Foreword

Education is not just knowledge transfer, but also a spark for curiosity and critical thinking. In line with NEP 2020, NCF 2023, and SCF–AP, this Teacher Handbook empowers teachers in this transformative journey. Teachers today are facilitators of learning, shaping future-ready students with values, skills and competencies. This hand book offers practical guidance for lesson planning, assessment, pedagogy and reflection.

It includes curricular goals, learning outcomes, and innovative teaching strategies. Resources like TLMs, Labs, Clubs and joyful learning techniques are featured. It aligns with the Academic Calendar for structured year-round teaching. This is your professional companion encouraging creativity, collaboration and growth. Let classrooms be inclusive, engaging and empowering learning spaces. This handbook is a valuable professional companion that empowers teachers to nurture lifelong learning and effective Classroom transformation.

The Department of School Education, Andhra Pradesh acknowledges the unwavering commitment of educators, academic experts and resource persons who contributed to the development of this Teacher Handbook

Together, let's shape the future of education in Andhra Pradesh.

– Department of School Education, Andhra Pradesh

Government of Andhra Pradesh, Amaravati
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Features of the Teacher's Handbook

The Teacher's Handbook serves as a practical and comprehensive guide to support teachers in planning, delivering, and reflecting on effective classroom instruction. It aligns with the **National Education Policy (NEP) 2020**, **National Curriculum Framework (NCF) 2023**, and the **State Curriculum Framework – Andhra Pradesh (SCF–AP)**. The handbook empowers teachers with structured guidance, tools, and strategies to enhance student learning and overall classroom engagement.

1. **Curriculum Interpretation**
    - Help teachers understand the curriculum's goals, competencies, and learning outcomes as outlined by SCERT–AP and NCF.
2. **Pedagogical Guidance**
    - Promote learner-centric, activity-based, and inquiry-driven teaching.
    - Encourage inclusive, experiential, and multidisciplinary approaches to meet diverse learner needs.
3. **Lesson Planning Support**
    - Provide sample lesson plans, creative TLM ideas, and assessment methods.
    - Integrate local context, values education, and 21st-century skills into classroom teaching.
4. **Assessment and Reflection**
    - Support teacher self-reflection and continuous professional development through guiding questions and tools.
5. **Integration of Teaching Supports**
    - Encourage the use of Science Labs and Science Clubs for hands-on learning and developing scientific temper.
    - Suggest joyful learning strategies—games, storytelling, simulations, and projects—for better engagement.
    - Provide guidance on using low-cost and digital TLMs.
    - Ensure alignment with the Academic Calendar for timely syllabus completion and assessment.

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GENERAL INFORMATION

EXAMINATION SCHEDULE

	FA1	FA2	SA1	FA3	FA4	SA2	Pre Final 1 For X Class	Pre Final 2 For X Class	Public Exams For X Class
Syllabus	Jun,July	Aug,Sep	June-Oct	Nov,Dec	Jan				
Time Slot	Aug-25 4-7	Oct-25 13-16	Nov-25 10-19	Jan-26 5-8	FEB-26 9-12	April-26 6-15	FEB-26 18-27	March-26 2-12	16.03.26 to 02.04.26

MONTH	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	TOTAL
No of working days For General	15	26	21	18	23	24	25	19	23	21	18	233
No of Holidays For General	4	5	10	12	8	6	6	12	5	10	5	83
No of working days For Minority	15	26	21	21	23	24	20	21	23	21	18	233
No of Holidays For Minority	4	5	10	9	8	6	11	10	5	10	5	83

FOR GENERAL SCHOOLS

Dasara Holidays	24.09.2025 to 02.10.2025
Pongal Holidays	10.01.2026 to 18.01.2026

FOR MINORITY SCHOOLS

Dasara Holidays	27.09.25 to 02.10.25
Christmas Holidays	21.12.25 to 28.12.25
Pongal Holidays	10.01.26 to 15.01.26

YEAR PLAN

S.NO	NAME OF THE CHAPTER	Month	No. of Instructional Periods Allocated	No. of Non-Instructional Periods Allocated	Total No of Periods
1.	Life processes	June July	16	13	29
2.	Control and coordination	August	8	4	12
3.	How do organisms reproduce	Sep	9	5	14
4.	Heredity	Oct	5	5	10
5.	Our Environment	Nov	7	2	9

June 2025

No bag Day — T1J2G6

Cluster Complex — Q3Y5K3

Teacher Resources — X9H6L6

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 Sunday	2	3	4	5	6	7 Bakr Eid
8 Sunday	9	10	11	NI 12 Reopening day	13 NI	14 Second Saturday
15 Sunday	16 5.1 – activities 5.1, 5.2 + NI	17	18	19	20	21 International Yoga Day ~~No Bag Day~~
22 Sunday	23 5.2.2 – 5.3	24	25	26	27	28 No Bag Day Mega PTM
29 Sunday National Statistics ~~Day~~	30 NI					

Week1:

Week 2:

Week 3: 5.1 – 5.2

Week 4: 5.2.2 – 5.3

Week 5:

↓ TEACHER'S NOTES ↓

July 2025

No bag Day — T1J2G6

Cluster Complex — Q3Y5K3

Teacher Resources — X9H6L6

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 5.3 – 5.4	2	3	4	5 No Bag Day
6 Sunday Muharram	7 5.4 + NI	8	9	10	11	12 Second Saturday
13 Sunday	14 5.4 – 5.4.2 + 2NI	15	16	17	18	19 No Bag Day Cluster meeting
20 Sunday	21 5.5 – 5.5.2 +NI	22	23	24	24	26 No Bag Day SMC Meeting
27 Sunday	28 NI	29 NI	30 NI	31 NI		

Week1: 5.3 – 5.4

Week 2: 5.4

Week 3: 5.4 -5.4.2

Week 4: 5.5 – 5.5.2

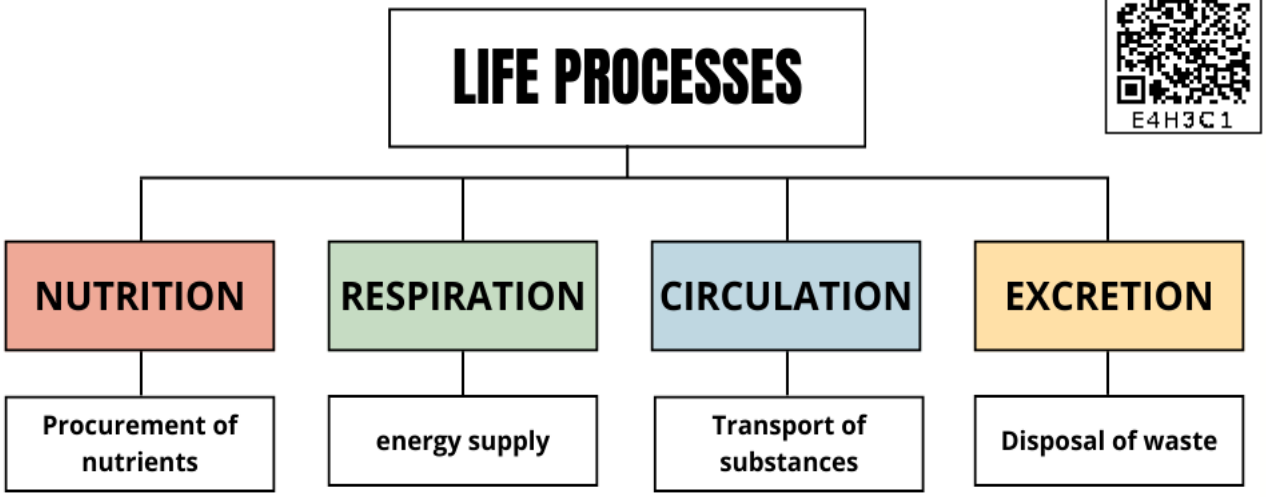
Week 5:

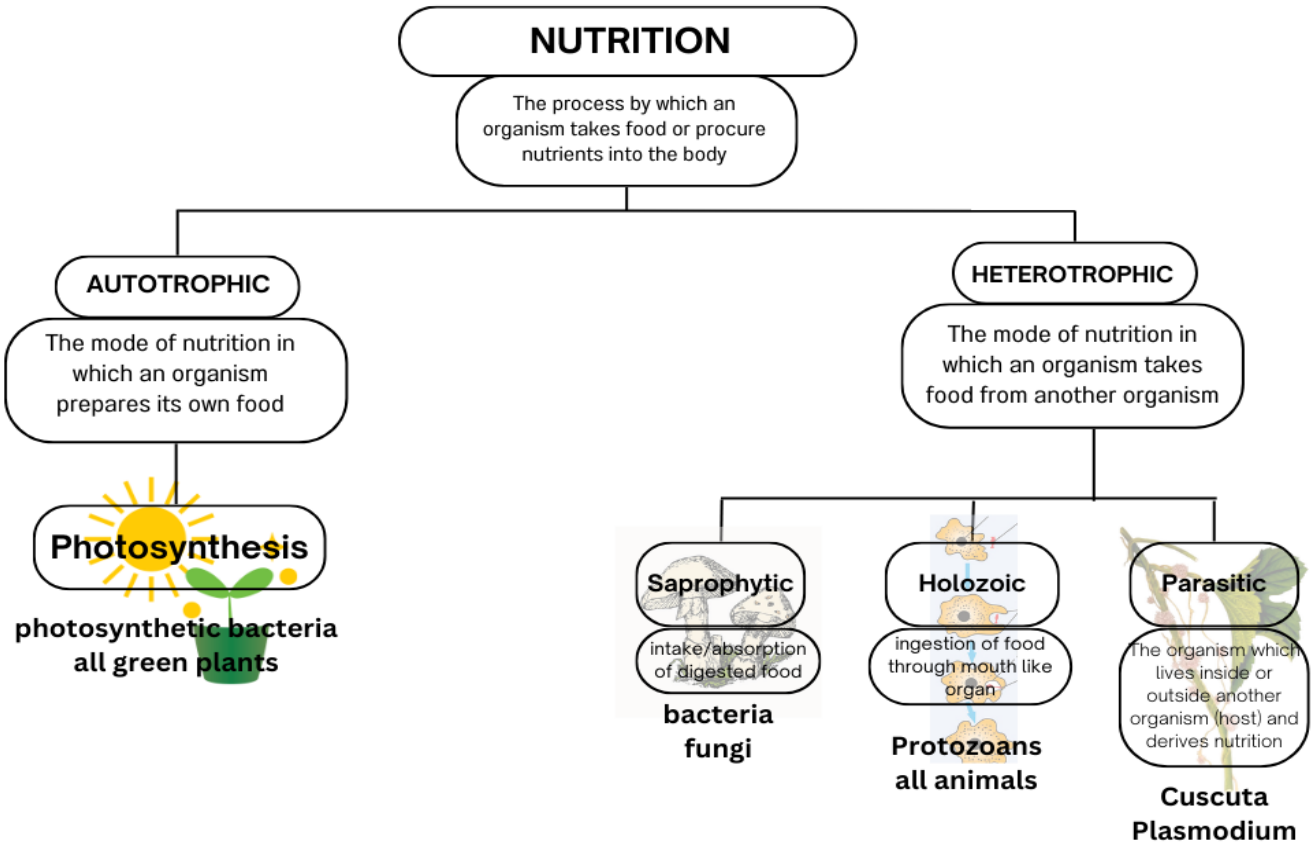
↓ TEACHER'S NOTES ↓

Unit 1 – Life Processes

No of Teaching periods: 16

Concept maps





Learning Outcomes: Student will be able to

identify the life processes in organisms	explain autotrophic nutrition in plants
conduct activities to understand photosynthesis	list out the heterotrophic nutrition methods in organisms
draw the diagram of digestive system	conduct various activities to understand the process of respiration
differentiate between aerobic and anerobic respiration	list out different respiratory organs in animals
explain the process of human respiration	explain the process of transportation
draw a neat labelled diagram of human heart	explain the cardiac cycle
differentiate the blood vessels	explain the transport of materials in xylem and phloem
draw the diagram of excretory system	identifies the excretory products of plants

Period wise division of concepts:

Concept	No of periods	Timeline of teaching	Any specific information
Introduction, 5.1 What Are Life Processes	1		
5.2 Nutrition, Autotrophic Nutrition	1		
Activity - 5.1, 5.2	1		
5.2.2 Heterotrophic Nutrition, 5.2.3 How Do Organisms Obtain Their Nutrition	1		
5.2.4 Nutrition in Human Beings	1		
5.3 Respiration, Activity-5.4,5.5	1		
Aerobic And Anerobic Respiration	1		
Respiration In Terrestrial and Aquatic Animals	1		
Human Respiratory System	1		
5.4 Transportation, Transportation in Human Beings	1		
Our Pump the Heart	1		
Oxygen Enters the Blood in The Lungs	1		
The Tubes- Blood Vessels	1		
5.4.2 Transportation in Plants	1		
5.5 Excretion, 5.5.1 Excretion in Human Beings	1		
5.5.2 Excretion in Plants	1		

Prior concepts and skills:

Students should be familiar with the hierarchical structure of living organisms, from cells (the basic unit of life) to tissues (groups of similar cells performing a specific function), organs (structures made of tissues), and organ systems (groups of organs working together).

Terms like "nutrition," "respiration," "transportation," "excretion," and "reproduction" should be familiar, as these are the core concepts of life processes.

Students should be able to interpret diagrams of various body systems (like the digestive, circulatory, and respiratory systems) and understand how different parts contribute to the overall function.

A basic understanding of how organisms obtain and utilize energy, including concepts like digestion, respiration, and the flow of nutrients through the body is important.

Teacher References:

Any external links that would help teachers to create activities on their own. This includes NCERT Material, OERs, Digital links etc.

TLM required:

Charts, models, materials for the experiments and dissection kit etc.

Behavioral expectations: Students will be able to

- listen attentively when others are speaking.
- actively participate in classroom discussions and activities
- bring the required material to class every day
- complete our tasks (classroom and homework) on time

Period – 1

Concepts to be covered: Introduction
What are life processes?

Learning objectives: The student will be able to

Identify the life processes in organisms.

Prior concepts/skills:

Student had a fair idea about the characteristics of living organisms.

Different life processes learnt in 7th class.

Igniting activity/Hook line: By asking the following question What Makes Something Alive? The teacher can start the lesson.

<table>
<tr><th>Explicit teaching/Teacher Modelling (I Do)</th><th>Group Work (We Do)</th><th>You do (independent practice)</th></tr>
<tr><td>Introduce the concept of life processes and ask students what they think it means.
Deliver a lecture on the different life processes, including nutrition, respiration, transportation, and excretion.
Provide guidance and support to students during group and individual activities.

Factual Questions
1. What are some characteristics that distinguish living organisms from non-living things?
2. What are life processes, and why are they necessary for living organisms?
Open ended questions</td><td>Divide students into small groups and assign each group a case study of a different organism (e.g. plant, animal, human).
Ask each group to identify and discuss the different life processes that occur in their assigned organism.
Have groups compare and contrast the life processes of their organism with those</td><td>Students should create a concept map illustrating the different life processes and how they are interconnected.

Home work
Identify the following functions with a tick mark
<table><tr><td>Functions</td><td>Plant</td><td>Animal</td></tr><tr><td>Digestion</td><td></td><td></td></tr><tr><td>Reproduction</td><td></td><td></td></tr><tr><td>Coordination</td><td></td><td></td></tr><tr><td>Excretion</td><td></td><td></td></tr><tr><td>Respiration</td><td></td><td></td></tr><tr><td>Photosynthesis</td><td></td><td></td></tr></table></td></tr>
</table>

Imagine you are a scientist studying a new organism that has just been discovered. How would you determine whether this organism is alive, and what life processes it might possess?	of other organisms.	

Summary:

Living organisms are characterized by molecular movements that maintain their organized structures.

Life processes, such as nutrition, respiration, transportation, and excretion, are necessary for maintaining these structures and preventing damage.

These processes require energy, which is obtained from outside the body through food and converted into a usable form.

In multi-cellular organisms, specialized tissues perform specific functions, including uptake of food and oxygen, transportation, and excretion.

The complexity of an organism's body design determines the complexity of its life processes.

Assessment:

How do plants and animals obtain energy?

List out the life processes and their role in living organisms.

Period – 2

Concepts to be covered: Nutrition
Autotrophic nutrition

Learning objectives: The student will be able to

explain autotrophic nutrition in plants.

Prior concepts/skills:

Student had a fair idea about the characteristics of living organisms.

Different life processes learnt in 7th class.

Igniting activity/Hook line: The Energy Puzzle

Ask students to think about where they get their energy from and how plants obtain their energy.

Discuss on:

- What do you think is the main source of energy for humans?
- How do plants make their own food?
- What would happen if plants didn't have sunlight?

Divide students into small groups and ask them to brainstorm and list all the ways they think about how living organisms get their energy.

Explicit teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**You do (independent practice)**
Introduce the concept of nutrition in living organisms, highlighting the importance of energy and materials for growth, development, and maintenance. Deliver a lecture on autotrophic and heterotrophic nutrition, explaining the processes of photosynthesis and the role of chlorophyll, sunlight, carbon dioxide, and water. Factual Questions 1. What is the primary source of energy for living organisms? 2. What is the difference between autotrophic and heterotrophic nutrition? 3. What is photosynthesis, and what are the raw materials required for it?	Divide students into small groups and assign each group a different type of organism (e.g., plants, animals, fungi). Ask each group to research and compare the nutritional processes of their assigned organism, highlighting similarities and	write a short report on the importance of photosynthesis in our ecosystem. Home work Draw a neat labelled diagram of TS of leaf. Write the equation of photosynthesis and list out requirements and end products.

4. What is the role of chlorophyll in photosynthesis? Open ended questions 1. How do you think the process of photosynthesis supports life on Earth? 2. What would happen if all plants suddenly lost their ability to undergo photosynthesis? Organism is alive, and what life processes it might possess?	differences.	

Summary:

Living organisms require energy and materials to sustain life, which they obtain through different modes of nutrition.

Autotrophs, such as plants, produce their own food through photosynthesis, using sunlight, carbon dioxide, and water.

Heterotrophs, including animals and fungi, rely on autotrophs for their energy and materials.

Photosynthesis involves the absorption of light energy by chlorophyll, conversion of light energy to chemical energy, and reduction of carbon dioxide to carbohydrates.

Plants store excess energy produced during photosynthesis in the form of starch, which serves as an internal energy reserve.

Assessment:

Define photosynthesis and write a balanced equation for photosynthesis.

Describe the role of chloroplast in photosynthesis.

Period – 3

Concepts to be covered: Opening and closing of stomata.
Activity 5.1
Activity 5.2

Learning objectives: The student will be able to

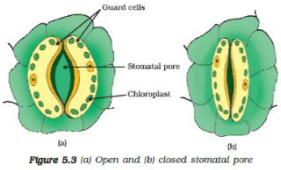
Conduct activities to understand photosynthesis.

Prior concepts/skills:

Students had some knowledge regarding requirements of photosynthesis.

Learnt about stomata.

Igniting activity/Hook line: How Plants Obtain Carbon Dioxide, discuss in groups and think of possible answers.

Explicit teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**You do (independent practice)**
1. Introduce the concept of stomata and their role in gaseous exchange for photosynthesis. 2. Demonstration: Conduct Activity 5.1 to demonstrate the presence of starch in leaves and the importance of sunlight for photosynthesis. 3. Experiment: Conduct the experiment with two potted plants to demonstrate the importance of carbon dioxide for photosynthesis. Factual Questions 1. How do guard cells regulate the opening and closing of stomata? 2. What is the importance of carbon dioxide for	1. Divide students into small groups and ask them to discuss the following questions: - How do plants obtain carbon dioxide? - What is the role of stomata in gaseous exchange? - How does the plant regulate the opening and closing of stomata? 2. Design an Experiment: Ask each group to design an experiment to demonstrate	Ask students to observe the color change of the leaf during the starch test and record their observations. Home work Draw the diagram of stomata.  Figure 5.3 (a) Open and (b) closed stomatal pore

photosynthesis? Open ended questions What would happen to plant growth and development if stomata were unable to open and close properly?	the importance of sunlight, carbon dioxide, or water for photosynthesis.	

Summary:

Plants obtain carbon dioxide through tiny pores called stomata, which are present on the surface of leaves, stems, and roots.

The stomata open and close due to the swelling and shrinking of guard cells, regulating gas exchange and water loss.

Plants use carbon dioxide, sunlight, and water to produce starch through photosynthesis, as demonstrated by the starch test and the experiment with potassium hydroxide.

Autotrophs also require other raw materials like nitrogen, phosphorus, iron, and magnesium, which are taken up from the soil.

These essential nutrients are used to synthesize proteins and other compounds necessary for plant growth and development.

Assessment:

Describe an experiment to prove carbon dioxide is essential for photosynthesis.

Draw a neat labelled diagram showing opening and closing of stomata.

Period – 4

Concepts to be covered: 5.2.2 Heterotrophic Nutrition ,
5.2.3 How Do Organisms Obtain Their Nutrition

Learning objectives: The student will be able to

list out the heterotrophic nutrition methods in organisms.

Prior concepts/skills:

Students learnt about what is heterotrophic nutrition.

Igniting activity/Hook line: Lead a class discussion to explore the different strategies used by organisms to obtain their nutrition, such as saprotrophic, holozoic, and parasitic nutrition.

Explicit teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**You do (independent practice)**
1. 1. Deliver a lecture on heterotrophic nutrition, highlighting the different strategies used by organisms to obtain their nutrition. 2. Demonstration: Use diagrams or models to demonstrate how different organisms obtain their nutrition, such as Amoeba and Paramecium. 3. Discussion: Lead class discussions to explore the importance of nutrition for organism survival and growth. Factual Questions 1. What are the different strategies used by organisms to obtain their nutrition, such as saprotrophic, holozoic, and parasitic nutrition? 2. How do single-celled organisms like Amoeba and Paramoecium obtain their nutrition? Open ended questions	1. 1. Divide students into small groups and assign each group a different organism, such as a cow, lion, or fungus. 2. Research: Ask each group to research and present on how their assigned organism obtains its nutrition, including the digestive system and any specialized structures. 3. Comparison: Ask groups to compare and contrast the nutritional strategies of different organisms.	Ask students to draw diagrams illustrating the different strategies used by organisms to obtain their nutrition, such as saprotrophic, holozoic, and parasitic nutrition. Home work Differentiate saprotrophic nutrition and holozoic nutrition.

What would happen if an organism's digestive system was unable to break down a particular type of nutrient?		

Summary:

Heterotrophic organisms obtain their nutrition by consuming other organisms or organic matter.
Different organisms use various strategies to obtain their nutrition, including saprotrophic, holozoic, and parasitic nutrition.
Single-celled organisms like Amoeba and Paramoecium use unique structures to obtain and digest their food.
The digestive system of an organism is adapted to its diet and environment, allowing it to break down and absorb nutrients.
Understanding heterotrophic nutrition can provide insights into the diversity of life and the complex relationships between organisms and their environment.

Assessment:

Describe the process of nutrition in amoeba.

Period – 5

Concepts to be covered: 5.2.4 Nutrition in Human Beings

Learning objectives: The student will be able to

Draw the diagram of human digestive system.
Understand the process of digestion in human beings.

Prior concepts/skills:

Students had some knowledge regarding eating food.
Heterotrophic nutrition.

