3. In a few days, these larvae change into adult mosquitoes.
 4. By not allowing water to collect, we stop mosquitoes from breeding and spreading.
-

E. ANSWER IN ONE OR TWO SENTENCES

1. What is meant by respiration?**Answer:**

Respiration is the process in which the body uses oxygen and food to produce energy, releasing carbon dioxide and water vapour.

2. Why are growth and reproduction called important characteristics of all living organisms?**Answer:**

Because every living organism, regardless of its size, grows and produces another organism similar to itself — these two characteristics are seen in all living things, from bacteria to elephants.

3. What is germination?**Answer:**

Germination is the process in which a seed grows into a new plant.

F. ANSWER THE FOLLOWING

1. Distinguish between growth and development in living organisms.**Answer:**

GROWTH	DEVELOPMENT
Increase in the size, height or weight of an organism.	Progress in body structure, intelligence, working capacity and skills.
Can generally be measured.	Observed through changes in abilities and capabilities.
In animals, occurs mainly during a specific period.	In plants, continues throughout their life.
Example: A puppy growing bigger in size.	Example: A puppy learning to run and hunt.

2. Describe, in sequence, the stages a frog passes through from egg to adult.**Answer:**

1. Eggs are laid in water and look like white foam in clusters.
 2. A tadpole hatches from the egg. It has gills and breathes through them.
 3. Two hind legs develop on the tadpole, followed later by two front legs.
 4. The tail becomes shorter and gradually disappears.
 5. Finally, a fully formed adult frog is produced. This entire series of changes is called metamorphosis.
-

3. Explain how plants show response to stimuli. Give two examples from the chapter.**Answer:**

1. Plants sense changes in their surroundings, such as light, water and touch, and this ability is called sensing a stimulus.
2. They show a reaction to these changes, which is called their response.
3. **Example 1:** Roots grow towards water, and branches grow towards sunlight.
4. **Example 2:** The leaves of some plants fold at night and open again in the morning.

G. MATCH THE PAIRS

	COLUMN A		COLUMN B
1.	Excretion	a.	Seed grows into a new plant
2.	Germination	b.	Removal of waste materials from the body
3.	Metamorphosis	c.	Changes seen in the life cycle of a frog
4.	Photosynthesis	d.	Process by which plants make their own food

Answer:

1 – b 2 – a 3 – c 4 – d

H. COMPLETE / IDENTIFY / NAME**1. Complete the sequence: Egg → Tadpole → _____ → _____ → Adult frog.****Answer:**

Egg → Tadpole → Two hind legs develop → Two front legs develop (tail disappears) → Adult frog.

2. Name the process by which a mosquito larva changes into an adult mosquito, and name the place where such larvae are usually found.**Answer:**

The larva changes into an adult mosquito through its life cycle; such larvae are usually found in stagnant or collected water.

3. Identify the term: "The action shown by an organism due to a stimulus."**Answer:**

Response (or reaction)

