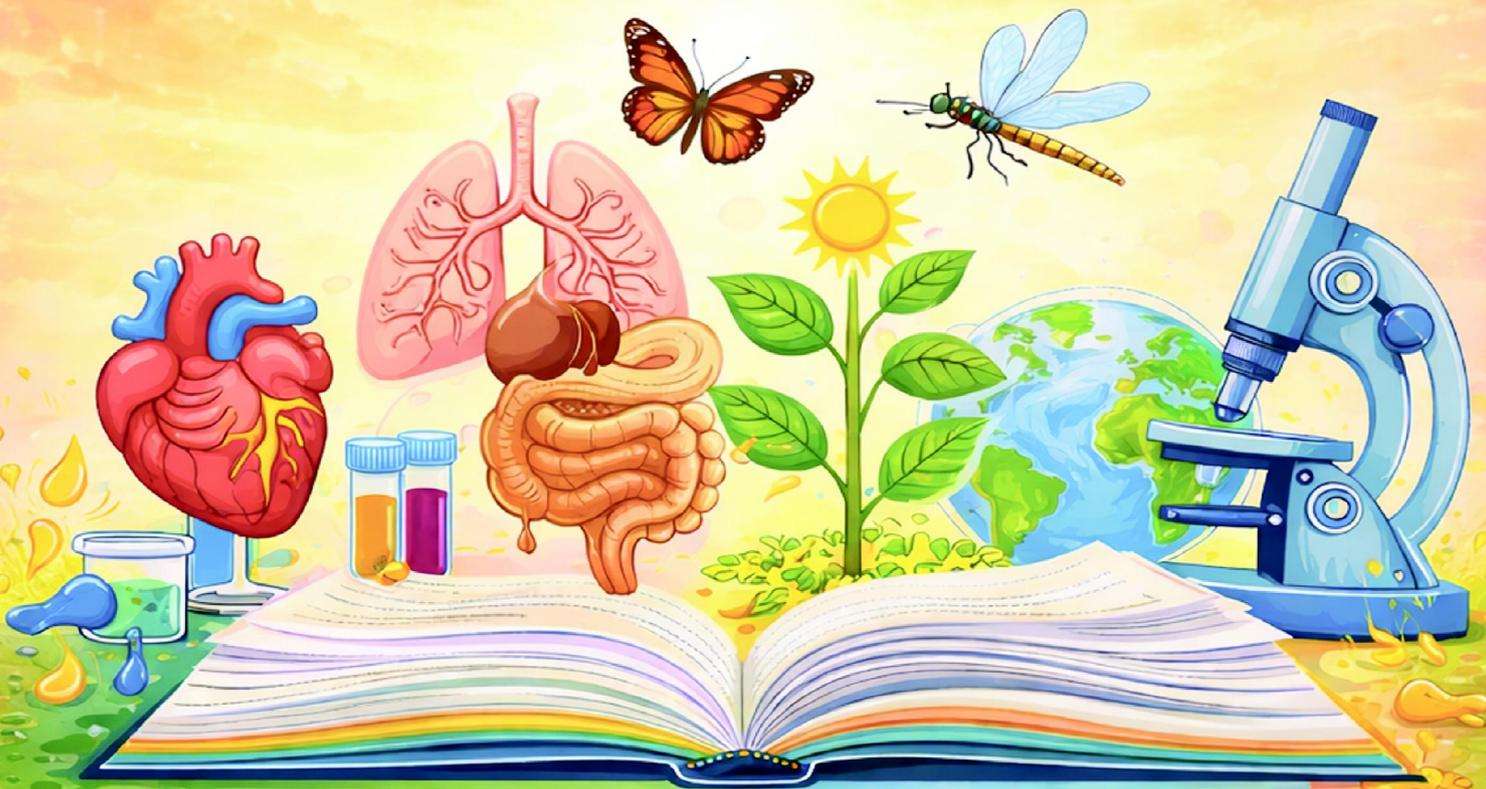


BRIDGE COURSE - BIOLOGICAL SCIENCE

From Class - IX to Class - X



BIOLOGICAL SCIENCE

SCHEDULE

S.No	Date	Period	Topic
1.	13-03-2026	Period 7	Complete syllabus analysis; SSC exam pattern & blueprint awareness; Performance improvement strategies
2.	16-03-2026	Period 3	Introduction; 5.1 What Are Life Processes
3.	17-03-2026	Period 3	5.2 Nutrition; Autotrophic Nutrition
4.	18-03-2026	Period 3	Activity 5.1, 5.2 (Life Processes activities)
5.	23-03-2026	Period 3	5.2.2 Heterotrophic Nutrition; 5.2.3 How Do Organisms Obtain Their Nutrition
6.	24-03-2026	Period 3	5.2.4 Nutrition in Human Beings
7.	25-03-2026	Period 3	Revision / Slip Test (5.1 & 5.2)
8.	30-03-2026	Period 3	5.3 Respiration; Activities 5.4, 5.5
9.	31-03-2026	Period 3	Aerobic and Anaerobic Respiration
10.	01-04-2026	Period 3	Respiration in Terrestrial and Aquatic Animals
11.	06-04-2026	Period 3	Human Respiratory System
12.	07-04-2026	Period 3	Revision / Slip Test (5.3)
13.	08-04-2026	Period 3	5.4 Transportation; Transportation in Human Beings
14.	10-04-2026	Period 6	Our Pump - The Heart
15.	13-04-2026	Period 3	Oxygen Enters the Blood in the Lungs
16.	15-04-2026	Period 3	The Tubes - Blood Vessels
17.	17-04-2026	Period 6	5.4.2 Transportation in Plants
18.	20-04-2026	Period 3	5.5 Excretion; 5.5.1 Excretion in Human Beings 5.5.2 Excretion in Plants
19.	22-04-2026		Grand test
20.	23-04-2026	Period 3	Review on Test Results - Guidance