Igniting activity/Hook line: The Digestive Journey"

To introduce the concept of the human digestive system and the process of digestion.
Use a model or diagram to simulate the journey of food through the digestive system, highlighting the different parts and their functions.

Explicit teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**You do (independent practice)**
1. 1. Deliver a lecture on the human digestive system, highlighting the structure and function of different parts, including the mouth, esophagus, stomach, small intestine, and large intestine. 2. Demonstration: Use diagrams or models to demonstrate the process of digestion, including the role of enzymes and acids. Factual Questions 1. What is the main function of the digestive system in the human body? 2. Which enzyme is present in saliva that breaks down starch? 3. What is the role of hydrochloric acid in the stomach? 4. Where does the complete digestion of carbohydrates, proteins, and fats take place in the human body? 5. What is the function of villi in the small intestine?? Open ended questions What would happen if the small intestine was not able to absorb nutrients properly?	1. Divide students into small groups and assign each group a different digestive disorder, such as acidity or lactose intolerance. 2. Ask each group to study and present on the causes, symptoms, and treatment options for their assigned disorder. 3. Ask groups to compare and contrast different digestive disorders and their effects on the body.	3. write about a specific digestive enzyme or acid, including its function and importance in the digestive process. Home work Draw the diagram of Human digestive system.

Summary:

Plants obtain carbon dioxide through tiny pores called stomata, which are present on the surface of leaves, stems, and roots.

The stomata open and close due to the swelling and shrinking of guard cells, regulating gas exchange and water loss.

Plants use carbon dioxide, sunlight, and water to produce starch through photosynthesis, as demonstrated by the starch test and the experiment with potassium hydroxide.

Autotrophs also require other raw materials like nitrogen, phosphorus, iron, and magnesium, which are taken up from the soil.

These essential nutrients are used to synthesize proteins and other compounds necessary for plant growth and development.

Assessment:

1. What is the role of the acid in our stomach?
2. What is the function of digestive enzymes?
3. How is the small intestine designed to absorb digested food?

Period – 6

Concepts to be covered: 5.3 Respiration
Activity-5.4
Activity 5.5

Learning objectives: The student will be able to

conduct various activities to understand the process of respiration.

Prior concepts/skills:

Students had some knowledge regarding respiration.

Breathing.

Igniting activity/Hook line: Take a deep breath in and out - can you think about where the air is going and what's happening in your body?

Explicit teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**You do (independent practice)**
1Introduce the concept of respiration and its importance in living organisms. 2. Demonstration: Conduct Activity 5.4 to demonstrate the presence of carbon dioxide in exhaled air. 3. Explanation: Explain the process of respiration, including the role of oxygen and carbon dioxide. 4. Discussion: Lead a class discussion to explore the importance of respiration in different organisms. Factual Questions 1. What happens when carbon dioxide is passed through lime water? 2. What is the role of yeast in fermentation? 3. What is the product of fermentation that reacts with lime water? Open ended questions How do you think the rate of fermentation would be affected by changing the temperature or pH of the mixture?	Fermentation Experiment: Divide students into small groups and ask them to conduct Activity 5.5 to investigate the products of fermentation. 2. Discussion: Ask each group to discuss and record their observations, and draw conclusions about the products of fermentation. 3. Presentation: Ask each group to present their findings to the class.	write a short report on the importance of respiration and fermentation in living organisms. Home work Write the procedure of fermentation experiment.

Summary:

The activities demonstrate the presence of carbon dioxide in exhaled air and the production of carbon dioxide during fermentation.

When carbon dioxide is passed through lime water, it turns milky due to the formation of calcium carbonate.

The time taken for lime water to turn milky can indicate the amount of carbon dioxide present.

Yeast plays a crucial role in fermentation, converting sugars into carbon dioxide and other products.

These activities illustrate the importance of carbon dioxide in biological processes and its applications in various fields.

Assessment:

Describe an experiment to prove carbon dioxide is released during respiration.

Period – 7

Concepts to be covered: Aerobic and Anerobic Respiration

Learning objectives: The student will be able to

differentiate between aerobic and anerobic respiration.

Prior concepts/skills:

Students had some knowledge regarding Respiration.

Fermentation process.

Igniting activity/Hook line: Imagine you're running a marathon - where does your body get the energy to keep you going?

Explicit teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**You do (independent practice)**
1Introduce the concept of cellular respiration and its importance in living organisms. 2. Explanation: Explain the process of cellular respiration, including glycolysis, aerobic respiration, and anaerobic respiration. 3. Diagram: Use diagrams to illustrate the different pathways of glucose breakdown and the production of ATP. 4. Discussion: Lead a class discussion to explore the importance of oxygen in aerobic respiration and the consequences of impaired cellular respiration. Factual Questions 1. What is the first step in the breakdown of glucose in cells? 2. What is the difference between aerobic and anaerobic respiration? 3. What is the product of anaerobic respiration in yeast? Open ended questions What would happen if oxygen was not available for aerobic respiration in cells?	Divide students into small groups and assign each group a different scenario, such as intense exercise or low oxygen levels. 2. Discussion: Ask each group to discuss how cellular respiration would be affected in their assigned scenario and present their findings to the class. 3. Comparison: Ask groups to compare and contrast aerobic and anaerobic respiration.	: Ask students to draw a diagram of the cellular respiration pathway, labeling the different stages and products. 2. Writing: Ask students to write a short report on the importance of ATP in cellular processes and its role in energy transfer. . Home work Draw a flow chart showing different types of cellular respiration.

Summary:

Cellular respiration is the process by which cells generate energy from glucose.

There are two types of respiration: aerobic, which involves oxygen, and anaerobic, which does

not involve oxygen.

Aerobic respiration produces more energy than anaerobic respiration and results in the production of carbon dioxide and water.

Anaerobic respiration, on the other hand, produces lactic acid or ethanol and carbon dioxide.

ATP is the energy currency of the cell, and it is produced during cellular respiration to fuel various cellular processes.

Assessment:

Write the differences and similarities between aerobic and anaerobic respiration.

Expand ATP.

Period – 8

Concepts to be covered: Respiration in Terrestrial and Aquatic Animals

Learning objectives: The student will be able to

list out different respiratory organs in animals.

Prior concepts/skills:

Students had some knowledge regarding respiration and respiratory system in different animals.

Igniting activity/Hook line: Have you ever wondered how fish breathe underwater, while humans need air to breathe?

Explicit teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**You do (independent practice)**
1. Introduce the concept of breathing in animals and the differences between aquatic and terrestrial organisms. 2. Demonstration: Conduct Activity 5.6 to observe the breathing mechanism of fish in an aquarium. 3. Explanation: Explain the process of gas exchange in fish and terrestrial animals, highlighting the differences in breathing mechanisms. 4. Discussion: Lead a class discussion to explore the importance of adaptations in breathing mechanisms for different environments. Factual Questions 1. What is the function of gills in fish? 2. What is the purpose of increasing surface area in respiratory organs? Open ended questions What would happen if the surface area of the respiratory organ was reduced?	1. Divide students into small groups and ask them to compare and contrast the breathing mechanisms of fish and terrestrial animals. 2. Ask each group to study and present on a different type of animal, such as insects, amphibians, or mammals, and their unique breathing mechanisms. 3. Discussion: Ask groups to discuss the advantages and disadvantages of different breathing mechanisms.	Ask students to draw a diagram of the breathing mechanism in fish or a terrestrial animal, labeling the different parts and their functions. Ask students to write a short report on the importance of adaptations in breathing mechanisms for different environments. Home work List out different respiratory organs in different animals.

Summary:

Animals have evolved different respiratory systems to adapt to their environments.

Fish use gills to extract oxygen from water, while terrestrial animals use lungs or other organs to absorb oxygen from the atmosphere.

The rate of breathing in aquatic organisms is faster than in terrestrial organisms due to the lower oxygen concentration in water.

Respiratory organs have a large surface area to facilitate gas exchange and are often protected within the body.

The breathing mechanism in animals is adapted to their specific environment, allowing them to survive and thrive in different conditions.

Assessment:

Describe the respiration process in a fish.

What are the common features in all the respiratory systems?

Period – 9

Concepts to be covered: Human Respiratory System

Learning objectives: The student will be able to

explain the process of human respiration.

Prior concepts/skills:

Students had some knowledge regarding requirements of respiratory system in human beings.

Breathing.

Igniting activity/Hook line: Take a deep breath in and out - can you think about the journey of oxygen in your body?

Explicit teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**You do (independent practice)**
1. Introduce the concept of the human respiratory system and its importance. 2. Explanation: Explain the structure and function of the respiratory system, including the role of the lungs, diaphragm, and haemoglobin. 3. Diagram: Use diagrams to illustrate the respiratory system and the process of gas exchange. 4. Discussion: Lead a class discussion to explore the importance of respiratory health and the risks of smoking. Factual Questions 1. What is the function of the respiratory system? 2. What is the role of haemoglobin in the body? 3. How does the diaphragm help in breathing? Open ended questions What would happen if diaphragm fail to work properly?	Divide students into small groups and ask them to create a model of the respiratory system. 2. Discussion: Ask each group to discuss and present on the importance of respiratory health and ways to maintain it.	Ask students to draw a diagram of the respiratory system, labeling the different parts and their functions. 2. Writing: Ask students to write a short report on the importance of respiratory health and the risks of smoking. Home work Draw the diagram of human respiratory system.

Summary:

The human respiratory system is responsible for bringing oxygen into the body and removing carbon dioxide.

The lungs, diaphragm, and haemoglobin work together to facilitate gas exchange and oxygen delivery to tissues.

The respiratory system is adapted to its environment, with features such as the alveoli and haemoglobin that enable efficient gas exchange.

Respiratory health is important, and smoking can have serious consequences for the lungs and overall health.

Understanding the respiratory system can help us appreciate the importance of maintaining good respiratory health.

Assessment:

What is the role of alveoli in the lungs?

Write the pathway of air into the lungs?

Period 10

Learning Objectives: Explains the process of transportation in Human

Teaching Learning Material (TLM): Human circulatory system chart.

I Do	We do	You Do
Teacher explains that…. • We have seen in previous sections that blood transports food, oxygen and waste materials in our bodies. • In Class IX, we learnt about blood being a fluid connective tissue. • Blood consists of a fluid medium called plasma in which the cells are suspended. • Plasma transports food, carbon dioxide and nitrogenous wastes in dissolved form. • Oxygen is carried by the red blood corpuscles. Many other substances like salts, are also transported by the blood. • We thus need a pumping organ to push blood around the body. • A network of tubes to reach all the tissues and a system in place to ensure that this network can be repaired if damaged • This distributing system is called as Transport system.	• Observe the circulatory system chart and discussion about the parts of it.	• Visit a health center in your locality and find out what is the normal range of haemoglobin content in human beings. • Is it the same for children and adults? • Is there any difference in the haemoglobin levels for men and women?

SUMMARY:

The circulatory system has heart, blood, blood vessels. The circulatory system is using for transportation of respiratory gases, hormones, nitrogen wastes, digested food.

Assignment:

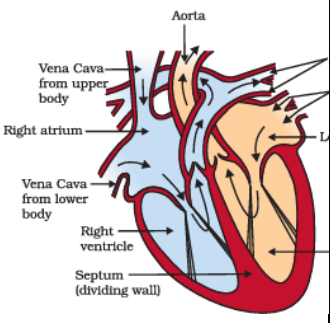
1. What is the use of circulatory system?
2. Which organ is working as a pumping device?
3. What are the parts of circulatory system?

Period 11

Learning Objectives: Draw a neat labelled diagram of human heart
Describe the structure of heart

Teaching Learning Material (TLM): Heart model

I Do	We do	You Do
The teacher explains the structure of heart by showing the model….	• Discussion about the	• Collect information

• The heart is a muscular organ which is as big as our fist. • The heart has different chambers to prevent the oxygen-rich blood from mixing with the blood containing carbon dioxide. • The carbon dioxide-rich blood has to reach the lungs for the carbon dioxide to be removed, and the oxygenated blood from the lungs has to be brought back to the heart. • This oxygen-rich blood is then pumped to the rest of the body. • Oxygen-rich blood from the lungs comes to the thin-walled upper chamber of the heart on the left, the left atrium. • The left atrium relaxes when it is collecting this blood. It then contracts, while the next chamber, the left ventricle, relaxes, so that the blood is transferred to it. • n the muscular left ventricle contracts in its turn, the blood is pumped out to the body. • De-oxygenated blood comes from the body to the upper chamber on the right, the right atrium, as it relaxes. • As the right atrium contracts, the corresponding lower chamber, the right ventricle, dilates. • This transfers blood to the right ventricle, which in turn pumps it to the lungs for oxygenation. • Since ventricles have to pump blood into various organs, they have thicker muscular walls than the atria do. • Valves ensure that blood does not flow backwards when the atria or ventricles contract.	structure of heart. • Describe the heart related diseases.  • Discussion on functioning of heart.	about heart diseases from a cardiologist. • Go to nearby PHC and know much about the precautions for heart care.

SUMMARY:

The heart has four chambers. The upper chambers are auricles and the lower chambers are the ventricles. The heart supply blood to body parts through arteries and receive the blood from body through the veins. The right portion of heart has deoxygenated blood and the left portion has the oxygenated blood.

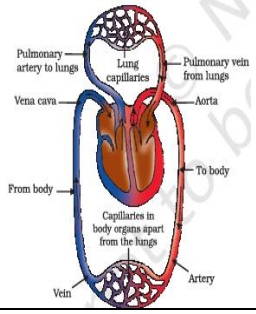
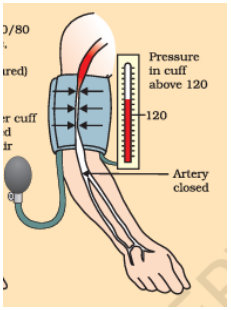
ASSIGNMENT:

1. What is the size of the heart?
2. Which part of the heart receives the blood from body parts?
3. Which blood vessel carries blood to lungs from heart?

Period 12

Learning Objectives: Explain the cardiac cycle.
Describe the single and double circulation.

Teaching Learning Material (TLM): Blood vessels chart, circulatory system model.

I Do	We do	You Do
The teacher explains…. • The separation of the right side and the left side of the heart is useful to keep oxygenated and de oxygenated blood from mixing. • Such separation allows a highly efficient supply of oxygen to the body. • This is useful in animals that have high energy needs, such as birds and mammals, which constantly use energy to maintain their body temperature. • In animals that do not use energy for this purpose, the body temperature depends on the temperature in the environment. • The animals, like amphibians or many reptiles have three-chambered hearts, and tolerate some mixing of the oxygenated and de-oxygenated blood streams. • Fishes, on the other hand, have only two chambers to their hearts, and the blood is pumped to the gills, is oxygenated there, and passes directly to the rest of the body. • Blood goes only once through the heart in the fish during one cycle of passage through the body. • If blood goes through the heart twice during each cycle in other vertebrates. This is known as double circulation. 	Checking the blood pressure of students by using Sphygmomanometer.  • Blood pressure is measured with an instrument called sphygmomanometer. • High blood pressure is also called hypertension and is caused by the constriction of arterioles, which results in increased resistance to blood flow. • It can lead to the rupture of an artery and internal bleeding.	• Check the BP of individuals . • Collect information of single and double circulations.

SUMMARY:

In the animals like fishes the blood flows only once through the heart this is called single circulation. But in animals like Amphibians, reptiles, birds and mammals blood flows twice through the heart is called is called double circulation.

ASSIGNMENT:

1. What is single circulation?
2. What is the normal blood pressure of man?
3. Name instrument useful for measuring BP?
4. Give examples for double circulation.

Period 13

Learning Objectives: Differentiate the blood vessels.
Teaching Learning Material (TLM): Arteries and Veins chart.

I Do	We do	You Do
The teacher explains the concept… • Arteries are the vessels which carry blood away from the heart to various organs of the body. • The blood emerges from the heart under high pressure, the arteries have thick, elastic walls. • Veins collect the blood from different organs and bring it back to the heart. • They do not need thick walls because the blood is no longer under pressure, instead they have valves that ensure that the blood flows only in one direction. • On reaching an organ or tissue, the artery divides into smaller and smaller vessels to bring the blood in contact with all the individual cells. • The smallest vessels have walls which are one-cell thick and are called capillaries. • Exchange of material between the blood and surrounding cells takes place across this thin wall. • The capillaries then join together to form veins that convey the blood away from the organ or tissue. • Blood platelet cells which circulate around the body and plug these leaks by helping to clot the blood at these points of injury **Lymph:** • There is another type of fluid also involved in transportation. This is called lymph or tissue fluid. • Through the pores present in the walls of capillaries some amount of plasma, proteins and blood cells escape into intercellular spaces in the tissues to form the tissue fluid or lymph. • It is similar to the plasma of blood but colourless and contains less protein. • Lymph drains into lymphatic capillaries from the intercellular spaces, which join to form large lymph vessels that finally open into larger veins. • Lymph carries digested and absorbed fat from intestine and drains excess fluid from extra cellular space back into the blood.	• Discussion about blood cells. • Discussion about lymph.	• Collect information about Edema.

SUMMARY:

There are three types of blood vessels in animals. Arteries carry oxygenated blood from heart to body parts. Veins carry deoxygenated blood from body parts to heart. These two blood vessels are

connected through minute blood vessels called blood capillaries. Along with blood another liquid lymph is also present in circulatory system.

ASSIGNMENT:

1. What is the use of lymph in our body?
2. What are blood capillaries?
3. How blood vessels get protection from injuries?

Period 14

Learning Objectives: explain the transport of materials in xylem and phloem

.**Teaching Learning Material (TLM):** Xylem and phloem charts and models.

Igniting Activity:

Take two small pots of approximately the same size and having the same amount of soil. One should have a plant in it. Place a stick of the same height as the plant in the other pot. Cover the soil in both pots with a plastic sheet so that moisture cannot escape by evaporation. Cover both sets, one with the plant and the other with the stick, with plastic sheets and place in bright sunlight for half an hour.

I Do	We do	You Do
The teacher explains.. • Plant transport systems will move energy stores from leaves and raw materials from roots. • The two pathways are constructed as independently organized conducting tubes. One, the xylem moves water and minerals obtained from the soil. • The other, phloem transports products of photosynthesis from the leaves where they are synthesized to other parts of the plant. **Transport of water** : • In xylem tissue, vessels and tracheids of the roots, stems and leaves are interconnected to form a continuous system of water-conducting channels reaching all parts of the plant. • At the roots, cells in contact with the soil actively take up ions. This creates a difference in the concentration of these ions between the root and the soil. • Through the stomata is replaced by water from the xylem vessels in the leaf. In fact, evaporation of water molecules from the cells of a leaf creates a suction which pulls water from the xylem cells of roots. The loss of water in the form of vapor from the aerial parts of the plant is known as transpiration. **Transport of food:** • The products of metabolic processes like photosynthesis, are moved from	**Conducting the experiment……..** • Take two small pots of approximately the same size and having the same amount of soil. • One should have a plant in it. Place a stick of the same height as the plant in the other pot. • Cover the soil in both pots with a plastic sheet so that moisture cannot escape by evaporation. • Cover both sets, one with the plant and the other with the stick, with plastic sheets and place in bright sunlight for half an hour.	• Collect information about xylem and phloem. • Explain the uses of transpiration.

leaves, where they are formed to other parts of the plant. This transport of soluble products of photosynthesis is called translocation and it occurs in the part of the vascular tissue known as phloem. • The translocation of food and other substances takes place in the sieve tubes with the help of adjacent companion cells both in upward and downward directions.		

SUMMARY:

The xylem transports water and minerals, the phloem transports food material.

ASSIGNMENT:

1. What is transpiration?
2. What are the cells present in the xylem?
3. What are the commercial uses of phloem?

Period – 15

Concepts to be covered: 5.5 Excretion,
5.5.1 Excretion in Human Beings

Learning objectives: The student will be able to
draw the diagram of excretory system.

Prior concepts/skills:
Student had a fair idea about elimination of waste and urination.

Igniting activity/Hook line: Have you ever wondered how your body gets rid of waste products? Let's explore the excretory system!

Explicit teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**You do (independent practice)**
Introduce the concept of excretion and its importance in human beings. 2. Explanation: Explain the structure and function of the kidneys, nephrons, and other parts of the excretory system. 3. Diagram: Use diagrams to illustrate the excretory system and the process of urine formation. 4. Discussion: Lead a class discussion to explore the importance of kidney function and the consequences of kidney failure. Factual Questions 1. What is the function of the kidneys in the excretory system? 2. What is the role of nephrons in the kidneys? Open ended questions Suggest some ways to promote kidney health and prevent renal failure.	Divide students into small groups and ask them to create a model of the excretory system. 2. Discussion: Ask each group to discuss and present on the importance of organ donation and transplantation. 3. Case Study: Ask groups to research and present on a case study of a person who has undergone a kidney transplant or dialysis.	write a short report on the importance of kidney function and the consequences of kidney failure. Home work Draw a neat labelled diagram of human excretory system.

Summary:

The excretory system in human beings includes the kidneys, ureters, urinary bladder, and urethra.
The kidneys filter waste products from the blood and produce urine, which is stored in the urinary bladder until it is released.
The nephrons in the kidneys are responsible for filtering and reabsorbing substances.
Kidney failure can lead to serious health problems, and dialysis or transplantation may be necessary.
Organ donation and transplantation can save lives and improve the quality of life for individuals with organ failure.

Assessment:

Draw a neat labelled diagram of human excretory system.
What is dialysis?
Write slogans on organ donation.

Period – 16

Concepts to be covered: 5.5.2 Excretion in Plants

Learning objectives: The student will be able to

identifies the excretory products of plants.

Prior concepts/skills:

Student had a fair idea about transpiration, functioning of stomata.

Igniting activity/Hook line: Have you ever wondered how plants get rid of waste products? Let's explore the unique strategies of excretion in plants!

Explicit teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**You do (independent practice)**
Introduce the concept of excretion in plants and its importance. 2. Explanation: Explain the different mechanisms of excretion in plants, including transpiration, dead cells, vacuoles, resins and gums, and soil excretion. 3. Diagram: Use diagrams to illustrate the different mechanisms of excretion in plants. 4. Discussion: Lead a class discussion to explore the importance of excretion in plants and how it contributes to their overall health. Factual Questions 1. What is transpiration, and how does it contribute to excretion in plants? 2. How do dead cells contribute to excretion in plants? Open ended questions Can you think of any examples of plants that have unique adaptations for excretion?	Divide students into small groups and ask them to study and present on a specific mechanism of excretion in plants. 2. Comparison: Ask groups to compare and contrast the mechanisms of excretion in plants with those in animals. 3. Discussion: Ask groups to discuss and present on the importance of excretion in plants and its role in maintaining cellular health.	write a short report on the importance of excretion in plants and its role in regulating water balance. Home work List out mechanisms by which plants get rid of wastes.

Summary:

Plants have unique mechanisms of excretion that allow them to remove waste products and maintain

cellular health.
Transpiration, dead cells, vacuoles, resins and gums, and soil excretion are all important mechanisms of excretion in plants.
Excretion helps plants regulate their water balance and maintain cellular health.
Understanding the mechanisms of excretion in plants can help us appreciate the complexity and adaptability of plant biology.
Plants have evolved unique strategies for excretion that enable them to thrive in a wide range of environments.

Assessment:

Describe transpiration in terms of excretion.