Syllabus

1. Life Processes
2. Control & Co-ordination
3. How do organisms reproduction?
4. Heridity
5. Our Environment

- ◆ Life Processes is an important chapter in Class X Biology because it explains how living organisms maintain life.
- ◆ The chapter mainly deals with four major processes:
 - Nutrition
 - Respiration
 - Transportation
 - Excretion
- ◆ These processes help organisms obtain energy, distribute materials, and remove wastes.
- ◆ This is a very important chapter in examination point of view as the chapter weightage is 22 marks.

Session - 1 : 13 - 03 - 2026.

Syllabus Analysis & SSC Exam Awareness

SSC Examination Pattern

Subject: General Science Paper - II (Biological Science)

Unit/Paper: 20 E/T

Class: X

Time: 2 hrs

Marks: 50

Weightage to Objective

Objective	Knowledge	Understanding	Application	Analysis	Evaluation	Creation	Total
% of Marks	20	25	20	15	10	10	100
Marks	10	12	10	8	5	5	50

Weightage to Form of Question

Forms of Questions	E/LA	SA	VSA	O (MCQ) - 1 Mark Qns	Total
No. of Questions	2	5	4	6	17
Marks Allotted	16	20	8	6	50
Estimated Time	30 min	40 min	20 min	15 min	105 min

Weightage to Chapters

S. No.	Unit/Sub-Units	Marks
1	Life Processes	22
2	Control & Co-ordination	14
3	How do organisms reproduce	14
4	Heridity	10
5	Our Environment	10
Total		70 (out of which 20 marks choice, remaining 50 for consideration)

- Note: 1. Total marks for Objectives and Chapters are constant as per weightage table.
2. Competencies/ objectives are not fixed for chapters. They may vary from paper to paper.
3. Type of question or choice is not fixed for any chapter.*

Weightage to Major Content Areas

Schemes of Sections	4/ Sec-I (6 x 1M); Sec-II (4 x 2M); Sec-III (5 x 4M); Sec-IV (2 x 8M)
Pattern of Options	Q.No 12 in Sec-III and Q.No 16 and 17 in Sec-IV only have internal choice

Estimated Difficulty Level	Difficult	20	% Marks
	Average	40	% Marks
	Easy	40	% Marks

Index of Abbreviations

(**E/LA**: Essay/Long Answer; **SA**: Short Answer; **VSA**: Very Short Answer; **O**: Objective)

Performance Improvement Strategies

- ◆ Understand concepts and processes, not just definitions.
- ◆ Revise keywords and terminology.
- ◆ Focus on application-based questions.
- ◆ There will be one experiment-based question for 8 marks. From Life Processes, experiments will be asked, with a choice from either Control and Coordination or How Do Organisms Reproduce?. Therefore, practise any one complete set (either Life Processes or Control and Coordination & How Do Organisms Reproduce?) of experiments on daily basis (One experiment per day). This can help you secure 8 marks.
- ◆ There will be one 8-mark analytical question, most likely from Heredity. A differentiation-type question may be given as an option. Hence, practise Heredity questions daily on a rotational basis along with experiments to score another 8 marks.
- ◆ Practise diagrams daily (at least one diagram per day). One 4-mark diagram is likely from How Do Organisms Reproduce?, with a choice from either Life Processes or Control and Coordination. Regular practice of important diagrams can help you secure 4 marks.
- ◆ Precautions / suggestions (application-based) questions carry 6 marks. These are easy to practise and score.
- ◆ Practise slogans (1 mark), abbreviations (1 mark), and identification of diagram/part/function (1 mark) questions. These can help you score 3 marks easily.
- ◆ Practise interpretation of tables or paragraphs. These questions are easy to attempt and usually carry 2 marks.

- ◆ Practise hypothesis-based or "What may happen?" type questions, which generally carry 4 marks.
- ◆ Practise justify / support your answer / conclude / determine / give reason type questions. These questions usually carry 5 marks.
- ◆ Solve previous SSC question papers. Practise questions from all available sources.
- ◆ Textbook reading is mandatory to get full marks.
In bridge course the first chapter will be covered.

Suggestions for Teachers:

1. Encourage Active Learning : Involve students in discussions, problem-solving on the board, and demonstrations so they understand concepts deeply rather than memorizing.
2. Use Summaries & Synopses : Use concise chapter summaries provided by SCERT AP, highlighting key definitions, formulas, and diagrams to help students. Utilize additional materials, if required, to cover concepts not fully addressed in the synopsis.
3. More time for practice : Perfection in these two chapters results from vigorous Practice only. Encourage students to use summer vacation for reinforcement of topics.