Teacher reflections

Period no	**Name of the Concept to be taught**	**Date**	**Activities Conducted during the teaching**	**TLM Used**	**Student Response 1/2/3/4/5**	**Topics Indented to Reteach**	**Additional Resources Used to Reteach**
1	Introduction, 5.1 What Are Life Processes						
2	5.2 Nutrition, Autotrophic Nutrition						
3	Activity - 5.1, 5.2						
4	5.2.2 Heterotrophic Nutrition, 5.2.3 How Do Organisms Obtain Their Nutrition						
5	5.2.4 Nutrition in Human Beings						
6	5.3 Respiration, Activity- 5.4,5.5						
7	Aerobic And Anerobic Respiration						
8	Respiration In Terrestrial and Aquatic Animals						
9	Human Respiratory System						
10	5.4						

	Transportation, Transportation in Human Beings						
11	Our Pump the Heart						
12	Oxygen Enters the Blood in The Lungs						
13	The Tubes-Blood Vessels						
14	5.4.2 Transportation in Plants						
15	5.5 Excretion, 5.5.1 Excretion in Human Beings						
16	5.5.2 Excretion in Plants						

Signature of the HM

Signature of the teacher

Teacher reflections	Action plan
What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?	
Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?	
What additional resources or modifications could improve the effectiveness of this lesson in future implementations?	
How well did I adjust my teaching based on student reactions or unforeseen challenges?	

Any other specific information:

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August 2025

No bag Day | Cluster Complex | Teacher Resources

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 NI	2 No Bag Day
3 Sunday	4 FA - 1	5 FA - 1	6 FA - 1	7 FA - 1	8 Vara Lakshmi Vratham NI	9 Second Saturday
10 Sunday	11 6.1 – 6.1.2	12 6.1 – 6.1.2	13 6.1 – 6.1.2	14 6.1 – 6.1.2	15 Independence day	16 Sri Krishna Ashtami
17 Sunday	18 6.1.3 – 6.2.2	19 6.1.3 – 6.2.2	20 6.1.3 – 6.2.2	21 6.1.3 – 6.2.2	22 6.1.3 – 6.2.2	23 No Bag Day Cluster meeting
24 Sunday	25 6.2	26 6.3	27 Sri Vinayaka Chavithi	28 NI	29 National Sports day NI	30 No Bag Day
31 Sunday						

Week1: FA - 1

Week 2: 6.1 – 6.1.2

Week 3: 6.1.3 – 6.2.2

Week 4: 6.2 – 6.3

TEACHER'S NOTES

CONTROL AND COORDINATION

NO OF TEACHING PERIODS: 8

Learning Outcomes: Learners ….

explain the need of control and co-ordination in organisms
explain the reflex arch
describe the structure and function of human brain
draw a diagram of structure of a neuron
understand the co-ordination in plants
conduct experiment about phototropism
compare the chemical co-ordination in plants vs hormonal co-ordination in animals
identify the location of endocrine glands in our body

Period	Topic
1	Introduction, 6.1 Animals Nervous System
2	6.1.1 What Happens in Reflex Actions
3	6.1.2 Human Brain
4	6.1.3 How Are Tissues Protected, 6.1.4 How Does the Nervous Tissue Cause Action
5	6.2 Co-ordination in Plants ,6.2.1 Immediate Response to Stimulus https://youtu.be/YhGdLK78n7Y?si=Rb8f02xn0q6GgFUm
6	6.2.2 Moment Due to Growth
7	Harmons In Plants
8	6.3 Hormones in Animals

Chapter: Control and Coordination **Grade: 10** **Subject: Biology** **Period:1** **Concepts Covered:**

- Introduction
- 6.1 Animals Nervous System

Learning Objectives:

- Relates the function of sense organs with respect to stimuli.
- Differentiates various receptors located in the sense organs.
- Relates receptors with their function in sense organs
- Explains the process of control and coordination in animals with reference to nervous system
- Analyses and interprets the flowchart of the electric impulse formation.
- Exhibits creativity in designing static model of neuron.
- Explain the nerve cell and synapse.

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

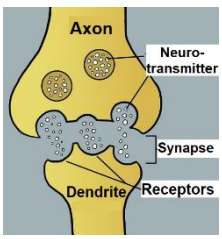
1. Nerve cell structure and function

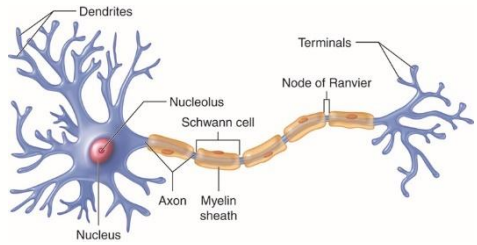
TLM Required: Images of nerve cell, synapse

Teacher Resources: (External links from DIKSHA and web pages)
https://www.khanacademy.org/science/biology/human-biology/neuron-nervous-system/a/overview-of-neuron-structure-and-function
Images of nerve cell and synapse
Igniting Activity:
Step 1: Visual Challenge (5 mins)
Show a short video clip or images of the following:

- A cat chasing a laser pointer
- A sunflower turning towards sunlight (timelapse)
- A robot moving its arm to pick something up
- Children playing and laughing
- A wind-up toy walking

Ask the class:
"Which of these do you think are *alive*? And *why*?"
"If something moves, does that automatically mean it's alive?"
Encourage quick responses and discussions. Some will say yes, others no
Step 2: The Twist (5 mins)
Now ask:
"If a sunflower moves slowly toward sunlight, and a robot moves quickly on wheels — which one do you think is responding to the environment more intelligently? Why?"
Let students reflect and share their thoughts.
Step 3: Big Reveal & Connection (5 mins)
Wrap up the discussion with something like:
"So, we've seen that movement alone doesn't always mean life. But when movement is carefully **controlled** and is a **response to the environment**, it tells us something deeper: the presence of a **coordination system** in the organism. In animals, this is mostly done through the **nervous system**."
"Today, we're going to dive into how animals detect what's going on around them and how they coordinate responses using specialised tissues like **nerves and muscles**."

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
Introduction • Begin with the *"Is It Really Alive?"* igniting activity (video/images discussion). • Clarify the concept of movement vs. life. • Introduce the idea of control and coordination in living organisms. **Concept Teaching**  	**Neural Relay Game** • Students form a line representing a neuron chain. – First student acts as receptor (receives a "stimulus" card). – Others pass it down as "impulses." – Last student converts the card into a "movement" (e.g., jumping or raising hand). • Reflect on how signal direction and coordination work.	**Diagram Labelling & Questions** • Students individually draw and label a diagram of a neuron (dendrite, cell body, axon, synapse). • Answer short questions: 1. Where is information received in a neuron? 2. What role does the synapse play? 3. What happens when you touch a

• Use a diagram of a neuron to explain the structure and flow of information through synapse with the help of diagrams and videos.  • Explain: – What are receptors and their locations – How electrical impulses travel in a neuron (dendrite → cell body → axon → synapse) – How impulses are transferred to other neurons or muscles via synapse		hot object? • Bonus: Reflective question – *Why is it useful for the body to respond quickly to certain changes?*

Summary:

1. Living organisms exhibit movement as a response to environmental changes, often controlled and purposeful, like plants growing toward light or animals reacting to stimuli.
2. In animals, the nervous system coordinates such responses using specialised tissues—nerve cells (neurons)—that detect stimuli and transmit impulses.
3. Neurons pass information through electrical impulses and chemical signals, enabling rapid communication between sense organs, brain, and muscles.

CFU

Factual Questions:

1. What is synapse?
2. Explain the structure of neuron in human beings.
3. What are receptors?

Open Ended Questions:

1. What might happen if the nervous system failed to transmit signals properly?

Quiz/ Assignment:

1. Which of the following is an example of movement not related to growth?

A. A seedling emerging from the soil
B. A sunflower turning toward light
C. A cat chasing a mouse
D. Roots growing downward into the soil

2. What role does the dendritic tip of a neuron play?

A. It releases chemicals across the synapse
B. It produces myelin sheath
C. It detects information from the environment
D. It generates energy for the neuron

3. What type of receptors detect taste?

A. Olfactory receptors
B. Gustatory receptors
C. Thermal receptors
D. Tactile receptors

4. What happens when an electrical impulse reaches the end of an axon?

A. It stops completely
B. It turns into a magnetic signal
C. It releases chemicals that cross the synapse

D. It strengthens the axon

5. Which system is primarily responsible for control and coordination in animals?

A. Circulatory system
B. Respiratory system
C. Nervous system
D. Digestive system

Chapter: Control and Coordination **Grade: 10** **Subject: Biology** **Period:2** **Concepts Covered:**

6.1.1 What Happens in Reflex Actions

Learning Objectives:

- Analyses the situations to predict how do people respond to sudden changes in the environment?
- Analyses the actions in the situation when a person touches a hot object
- Distinguishes between the actions coordinated by brain and spinal cord
- Draws a labelled diagram of Reflex arc.
- Explains the process of reflex arc.
- Applies the learning of reflex arc in hypothetical situation.

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

1. Nerve cell structure and function
2. The flow of information via synapse.
3. About the location of Brain and spinal cord

TLM Required: Images of reflex arc

Teacher Resources: (External links from DIKSHA and web pages)

https://youtu.be/Qiv8dUp_I3c?si=q1Fl92siWqlhiD6a
https://youtu.be/PVvKKpGlL3Y?si=YLMRyY2LIZ2h30Tb

Images of reflex arc in IFP

Igniting Activity:

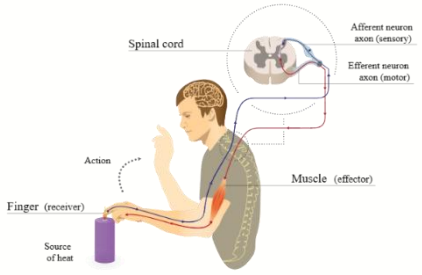
1. Pair up students or demonstrate in front of the class.
2. One student (or the teacher) holds the ruler vertically, with the 0 cm mark at the bottom.
3. The other student places their thumb and forefinger near the 0 cm mark—ready to catch—but not touching the ruler.
4. Without warning, the ruler is dropped.
5. The student must try to catch it as fast as possible using just their reflexes.
6. Note where their fingers catch the ruler. The smaller the distance it falls, the faster their reflex!

Discussion with the following Questions:

- Did you have time to *think* before you caught the ruler?
- Why do you think some people caught it faster than others?
- Can you imagine what would happen if your brain had to *think* through everything before reacting?
- Have you ever pulled your hand back from something hot without even realizing it at first? What do you think was happening in your body?

"Just like catching the ruler or pulling your hand from heat, our bodies have built-in systems for fast responses that happen without us even thinking. Today, we're going to explore how this works through something called *reflex actions* and understand what happens inside our body during these sudden reactions."

Summary:

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
• Begin with a quick scenario: "Imagine you accidentally touch a hot iron. What happens?" • Elicit quick student responses. • Introduce the idea of reflex action as quick, automatic response without conscious thought. • Use a diagram of a reflex arc (spinal cord, sensory neuron, motor neuron, etc.) on the board or projector.  • Explain step-by-step: stimulus → receptor → sensory neuron → spinal cord → motor neuron → effector. • Emphasize why this bypasses the brain for speed.	**Discussion on Ruler Drop Test (Reflex Demo):** • Students pair up. One holds a ruler vertically, the other places fingers at the bottom. • When the ruler is dropped, the partner catches it. • Measure reaction time. • Groups reflect: "Was there time to think before catching?" • Each group shares observations from the reflex demo. • Teacher connects responses to the concept of *reflex arc*. • Ask guiding questions like, "What if the brain was involved first—would it take longer?"	Students answer: • "Trace the sequence of events when a bright light is focused on your eyes." • Draw and label a simple reflex arc. • Optional Extension: Write a short paragraph explaining how reflexes help protect us.

1. Reflex actions are quick, automatic responses to stimuli, performed without conscious thought, such as pulling your hand from a hot object or blinking when light is flashed in your eyes.
2. Thinking takes time, as it involves complex nerve impulse processing in the brain; relying solely on the brain for urgent responses can delay action and cause harm.
3. The body uses a reflex arc, a shortcut neural pathway where sensory and motor nerves connect in the spinal cord, to enable rapid responses without brain involvement.
4. Reflex arcs evolved as a survival mechanism in animals and continue to be efficient for fast reactions, even in organisms with advanced brains.

CFU

Factual Questions:

1. What is reflex arc?
2. What is the pathway of reflex arc?

Open Ended Questions:

1. Why do you think reflex actions are important for survival? Can you give examples from daily life where they help us avoid danger?
2. If our brain can process information, why doesn't it handle all our responses instead of using reflex arcs?
3. Imagine you are designing a robot that mimics human reflexes. What parts would you include to make sure it can react quickly to danger?

Quiz/ Assignment:

1. Which of the following best describes a reflex action?

A. A slow, planned movement controlled by the brain
B. A voluntary action involving decision making

C. A quick, automatic response to a stimulus without conscious thought
D. A muscular movement after deep thinking

2. Where are reflex arcs primarily formed in the human body?

A. Brain
B. Muscles
C. Spinal cord
D. Heart

3. What is the main reason reflex actions bypassing the brain initially?

A. To save energy
B. To give more time for reaction
C. Because the brain cannot handle pain
D. To allow faster response in emergency situations

4. What type of neurons are involved in forming a reflex arc?

A. Only motor neurons
B. Only sensory neurons
C. Both sensory and motor neurons
D. Only interneurons

5. Which of the following is NOT a reflex action?

A. Blinking when something comes close to the eye
B. Pulling your hand back after touching something hot
C. Deciding to drink water after feeling thirsty
D. Sneezing when dust enters the nose

Chapter: Control and Coordination **Grade: 10** **Subject: Biology** **Period:3** **Concepts Covered:**

6.1.2 Human Brain

Learning Objectives:

- Identifies the location of brain and spinal cord in human body.
- Differentiates central nervous system and peripheral nervous system
- Distinguishes cranial nerves and spinal nerves.
- Describes the function of fore brain.
- Applies the learning relating to fore brain functioning to hypothetical situation
- Draws labelled diagram of human brain and its parts.
- Categorizes the functions performed by various parts of the brain
- Exhibits creativity in designing static model of brain parts using eco- friendly resources.
- Take initiatives to know about scientific discoveries related to brain and its structure.

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

1. Neuron structure and function.
2. Brain as a part of nervous system

TLM Required: Images of brain, 3D model of brain (POP mode),

Teacher Resources: (External links from DIKSHA and web pages)

https://youtu.be/PVvKKpGlL3Y?si=YLMRyY2LIZ2h30Tb

https://quizizz.com/admin/presentation/65aa2916c31cda921e0d5113 - flash cards with a small game

Igniting Activity:

Ask students to:

- Blink as fast as they can – then stop.
- Hold their breath for a few seconds.

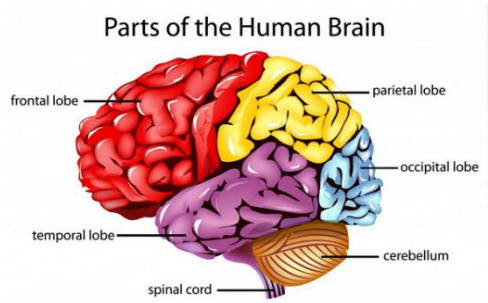
- Clap their hands 5 times quickly.
- Try to stop their heartbeat (they'll laugh and realize they can't).
- Walk in a straight line with eyes closed (do it in pairs if space allows).

Then ask:

- "Which of these actions could you control?"
- "Which ones happened even when you weren't thinking?"
- "Why do you think that is?"

Then Say:

- "We just did a bunch of things—some we controlled, some we didn't, and some we didn't even think about. But did you know there's a super-organ inside us that handles *all* of it? It even helps us ride bikes and stop us from falling! Today, we'll meet the parts of our brain that do these jobs—and discover who's really in control!"

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
• Introduction**:** - Ask, *"Can we control our heartbeat?"* - Brief discussion on voluntary vs involuntary actions. -  Display a diagram of the human brain and introduce the 3 main parts: forebrain, midbrain, hindbrain. • Explanation with Diagram: - Show a labeled diagram and explain: – Forebrain: thinking, sensory processing, hunger – Midbrain & Hindbrain: involuntary actions – Cerebellum: coordination and balance - Use real-life examples: eating, walking, clapping	• Participate in discussion and list out voluntary and involuntary actions • Brain Function Role Play - Divide class into small groups. - Assign each group a part of the brain (e.g. Group 1 = Forebrain, Group 2 = Hindbrain, etc.). - Ask them to act out or explain a situation showing what their assigned part controls (e.g. riding a bike = cerebellum). Interactive Quiz Game : - Use flashcards or digital quiz tools (Quizizz). - Teams guess the brain part based on clues or scenarios	Brain Functions - Notebook Task or worksheet: • Draw a picture of brain and label its parts. • Label forebrain, midbrain, cerebellum, medulla, etc. • Short reflective question: *"Which part of your brain was likely working during your morning routine?"* • Write a brief explanation of the difference between voluntary and involuntary actions. - Include one example for each and mention which part of the brain controls them.

Summary:

1. Central Nervous System (CNS):

The brain and spinal cord together form the CNS, which receives, processes, and integrates

information from all parts of the body to coordinate actions.
2. Voluntary and Involuntary Actions:
The brain controls voluntary actions like writing and talking, while involuntary actions such as heartbeat and digestion are managed mainly by the mid-brain and hind-brain.
3. Peripheral Nervous System:
This system includes cranial and spinal nerves that connect the CNS to the rest of the body, allowing communication between the brain, spinal cord, and muscles/organs.
4. Brain Regions and Functions:

- Fore-brain: Responsible for thinking, decision-making, interpreting sensory inputs, and voluntary muscle movement.
- Mid-brain and Hind-brain: Control involuntary functions such as blood pressure, salivation, and vomiting (via medulla), and maintain posture and balance (via cerebellum).

5. Special Brain Centres:
Certain specialized areas in the fore-brain manage specific sensations like hunger, showing how the brain also handles internal signals apart from external sensory inputs.

CFU

Factual Questions:

1. What are the different parts of the human brain?
2. Describe the functions of various parts of the brain.

Open Ended Questions:

1. Why do you think it is important for the brain to have specialized areas for different functions like sight, smell, or hunger?
2. What might happen if the cerebellum of the hind-brain is damaged? How would it affect our daily life?

Quiz/ Assignment:

1. Which part of the brain is primarily responsible for thinking and voluntary actions?
A. Mid-brain
B. Hind-brain
C. Fore-brain
D. Medulla

2. What is the function of the cerebellum in the human brain?
A. Controls heartbeat and blood pressure
B. Maintains posture and balance
C. Interprets sensory inputs
D. Controls hunger and thirst

3. The medulla in the hind-brain is mainly responsible for controlling:
A. Voluntary muscle movement
B. Memory and learning
C. Involuntary actions like salivation and vomiting
D. Problem-solving and decision-making

4. The communication between the central nervous system and the rest of the body is carried out by:
A. Cerebellum
B. Peripheral nervous system
C. Spinal cord only
D. Medulla oblongata

5. Which of the following is *not* a voluntary action?
A. Writing an essay
B. Clapping after a performance
C. Heartbeat
D. Moving a chair

Chapter: Control and Coordination **Grade: 10** **Subject: Biology** **Period:4** **Concepts Covered:**

- 6.1.3 How Are Tissues Protected,
- 6.1.4 How Does the Nervous Tissue Cause Action

Learning Objectives:

- Explains the concept of muscle contraction.
- Explain how the brain and spinal cord are protected from shocks

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

1. Brain structure and functions
2. Nerves structure and functions

TLM Required: Images of brain, 3D model of brain (POP mode),

Teacher Resources: (External links from DIKSHA and web pages)

https://youtu.be/PVvKKpGlL3Y?si=YLMRyY2LIZ2h30Tb

Igniting Activity:

- Show students the raw egg and tell them it represents the brain—soft and fragile.
- Ask: "If this egg is the brain, how would you design a system to protect it from breaking?"
- Divide them into groups and give them the materials.
- Let them build a protective casing (using the box and soft padding) around the egg.
- Drop each group's protected egg from a small height and observe the results.
- Link the egg to the brain, the box to the skull, and the padding to the cerebrospinal fluid.
- Discuss the vertebral column as a similar protective structure for the spinal cord.

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
Begin with a brief explanation of why the brain and spinal cord are important and delicate.  • Use visual aids or models (like a skull model or a diagram) to show the bony box (skull) and vertebral column. - Explain how the cerebrospinal fluid protects the brain like a cushion. - Transition to how nervous tissue helps cause action: describe how nerve impulses reach muscles and cause them to contract using special proteins. - Model a reaction using your own hand (e.g., flinching from an imaginary hot	- Activity 1 (5–7 mins): Groups build a protective structure for a raw egg (representing the brain) using sponges, cotton, and a coconut shell. Test it by dropping. Relate to the skull and cerebrospinal fluid.  - Activity 2 (5–7 mins): Ruler drop test in pairs. One student drops a ruler, the other catches it. Record reaction time. Discuss what parts of the body were involved in the	- Worksheet or Notebook Task: 1. Draw and label the protective parts of the nervous system. 2. Answer short questions: "What protects the spinal cord?" / "How does a muscle cell move?" 3. Reflective question: *"Describe the difference between voluntary and involuntary muscles with examples."* - Encourage neat diagrams and

object) and explain what's happening inside the body in simple steps.	process (sensory input, brain processing, motor response).	logical explanations.

Summary:

1. **Protection of Nervous Tissue**:

The brain is protected by a bony skull and a fluid-filled sac that cushions it from shocks, while the spinal cord is safeguarded by the vertebral column (backbone).

2. **Action by Nervous Tissue**:

Nervous tissue sends electrical signals (nerve impulses) to muscles, causing special proteins in muscle cells to change shape and shorten, resulting in movement.

CFU

Factual Questions:

1. How the brain is protected?
2. Explain the control and coordination of the brain during muscle activity.

Open Ended Questions:

1. What might happen if the spinal cord were not protected by the vertebral column?
2. Can you think of any situations where the brain's protective system might still be at risk? How can we prevent such risks?

Quiz/ Assignment:

1. What protects the brain from external injury?

A. Muscles
B. Skin
C. Bony box (skull) and fluid-filled sac
D. Blood vessels

2. Which structure protects the spinal cord?

A. Rib cage
B. Skull
C. Vertebral column
D. Cartilage

3. How does a muscle cell move in response to a nerve impulse?

A. It increases in size
B. It changes color
C. It changes shape and becomes shorter
D. It breaks into smaller cells

4. What causes the muscle proteins to rearrange and contract the muscle?

A. Hormones
B. Blood flow
C. Nervous electrical impulses
D. Oxygen supply

5. Which of the following is an example of an involuntary muscle?

A. Biceps
B. Leg muscle
C. Heart muscle
D. Arm muscle

Chapter: Control and Coordination **Grade: 10** **Subject: Biology** **Period:5** **Concepts Covered:**

- 6.2 Co-ordination in Plants
- 6.2.1 Immediate Response to Stimulus

Learning Objectives:

- Explains the process of immediate response to stimulus in Mimosa pudica.

• Relates cause and effect between touch and movement in Mimosa pudica.

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

1. Sunflower plants

TLM Required: Mimosa plant

Teacher Resources: (External links from DIKSHA and web pages)

1. https://youtu.be/YhGdLK78n7Y?si=Rb8f02xn0q6GgFUm
2. https://youtube.com/shorts/x6Ihdhl27qI?si=VZOsC-jolWcTBeZl

Igniting Activity:

1. Ask a Thought-Provoking Question:

"Can plants feel when you touch them? Can they move without muscles?"