Session - 2 : 16-03-2026

Introduction & What Are Life Processes

Key Points

Living organisms show characteristics that distinguish them from non-living things.

Identifying Living Organisms

- ◆ Living organisms often show movement.
- ◆ Example : dog running, cow chewing cud, human walking.
- ◆ However, visible movement alone is not enough to define life.

Example:

- ◆ A sleeping person or animal may not move but is still alive.

Molecular Movement

- ◆ Living organisms show continuous internal molecular movements.

- ◆ These movements include chemical reactions and transport of molecules.

Viruses

- ◆ Viruses show no molecular movement outside host cells.
- ◆ Therefore scientists debate whether viruses are living or non-living.

Life Processes

Life processes are maintenance processes required to keep an organism alive, even during rest or sleep.

Major Life Processes

- ◆ Nutrition
- ◆ Respiration
- ◆ Transportation
- ◆ Excretion

These processes maintain the structure and functioning of the body.

Check for Understanding

1. Why is visible movement not a reliable indicator of life?
2. What are life processes?
3. Why is there a debate about viruses being living organisms?

Assessment

1. What processes would you consider essential for maintaining life?
2. Define life processes.

Session - 3 : 17-03-2026

Nutrition & Autotrophic Nutrition

Key Points

Nutrition

Nutrition is the process by which organisms obtain food and use it for energy, growth and repair.

Organisms need food for:

- ◆ Energy production
- ◆ Growth and development

- ◆ Repair of tissues
- ◆ Maintenance of body functions

Types of Nutrition

1. Autotrophic Nutrition
2. Heterotrophic Nutrition

Autotrophic Nutrition

- ◆ Organisms prepare their own food from simple inorganic substances.

Examples:

- Green plants
- Some bacteria

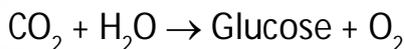
Photosynthesis

Plants prepare food by photosynthesis.

During photosynthesis:

- ◆ Carbon dioxide + water → carbohydrates
- ◆ Sunlight provides energy
- ◆ Chlorophyll absorbs light

Photosynthesis Equation



(in presence of sunlight and chlorophyll)

Importance of Photosynthesis

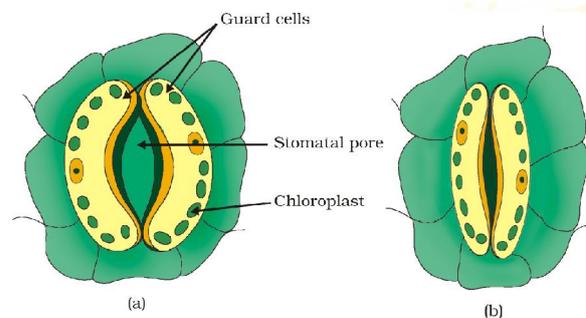
- ◆ Produces food for plants
- ◆ Supplies oxygen to atmosphere
- ◆ Forms the base of food chains

Check for Understanding

1. Define nutrition.
2. What is autotrophic nutrition?
3. What are the raw materials required for photosynthesis?

Assessment

1. Where do plants get each of the raw materials required for photosynthesis?
2. What are the steps involved in production of food during photosynthesis?



Opening and closing of stomata

Activities 5.1 & 5.2

Activity 5.1 - Starch Test

Procedure

1. Take a plant with variegated leaves.
2. Keep the plant in darkness for 3 days to remove stored starch.
3. Place it in sunlight for a few hours.
4. Remove a leaf and boil it in alcohol.
5. Add iodine solution.

Observation

- ◆ Green parts turn blue-black.

Conclusion

- ◆ Starch is formed only in green parts of leaves.
- ◆ Chlorophyll is necessary for photosynthesis.

Activity 5.2 - Carbon Dioxide Requirement

Procedure

- ◆ Two plants are placed under bell jars.
- ◆ One jar contains potassium hydroxide (KOH) to absorb CO_2 .
- ◆ Plants are kept in sunlight.

Observation

- ◆ Plant without CO_2 does not form starch.

Conclusion

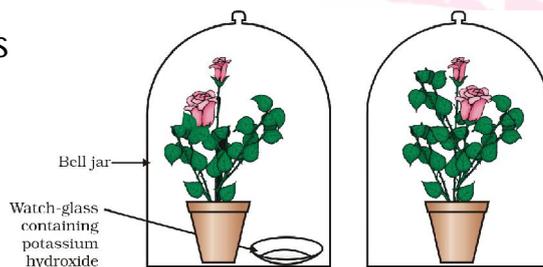
- ◆ Carbon dioxide is essential for photosynthesis.

Check for Understanding

1. Why is alcohol used in the starch test?
2. What is the role of KOH in the experiment?
3. What do these experiments prove?

Assessment

1. Describe an experiment to prove that CO_2 essential for photosynthesis.
2. Write the procedure you followed to test the presence of starch.



Carbon Dioxide Requirement

Heterotrophic Nutrition

Key Points

Heterotrophic Nutrition

- ◆ Organisms obtain food from other organisms.
- ◆ They cannot prepare food on their own.

Examples:

- ◆ Animals
- ◆ Fungi
- ◆ Some bacteria

Types of Heterotrophic Nutrition

1. Holozoic Nutrition

- Food is ingested, digested and absorbed.
- Example: humans, amoeba.

2. Saprophytic Nutrition

- Organisms feed on dead and decaying matter.
- Example: fungi.

3. Parasitic Nutrition

- Organisms live on or inside another organism.
- Example: cuscuta, tapeworm.

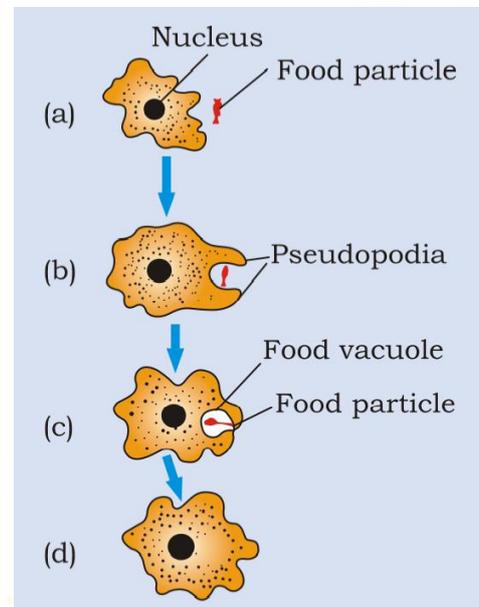
Nutrition in Amoeba

Steps:

1. Ingestion
2. Digestion
3. Absorption
4. Assimilation
5. Egestion

Check for Understanding

1. What is heterotrophic nutrition?
2. Give examples of saprophytic nutrition.
3. Explain nutrition in Amoeba.



Nutrition in Amoeba

Assessment

1. Draw a neat and well labelled diagram of nutrition in Amoeba.
2. Differentiate autotrophic nutrition with heterotrophic nutrition.

Session - 6 : 24-03-2026

Nutrition in Human Beings

Human Digestive System

Alimentary Canal

Mouth → Oesophagus → Stomach → Small intestine → Large intestine → Anus

Digestion in Mouth

- ◆ Food is chewed by teeth.
- ◆ Saliva contains salivary amylase which digests starch.

Digestion in Stomach

- ◆ Gastric glands produce :
 - Hydrochloric acid (HCl)
 - Pepsin (protein digestion)
 - Mucus (protects stomach lining)

Digestion in Small Intestine

- ◆ Bile from liver emulsifies fats.
- ◆ Pancreatic enzymes digest proteins, fats and carbohydrates.

Absorption

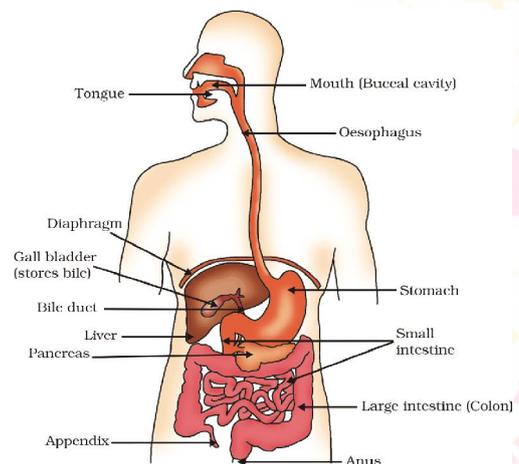
- ◆ Occurs through villi in small intestine.
- #### Egestion
- ◆ Undigested food is removed through anus.

Check for Understanding

1. What is the function of saliva?
2. What is the role of HCl in the stomach?
3. Why are villi important?

Assessment

1. Describe an experiment to show the action of saliva on starch.
2. How are fats digested in our bodies? Where does this process take place?



Human Digestive System

Revision / Slip Test (Nutrition)

- ◆ The slip test is a short formative assessment conducted after completion of a topic or sub-topic.
- ◆ **Its purpose is to :**
 - Assess students' understanding of key concepts.
 - Identify learning gaps and misconceptions.
 - Provide immediate feedback to improve learning.
 - Prepare students for SSC examination pattern.
- ◆ **Conduct the test :**
 - At the end of the lesson
 - During the revision period
 - After completing a major subtopic
- ◆ **Prepare the questions covering:**
 - Key concepts
 - Definitions
 - Diagram-based questions
 - Application questions
- ◆ Ensure questions are aligned with learning outcomes.
- ◆ Keep the test short and focused.
- ◆ Instruct the students to
 - Read all questions carefully.
 - Write clear and brief answers.
 - Do not discuss with classmates.
 - Complete the test within the given time limit.
- ◆ **During the slip test, the teacher should:**
 - Maintain a quiet and focused environment.
 - Ensure independent work by students.
 - Observe students to identify common difficulties.
 - Encourage students to attempt all questions.