2. Demonstration:
   - Bring out the touch me not plant.
   - Gently touch the leaves and let students watch them fold and droop.
   - If the plant is not available, show a short video clip of the same.
   - If plant is not available, show the video of the above said action

3. Observation Time:
   - Ask students to quietly observe:
     - What part was touched?
     - What part moved?
     - How quickly did it happen?

4. Trigger Curiosity:
   - Spray a mist of water on the plant or gently shake the pot. Ask:

"Did the plant react the same way?" "How is it doing this without a brain or nerves?"

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
- Begin by asking a thought-provoking question: "Can plants really move if they don't have brains or muscles?" - Use a real Mimosa pudica (chhui-mui) plant or video to demonstrate touch response. - Explain the two types of movements in plants: 1. *Growth-independent movement* (e.g., Mimosa folding its leaves). 2. *Growth-dependent movement* (e.g., root and shoot direction during germination). - Use a diagram or chart to show how water movement in cells causes plant cells to swell or shrink, leading to movement. - Emphasize that plants use electrical-chemical signals (but not nerves) to transmit information.	- Activity Setup: Provide each group with: - A small plant (real or artificial) - A scenario card (e.g., "sunlight from one side," "touch on one leaf," "root grows near a rock") - Task: Discuss and present: • What type of plant movement is happening? • Is it growth-based or not? • How does the plant detect and respond to the stimulus? • Encourage mini skits, drawings, or role-plays to act out the plant's response.	- Worksheet or Notebook Tasks: 1. Complete a table comparing growth-dependent vs growth-independent movements (include examples and mechanisms). 2. Short-answer questions: - "Why does Mimosa fold its leaves when touched?" - "How do plant cells move without muscles?" 3. Draw and label a diagram showing how water movement in cells leads to leaf movement in Mimosa. - Finish with a reflection question: "What surprised you the most about how plants can respond to the environment?"

Summary:

1. Types of Plant Movements:

Plants show two types of movements—growth-independent movements (like the quick folding of Mimosa leaves when touched) and growth-dependent movements (such as roots growing downward and shoots growing upward).

2. Plant Response Mechanism:

Although plants do not have a nervous system or muscles, they respond to stimuli through electrical-chemical signals and change in water content in cells, which causes movement by swelling or shrinking of cells.

CFU

Factual Questions:

1. What are the different types of movement in plants

Open Ended Questions:

1. If a plant doesn't have nerves or muscles, how do its cells know how and when to move?
2. What would happen if a plant could not respond to any external stimulus? How might that affect its survival?

Quiz/ Assignment:

1. Which of the following shows movement without involving growth?

A. Germination of a seed
B. Growth of roots downward
C. Folding of Mimosa leaves
D. Bending of a sunflower toward light

2. How do plant cells move in the absence of muscles?

A. By dividing rapidly
B. By changing the amount of water in them
C. By producing more chlorophyll
D. By producing electrical impulses only

3. What type of signal is used by plants to convey information between cells?

A. Sound waves
B. Light signals
C. Electrical-chemical signals
D. Magnetic pulses

4. Which of the following movements in plants is dependent on growth?

A. Folding of Mimosa leaves
B. Closing of a Venus flytrap
C. Roots growing toward water
D. Touch response in leaves

5. Why do the Mimosa plant's leaves fold when touched?

A. To trap insects for food
B. Due to decrease in sunlight
C. To prevent water loss
D. As a quick response to touch stimulus

Chapter: Control and Coordination **Grade: 10** **Subject: Biology** **Period:6** **Concepts Covered:**

6.2.2 Moment Due to Growth

Learning Objectives:

- Identifies different types of movements in plants.
- Relates the bending in plants to differential growth.
- Relates the tropic movement in plants with the stimulus.
- Investigates about the stimulus and resulting movements across variety of plants
- Distinguishes the different tropic movements in plants.

• Exhibits value of –respect for life by appreciating the chemotropism in plant reproduction.
• Compares and differentiate the different movements shown by plants

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

1. Movement in sunflower plant

TLM Required: Materials required to conduct the experiment to prove the phototropism.

Teacher Resources: (External links from DIKSHA and web pages)

1. https://youtu.be/YhGdLK78n7Y?si=Rb8f02xn0q6GgFUm

Igniting Activity:

1. Show any photos of plants beside the wall, growing roots away from the soil, discuss and arise thought provoking questions.

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
• Begin with an explanation of movement in plants, focusing on growth-based movement (tropism). • Use the pea plant and tendril example to explain thigmotropism. • Describe Activity 6.2 step-by-step using diagrams or a short video. • Define and discuss types of tropisms: ➤ Phototropism ➤ Geotropism ➤ Hydrotropism ➤ Chemotropism - Highlight the difference between fast and slow plant responses.	Observation Discussion: • Show a time-lapse video of plants responding to light or gravity. • Discuss: What happened? Why did the shoots and roots move in those directions? • Let groups hypothesize what might happen if the plant is rotated or the light source changes.	• Students make arrangements to do the activity 6.2 and observe the changes discussed in the classroom. • Students draw a labeled diagram showing the phototropic movement from Activity 6.2. and write the procedure. • Write answers to reflection questions from the textbook: ➤ Have the old parts of the shoot and root changed direction? ➤ Are there differences in the direction of the new growth? • Create a table listing the different types of tropisms, the stimulus involved, and one real-life plant example for each. • Write a short paragraph on "Why is directional growth important for plants?"

Summary:

1. Plants exhibit directional growth movements called tropisms in response to environmental stimuli like light, gravity, water, and chemicals.
2. These movements help plants adapt to their surroundings by guiding roots and shoots appropriately.

CFU

Factual Questions:

1. What are different tropic movements?
2. Write the procedure to prove the phototropism in plants.

Open Ended Questions:

1. How might a plant's survival be affected if it did not respond to environmental stimuli?
2. Can you think of any real-life situations where understanding plant tropisms could be useful to humans?
3. If you were designing an experiment to test geotropism, what materials and steps would you use?

Quiz/ Assignment:

1. What type of movement do tendrils of a pea plant show when they touch a support?
A) Phototropism
B) Geotropism
C) Thigmotropism
D) Chemotropism
2. In Activity 6.2, why do the shoots bend towards the window light?
A) Because roots push them in that direction
B) Due to lack of gravity
C) Due to phototropism
D) Because of wind
3. What kind of tropism is shown by roots growing downwards into the soil?
A) Chemotropism
B) Hydrotropism
C) Geotropism
D) Thigmotropism
4. The growth of a pollen tube towards an ovule is an example of:
A) Phototropism
B) Chemotropism
C) Geotropism
D) Hydrotropism
5. Which of the following is true about growth-related movement in plants?
A) It is always fast and visible
B) It occurs only in flowers
C) It is a slow response to stimuli
D) It happens randomly

Chapter: Control and Coordination **Grade: 10** **Subject: Biology** **Period:7** **Concepts Covered:**
Harmons In Plants
Learning Objectives:
- Explain the phytohormones and their functions.
- Analyze the action of phytohormone in plants
- Interprets the table showing the functions of Phytohormones

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*
1. Tropic movements in plants like phototropism, geotropism, thigmotropism, Chemotropism, etc.
TLM Required: Chart showing the table of contents with phytohormones and their functions.
Teacher Resources: (External links from DIKSHA and web pages)
https://youtu.be/dV9QcGs58l0?si=H6Z4aMmBUTn53e2F
Igniting Activity:
1. Ask a question:
"If I shine light on only one side of this plant, what do you think will happen over a few days?"
2. Shine the flashlight on one side of the plant (or show a pre-recorded time-lapse video of a plant bending toward light).
Let them observe and wonder.
3. Discussion prompt:
"Do plants have brains or nerves like us?" → No.
"Then how do they *know* which way the light is coming from and *respond* to it?"
Let students share their guesses. Most will think about nerves or something similar.
4. Explain that instead of nerves and fast messages like animals, plants use chemical messengers called

hormones to *communicate internally* and decide how to grow or react.

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
• Begin with a quick recap of limitations of electrical impulses in plants. • Introduce the idea of chemical communication and plant hormones. • Use diagrams or animations to explain the role of hormones like auxin, gibberellins, cytokinins, and abscisic acid. • Demonstrate phototropism with visuals or a time-lapse video showing a plant bending toward light. • Model how auxin moves to the shaded side of the plant, causing those cells to grow longer.	• Divide students into groups of 4–5. • Provide each group with a chart of plant hormones with missing information (hormone name, function, location, effect). • Ask students to fill in the blanks using textbook clues or class notes. • Each group picks one hormone and creates a quick skit, model, or role-play to show how it works (e.g., auxin being "pulled" to the shaded side). • Groups present briefly to the class.	• Students complete a worksheet that includes: 1. Matching plant hormones to their functions 2. Drawing and labelling a diagram showing auxin in phototropism 3. A short answer question: "Why do plants use chemical messengers instead of electrical impulses?" 4. Write a paragraph on how hormone balance affects plant survival in extreme conditions (e.g., drought, low light).

Summary:

1. Electrical impulses in animals are fast but limited, as they only reach cells connected by nerves and require time for resetting, making continuous signalling difficult.
2. Plants use chemical messengers called hormones to communicate and coordinate activities like growth and response to stimuli, which is slower but more widespread and consistent.
3. Auxin is a plant hormone that helps shoots bend towards light by promoting cell growth on the shaded side, demonstrating a chemical-based response to environmental stimuli (phototropism).
4. Other key plant hormones include gibberellins (promote stem growth), cytokinins (stimulate cell division), and abscisic acid (inhibits growth and causes leaf wilting), each playing a unique role in plant development and survival.

CFU

Factual Questions:

1. Tabulate the phytohormone and their functions.

Open Ended Questions:

1. What would happen to a plant if it could not produce abscisic acid during a drought?
2. What might be the consequences if a plant produced too much or too little of a particular hormone like gibberellin or cytokinin?
3. Can you think of a situation where slow chemical communication might be an advantage for a plant? Why?
4. If you could create a new plant hormone, what would it do, and how would it help the plant?

Quiz/ Assignment:

1. Which of the following is a plant hormone responsible for bending of shoots towards light?

A) Cytokinin
B) Gibberellin
C) Auxin
D) Abscisic acid

2. Why are electrical impulses not suitable for all types of communication in plants?

A) They are too slow
B) They can't reach all cells and require reset time
C) They damage plant tissues

D) They are only used in animals

3. What is the primary function of gibberellins in plants?

A) Inhibit growth

B) Promote wilting

C) Promote stem growth

D) Stimulate root branching

4. Which plant hormone is responsible for cell division and is found in fruits and seeds?

A) Auxin

B) Gibberellin

C) Cytokinin

D) Abscisic acid

5. What is the main role of abscisic acid in plants?

A) Promote leaf growth

B) Promote flowering

C) Inhibit growth and cause wilting

D) Stimulate cell division

Chapter: Control and Coordination **Grade: 10** **Subject: Biology** **Period:8** **Concepts Covered:**

6.3 Harmons in Animals

Learning Objectives:

- Identifies the hormonal controls in animals.
- Relates the hormone adrenalin with its function in animal.
- Describes the changes brought in human body systems by hormone adrenalin.
- Identifies various endocrine glands present in human body
- Draws a labelled diagram of endocrine glands present in human body.
- Relates various hormones with their functions in the body.
- Describes the concept of feedback mechanism for hormonal regulation.

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

1. Definition of hormones.
2. Phytohormones

TLM Required: Chart showing the endocrine glands in human beings

Teacher Resources: (External links from DIKSHA and web pages)

https://youtu.be/ER49EweKwW8?si=Tkwj3QW7vSzr1qk4

Igniting Activity:

1. Prepare Situation Cards (Examples):
    - You suddenly get scared by a barking dog
    - You feel hungry
    - You grow taller over time
    - You feel sleepy at night
    - You start noticing changes as you reach age 11 or 12

2. Ask Students

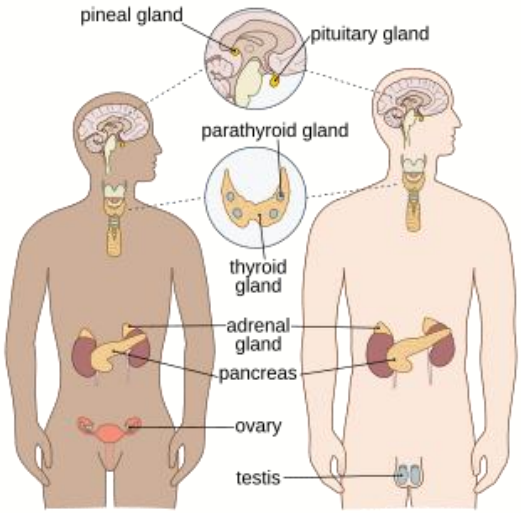
Show or read each situation and ask,

"Who do you think tells the body what to do in this situation?"

Let students guess — some might say "brain", "stomach", or "I don't know!"

3. Reveal the Clue:

After a few guesses, say: "There's a secret messenger system inside our body called *hormones*. Let's find out how they help control things we don't even think about!"

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
• Begin with a quick recap of plant hormones. • Introduce the concept of hormones as chemical messengers in animals. • Explain major hormones: adrenaline, insulin, thyroxin, growth hormone, testosterone, oestrogen with the help of a diagram and table of contents with hormones and their functions.  • Demonstrate how adrenaline works during "fight or flight" using gestures or a video. • Explain feedback mechanism with an example	• Roleplay: "The Emergency Team" – groups act as body organs responding to adrenaline. • Each group receives a "situation card" (e.g., fear, hunger, puberty) and presents how hormones help. • Use body cut-outs or diagrams: groups label endocrine glands and hormones using sticky notes. • Quick quiz game in groups: "Which hormone am I?" (Clue-based game)	• Match the hormone to its function and gland (worksheet or chart). • Short reflective writing: "Why is balance in hormone secretion important for our body?" • Complete a fill-in-the-blanks or crossword based on hormone names, glands, and functions.

Summary:

1. Hormones are chemical messengers secreted by endocrine glands that help control and coordinate various body functions.
2. Adrenaline, secreted during fear or stress, prepares the body for "fight or flight" by increasing heart rate, breathing, and redirecting blood flow.
3. Other important hormones include thyroxin (regulates metabolism), insulin (controls blood sugar), growth hormone, testosterone, and oestrogen (control growth and puberty changes).
4. Hormone secretion is regulated through feedback mechanisms to maintain balance and ensure proper body functioning.

CFU

Factual Questions:

1. Tabulate the hormones in human beings and their effects.
2. Explain feedback mechanism.

Open Ended Questions:

1. What might happen if the body produced too much or too little of a particular hormone? Can you give examples?
2. Can you think of any situations in your daily life where hormones might be at work without you realizing it?
3. If you could design a new hormone, what function would it perform and why?

Teacher Diary

Period no	Name of the Concept to be taught	Date	Activities Conducted during the teaching	TLM Used	Student Response 1/2/3/4/5	Topics Indented to Reteach	Additional Resources Used to Reteach
1	Introduction, 6.1 Animals Nervous System						
2	6.1.1 What Happens in Reflex Actions						
3	6.1.2 Human Brain						
4	6.1.3 How Are Tissues Protected, 6.1.4 How Does the Nervous Tissue Cause Action						
5	6.2 Co-ordination in Plants ,6.2.1 Immediate Response to Stimulus						
6	6.2.2 Moment Due To Growth						
7	Hormones In Plants						
8	6.3 Hormones In Animals						

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Signature of the HM

Signature of the teacher

Teacher reflections	Action plan
What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?	
Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these	

difficulties in the next lesson?	
What additional resources or modifications could improve the effectiveness of this lesson in future implementations?	
How well did I adjust my teaching based on student reactions or unforeseen challenges?	

Any other specific information:

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September 2025

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 7.1 – 7.2	2	3	4	5 Milad -Un -Nabi National Teacher's Day	6 No Bag Day
7 Sunday	8 International Literacy 7.2.5 – 7.3.2 + NI	9	10	11	12	13 Second Saturday
14 Sunday Hindi Diwas	15 International 7.3.3 – 7.3.3D = NI	16	17	18	19	20 No Bag Day Cluster and SMC meeting
21 Sunday	22 NI	23 NI	24 Dussera Holiday	25	26	27
28 Sunday	29 Dussera Holiday	30 Durgaa shtami				

T1J2G6 No bag Day

Q3Y5K3 Cluster Complex

X9H6L6 Teacher Resources

Dasara Holidays 24.09.25 to 02.10.25

Dasara Holidays for Minority Institutions
27.09.25 to 02.10.25

Week1: **7.1 – 7.2**

Week 2: **7.2.5 – 7.3.2**

Week 3: **7.3.3 – 7.3.3D**

Week 4:

Week 5:

TEACHER'S NOTES

7. HOW DO ORGANISMS REPRODUCE

NO OF TEACHING PERIODS: 9 **NO OF PRACTISE PERIODS:**
LAB PERIOD: 01

Learning Outcomes: Learners…..

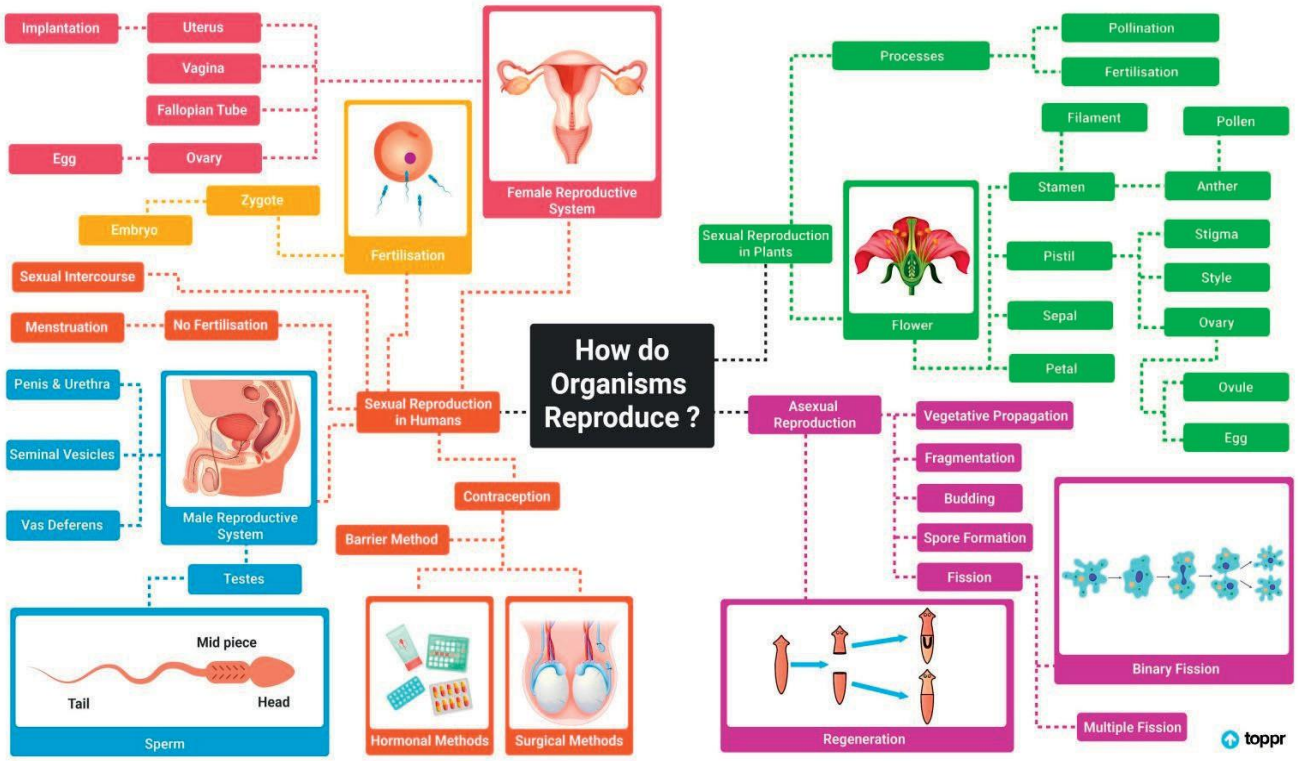
1. understand the need of reproduction in organism

2. explain the importance of variations

3. list out various asexual reproduction methods in single celled organisms
4. list out various asexual reproduction methods in plants

5. draw labelled diagram of LS of a flower
6. understand sexual reproduction in human beings
7. draw the diagrams of male and female reproductive system
8. find out the reasons for adopting contraceptive methods

Mind Map:



Period wise topics

S.No.	Topic	S.No.	Topic
1	Introduction , 7.1 Do Organisms Create Exact Copies of Themselves	6	7.3.2 Sexual Reproduction in Flowering Plants
2	7.1.1 Importance of Variation	7	7.3.3 Reproduction in Human Beings
3	7.2 Modes of Reproduction Used by Single Organisms	8	7.3.3 (A) Male reproductive System , 7.3.3(B,C) Female Reproductive System

4	**7.2.5 Vegetative Propagation**	**9**	**7.3.3 (D) Reproductive Health**
5	**7.3 Sexual Reproduction**		

Period:1

Concepts Covered:

• Cellular components in reproduction;

Learning Objectives:

● SWBAT understand the components in reproduction

● SWBAT know relationship between reproduction and DNA

Prior Concept/ Skills: (Essential concepts and skills to be checked/bridged before teaching the current concept.)

● Animals and their babies, male and female parts of flower, characters from parents,

TLM Required:

1. Pictures or toys of animals

Teacher Resources:

(Any external links that would help teachers to create activities on their own. This includes NCERT Material, OERs, Digital links etc.)

• Textbook

• Crash Course: Reproduction in Animals: Link 2

Igniting Activity:

Pupils recall their previous knowledge through the open-ended questions

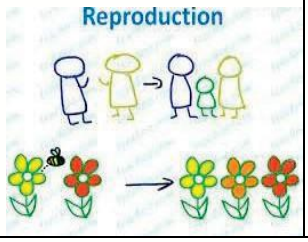
* How are we born?
* What is life process?
* Which life processes are needed for the survival of an organism?
* How do organisms increase their number?
* Name the life process by which organisms continue their generation.

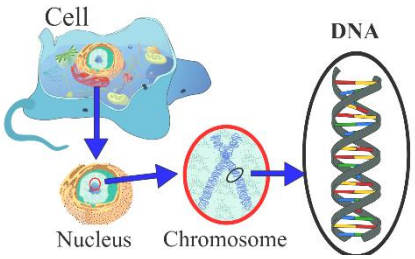
Experience and reflection:

Do you have any animals or pet at your house? Do you know how they multiply?

Learning Point:

• understand the need of reproduction in organism

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
Introduce the chapter, give a brief about the following topics of the lesson: 1. Introduction to the topic of reproduction. 2. What is reproduction? 3. Why reproduction is important. 4. why do organisms reproduce? Discusses the importance and necessity of reproduction. 	Activity : Group Discussion Discussion topic: • Imagine a what would be the reason behind the characters carry from one	• What happens if the process of reproduction is absent? • Can an organism propagate without reproduction? • What do you think about

5. Teacher illustrates the mechanism of DNA  copying (Replication) **CFU:** Factual Question number • What is the full form of DNA Open-ended question number • What will happen if an organism stops the reproduction? • What will happen if all human beings are look like same without variations? **Closing:** Recap on the topic. Make it relevant to students' daily lives & see if they can understand its importance	generation to another generation Instructions: • Divide students into groups • Give each group a 5 mins on the topic discussion & let them work together. After discussion, ask a few students from each group to share their discussion	continuation of species on Earth? • What is the basic event in reproduction to create a new organism? • What happens when there is no DNA replication during reproduction? • How does DNA replication take place? • Which sugar is present in DNA? • As the name suggests, is DNA acidic or basic?