- ◆ **The teacher should:**
 - Check the answers immediately after the test.
 - Discuss correct answers in class.
 - Explain the concepts behind incorrect responses.
 - Record marks to monitor student progress.
- ◆ **After evaluation:**
 - Identify common errors made by students.
 - Provide additional explanation or examples.
 - Conduct quick revision or reinforcement activities.
 - Encourage students to improve weak areas.
- ◆ **Based on the slip test results, the teacher may:**
 - Conduct peer discussion
 - Assign practice questions
 - Provide diagram practice
 - Organize short revision sessions

Session - 8 : 30-03-2026

Respiration & Activities 5.4, 5.5

Key Points

Respiration is the process by which food is broken down to release energy required for life activities.

Cellular Respiration

- ◆ Occurs inside cells.
- ◆ Glucose is broken down to release energy.
- ◆ Energy released is stored in the form of ATP (Adenosine Triphosphate).

ATP

- ◆ Known as the energy currency of the cell.
- ◆ Used for activities like muscle contraction, synthesis of molecules and active transport.

Activity 5.4 - Carbon Dioxide Detection

- ◆ Lime water turns milky when carbon dioxide is passed through it.
- ◆ Exhaled air contains more CO_2 than inhaled air.

Activity 5.5 - Fermentation

- ◆ Yeast converts sugar into alcohol and carbon dioxide.
- ◆ This process occurs without oxygen.

Importance of Respiration

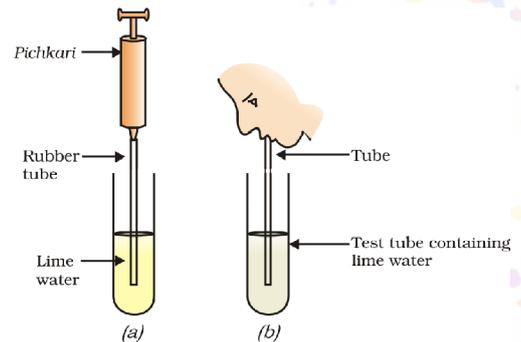
- ◆ Provides energy for growth and maintenance.
- ◆ Supports all metabolic activities.

Check for Understanding

1. What is respiration?
2. Why is ATP called the energy currency of the cell?
3. What does lime water turning milky indicate?

Assessment

1. Describe an experiment to prove carbon dioxide is released during respiration.
2. How do you prove that respiration takes place without oxygen?



Carbon Dioxide Detection

Session - 9 : 31-03-2026

Aerobic and Anaerobic Respiration

Key Points

Aerobic Respiration

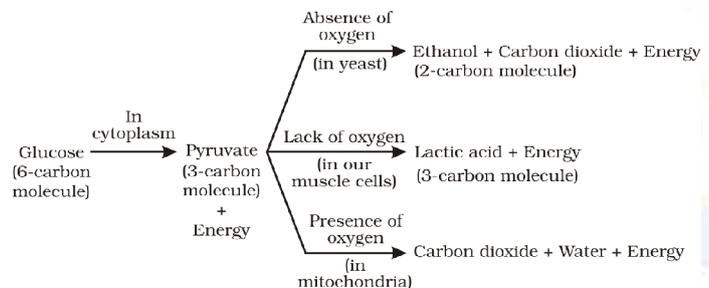
- ◆ Occurs in the presence of oxygen.
- ◆ Glucose completely breaks down into CO_2 and water.
- ◆ Releases large amount of energy.

Example:

- ◆ Humans
- ◆ Most plants and animals

Anaerobic Respiration

- ◆ Occurs in the absence of oxygen.
- ◆ Glucose breaks down partially.



Examples:

- ◆ Yeast → alcohol + CO₂
- ◆ Muscle cells → lactic acid

Muscle Cramps

- ◆ Occur due to accumulation of lactic acid during heavy exercise.

Differences

Aerobic Respiration	Anaerobic Respiration
Requires oxygen	No oxygen required
More energy produced	Less energy produced
End products : CO ₂ + water	End products : alcohol / lactic acid

Check for Understanding

1. What is the difference between aerobic and anaerobic respiration?
2. Why do muscles get cramps during heavy exercise?

Assessment

1. What are the different ways in which glucose is oxidised to provide energy in various organisms?
2. What are muscle cramps?

Session - 10 : 01-04-2026

Respiration in Terrestrial and Aquatic Animals

Key Points

Different organisms have different respiratory organs depending on their environment.

Aquatic Animals

- ◆ Example : fish
- ◆ Use gills for respiration.
- ◆ Oxygen dissolved in water is absorbed by blood.

Terrestrial Animals

- ◆ Example : humans, birds, reptiles
- ◆ Use lungs to breathe atmospheric oxygen.

Breathing Rate

- ◆ Aquatic organisms breathe faster because dissolved oxygen in water is limited.
- ◆ Terrestrial animals breathe slower due to higher oxygen concentration in air.

Gas Exchange

- ◆ Oxygen is used for respiration.
- ◆ Carbon dioxide is released as waste.

Check for Understanding

1. Why do fish breathe faster than humans?
2. What are the respiratory organs of aquatic animals?

Assessment

1. What advantage over an aquatic organism does a terrestrial organism have with regard to obtaining oxygen for respiration?
2. What are the similarities between respiration in aquatic animals and terrestrial animals?