Summary:

- Organisms reproduce to continue the chain of life, to pass on its genes which are acquired over millennia. Reproduction is essentially a process by which individuals produce new individuals of the same kind. And this process is very important for the existence of life on earth.
- Different organisms reproduce in different ways. Let us have a detailed look at how different organisms reproduce.

Period:2

Concepts Covered:
• Importance Of Variation
Learning Objectives:
• SWBAT understand the Variation
• SWBAT know the Importance of Variation
Prior Concept/ Skills: (Essential concepts and skills to be checked/bridged before teaching the current concept.)
● Animals and their babies, male and female characters from parents, identification of variations in animals
TLM Required:
1. Pictures of variations in animals
Teacher Resources:
(Any external links that would help teachers to create activities on their own. This includes NCERT Material, OERs, Digital links etc.)
• Textbook
• Crash Course: Reproduction in Animals: Link 2

Igniting Activity:
• Write down the common features of you and your father and mother?
• What is the different ear pattern of your classmates?
• discussion
Experience and reflection:
Do you have any animals or pet at your house? Do you know how they multiply? Is that puppy look like mother?
Learning Point:
• explain the importance of variations

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
Introduce the chapter, give a brief about the following topics of the lesson: 1. Introduction to the topic of variation 2. Why variation is important? Discusses the importance and necessity of variation. 3. Teacher illustrates the mechanism variation 4. Do all the members in your family look alike? 5. Why are they similar but not identical? 6. How is the consistency of DNA replication related to its niche in an ecosystem? 7. Can you quote an example of a population that was completely wiped out due to drastic change in its niche? 8. Teacher stresses the importance of variations in the survival of a species. copying (Replication) **CFU:** Factual Question number 1. What is variation? Open-ended question number 1. What will happen if all human beings are look like same without variations? **Closing:** Recap on the topic. Make it relevant to students' daily lives & see if they can understand its importance	**Activity : Group Discussion** **Discussion topic:** • What will happen if all human beings are look like same without variations? **Instructions:** • Divide students into groups • Give each group a 5 mins on the topic discussion & let them work together. After discussion, ask a few students from each group to share their discussion 	• How do variations occur in a population? • How do variations in species help them to adapt to a particular environment? • What is the role of variation in the process of evolution?

Summary:

- Organisms reproduce to continue the chain of life, to pass on its genes which are acquired over millennia. Reproduction is essentially a process by which individuals produce new individuals

of the same kind. And this process is very important for the existence of life on earth.

- Different organisms reproduce in different ways. Let us have a detailed look at how different organisms reproduce.

Period:3

Concepts Covered:

- Modes Of Reproduction Used by Single Organisms

Learning Objectives:

- SWBAT understand the asexual reproduction
- SWBAT know the types of asexual reproduction

Prior Concept/ Skills: (Essential concepts and skills to be checked/bridged before teaching the current concept.)

- Amoeba, paramecium, bread mold, Hydra etc

TLM Required:

- Pictures of the types of asexual reproduction

Teacher Resources:

(Any external links that would help teachers to create activities on their own. This includes NCERT Material, OERs, Digital links etc.)

- Textbook
- Crash Course: Reproduction in Animals: Link 2

Igniting Activity:

- Begin with a mysterious question:

"What if I told you we could make a whole new plant without any seeds or even another potato plant?" Show a sprouting potato. Let them guess how that could work.

- Is this a new potato or a clone?"
- "Did we use any seeds?"
- "How is this different from how humans or animals reproduce?"
- "What might be the advantages of this kind of reproduction?"

Experience and reflection:

"How does asexual reproduction, like the potato cloning we started, help certain organisms survive and spread in their environment —
and what might be some challenges of relying only on this method to reproduce?"

Learning Point:

- Modes Of Reproduction Used by Single Organisms

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
Teacher conducts Activity 7.1: copying (Replication) •  • Why is sugar solution used for this experiment?	Class is divided into two groups Group: 1 Make sugar solution, add pinch of yeast put the cotton plug on the mouth of the test tube. Observe it under microscope in our lab. Group: 2 Pour water and add pinch of yeast put the cotton plug on the mouth of the test	What is the common factor in the division of amoeba and leishmania? Is there any difference in the sequence of division in the examples you have seen? Observe the shape if amoeba while division is taking place, and now identify how it differs from Leishmania.

- Yeast cells increase in size and multiply in sugar solution, but not in water. Explain the reason?
- Figure out why cotton plug is inserted in the mouth of the test tube?

- Name the changes that you observe
- Name the outgrowth seen on the wall of the parent cell?

What do you call this process of multiplication in yeast?

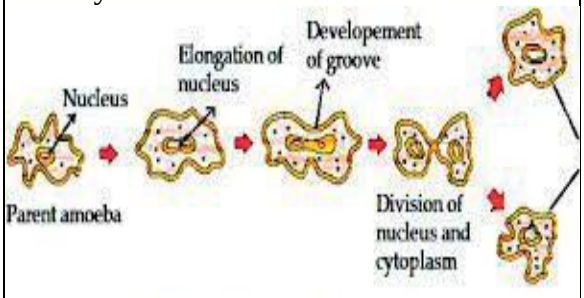
Observation of yeast multiplication under a microscope:

Teacher differentiates mechanism of budding in yeast and sporulation in fungi

- What do we call the process cell division where one cell divides into equal halves, in unicellular organisms?
- Which fission leads to the division of one cell into two equal halves?

How can you name the process if cell division leads to a large number of daughter cells?

Activity 7.3:



Binary fission in Amoeba

- Of both the slides which one shows multiplication of cells?
- Note down the various

tube. Observe it under microscope in our lab

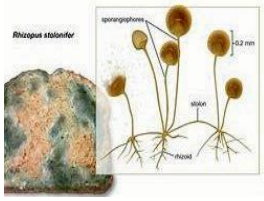
- What happens when yeast is added to dough?
- Which division occurs in the cell?
- Bread mold is not found on dry bread slices. Explain why?
- Why do pickles get spoiled when they are not immersed in oil?
- What are the reproductive structures found on bread mold.
- Identify the colour of the sporangium for the following fungus…

Rhizopus — Aspergillus – Mucor —Penicillium

Is yeast a unicellular or multicellular organism?

Activity 7.2; To show growth of mold in bread

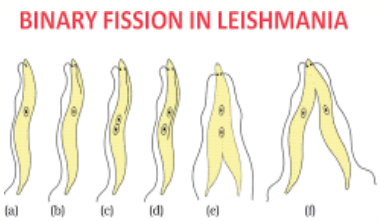
- Why is bread spoiled when kept in moist



environment?

- What do we call thread like and knoblike structures in the slide prepared from bread mold?

Which part of the bread mold consists of spores?



How is binary fission in Leishmania different from that of amoeba?

How many types of reproduction are found in living organisms?

Does a single cell increase in number through Asexual reproduction?

Do you know what Asexual reproduction is?

How many types of Asexual Reproduction can you find?

Why is this reproduction called as fragmentation?

Give examples of other organisms where you can find multiplication by fragmentation?

By the mode of regeneration some organisms produce new organism. Name such organisms?

Is any specialized cell involved in regeneration process?

Can you think of reason why more complex organisms cannot give rise to new individuals through regeneration?

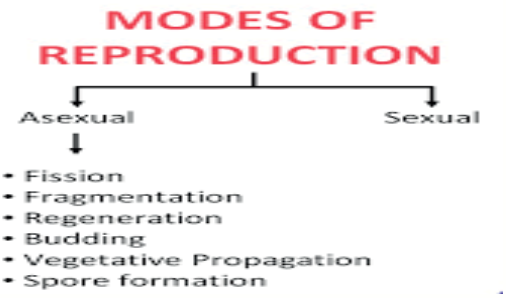
What is the difference between regeneration and fragmentation?

-

stages in the multiplication.

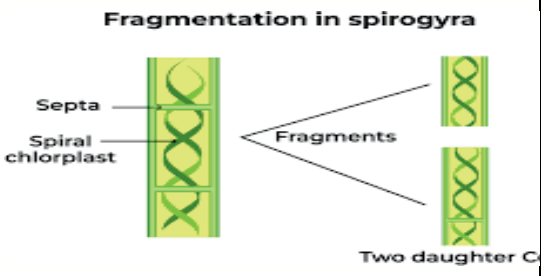
Nuclear division precedes or succeeds cytoplasmic division?

By which mode single and multicellular organisms continue their life?



Depending on their body design how do Single organisms reproduce?

Activity 7.4:



- Note down the shape and structure of the filaments.
- Is it unicellular or multicellular?
- Can you see separate pieces of spirogyra filaments?

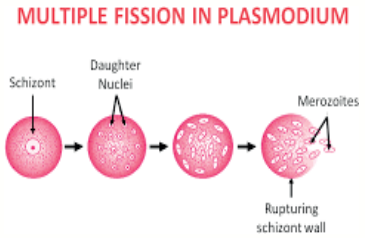
What can you call these pieces?

EGENERATION

- If a part of our body is completely separated or cut off (like a finger), is it possible to grow it again?
- What do you observe when the tail of a lizard is cut?
- If an organism cut into any number of pieces and each piece grows into a complete organism? What is the process called as ?

Why can't you call the process of regrowth of tail in lizard as regeneration?

Teacher introduces the concept of regeneration in lower organisms.



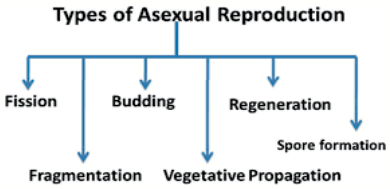
Observe two pictures and discuss the differences

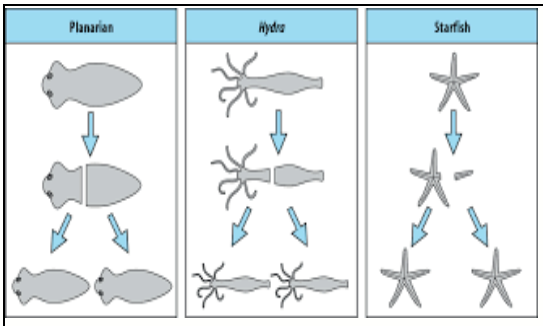
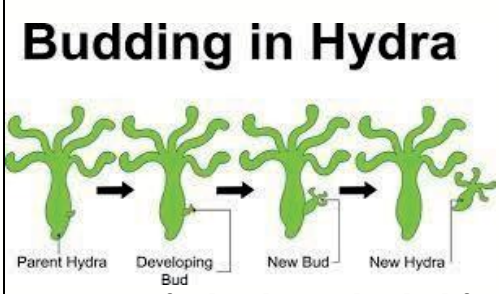
- In this image how many daughter cells are produced after the fission?

If the fission giving rise to two daughter cells is binary fission, what can you call the fission with multiple number of daughters?

Depending on their body design how do Single organisms reproduce?

Discuss and try to write the flow chart asexual reproduction



  Formation of a daughter individual from a small projection is known as? **CFU:** Factual Question number 1. What is called fission? Open-ended question number 1. What will happen if all living organism also capable of regeneration? **Closing:** Recap on the topic. Make it relevant to students' daily lives & see if they can understand its importance		

Summary:

Asexual Reproduction

Asexual Reproduction is further divided into:

- Fission
- Budding
- Vegetative propagation
- Regeneration
- Spore formation

Fission

This process takes place in unicellular organisms. It is of two types:

- Binary Fission– The organisms reproduce by binary fission only when adequate amounts of food and moisture is available. In this, the mother cell divides into two daughter cells, each containing a nucleus. Amoeba divides by binary fission.
- Multiple Fission– The unicellular organisms reproduce by multiple fission when the conditions are unfavourable with no proper amounts of food, moisture, and temperature. In this, the organism forms a cyst around itself. The nucleus divides, and each daughter nuclei are surrounded by a membrane. When the conditions are favourable again, the cyst dissolves and the daughter nuclei are released, which later develops into an individual cell. Plasmodium and Entamoeba undergo this process

Period:4

Concepts Covered:

- Vegetative Propagation

Learning Objectives:

- SWBAT understand the vegetative propagation
- SWBAT know the types of vegetative propagation

Prior Concept/ Skills: (Essential concepts and skills to be checked/bridged before teaching the current concept.)

- Plant parts, potato, rose, hibiscus

TLM Required:

- Plant specimens, potato eyes, bryopyllum leaf

Teacher Resources:

(Any external links that would help teachers to create activities on their own. This includes NCERT Material, OERs, Digital links etc.)

- Textbook
- Crash Course: Reproduction in Animals: Link 2

Igniting Activity:

- Show students a healthy leaf cutting or small stem from a plant and ask:

"Can this small piece of a plant grow into an entirely new one?"

Let them predict what might happen if you place it in water or soil.

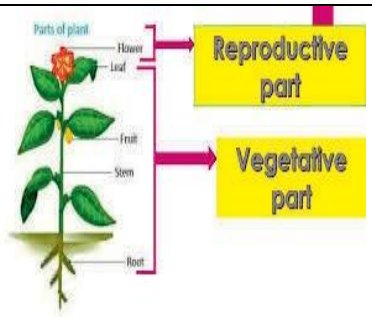
Experience and reflection:

- "Where do you think roots will come from?"
- "Is this plant being 'born' or is it a copy?"
- "Why might a plant want to grow this way instead of from seeds?"

Learning Point:

- list out various asexual reproduction methods in plants

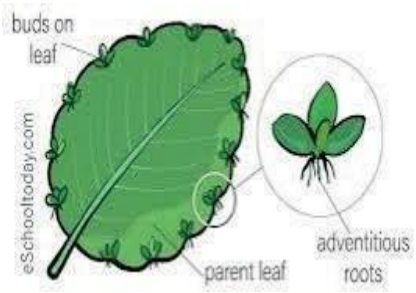
I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
• The reproduction that involves gametes from two parents is called as sexual reproduction. So why reproduction through single parent is called as asexual reproduction in unicellular organisms and vegetative reproduction in higher plants? • What are the parts present in flowering plants? • What are the vegetative parts of a plant? • Are all parts of plant capable of reproduction to produce new plants? • Name the reproductive parts of a plant?	**Activity 7.5:** • What do you call the bud like structures on potato? • What do they contain that helps them grow into new plants?	• Why potato tuber is called as the underground stem? • Does sweet potato also propagates in the same way? • Why do farmers prefer vegetative propagation to propagation through seeds? • Can you name some plants that propagates through leaves? • What name is given to the buds that are



- Do roots, stems, leaves also produce new plants?
- In which reproduction parts other than the flower are involved?
- What do you understand by natural and artificial vegetative propagation?

- When it (bud) detaches from the potation is it grown to new one?
- Do you observe small buds?

- bud like structures on potato in your kitchen or vegetable market?

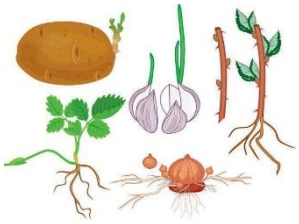


- What do you observe in the picture?
- Where do you find buds in bryophyllum leaf?

Activity 7.6:

How does money plant reproduce? What is node?

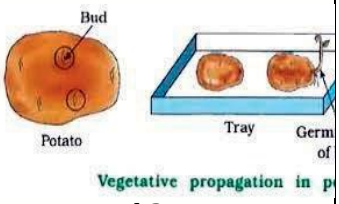
- What is inter node?
- Can money plant grow from stem cuttings?
- Of the two samples, which one formed new plant?



In the above images of vegetables, how do they produce new individuals? Identify and list the different types of vegetative propagation

How do you propagate jasmine plant?

Why didn't the piece without the bud show any growth?

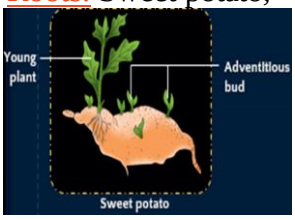


- The part of the baby plant that develops into shoot is called _____

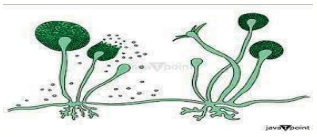
- As observed in the above activity how many types of vegetative propagation can be seen in plants?

NATURAL PROPAGATION ACTIVITY :

Roots: Sweet potato,



ROOT PROPAGATION



- What are the parts present in the image?
- What do you call the thread like structure?

What do you call the swollen structure which produces spores?

Group activity:

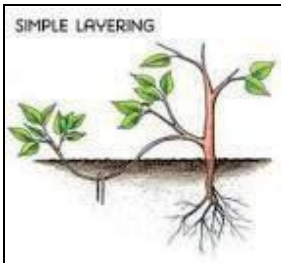
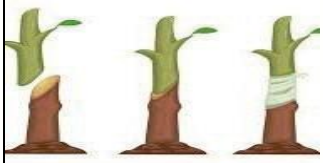
on the leaves?

- A small piece of a plant at least having one leaf to emerge into new plant?
- Does money plant propagate without nodes?
- Which part of the money plant is reproductive in nature?
- List out some plants that grow into new plants by vegetative propagation of roots
- In your kitchen what type of vegetables propagates through by mode of stem propagation?
- What is layering?
- Which plants are propagated through layering?
- How do you get two desirable characters in one plant?

- What is the role of stock in grafting?

- What is the purpose of grafting technique?

- Which plants can be grown by grafting?
- What are the branches to which the graft is tied, called?
- What is Totipotency?
- What is callus?
- Which plant hormones are used in tissue culture?
- Do animals have totipotent cells?
- Tissue culture in plants is easier than in animals. Guess the

 Vicky's father wants to grow a single plant having two desirable characters colourful flowers and big fruits. What method will you suggest him and why?  The cut stem of a plant having roots is called The cut stem of a plant without roots is called - • What is a tissue? • What is the ability of the plant cell to develop into an entire plant? • Group of cells which are formed in tissue culture are called? • Which tissue is commonly used in tissue culture? • What is the medium used in tissue culture? • What is the role of hormones in tissue culture? Explain how the tissue culture helps farmers to produce large number of disease-free plants in short period of time? **CFU:** Factual Question number • What is called Totipotency? **Open-ended question number** • How does vegetative propagation affect the genetic diversity of plant populations? **Closing:** Recap on the topic. Make it relevant to students' daily lives & see if they can understand its importance	Whole class will be divided into three groups: Group No.1 will be asked to collect different plants and show its different parts Group No. 2 will be asked to identify the plants parts which reproduce sexually. Group No.3 will collect the plants which reproduce through the Root, stem and leaves.. • What are the different natural vegetative propagation methods? • Which part of the plant helps in sexual reproduction? • Give some examples of artificial methods of vegetative propagation. Which part of the potato plant we eat?	reasons. • Can we produce an entire animal from its tissue? • Undifferentiated mass cells are called _____? • How can you differentiate between invitro and in vivo? • List out some organism Which reproduce by spore formation?

Summary:

Vegetative Propagation

- This is a type of asexual reproduction seen in plants.
- The vegetative parts of the plant, like leaves, stems, and roots, give rise to a new plant.
- Vegetative propagation can be artificial or natural.

- Natural vegetative propagation happens through leaves (e.g. Bryophyllum), stem (e.g. turmeric, ginger), runners/stolon (e.g. grass runners, strawberry), bulbs (e.g. onion, lily), etc.

- Artificial methods include cutting, grafting, layering and plant tissue culture.

Period:5

Concepts Covered:
- Vegetative Propagation

Learning Objectives:
- SWBAT understand the vegetative propagation
- SWBAT know the types of vegetative propagation

Prior Concept/ Skills: (Essential concepts and skills to be checked/bridged before teaching the current concept.)
- Plant parts, potato, rose, hibiscus

TLM Required:
- Plant specimens, potato eyes, Bryopyllum leaf

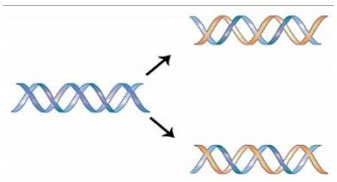
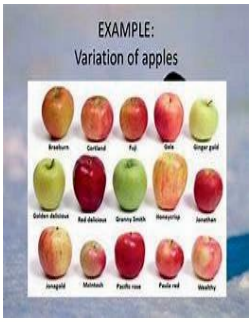
Teacher Resources:
(Any external links that would help teachers to create activities on their own. This includes NCERT Material, OERs, Digital links etc.)
- Textbook
- Crash Course: Reproduction in Animals: Link 2

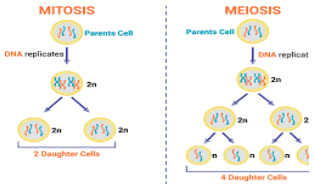
Igniting Activity:
- Show students a healthy leaf cutting or small stem from a plant and ask:

"Can this small piece of a plant grow into an entirely new one?"
Let them predict what might happen if you place it in water or soil.

Experience and reflection:
- "Where do you think roots will come from?"
- "Is this plant being 'born' or is it a copy?"
- "Why might a plant want to grow this way instead of from seeds?"

Learning Point:
- list out various asexual reproduction methods in plants

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
What are variations? What is DNA copying?  How are different variants produced? What is the use of variations? By which type of reproduction variations occur? • What are the two types of cell divisions? • By which cell division the daughter cells receive the same number of chromosomes? In which cell division daughter cells receive half the	 How is reproduction linked to variation? What is the reason behind variation?	How do variations occur in populations? What role does sexual reproduction play in evolution? Why is sexual reproduction more advantageous than asexual reproduction? How is a constant number of chromosomes maintained through generations?

number of chromosomes?  Which cell division occurs in reproductive cells? • How many daughter cells are produced in meiosis? • How many chromosomes are received by the daughter cells in meiosis? • By which cell division male gametes and female gametes are formed? Explains the role of meiosis in reproductive cells **CFU:** Factual Question number • What is called mitosis and meiosis? **Open-ended question number** • How does vegetative propagation affect the genetic diversity of plant populations? • What will happen if the cell division go uncontrol? • What will happen if meiosis not takes place in organisms? **Closing:** Recap on the topic. Make it relevant to students' daily lives & see if they can understand its importance		What happens if there is no meiosis in reproductive cells? What is the source of variation in sexual reproduction? What do you call the production of a haploid cell in a diploid-dominant organism by meiosis? gamete gametophyte spore sporophyte What is the exchange of genetic material between maternal and paternal chromatids of homologous chromosomes during meiosis called? What is the main difference between haploid and diploid condition?

Summary:

Sexual reproduction involves the combination of DNA from two individuals, creating new variations and increasing genetic diversity.

This mode of reproduction allows for the creation of new combinations of variants, which can be beneficial for adaptation and survival.

The process of DNA copying is not absolutely accurate, resulting in variations that are useful for ensuring the survival of a species.

Sexual reproduction incorporates the combination of DNA from two individuals, but this creates a difficulty in maintaining the correct amount of DNA.

To solve this, organisms have evolved meiosis, a process of cell division that reduces the amount of DNA in germ-cells.

As organisms become more complex, germ-cells specialize into male and female gametes.

Male gametes are typically motile, while female gametes contain stored food.

Overall, sexual reproduction is essential for creating genetic diversity and allowing species to adapt to changing environments.

Period:6

Concepts Covered:
Sexual Reproduction in Flowering Plants
Learning Objectives:

- SWBAT understand the flower is call the reproductive part of the plant
- SWBAT know deference between unisexual and bisexual flower.

Prior Concept/ Skills: (Essential concepts and skills to be checked/bridged before teaching the current concept.)

- Petals, sepals, stamens, pistil

TLM Required:

- Flowers, microscope

Teacher Resources:
(Any external links that would help teachers to create activities on their own. This includes NCERT Material, OERs, Digital links etc.)

- Textbook
- Crash Course: Reproduction in Animals: Link 2

Igniting Activity:

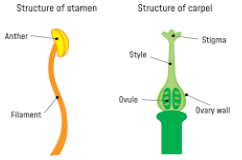
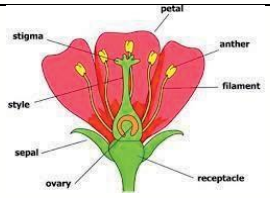
- To spark curiosity about how plants reproduce sexually and how different parts of the flower play a role.
- Materials Needed:
- Real flowers (like hibiscus or lilies) or labeled diagrams/models
- Sticky notes or index cards with labels (e.g., anther, stigma, pollen, ovule, fruit, seed)

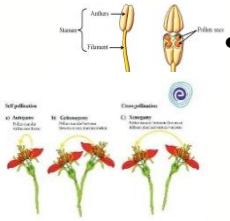
Experience and reflection:
Hand out mystery question cards to groups with prompts like:

- "Who is the 'male' part and who is the 'female' part of the flower?"
- "How does the pollen travel from one flower to another?"
- "What happens after the pollen reaches the stigma?"
- "Why do flowers have bright colors and sweet smells?"

Learning Point:

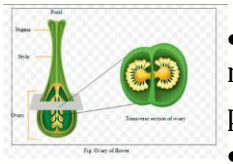
- differentiate between asexual and sexual methods of reproduction

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
Teacher demonstrates the parts of a flower  Observe different types of flowers and describe and differentiate between androecium and gynoecium.	 • What is the sexual part of the angiosperm	Draw the diagrams of Flower Pollination Fertilization Stamens Pistil Draws the life cycle of a flowering plant



- What are the different parts of a stamen?
- Observe different flowers and compare the length of filaments in different stamens and justify these differences.

Where are pollen grains present?

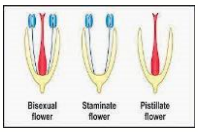


- What do you call the female reproductive part of the flower?
- What is the swollen part of the pistil?

What is the sticky part of the pistil? Why is it sticky?

- How do you identify a male flower?
- Which part of the flower will identify it as a female flower?

Collect different flowers from your locality and identify them as unisexual or bisexual.



A gardener observes that pollen grains of the flower did not reach the same flower, as the stamens were shorter than the pistil. But the plant produced fruits and seed. How is it possible?

- How can you define pollination?

Teacher discusses the various types of pollination with examples.

CFU:

Factual Question number

- What is called unisexual flower?

Open-ended question number

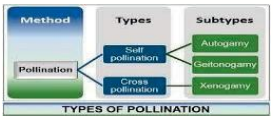
- What will happen if you cut the stamens in bisexual flower?

Closing:

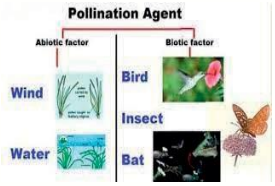
Recap on the topic. Make it relevant to students' daily lives & see if they an understand its importance

- What happens to the pollen grain after it reaches the stigma?
- How is pollen tube formed and how does it reach the ovule (Embryo sac) ?
- Of the different parts of flower shown in the picture, which could be essential for reproduction, and which are not mandatory for reproduction?

What is the significance of the non-essential parts, calyx and corolla in reproduction?



- Pollen grains are not motile. How do they reach the stigma?



Observe the different pollinating agents, discuss their roles and guess the plants in which these agents bring about pollination.

highlighting the events in sexual reproduction

How does the structure of a flower relate to its function?

Which part of the flower protects its internal structures?

Compare and contrast the arrangement of androecium and gynoecium in different types of flowers. Justify it.

What is the formation of male and female gametes in a flower called?

How is filament helpful in dehiscence of pollen grains?

What is the need of having separate male and female flowers?

What is the advantage of a unisexual flower over a bisexual flower and vice versa?

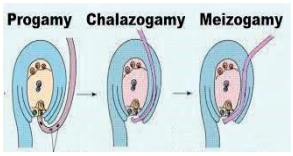
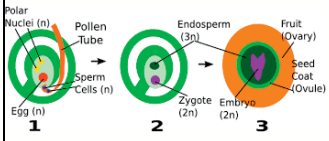
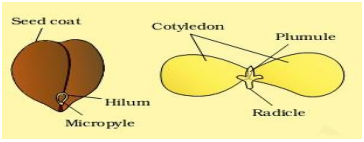
List out the examples as per the table

Why is fertilization in flowering plants not possible without pollination?

After understanding the pollination, which type of pollination do you think is better for producing new varieties?

Can cross pollination occur in the same plant?

Which flowers carry out self-pollination?

Teacher discusses various types of entry of pollen tube into the ovary  What is the main characteristic feature of angiosperm plant? Teacher introduces the concept of Double fertilization and Triple Fusion.  Post fertilization changes in flowering plant? What is the future of the seed  What are the types of seed. From which part root system develops from the seed? If seed germinate what will be the fate of cotyledon?  Teacher helps students to conduct an activity to show the germination of seeds. Identify the parts of a plantlet arising from a germinating seed. **CFU:** Factual Question number • What is called unisexual flower? **Open-ended question number** • What will happen if you cut the stamens in bisexual flower? **Closing:** Recap on the topic. Make it relevant to students' daily lives & see if they can understand its importance		List out the different agents of pollination. Mention some unique and fascinating pollination strategies. What is the name given to pollination by humans. w do aquatic plants dergo pollination? Give examples of plants performing porogamy, chalazogamy and Misogamy. How do you differentiate between Syngamy and double fertilization? What is the fate of these parts after fertilization - petals, sepals, stamens, style and stigma? Give some examples of persistence of the calyx after fertilization. Give some examples of dicotyledons seed plants?

Summary:
Flowering plants reproduce sexually through flowers, which contain stamens (male) and pistils (female).
Stamens produce pollen grains, while pistils contain ovules with egg cells.
Pollination occurs when pollen grains are transferred from the stamen to the stigma, allowing fertilization to take place.

After fertilization, the zygote develops into an embryo within the ovule, which becomes a seed.
The ovary grows into a fruit, protecting the seeds.
Seeds contain the embryo and provide protection, nutrients, and dispersal mechanisms.
When conditions are favorable, the seed germinates, and the embryo develops into a new plant.

Period:7

Concepts Covered:

• Reproduction In Human Beings

Learning Objectives:

• SWBAT understand the reproductive system.

• SWBAT know deference between sperm and egg cell.

Prior Concept/ Skills: (Essential concepts and skills to be checked/bridged before teaching the current concept.)

● Models of male and female systems

TLM Required:

• Flowers, microscope

Teacher Resources:

(Any external links that would help teachers to create activities on their own. This includes NCERT Material, OERs, Digital links etc.)

• Textbook

• Crash Course: Reproduction in Animals: Link 2

Igniting Activity:

• "What do you already know or wonder about how human beings reproduce?"

• Let them write their thoughts anonymously — facts, questions, even myths they've heard. Collect the slips in the box.

• Choose a few to read aloud (filter for appropriateness), and respond with a neutral:

• "Great question — we'll explore that in today's lesson."

• This makes students feel heard and engaged, while allowing the teacher to steer the lesson respectfully.

Experience and reflection:

• "If human beings need two parents to reproduce, what's really happening inside the body to make that possible?"

• Let that question hang and transition into your main lesson on the male and female reproductive systems, fertilization, and development of a foetus.

Learning Point:

• understand sexual reproduction in human beings

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
• Recalls their previous knowledge. • What are the different modes of reproduction in animals? • How do human beings reproduce? • What are the reproductive organs in male and female? • What are the different ways of reproduction in	• When new changes appear in humans? Are the changes as same as boys and girls early teenage?	What gland causes puberty in boys? List out some physical and sexual changes

single cell organisms and in plants? • What are the different stages of life? • What are the changes observed in childhood? • When do baby teeth start falling out? • What are the general changes in growth that can occur from infancy to childhood? • What are the new changes you observe in • What are the changes you observed as your age increased? • What are the different stages of life? • What are the changes observed in childhood? • When do baby teeth start falling out? • What are the general changes in growth that can occur from infancy to childhood? • What are the new changes you observe in early teenage? • Which age is known as adolescence? What are the changes you observe in skin during adolescence? • What are the physical changes observed in males? • What are the changes observed in females? • What is puberty? What are the changes observed in puberty? • Why do these changes occur in puberty? • What hormones are responsible for these changes? • How do these changes are related to reproductive process? Explains how these changes lead to the formation of germ cells. **CFU:** Factual Question number • What is called puberty? **Open-ended question number** • What will happen if hormones don't control the changes at adolescence? **Closing:** Recap on the topic. Make it relevant to students' daily lives & see if they can understand its importance	 Observe your appearance in the mirror and note down the changes.  How do you explain puberty in girls? When puberty ends?	in boys that you see in the picture? What are some physical changes of a girls? What physical and sexual changes do you find in girls? what changes have you gone through from your childhood? How is adolescence different from childhood? Why is adolescence also called teenage? Puberty ends when adolescent reaches reproductive maturity. Do you agree with this or not? • How hormones control the changes at adolescence?

Summary:

Human reproduction is a complex process that involves the maturation of reproductive tissues and organs.

During puberty, the body undergoes significant changes, including the development of secondary sexual characteristics.

These changes are triggered by hormonal changes in the body and prepare the individual for reproductive maturity.

The reproductive system in humans involves specialized organs and tissues that enable the production of germ-cells and their fusion during sexual reproduction.

Sexual reproduction in humans involves the transfer of germ-cells between two individuals, which can lead to fertilization and the development of a fetus.

The male and female reproductive systems have distinct organs and functions that work together to enable reproduction.

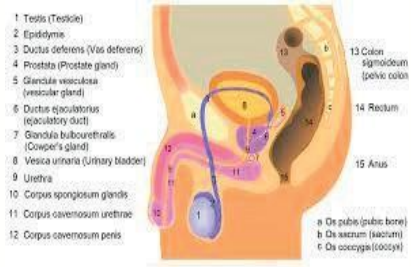
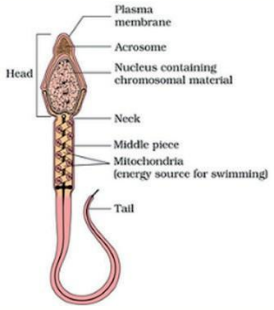
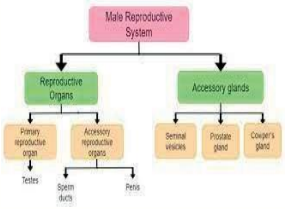
Understanding reproductive health is crucial for maintaining overall health and well-being.

Reproductive health involves practicing safe sex, using contraception, and being aware of the risks of sexually transmitted infections.

Period:8

Concepts Covered:
• Male reproductive System,
• Female Reproductive System
Learning Objectives:
• SWBAT understand the male and female reproductive system.
• SWBAT know deference between male and gamete.
Prior Concept/ Skills: (Essential concepts and skills to be checked/bridged before teaching the current concept.)
Male and female parts, gametes, fertilization, zygote, sex determination.
TLM Required:
● Models of male and female systems
Teacher Resources:
(Any external links that would help teachers to create activities on their own. This includes NCERT Material, OERs, Digital links etc.)
• Textbook
• Crash Course: Reproduction in Animals: Link 2
Igniting Activity:
• Cards or slides with clues about different body systems (e.g., digestive, circulatory, respiratory, reproductive)
Instructions:
Read or display clues like:
• “I carry oxygen to your body.” (Circulatory system)
• “I help break down the food you eat.” (Digestive system)
• “I help make new human life.” (Reproductive system)
Ask students to guess which system is being described. When you get to the reproductive system, pause and say:

"Yes! The reproductive system plays a role no other system can — it allows humans to create new life. But how exactly does it work?"
Experience and reflection:
• "Why do you think humans have two different reproductive systems? What role might each play in creating new life?"
Collect a few answers, then say:
• "In today's lesson, we'll discover how the male and female reproductive systems work together to make reproduction possible."
Learning Point:
• draw the diagrams of male and female reproductive system

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
• Teacher explains the parts of male reproductive system by showing the picture • What are the male reproductive organs? • Where the testes are present? • In which structure they are located? • Why they are located outside the abdomen? • What is the temperature required for the formation of sperms? • Name the hormone which is responsible for the formation of sperms • Which hormone is responsible for the formation of secondary sexual characters  •  What are the different parts of sperm? Which structure of sperm help to penetrate sperm? What is the function of tail in sperm? • Name the fluid which nourishes the sperms.	 Explains the structure of male reproductive system What are the male gametes? Name the tube which arises from the testes. What is the common passage for both urine and sperms? where the sperms are stored? Name the glands which secrete seminal fluid Component / Function Testes — Produce sperms and male sex steroids Epididymis — Store sperm Vasa deferentia — Conduct sperm to urethra Sex accessory glands — Produce seminal fluid that nourishes sperm Urethra — Conducts sperm to outside Penis — Organ of copulation Scrotum — Provides proper temperature for testes	Observe the picture and identify the different parts Where the sperms are produced? How the sperm are passed from testes to ejaculatory duct? Where the sperms are stored temporarily? Name the glands that produces seminal fluid Draw a neat labelled diagram of sperm Name the accessory gland found in male reproductive system and state its function Name the organ that produces sperms and also secretes a hormone. Write the function of the hormone What is semen? What is the function of acrosome? What is the role of mitochondria in middle piece of sperm?

CFU: Factual Question number • What is use acrosome? **Open-ended question number** • What will happen if gametes or not formed by meiosis?		

Summary:

The human reproductive system involves the production of germ-cells and their delivery to the site of fertilization.

The male reproductive system consists of the testes, vas deferens, and other organs that produce and deliver sperm.

The sperm are tiny bodies that consist of genetic material and a long tail.

The female reproductive system consists of the ovaries, fallopian tubes, uterus, and vagina.

The ovaries produce eggs and hormones, while the fallopian tubes carry eggs from the ovaries to the uterus.

The uterus nurtures the developing embryo during pregnancy.

If the egg is not fertilized, the uterus lining breaks down and is shed through the vagina as blood and mucous, a process known as menstruation.

Fertilization occurs when a sperm meets an egg in the fallopian tube, resulting in the formation of a zygote.

The zygote develops into an embryo, which implants in the uterus lining and receives nutrition from the mother's blood.

The development of the child inside the mother's body takes approximately nine months.

Period:9

Concepts Covered:
• Reproductive Health
Learning Objectives:
• SWBAT understand the importance of contraception.
• SWBAT know deferent contraceptive methods and prevention of STD
Prior Concept/ Skills: (Essential concepts and skills to be checked/bridged before teaching the current concept.)
Male and female parts, gametes, fertilization, zygote, sex determination.
TLM Required:
● Models of male and female systems
Teacher Resources:
(Any external links that would help teachers to create activities on their own. This includes NCERT Material, OERs, Digital links etc.)
• Textbook

• Crash Course: Reproduction in Animals: Link 2

Igniting Activity:

"When you hear the word 'health,' what comes to your mind?"

Write students' responses on the board (e.g., fitness, food, exercise, sleep, no disease).

Now ask:

"What do you think reproductive health means? Is it just about having babies?"

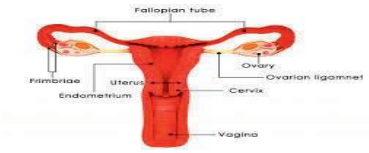
This sets the stage for a broader, more thoughtful understanding of reproductive health.

Experience and reflection:

• "What advice would you give? Why is it important for everyone to have accurate knowledge about reproductive health?"

Learning Point:

• find out the reasons for adopting contraceptive methods

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
• Where female germ cells are produced? • Where the ovaries are located? • Teacher explains the parts of a female reproductive system by showing the picture  • Name the duct which arises from the ovaries. • Oviducts open into a baglike structure known as • Where the uterus opens into? • Cervix opens into which part? • Rupture of graafian follicle and release of ovum is called_____ • Where does fertilization take place in female?	The Female Reproductive System Component / Function Ovary — Site of storage and development of oocytes. Oviduct — Duct for transporting oocyte from ovary to uterus; also site of fertilization if it occu Uterus — Hollow chamber in which embryo develops. Cervix — Lower part of the uterus that opens into the vagina. Vagina — Organ of sexual intercourse. Produces lubricating fluids; also the birth canal. Clitoris — Organ of sexual arousal • What happens to the zygote after fertilization? • Mass of cells formed from the zygote is called_____ • Name the structure formed between the foetus and mother • Fixing of developing embryo in the uterine wall is called • How the embryo gets nutrition from the mother's blood? • What is gestation period in human beings? • What happens if egg is not fertilized? What is menstrual cycle?	• Draw a neat labelled diagram of female reproductive system • Where is the female reproductive system located? • what are the hormones secreted by ovaries? • What is implantation? Where does it take place? • What is the role of placenta in human embryo development? • What is female foeticide? • Why there is gender discrimination existing in many countries till today? • Prepare some slogans on save girl child and display it in the class.

Summary:

Reproductive health involves understanding the physical, emotional, and social aspects of sexual maturation and reproduction.

The decision to engage in sexual activity or have children is influenced by various pressures, including social, familial, and personal factors.

Sexually transmitted infections (STIs) are a significant concern, and using protection like condoms can help prevent their transmission.

Various contraceptive methods are available to prevent pregnancy, including mechanical barriers, hormonal methods, and surgical procedures.

Maintaining a healthy society requires addressing issues like population growth, sex-selective abortion, and promoting reproductive health and well-being.

Teacher Diary

Period no	**Name of the Concept to be taught**	**Date**	**Activities Conducted during the teaching**	**TLM Used**	**Student Response 1/2/3/4/5**	**Topics Indented to Reteach**	**Additional Resources Used to Reteach**
1	Introduction , 7.1 Do Organisms Create Exact Copies of Themselves						
2	7.1.1 Importance of Variation						
3	7.2 Modes of Reproduction Used by Single Organisms						
4	7.2.5 Vegetative Propagation						
5	7.3 Sexual Reproduction						
6	7.3.2 Sexual Reproduction in Flowering Plants						
7	7.3.3 Reproduction in Human Beings						
8	7.3.3 (A) Male reproductive System , 7.3.3(B,C) Female Reproductive System						
9	7.3.3 (D)						

	Reproductive Health						

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Signature of the HM Signature of the teacher

Teacher reflections	Action plan
What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?	
Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?	
What additional resources or modifications could improve the effectiveness of this lesson in future implementations?	
How well did I adjust my teaching based on student reactions or unforeseen challenges?	

Any other specific information:

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October 2025

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
T1J2G6 No bag Day	Q3Y5K3 Cluster Complex	X9H6L6 Teacher Resources	1 Dussera Holiday	Mahatma Gandhi Jayanti Vijayadashami 2	3 NI	No Bag Day 4 Sakunthala Devi Jayanti
Sunday 5 International Teacher's Day	6 8.1 – 8.2.2 = 2NI	7	8	9	10	11 Second Saturday
12 Sunday	13 FA - 2	14	15	16	17 NI	No Bag Day 18 Cluster meeting
19 Sunday	20 Deepavali	21 8.2.2 – 8.2.3 = 2NI	22	23	24	No Bag Day 25 SMC Meeting
26 Sunday	27 8.2.4 + 3NI	28	29	30	31 National Unity Day	

Week1:

Week 2: 8.1 – 8.2.2

Week 3:

Week 4: 8.2.2 – 8.2.3

Week 5: 8.2.4

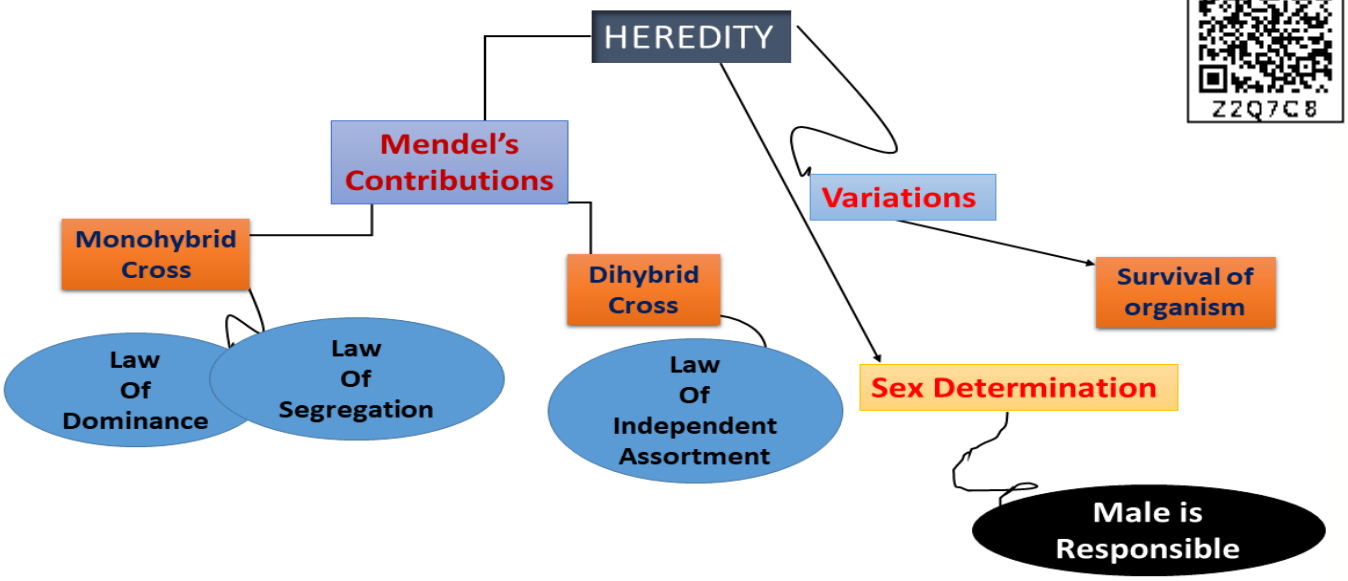
↓ TEACHER'S NOTES ↓

Name of the Chapter: Heredity **Chapter Number: 4**

No. Of Teaching Periods:

Explain the significance of variations.	Give reasons for appearing dominant characters in generations.
Explain the experiments conducted by Mendal.	Apply the knowledge of sex determination in real life scinarioes.
Draw the checker boards and analyse them to explain the ratio in offsprings.	Classify the traits as dominant and recessive. .

Mind Map:



Period No.	Topic
1.	Introduction 8.1 Accumulation Of Variations During Reproduction
2.	8.2 Heredity 8.2.1 Inherited Traits 8.2.2 Mendel's Contributions
3.	8.2.2 Mendel's Contributions
4.	8.2.3 How DO These Trairs Get Expressed
5.	8.2.4 SexDetermination

Period 1

Concepts Covered:

1. **Introduction**
2. **Accumulation Of Variations During Reproduction**

Prior Concept/ Skills: (Essential concepts and skills to be checked/bridged before teaching the current concept.)