Session - 11 : 06-04-2026

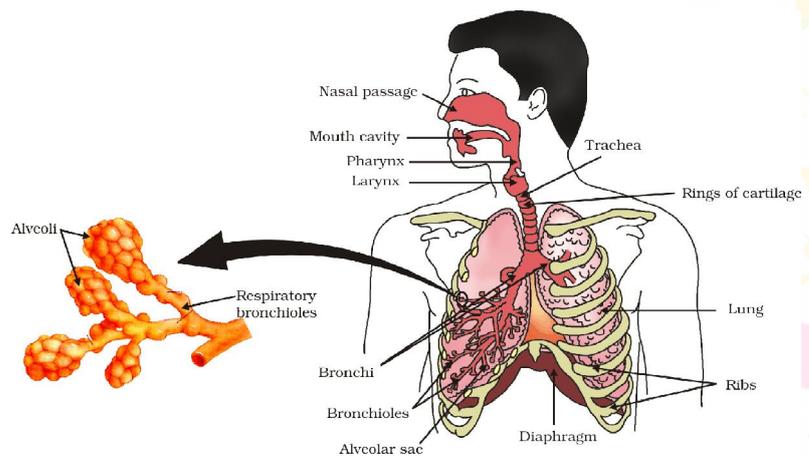
Human Respiratory System

Main Organs

- ◆ Nostrils
- ◆ Nasal cavity
- ◆ Trachea
- ◆ Bronchi
- ◆ Lungs
- ◆ Alveoli

Process of Breathing

1. Air enters through nostrils.
2. It passes through the trachea.
3. Air reaches lungs via bronchi.
4. Gas exchange occurs in alveoli.



Human Respiratory System

Alveoli

- ◆ Tiny balloon-like structures.
- ◆ Provide large surface area for gas exchange.
- ◆ Surrounded by blood capillaries.

Breathing Mechanism

- ◆ Inhalation: chest cavity expands.
- ◆ Exhalation: chest cavity contracts.

Check for Understanding

1. What is the function of alveoli?
2. What happens during inhalation?

Assessment

1. How are the lungs designed in human beings to maximise the area for exchange of gases?
2. How do you differentiate inhalation with exhalation?

Session - 12 : 07-04-2026

Revision / Slip Test (Respiration)

Session - 13 : 08-04-2026

Transportation in Human Beings

Key Points

Transportation is the process of moving substances such as food, oxygen and wastes in the body.

Components of Transport System

1. Heart
2. Blood
3. Blood vessels

Blood

Blood consists of :

- ◆ Plasma

- ◆ Red blood cells (RBC)
- ◆ White blood cells (WBC)
- ◆ Platelets

Functions of Blood

- ◆ Transport oxygen
- ◆ Transport nutrients
- ◆ Remove wastes
- ◆ Protect body against infection

Check for Understanding

1. What are the components of the transport system?
2. What is the function of red blood cells?

Assessment

1. What would be the consequences of a deficiency of haemoglobin in our bodies?
2. What are the components of the transport system in human beings? What are the functions of these components?

Session 14 - 10-04-2026

Our Pump - The Heart

Key Points

Heart

- ◆ Muscular organ about the size of a fist.
- ◆ Pumps blood throughout the body.

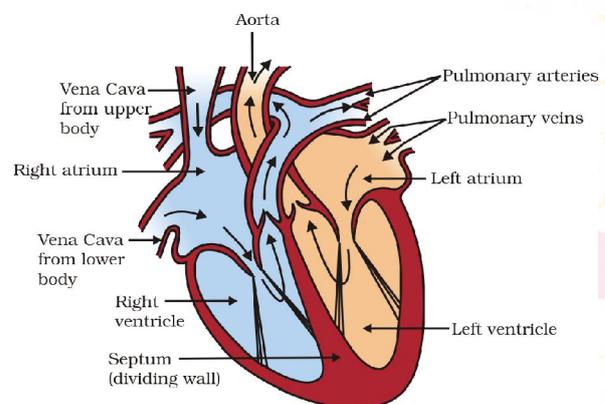
Chambers of the Heart

- ◆ Right atrium
- ◆ Right ventricle
- ◆ Left atrium
- ◆ Left ventricle

Double Circulation

Blood passes through the heart twice in one complete cycle:

1. Pulmonary circulation
2. Systemic circulation



Structure of Human heart

Valves

- ◆ Prevent backflow of blood.

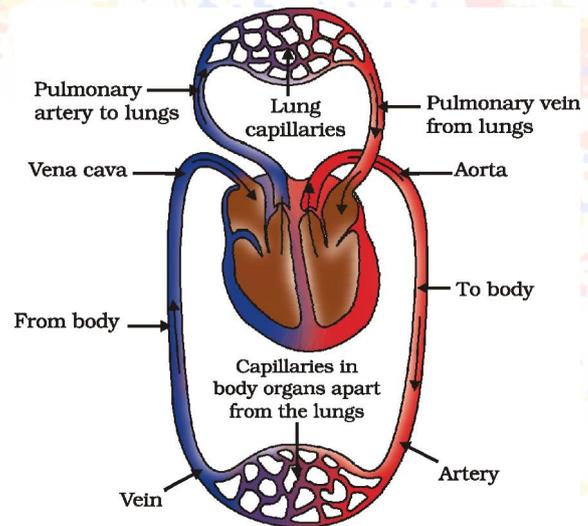
Check for Understanding

1. How many chambers are present in the human heart?
2. Why heart is called as a pumping organ?

Assessment

1. Write a note on circulation of blood through heart.
2. What is the role of valves in the heart?

Session - 15 : 13-04-2026



Double circulation

Oxygen Enters the Blood in the Lungs

Key Points

Oxygen enters the blood in the lungs.

- ◆ The right and left sides of the heart are separated to prevent mixing of oxygenated and deoxygenated blood.
- ◆ Birds and mammals have a four-chambered heart for efficient oxygen supply because they need more energy to maintain body temperature.
- ◆ Amphibians and many reptiles have a three-chambered heart, so some mixing of blood occurs.
- ◆ Fishes have a two-chambered heart, where blood passes through the heart only once, while in other vertebrates it passes twice (double circulation).

Check for Understanding

1. What is double circulation?
2. What is the purpose of blood entering into the lungs?

Assessment

1. Which instrument is used to measure BP?
2. Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?
3. Describe double circulation of blood in human beings. Why is it necessary?

Session - 16 : 15-04-2026

Blood Vessels

Types of Blood Vessels

Arteries

- ◆ Carry blood away from heart.
- ◆ Thick elastic walls.

Veins

- ◆ Carry blood towards heart.
- ◆ Have valves.

Capillaries

- ◆ Very thin vessels.
- ◆ Exchange of materials occurs here.

Blood Pressure

- ◆ Blood pressure is measured using SPHYGMOMANOMETER.

Blood Clotting

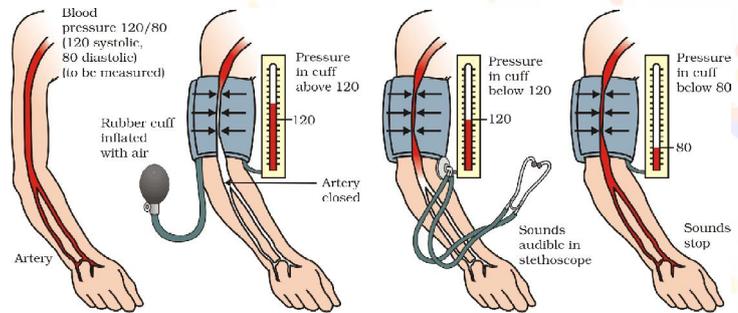
- ◆ Platelets help in clot formation to prevent excessive bleeding.

Check for Understanding

1. What are capillaries?
2. Why do veins have valves?

Assessment

1. Write the differences between arteries and veins.
2. Name different types of blood vessels and write their functions.



Measuring Blood pressure

Session - 17 : 17-04-2026

Transportation in Plants

Key Points

Plants transport materials through vascular tissues.

Xylem

- ◆ Transports water and minerals from roots to leaves.

Phloem

- ◆ Transports food from leaves to other parts of the plant.

Xylem	Phloem
1. Transports water and minerals	1. Transports food materials
2. Transportation occurs in upward direction.	2. Transportation is multi directional.
3. Contains dead cells except parenchyma.	3. Except fibers all are living cells.
4. Usually found towards the centre in the vascular bundle.	4. Usually found towards the periphery in the vascular bundle.

Transpiration

- ◆ Loss of water through stomata.
- ◆ Helps in upward movement of water.

Importance

- ◆ Maintains water balance.
- ◆ Helps in temperature regulation.

Check for Understanding

1. What is transpiration?
2. What is the function of xylem?

Assessment

1. Write the differences between xylem and phloem.

Session - 18 : 20-04-2026

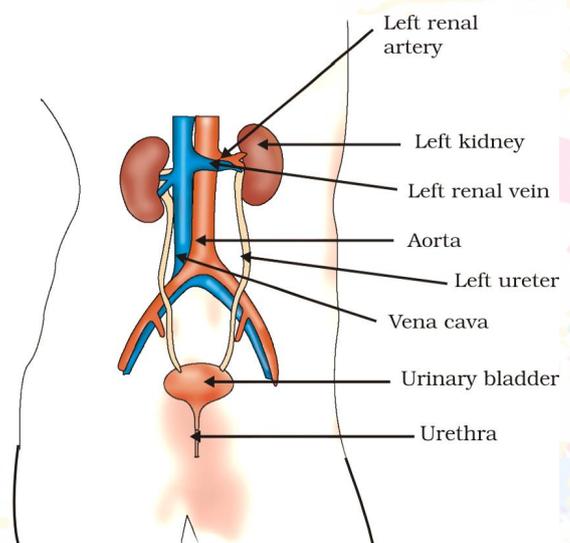
Excretion in Human Beings

Key Points

Excretion is the process of removing metabolic wastes from the body.

Human Excretory System

- ◆ Kidneys
- ◆ Ureters
- ◆ Urinary bladder
- ◆ Urethra



Human excretory system

Kidney Function

- ◆ Filters blood
- ◆ Removes nitrogenous wastes like urea

Urine Formation

Occurs in units called nephrons.

- ◆ Dialysis is the artificial process of removing waste from the blood when the kidneys fail to function properly.
- ◆ Organ donation is the act of giving a healthy organ to improve the life of another person.