- Organisms in a particular species are resemble one other.
- Every organism is uniue inits own way by possessing certain characters.

TLM Required:

- Pictures of cells, organisms and tissues

- How Do Variations Accumulate in generations https://youtu.be/a8LEtYFiyDQ?si=hiQL1zbV94pNEmh9g
- Variations and their advantages https://youtu.be/Da6fCN4Pa5w?si=3AlhNCHM3NPC2trD
- Variations https://youtu.be/2m-Ak1TvPL4?si=98sKRj4jjZGx0oUA
- Greoger Johnn Mendel https://youtu.be/95SL6UbP3ww?si=q2m_LzQdiOCgTjcN
- Monohybrid cross https://youtu.be/B7VMXUk6TEg?si=NMtuU_OzXMCy3b44
- Dihybrid cross https://youtu.be/1QU2phs-hws?si=KfNjdeTuqu8gjFzJ
- How do traits get expressed? https://youtu.be/Afog9Y1cG7g?si=p42yExVXm2c72Kuk
- Sex Dtermination https://youtu.be/D2hVgujy2E8?si=0MPRSa_idqT8m-gt

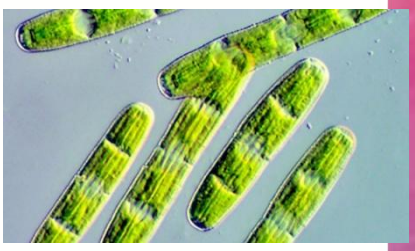
Teacher Reources:

- **APSCERT IX class textbook**

Period 1

Igniting Activity: Use pictures of two Diatoms and two boys to get the idea of variations.

- Ask the following questions by showing those pictures.
- (By showing the pictures of Diatoms) Can you identify differences between these two strands?



- Why cant you differentiate them? .
- (By showing the picture of two boys) Are these boys identical like Diatoms? Can you differentiate them?
- What is the reason for easy differentiation between boys and the task goes difficult in case of Diatoms?
- Diatoms belong to the group Algae. They undergo aexual reproduction. Humanbeings undergo sexual reproduction. Through which type of reproduction, the organisms of the same species get more differences?
- How can a shepherd identify each sheep of his herd though all of them resemble one another having four legs, similar fur colour, two horns etc.?

- The teacher defines variations as**" any difference between cells, individual organisms, or groups of organisms of any species caused by genetic differences."**
- Here the video https://youtu.be/2m-Ak1TvPL4?si=98sKRj4jjZGx0oUA is helpful for better understanding variations.
- Then the teacher leads the discussion towards their accumulation.

I do (Direct Instructions)	**We do (Guided Practice)**	**You do (Independent Practice)**
The teacher can present the video https://youtu.be/a8LEtYFiyDQ?si=hiQL1zbV94pNEmh9 To show how variations are accumulated throughout the generations. Then the teacher can continue the discussion with questions- • Through which mode of reproduction variations occur frequently? • What will happen if the variations inherit generations after generations? What will be the resulting organisms after several generations?	Students can discuss the accumulation of variations and their advantages.	Students can fill out the worksheet: 1. Which of the following is not the effect of variations a) Evoution b) Decrease in the populations

• Yes there would a new type of organism be appeared. This process is called Evolution. • New species are formed due to the process of Evolution. Then the teacher can use the video clip to discuss the advantages of variations. https://youtu.be/Da6fCN4Pa5w?si=3AlhNCHM3NPC2trD Then the following questions can be discussed. • What if the variation occurred in the organism that was useful to it?		c) New species d) Adjusting to changing the surroundings 2. Correct statement about the variations a) Very frequent in asexual reproduction b) Differences in the organisms from relative species c) Occurred due to the errors in DNA copying d) These are not useful to organisms most of the time

Factual Questions:

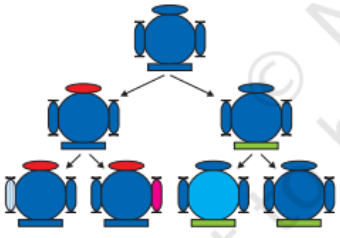
- How does sexual reproduction help the process of Evolution and the origin of new species?
- In which type of organism variations occur very frequently? Why?
- Explain with an example how variation took place due to inheritance.

Open Ended Questions:

- What will happen if variations have not occurred in organisms?
- Imagine the future if humans undergo asexual reproduction or are born from a single parent.
- If trait A exists in 10% of a population of an asexually reproducing species and trait B exists in 60% of the same population, which trait is likely to have arisen earlier?

Evaluation/Quiz/ Assignment:

- Explain the given picture. How would the variations accumulate during the generations?



Home Work:

- What are called variations? How do they help organisms?

Period 2:

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
The teacher at first can introduce the terms Heredity, Inheritance, character, Trait and factors or genes. **Heredity**: Passing of genetic information from parents to offspring. **Inheritance:** The way the genetic traits are interpreted. **Characters:** A character is an observable feature of a particular group of organisms. Characters are inherited as genes by organisms from their parents. **Traits:** Traits are the expressions of a character. **Factors /Genes**: Genes are the units of inheritance, a small strand of DNA is called genes. Each trait is maintained by a pair of factors or genes. Mendelcalled Genes as factors. Then the teacher encourages the students to read about Greoger Johann Mendel. Then the discussion leads to his experiments.	The students read silently about Mendel and discuss about him.	Students can note down the terms and their definitions.
The teacher can explain Mendel's Monohybrid Cross by taking two traits-Tall and Short for example. The teacher may use a videoclip or black board demonstration for the purpose.	Students can identify that there are no medium height plants but only Tall plants in the F1 generation.	Students can learn to calculate the phenotypic and Genotypic ratio by using purette suare/ checker board showing F2 generation.

Factual Questions:

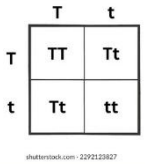
- What contrast characters did Mendel choose for his experiments? Why did he chose the pea plant?
  What are the genes? What is their role in inheritance of characters?

Open Ended Questions:

- How do genes maintain the traits in orgnisms? Discuss your findings.

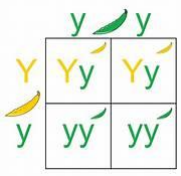
Evaluation/Quiz/ Assignment:

- Calculate the phenotypic and Genotypic ratio of tall and short



plants.

- Calculate the phenotypic and Genotypic ratios of Yellow and Green poded fruits.



Home Work:

- Observe the ears of all the students in the class. Prepare a list of students having free or attached earlobes and calculate the
  percentage of students having each (Fig. 8.2). Find out about the earlobes of the parents of each student in the class. Correlate the
  earlobe type of each student with that of their parents. Based on this evidence, suggest a possible rule for the inheritance of earlobe types.

Period 3

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
The teacher encourages students to recall Monohybrid cross experiment at tfirst and then lead the class towards Dihybrid cross. . The teacher may use a video clip or blackboard demonstraatin to explain Dihybrid cross. Then the teacher can explain the Laws of Inheritance by giving reasons for passing of the factors by segregating one another, appearing all tall plants in F1 generation and passing of traits independently without influencing one another.	The students can discuss the pattern of the F2 generation and how do they appear in such pattern.	Students can note down the Laws of Inheritance with examples.

Factual Questions: .

- What are the contributions of Mendel to the Science of Gnetics? What conclusions he made from his experiments?
- Differentiate between F1 and F2 generation of Monohybrid cross.
- How do Mendel's experiments show that traits may be dominant or recessive?

Open Ended Questions:

- In a fish, gold skin color (G) is dominant to black skin color (g) and split tail fin (S) is dominant to single tail fin (s). Breeding between two fish of unknown genotypes results in the following phenotypic ratios in the progeny: 1/4 gold, split tail fin; 1/4 gold, single tail fin; 1/4 black, split tail fin, and 1/4 black, single tail fin. What are the genotypes of the two fish used for breeding?
- In a fish, gold skin color (G) is dominant to black skin color (g) and split tail fin (S) is dominant to single tail fin (s). A breeder crosses a male fish having GgSs genotype with a female fish having ggSs genotype. Determine the expected phenotypic ratio of the progeny.
- A man with blood group A marries a woman with blood group O and their daughter has blood group O. Is this information enough to tell you
  which of the traits – blood group A or O – is dominant? Why or why not?
- A Mendelian experiment consisted of breeding tall pea plants bearing violet flowers with short pea plants bearing white flowers. The progeny all bore violet flowers,but almost half of them were short. This suggests that the genetic make-up of the tall parent can be depicted as

(a) TTWW (b) TTww (c) TtWW (d) TtWw

- A study found that children with light-coloured eyes are likely to have parents with light-coloured eyes. On this basis, can we say anything about whether the light eye colour trait is dominant or recessive? Why or why not?

Evaluation/Quiz/ Assignment:

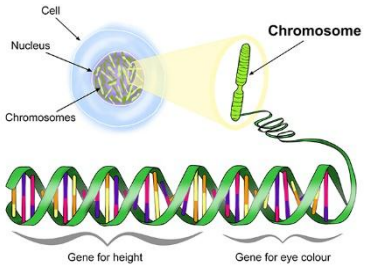
- If the blood group of both the parents is AB, then the possible blood group will be___
  a) A, B or AB b) A & B c) A, B & O d) None of the above

- Which of the following is a dominant trait?
  a) Wrinkled seed b) Green seed c) Short plant d) Round seed
- A pure tall pea plant is crossed with a pure short plant, what will be the ratio of homozygous tall and homozygous short plants in F2 generation?
  a) 1:2:1 b) 3:1 c) 2:1 d) 1;1

Home Work:

- Explain Mendel's Monohybrid cross experiment with and example.
- How do Mendel's experiments show that traits are inherited independently?

Period 4

I do (Direct Instructions)	**We do (Guided Practice)**	**You do (Independent Practice)**
The teacher can use the video clip https://youtu.be/Afog9Y1cG7g?si=p42yExVXm2c72Kuk To help students to understand how the traits get expressed.  The teacher may also use the picture to explain the nucleus, DNA, Chromosomes and Genes, the units on that chromosomes. The teacher can make students to recall Meoisis process to pass half of the set of chromosomes through their gametes and Fertilization process to form an embryo in sexually reproducing orgnaisms during the demonstration. The teacher can also relate the action of plant hormones with the presence of gene inside the cells of the organism.	The students can give examples for the expression of traits caused by the transmission of genes.	The students can note down their perception of how do the traits get expressed. It can be like this: **DNA is the source of information for making proteins in the ceil. The section of DNA is called gene. For example, the height of a plant depends on the hormone. The amount of hormone depends on the process of its formation. A protein is important for this process. If this protein works efficiently a lot of hormones will be made. If the gene responsible for that protein has an alteration, this will make the protein less efficient. The amount of hormone**

		will be less and the plant will be short. Thus, traits get expressed.

Factual Questions: .

- How do traits get expressed? Explain with an example.
- How is the sex of the child determined in human beings?
- How is the equal genetic contribution of male and female parents ensured in the progeny?

Open Ended Questions:

- What will happen if a gene does not transferred to the nex generation unexpectedly?
- How does Meiosis cell division helps in maintainance of the state of DNA constant in a species?

Evaluation/Quiz/ Assignment:

- Genes are the_____

  a) set of chromosomes b) Units of inheritance on DNA c) Expressions of characters d) Forms of traits
- Following factors do not affect the release of auxin in a plant

  a) The hormone that inhibits the growth of plant b) The gene that represents tallness
  c) The number of chromosomes the plant contain d) Environmental factors like light and water availability

Home Work:

- Draw the structure of DNA

Period 5

I do (Direct Instructions)	**We do (Guided Practice)**	**You do (Independent Practice)**
The teacher can explain the concept by blackboard demonstration.	The students may discuss about female foeticide, Taboos regarding sex determination etc.	Students can draw the flowchart of sex determination in humans.

Factual Questions: .

- Sex determination in animals is of how many types? What are they? Explain with examples.
- Are there any aniamls with no particular sex? What are they?

Open Ended Questions:

- Is it correct to blame female for getting girl children? Who is responsible for sex determination in humans? How? Express your feelings.
- Write some slogans on female foeticide.
- Write some slogans to aware people on equality of women and men.

Evaluation/Quiz/ Assignment:

- **Match the following:**

  (1) Autosomes ( ) (a) XY
  (2) Allosomes ( ) (b) 23 pairs
  (3) No. Of chromosomes in humanbeings ( ) (c) 22 pairs
  (4) Female ( ) (d) X
  (5) Male ( ) (e) Y

Home Work:

- Draw the flowchart showing sex determination in humanbeings.

Teacher Diary

Pe Ri Od No.	Name Of The Concept	Date	Activities Conducted during the teaching	TLM Used	Student Response 1/2/3/4/5	Topics Indented to Reteach	Additional Resources Used to Reteach
1	Introduction 8.1 Accumulation Of Variations During Reproduction						
2	8.2 Heredity 8.2.1 Inherited Traits 8.2.2 Mendel's Contributions						
3	8.2.2 Mendel's Contributions						
4	8.2.3 How DO These Trairs Get Expressed						
5	8.2.4 SexDetermination						

Signature of the HM **Signature of the teacher**

Teacher reflections	Action plan
What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?	
Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?	
What additional resources or modifications could improve the effectiveness of this lesson in future implementations?	
How well did I adjust my teaching based on student reactions or unforeseen challenges?	

Any other specific information:

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November 2025

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 No Bag Day Andhra Pradesh Avatarana
2 unday	3 13.1 – 13.2 + NI	4	5	6	7	8 Second Saturday
9 Sunday	10 SA - 1	11 Day	12	13	14 Day	15 No Bag Day
16 Sunday	17 SA - 1	18	19	20 NI	21 NI	22 No Bag Day Cluster meeting Fibonacci Day
23 Sunday	24 13.2.1 – A13.8	25	26 National Constituti India	27 Sanjeevarava	28	29 No Bag Day SMC Meeting
30 Sunday						

14 - 20 National Library Week

TEACHER'S NOTES

Week1: **13.1 – 13.2**

Week 2:

Week 3:

Week 4: **13.2.1 – A13.8**

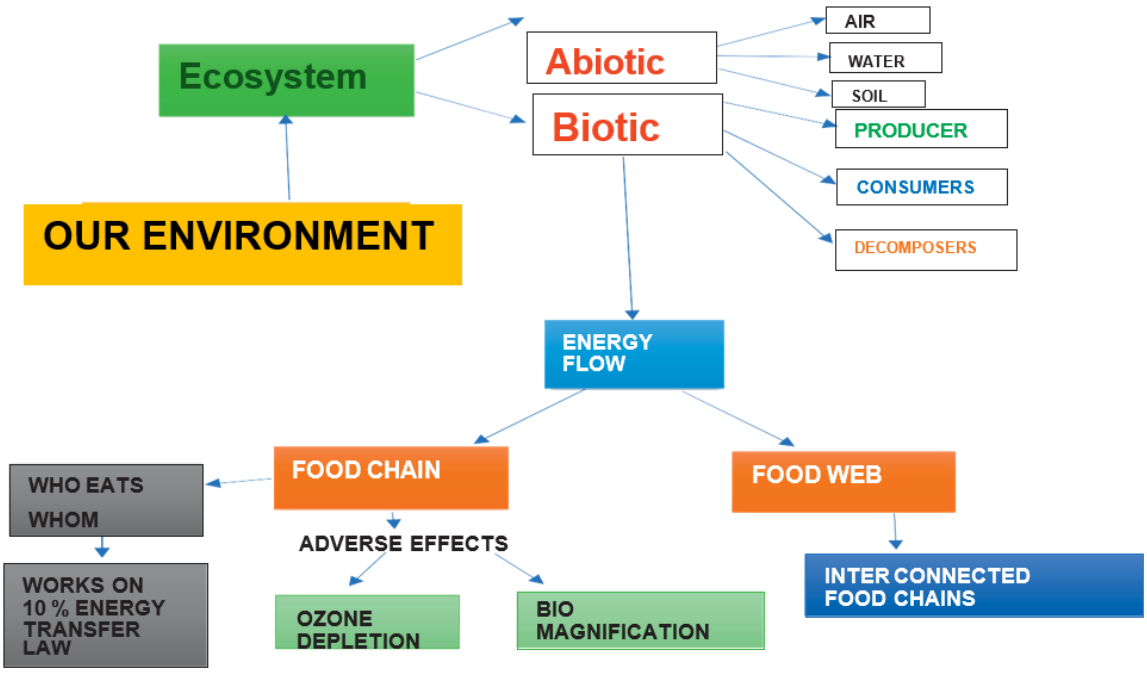
Our Environment

NO OF TEACHING PERIODS: 06

Learning Outcomes: Learners…..

1.Explain about the ecosystem and its components
2. Derive possible food chains and food webs
3. Explain the human activities that affect the environment
4. Find out the reasons for ozone depletion
5. Apply waste disposal management in day-to-day life
6. Conduct the activities and identifies the materials that remain unchanged over long. Time and the materials which change their form and structure over time
7. Conduct the activities and calculate the amount of waste generated and find out how sewage treated in our locality and how the local industries treat their waste.

Mind map



S.NO	TOPIC
1	1.Introduction 13.1 Ecosystem what are its components
2	13.1.1 Food chains and webs
3	13.2 How do our activities effect the environment 13.2.1 ozone layer and how it's getting depleted
4	13.2.2 Managing the garbage we produce Activity 13.5, Activity 13.6
5	Activity 13.7, 13.8
6	Activity 13.9

Teacher can revise following concept (Synopsis)

1.The various components of an ecosystem are interdependent.
2. The producers make the energy from sunlight available to the rest of the ecosystem.

3.There is a loss of energy as we go from one trophic level to the next, this limits the number of trophic levels in a food-chain.
4.Human activities have an impact on the environment.
5.The use of chemicals like CFCs has endangered the ozone layer. Since the ozone layer protects against the ultraviolet radiation from the Sun, this could damage the environment.
6.The waste we generate may be biodegradable or non-biodegradable.

Period:1
Concepts Covered:
1.Introduction
13.1 Ecosystem what are its components
Learning Objectives:
Differentiates(i) biotic and abiotic components
(II) terrestrial and aquatic ecosystems
Defines ecosystem, biotic and abiotic components of an ecosystem
Classifies ecosystems as natural and artificial
Applies learning of ecosystem to hypothetical situations
Exhibits creativity in designing a model aquarium
elates the dependency of organisms on each other
Applies learning to hypothetical situations
Exhibits creativity in designing models using ecofriendly resources

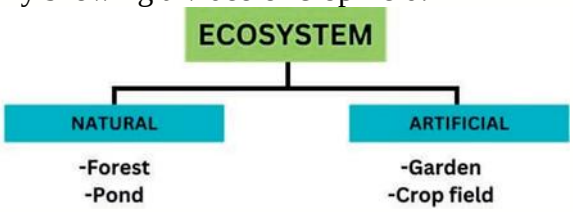
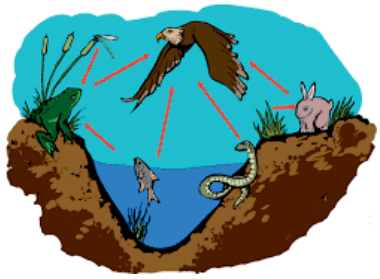
Prior Concept/ Skills: (Essential concepts and skills to be checked/bridged before teaching the current concept.)
What do we see in our surroundings?
What do you call the things which have life?
How do you differentiate living things from non-living things?
We often come across in Newspapers, “Environment is changing” what does it mean?
What do you mean by environment?

TLM Required: Flash Cards, Text Book images, Activity Cards, videos
Teacher Resources:
NCERT Class 10 Textbook
Diksha videos

Igniting Activity.
The Teacher shows an aquarium to the students which contain water, plants, pebbles and different types of fishes.

Learning Point: Where does fish live?
Why don’t fish lives on earth?

I DO	WE DO	YOU DO
The teacher introduces the concept of environment and illustrates the concept of ecosystem with the help of a video or by a	By following questions Teacher and student will find the answers to the following questions What do you find in a garden? Do we find only living things in the garden? Name the non-living components which affects the growth and other activities of living things? Is there any relation between the living and non-living components of the garden?	1.Prepare a model of an ecosystem by using a cardboard 2. What is an ecosystem what are its components? 3. Biotic components of an ecosystem includes Sunlight and water Plants and animals

visit to nearby Park.	If living things in the garden constitutes the biotic factors, what are abiotic factors? Now can you tell what does a garden constitute? So, garden is an ecosystem. Define ecosystem? Name the biotic and abiotic components in the garden ecosystem? The teacher elicits the types of ecosystems By showing a video of crop field.  Who grow and maintain the gardens and crop fields? Can we call crop field a natural ecosystem? Why? Can you name an ecosystem which develop in the nature without human support? What do you call the ecosystem present on land? What do you call the ecosystem present in water? You might have seen an aquarium. Let us try to design one. What are the things that we need to keep in mind when we create an aquarium? The fish would need a free space for swimming (it could be a large jar), water, oxygen and food. We can provide oxygen through an oxygen pump (aerator) and fish food which is available in the market. If we add a few aquatic plants and animals it can become a self-sustaining system. Can you think how this happens? An aquarium is an example of a humanmade ecosystem. Can we leave the aquarium as such after we set it up? Why does it have to be cleaned once in a while? Do we have to clean ponds or lakes in the same manner? Why or why not? The teacher asks the students to divide into two groups and asks the students of one of the groups to write the name of different kinds of living organisms on paper. The second group should categorize the names of all these living organisms into producers and consumers and discusses	Soil and minerals Air and temperature 4. How are ecosystems broadly classified? 5.Which of the following is a natural ecosystem Garden crop field pond aquarium Observe the below picture and name the type of ecosystem identify the producers and types of consumers 

	How do plants get their food? Why are they called producers? Why are plants important in an ecosystem? Which animals consume plants as food? What do we call them? Given example of animals which consume other animals as food?   The Teacher enables students to identify and classify primary, secondary and tertiary consumers through an activity and simple questions <u>Activity:</u> Make a list of consumers that you see in your surroundings and categorize them in the order **Who eats Whom** as primary secondary and tertiary consumers? Why are herbivores called primary consumers? Which animals are called secondary consumers? Why? <u>ACTIVITY</u> The teacher setups a decomposition experiment and asks the students to collect kitchen waste, papers and the plastic waste and dump them in a pit and discuss the role of decomposers in breaking down the organic matter. Observing the changes over time will help to find out, how decomposers contribute to nutrient recycling in ecosystems. Give examples of decomposers. Why are decomposers called microconsumers? What is the role of decomposers in the environment?	Categorize the following animals to primary, secondary and tertiary consumers: Deer, goat, cat, rat, dog, hen, eagle, dove, spider, lizard, snake

SUMMARY

An ecosystem consists of biotic components comprising living organisms and abiotic components comprising physical factors like temperature, rainfall, wind, soil and minerals.

ASSIGNMENT

1. A rotting piece of wood is a small ecosystem. Justify
2. While creating an aquarium did you take care not to put an aquatic animal which would eat others? What would have happened otherwise?
3. Write the aquatic organisms in order of who eats whom and form a chain of at least three steps.
4. Would you consider any one group of organisms to be of primary importance? Why or why not?
5. The microorganisms comprising and , break down the dead remains of organisms into simple forms.
6. What conclusions can we draw from the observations made in the decomposition experiment?
7. How does the natural replenishment of the soil take place?
8. What will happen if we remove the decomposers in the biosphere?
9. Now a days farmers are making indiscriminate use of fungicides to protect their crops from microbes. This act kills many useful microbes. Suggest ecofriendly methods to save useful microbes.