Plants remove wastes in several ways:

- ◆ Through transpiration
- ◆ Storage in vacuoles
- ◆ Storage as resins and gums
- ◆ Shedding of leaves
- ◆ Excretion into surrounding soil

Example

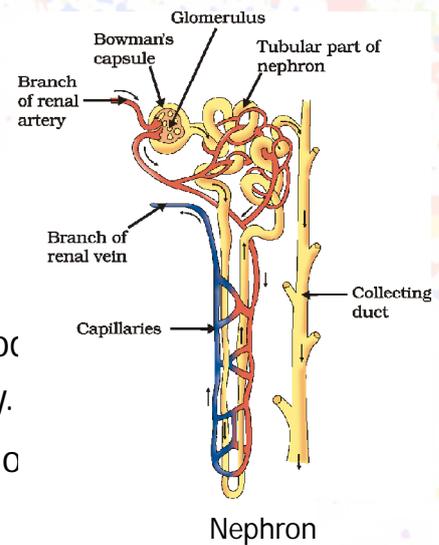
- ◆ Oxygen released during photosynthesis.

Check for Understanding

1. What is excretion?
2. What is the function of kidneys?
3. How do plants remove waste substances?
4. What is the role of vacuoles in plants?

Assessment

1. Describe the structure and functioning of nephrons.
2. How is the amount of urine produced regulated?
3. Draw a neat and well labelled diagram of human excretory system.
4. Write some slogans on organ donation.
5. What are the methods used by plants to get rid of excretory products?



Grand Test

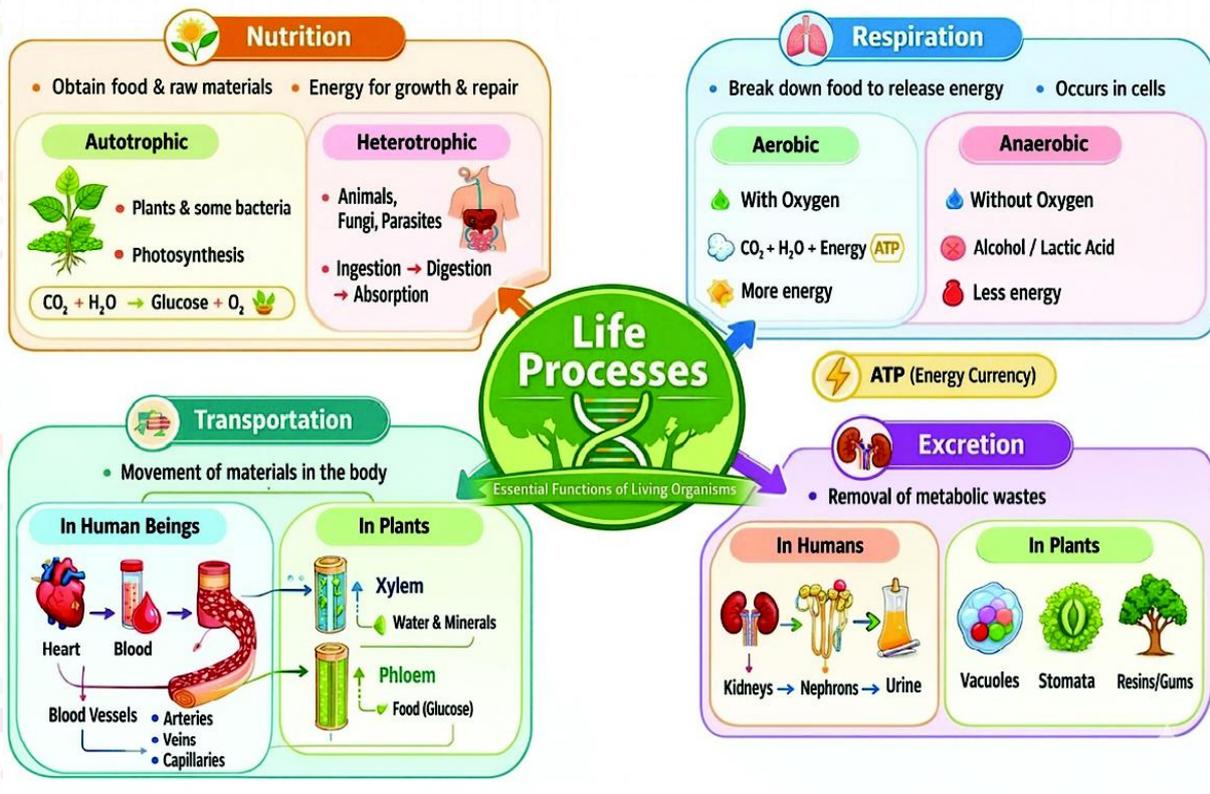
Review of Test Results & Guidance

Discussion Points

- ◆ Analyse student performance.
- ◆ Identify common mistakes.
- ◆ Clarify difficult concepts.

Improvement Strategies

- ◆ Practice diagrams regularly.
- ◆ Focus on conceptual understanding.
- ◆ Revise definitions and processes.



⚡ Energy for Life ←↔ Material Movement 🗑️ Waste Removal 🔧 Body Maintenance