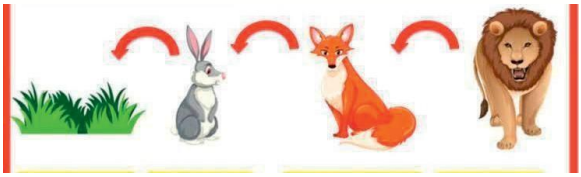
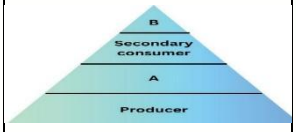
Period 2

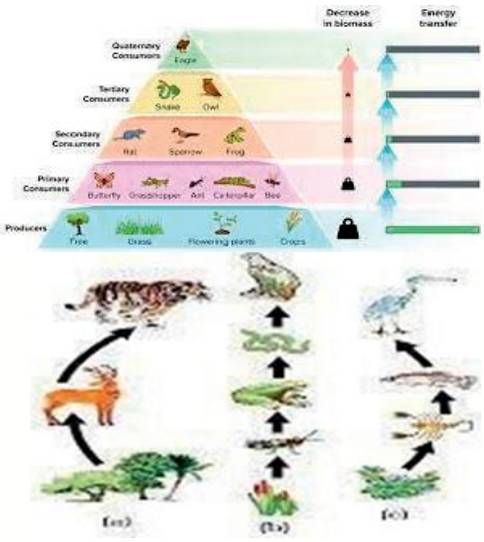
Topics to be covered

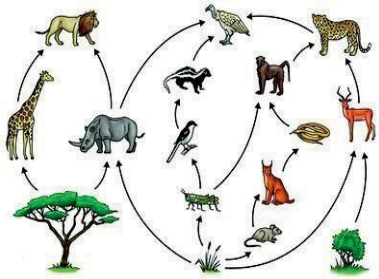
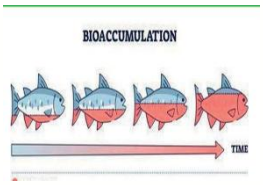
13.1.1 Food Chains and Webs

Learning Objectives

- Classifies organisms according to the manner in which they obtain their sustenance from the environment.
- Differentiate consumers as primary, secondary and tertiary consumers.
- Analyze and interprets the concept of food chain
- Applies learning about biomagnification to hypothetical situations.
- Explains the trophic levels in ecosystem.
- Draw flowcharts of food chains and trophic levels
- Take initiative to know about the scientific contributions of Scientist Lindeman.

I DO	WE DO	YOU DO
The teacher introduces the concept of food chain with the help of a model and activity	The teacher gives the names of a few animals on cards in a jumbled way and asks the students to tell which animal becomes the food for the other and arrange them in the series of order given below: PRODUCERS → PRIMARY CONSUMER → SECONDARY ~~CON~~SUMERS TERITIARY CONSUMERS What do the above series of organisms imply? As this series of chain is formed by organisms for food. What do we call this chain as?  How many steps or levels do you observe in the above food chains (a), (b)and (c)	1.Write the appropriate names of trophic levels A and B in the following figure  2.Which among the

	respectively? The teacher elicits the trophic levels and flow of energy with the help of a model  As each step or level of the food chain forms a trophic level, at which tropic level are producers present? Why? Which organisms come at second, third and fourth trophic levels respectively? The teacher further elaborates the Ten Percent Law of Energy flow, put forth by Lindeman (1942). **SUN (1000 J of energy)□ GREEN PLANTS (1000-990=10J)□HERBIVORE (10-9=1J)□PRIMARY CARNIVORE (1-0.9=0.1J)□SECONDARY CARNIVORE (0.1-0.9=0.09J)** **What percent of the energy from sun is captured by green plants?** **What percent can be taken as average value for the amount of organic matter that is present at each trophic level?** **Which level will have greater number of organisms?** <u>Activity</u>: The teacher introduces the concept of food web through a group activity with the help of pictures of a food chains on cards and asks to identify the number of steps/ levels in the given food chains: Group 1-Vegetation (producer) → Elephant(herbivore) Group 2- Vegetation (producer) → Rabbit (herbivore) Group 3- Vegetation (producer) → Deer (herbivore)□Lion (Carnivore) Group 4- Grass (producer) → Worms (herbivore)→ Small bird (carnivore I)→ Hawk (carnivore II) Group 5- Grass (producer) → Flies(herbivore) → Frog (carnivore I) → Snake (carnivore II) → Peacock (carnivore III}) How are these food chains interrelated?	following belongs to first trophic level and give reasons. Grass., Grasshopper, rat, plants, Tiger 3.Which trophic level eats nothing and which one is not eaten? What is the reason that a food chain consists of only 3-5 steps? (Hint: 10% law of Lindeman) Collect information about the scientist's contribution in studying about environment Differentiate between the food habits of organisms belonging to first and second trophic levels. Differentiate food chain and food web. Make a flowchart of food chains using the following organisms in the form of who eats whom: Grass, frog, seeds, eagle, cat, insects, snake, rat

	• Can organisms in one food chain be a part of other food chain? The teacher further reinforces the concept of food web and interrelationships between the different organisms How many food chains do you observe? Do all the food chains have same length? Which animal becomes the food for the other in a food chain? Can one animal become the food for many?  How can we show the relationship of who eats whom in the above diagram? What is the relationship between food chains shown as a series of branching lines called? What is the direction of energy flow in the food web? Does the energy captured by autotrophs revert back to solar input? The teacher by posing the questions explains about pesticides Where do we get our food from? What are the requirements in an agricultural field for a farmer? What measures are adopted by the farmer to take care of the crop from diseases? The teacher discusses with the students that different kinds of pesticides are used in the agricultural field.  What happens to the pesticides after it enters the soil? Can pesticides be also found in water bodies? What absorbs the pesticides from the soil along with water and minerals? How do these pesticides enter the herbivores? Are the chemicals in the pesticides degradable? To which trophic level does these chemicals accumulate progressively? Define bio magnification. The teacher further reinforces the concept of biomagnification through the below diagram Which organism in the food chain will have maximum containment? Where do human beings lie in the food chain? How do harmful chemicals enter human bodies?	Explain how pesticides enter the food chain. What do you understand from the below picture? 

SUMMARY

The producers make the energy from sunlight available to the rest of the ecosystem.
There is a loss of energy as we go from one trophic level to the next, this limits the number of trophic levels in a food-chain.

ASSIGNMENT

1. In a village, vultures are found to be dead due to insecticide poisoning after eating dead animals. Vultures are very important for a food chain and their death has become a matter of great concern.

A) What do you learn from the death of the vultures?
B) What precautions should we take in eating of our food?
C) What should the government do to reduce biological magnification?

2. A geographical area contains organisms like snakes, grasshoppers, peacocks, grass and frogs. If pesticide was used in this area to kill insects, which among the following organisms will have maximum amount of pesticide? Name the phenomenon involved.

3. Give reason why fruits and vegetables should be washed with plenty of water before consuming them?

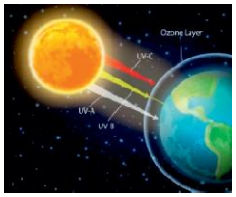
4. The maximum concentration of harmful chemicals accumulates in human beings? State the phenomenon involved and justify this statement.

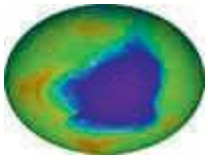
Period 3

Topics to be covered
13.2 How do our activities affect the environment
13.2.1 Ozone layer and how it is getting depleted
Learning Objectives

- Analyze and interprets the concept of food web
- Draws the flowchart and diagrams of food web
- Relates the food chains and the flow of energy in a food web
- Exhibits creativity in designing the models
- Relates the process of biomagnification and its effect on organisms.

I DO	WE DO	YOU DO
The teacher introduces the concept by asking How do the changes in the environment affect us? Why do we often use a sunscreen lotion or an umbrella during a hot sunlight in the mid-afternoon?	The Teacher shows the following picture and asks the following questions What changes happen in the skin when we are constantly exposed to the sunlight?  The teacher introduces the concept of ozone layer and its function to shield the earth from harmful UV radiations. Which gas is essential for all aerobic forms of life? What does O2 refer to? When and why is Ozone Day celebrated in your school? What does O3 refer to?	The pigment present in the human body which prevents harm from ultraviolet radiations? **Mr. Sam has recently come back from an expedition to Antarctica. After a few days of his return, the doctors have diagnosed his skin**

	How are the living organisms protected from the harmful radiations?  What is the function of Ozone? Why does our skin tan when we are constantly exposed to the sunlight? What is the cause for skin cancer in human beings? The teacher further elaborates the formation of ozone. How is Ozone formed? The teacher discusses the effect of chlorofluorocarbon on the atmosphere. Where do you store the vegetables and fruits for a longer time at your home? How do you think the refrigerator gets cooled? Is it by electricity or by chemicals? What chemicals are released by the refrigerators? Can these synthetic chemicals be linked to the depletion of ozone layer? How is ozone depleted? What are the effects of ozone on the atmosphere? When did UNEP agreement to freeze the CFC production took place? As a result of the agreement what was made mandatory? What is being done to recover the ozone depletion? The teacher further elaborates the topic through activity 13.4 Which chemicals are responsible for the depletion of ozone? Ozone-depleting substances (ODS) are commonly used in products such as refrigerators, air conditioners, fire extinguishers, and aerosols. Which include CFCs, HCFCs, halons, methyl bromide, carbon tetrachloride, and methyl chloroform. ODS are generally very stable	**problem as skin cancer.** **A) What might be the reason for developing skin cancer immediately after return from Antarctica?** **B) What do we learn from the incident?** **C) How will you carry the message to common people?** **Ozone is deadly poisonous. Still, it performs an essential function. How?** **What is the full form of CFC?** Which chemical is used as fire extinguisher? How it is harmful?

	in the troposphere and only degrade under intense ultraviolet light in the stratosphere What regulations were put in place to control the emissions of ODS? The Montreal Protocol, finalized in 1987, is a global agreement to protect the stratospheric ozone layer by phasing out the production and consumption of ozone-depleting substances (ODS). By Group discussion Teacher explains about ozone hole  Will the ozone layer recover? Can we make more ozone to fill in the hole? The student groups further discussed to make posters depicting the ozone layer depletion, its effects on the environment and whether the damaged Ozone layer was reduced or not and what efforts they can put to protect ozone. As a student what measures will you take to prevent the ozone layer depletion in your neighbourhood?	

SUMMARY

Human activities have an impact on the environment.

The use of chemicals like CFCs has endangered the ozone layer. Since the ozone layer protects against the ultraviolet radiation from the Sun, this could damage the environment.

ASSESSMENT

1. Suggest any two methods to control ozone depletion?
2. The depletion of ozone layer is cause of concern why?

Period 4

Topics to be covered: 13.2.2 Managing the Garbage We Produce
Activity 13.5,13.6

Learning Objectives:

- Classifies materials based on the time taken to change (degrade)
- Differentiates biodegradable and non-biodegradable materials
- Exhibits rational thinking in the usage of biodegradable and non-biodegradable materials

I DO	WE DO	YOU DO
Teacher starts the topic by discussion	Give examples of few materials that you have thrown in the dustbin today?	Mention the basis of classifying substances as biodegradable and non-biodegradable.

	What happens when you do not empty the dustbin for a few days? Why do you think we get a bad smell from the dustbin which was not emptied for a few days? What is the function of decomposers? The teacher performs Activity 13.5to find answers to the above questions. The students are instructed to collect the waste materials of different types from their household or from the dustbin and bury the waste materials in a pit in the school garden (students record their observations) The teacher gives the task to classify the materials as those which decompose easily and those which do not and differentiate them as biodegradable and non-biodegradable materials.  The teacher reintroduces the concept of enzymes and their action on different kinds of food components. (ENZYMES BIOCHEMICAL KNIFE) Why do we need different types of enzymes to digest different components of food? Which enzymes help to digest carbohydrates? What is the function of the enzyme trypsin? Enzymes are specific in action. Clarify? Why can't get energy if we eat coal or wood? A fruit perishes but a plastic ball doesn't. Why? How do non-biodegradable substances harm the various members of the eco-system? The teacher guides the students to conduct the activity 13.6. Non-biodegradable substances and average time to break down: Glass bottle-500 years, Plastic soda bottle-450 years, Plastic container-50-80 years, plastic bags-10-20years Why should we not use non-biodegradable materials in our day today life? What do you learn from the activity?	Give two examples of each. Why are some substances as biodegradable and non-biodegradable? Why do some materials do not change their form and structure? Which of the following materials are biodegradable: Glass, leather, GLUCOSE, SILVER FOIL Which bag will you prefer for shopping? Can biodegradable waste be hazardous for human health? Which bag will you prefer for shopping? Can biodegradable waste be hazardous for human health? <u>Identify</u> the <u>mismatched statement</u> Biodegradable materials easily mix in the soil. Bacteria and the saprophytes feed on the manmade materials like plastic Enzymes are responsible for the break- down of food materials . Find out the time period required for a plastic bag to degrade? . Why should we prefer bioplastics?

SUMMARY

Substances that are broken down by biological processes are said to be biodegradable. substances that are not broken down in this manner are said to be non-biodegradable.

ASSESSMENT

1. We as responsible individuals can contribute by becoming Environment friendly. What practices we can adopt in order to do so?

Period 5

Topics to be covered: Activity 13.7
Activity 13.8

Learning Objectives:

Differentiates materials based on properties and characteristics
Draws conclusions and communicates the findings and effectively.
Applies learning to hypothetical situations.

I DO	WE DO	YOU DO
Teacher shows a video on Garbage Biodegradable and Non-Biodegradable waste	 What will happen if you do not clean your house for a week? Give examples of a few waste materials that are produced at your home? How do you differentiate biodegradable and non-biodegradable substances? Which bag will you prefer for shopping? What do you observe in the following picture below? The teacher motivates students to conduct the activity 13.7 through Survey and discussion. Garbage management- steps Collection of garbage Transport of garbage from collection site to disposal site Segregation of garbage into components (decomposable/ recyclable/ combustible/ non-combustible) Disposal of garbage (Degradable – Pig and cattle feeding, Composting, Biogas and Manure Recyclable – Picked by Rag pickers Combustible – Burning, Incineration and Pyrolysis Non-combustible— Landfilling or Dumping	What is meant by garbage? Mention various methods of garbage disposal? Estimate the type of waste which is taken away by the rag pickers? Can we make biodegradable plastic materials? Why do the municipality people use the different colours dustbin for throwing the waste collected in the street?  Why should be biodegradable and nonbiodegradable waste discarded into different dustbins?

	Prepares list of waste items which are generated at our homes. System to collect the generated wastes Administrative body in collection and disposal Location of disposal sites Mechanism of separating and treatment of garbage Methods of final disposal Further information is derived regarding Weight of the waste generated at home daily for a fortnight Calculate the average per day per person Identifies biodegradable and non-biodegradable wastes Finding out the waste generated in the class Suggest methods to dispose off The teacher conducts discussion on Activity 13.8 based on the collected information Study on the mechanism of disposal of sewage by your local Panchayat or Municipal Corporation Sewage treatment of disposed waste Mechanism followed to protection of local water bodies from getting polluted Study on the waste generated by the local industries Suggests ways of dealing with the waste Mechanism to ensure that soil and water are not polluted	

SUMMARY

The waste we generate may be biodegradable or non-biodegradable.

The disposal of the waste we generate is causing serious environmental problems.

ASSESSMENT

1. How do biodegradable substances affect the environment?
2. Ram and his friends went for a picnic to a park. They carried food packed in plastic materials. After eating the food some of his friends collected the leftover food and plastic materials to dispose them off by burning. Ram immediately stopped and suggested to segregate the leftover food and peels of fruits from plastic materials and respectively dispose them off separately in the green and red dustbins placed there.

(I) In your opinion, is burning plastic an eco-friendly method of waste disposal? Why? State the advantage of method suggested by Ram.

(II) How can we contribute in maintaining the parks and roads neat and clean?

Period 6

Topics to be covered: Activity 13.9

Learning Objectives

Differentiates materials based on properties and characteristics
Explains about the effect of hazardous materials on the environment
Applies learning to hypothetical situations.

I DO	WE DO	YOU DO
The introduces the topic by a video	The teacher elicits from the students In olden days people used to serve food in banana leaves during feast. What type of materials are banana leaves? What are used now a days to serve food during parties and feasts? What type of materials are disposable packaging? What are food packages made up of? What materials do people use to carry and pack materials? What change in the attitude of people is observed in the usage of materials? What has changes in the packaging caused? What will be the impact of non-biodegradable materials on our environment? How do vendors sell tea/coffee in train now a days? Some time back, *kulhads*, disposable clay cups, were used but were stopped. Why? The Teacher discusses on activity 13.9 Hazardous materials to be dealt while disposing electronic items - silicon, nickel, arsenic, beryllium, cadmium, lead, mercury, selenium, chromium, brominated flame retardants, polyvinyl chlorides, etc.) What hazardous material are dealt with while disposing of electronic items? These materials affect the environment. Recycling process: Reduce, Reuse, Recycle – divert waste from landfills, mitigating soil and water pollution	Improvement in life style often results in increased generation of ---------- material. Use of paper is more environment friendly than the use of polythene for packaging. Justify? Students in a school listened to the news in the morning assembly that the mountain of garbage in Delhi suddenly exploded and various vehicles got buried under it. Several people were also injured and there was a traffic jam all around. In the brain storming session the teacher also discussed this issue and asked the students to find out a solution to the problem of garbage. Finally, they arrived at two main points – one is self-management of the garbage we produce and second is to generate less garbage at individual level Suggest two measures to manage the garbage we produce? As an individual what can be done to generate the least garbage? List two values the teacher instilled in his students in this episode?

	Recycling of plastics emits chemicals - hydrocarbons, toxins like dioxin causing cancers, respiratory and skin problems) How does recycling process impact the environment? What are the three R's in saving the environment? What are the problems caused by the nonbiodegradable waste we generate? How will you sensitize others regarding the harmful effects of improper disposal of garbage.	

SUMMARY

Improvements in our life-style have resulted in greater amounts of waste material generation. Changes in attitude also have a role to play, with more and more things we use becoming disposable.

ASSESSMENT

1. State the advantage of using disposable paper cups over disposable plastic cups.
2. The disposal of electronic waste creates hazards to the environment. Discuss.
3. How are e-wastes disposed?
4. Recycling is considered as a welcome practice to deal with the environmental problems. Justify.
5. Explain about the process of plastic recycling.
6. Write a few slogans on waste management?
7. Improvement in life style often results in increased generation of waste material" What changes can we incorporate in our life style in order to reduce nonbiodegradable waste?

Teacher Diary:

Period No	Name of the Concept to be taught	Date	Activities Conducted during the teaching	TLM Used	Student Response 1/2/3/4/5	Topics Indented to Reteach	Additional Resources Used to Reteach
1	Introduction ,13.1 Ecosystem- What Are It's Components						
2	13.1.1 Food Chains And Webs						

3	13.2 How Do Our Activities Effect The Environment						
4	13.2.1 Ozone Layer And How It's Getting Depleted						
5	13.2.2 Managing The Garbage We Produce						
6	Activity-13.5,13.6						
7	Activities 13.7 13.8						

Signature of the HM

Signature of the teacher

Teacher reflections	Action plan
What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?	
Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?	
What additional resources or modifications could improve the effectiveness of this lesson in future implementations?	
How well did I adjust my teaching based on student reactions or unforeseen challenges?	

Any specific information

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LIST OF MATERILS REQUIRED TO PERFORM ACTIVITIES

CLASS: X

ACTIVITY NO:	ACTIVITY NAME	RESOURCES REQUIRED
	CHAPTER - 5: LIFE PROCESSES	
5.1	Testing for starch in leaves	Potted croton plant, Beakers – 1 small & 1 large, Petri dish, water, Iodine solution, Alcohol.
5.2	Experiment to prove that Carbon dioxide is essential for Photosynthesis.	Two small-sized potted plants, Bell Jars -2, Watch glass, Material useful for Iodine test (Activity 5.1), Vaseline, and Potassium Hydroxide palettes.
5.3	Experiment to prove the action of saliva on starch/ carbohydrates	Test tubes -2, Starch solution – 1ml., saliva -1ml., Iodine solution
5.4	Experiment to prove the presence of excess of Carbon dioxide in exhaled air	Test tubes -2, syringe, Lime water, stopwatch
5.5	Experiment to prove anaerobic respiration in yeast.	Test tubes -2, One holed cork, Bent glass tube, Yeast powder, Fruit juice/ sugar & water, Lime water
5.6	Observation of breathing process in fish.	Glass aquarium, water, aquarium fish
5.7	Field visit to nearby PHC & Veterinary hospital to collect information of normal range of Hemoglobin in humans as well as in animals.	Plan as per the schedule.
5.8	Observation of Transpiration in plants.	Plant pots -2, soil, polythene covers -2, plastic sheet, A dry stick, plant
	CHAPTER -6: CONTROL & COORDINATION	
6.1	Determination of the relation between tongue and nose.	Sugar
6.2	Experiment to prove the effect of light on plant growth.	Conical flask, wire mesh, cardboard box, germinated Bean seeds – 3,water

ACTIVITY NO:	ACTIVITY NAME	RESOURCES REQUIRED
CHAPTER -7: HOW DO ORGANISMS REPRODUCE		
7.1	Experiment to observe budding in yeast.	Test tube, sugar, water, cotton plug, dropper, glass slide, coverslip, compound microscope
7.2	Experiment to observe spore formation in bread mold.	Bread slice, water, magnifying glass/ compound microscope, glass slide, coverslip
7.3	Experiment to observe Binary fission in Amoeba.	Permanent slides of Amoeba and Binary fission in Amoeba, Compound microscope
7.4	Experiment to observe filaments in Spirogyra.	Glass slide, Coverslip, Glycerine, water from a pond containing green filaments, Compound microscope
7.5	Experiment to observe vegetative reproduction in potato	Tray, Surgical cotton roles of 500 gms. Weight – 2, water, a sharp knife/ blade, A potato with germinating buds
7.6	Experiment to observe vegetative propagation through stem	A flask/ vessel, water, sharp blade, money plant
7.7	Experiment to observe germination in seeds	A beaker, water, a cotton cloth, sharp blade, Seeds of Bengal gram
CHAPTER 13: OUR ENVIRONMENT		
13.1	Creation & observation of Aquatic Ecosystem	Glass aquarium, oxygen pump, water, aquatic plants/ algae, a gold fish
13.3	Discussion on pesticide contamination in foods	New paper articles stating traces of pesticides in food material
13.4	Discussion on depletion of the Ozone layer	Newspaper articles discussing ozone depletion and its causes and consequences
13.5	Experiment to classify wastes as Biodegradable and Non Biodegradable	Kitchen wastes, milk packets, waste paper, empty medicine bottles/strips/bubble packs, old and torn clothes and broken footwear, Tools for digging soil, water, magnifying glass Plan as per the schedule
13.7	Project on the collection of information about waste managem -ent techniques implemented by local bodies like gram panchayat, municipality or corporation	
13.8	Field visit to local sewage management unit, locally located industry to observe the waste management methods used by them	Plan as per the schedule