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
First Published: 2025

This handbook has been printed on 70 G.S.M. SS Maplitho paper. Title page printed on 220 G.S.M. White Art Card.

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.

Table of contents

GENERAL INFORMATION

EXAMINATION SHEDULE									
	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	Micro Organisms ; Friend and Foe	June July	9	15	24
2	Crop Production And Management.	August September	10	10	20
3	Reproduction In Animals	September October	8	8	16
4	Reaching The Age Of Adolescence	November December	12	10	22
5	Conservation Of Plants And Animals	January February	10	10	20

June 2025

No bag Day | Cluster Complex | Teacher Resources

T6N3R7 | Z7U8M9 | C4G3C5

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 Sunday	2	3	4	5	6	7 Bakr Eid
8 Sunday	9	10	11	12 NI Reopening day	13 NI	14 Second Saturday
15 Sunday	16 1.1 – 1.2 + 2NI	17	18	19	20	21 International Yoga Day No Bag Day
22 Sunday	23 1.3 – 1.4 + NI	24	25	26	27	28 No Bag Day Mega PTM
29 Sunday National Statistics Day	30 1.4					

Week1:

Week 2:

Week 3: **1.1 – 1.2**

Week 4: **1.3 – 1.4**

Week 5: **1.4**

TEACHER'S NOTES

July 2025

T6N3R7
No bag Day

Z7U8M9
Cluster Complex

C4G3C5
Teacher Resources

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5 No Bag Day
		1.5 + 2NI				
6 Sunday Muharram	7	8	9	10	11	12 Second Saturday
	1.5 + 3NI					
13 Sunday	14	15	16	17	18	19 No Bag Day Cluster meeting
	1.6 + 3NI					
20 Sunday	21	22	23	24	24	26 No Bag Day SMC Meeting
	4NI					
27 Sunday	28	29	30	31		
	3NI					

Week1: 1.5

Week 2: 1.5

Week 3: 1.6

Week 4:

Week 5:

↓ TEACHER'S NOTES ↓

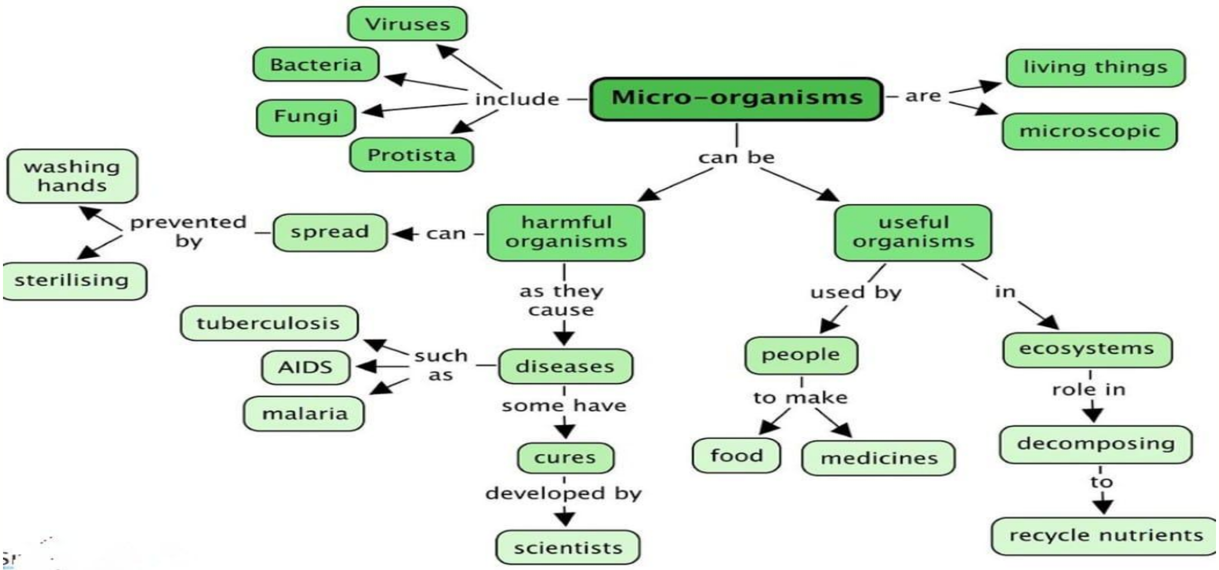
Micro-Organisms: Friend and Foe

NO OF TEACHING PERIODS: 09   NO OF PRACTISE PERIODS:04   LAB PERIOD: 02

Learning Outcomes: Learners…..

- understands what microorganisms are
- classify microorganisms
- explain the uses of microorganisms.
- explain the uses of microorganisms.
- apply preventive measures for some common human diseases
- apply preventive measures for some common diseases
- list out various methods of food preservation
- list out various methods of food preservation
- understands nitrogen fixation and nitrogen cycle.

Mind Map:



Chapters and Concepts

Topic/Concept	Number of periods	Timeline for teaching	Any specific information
Introduction of Microorganisms	1		
1.1 and 1.2 microorganisms and where do they live	1		
1.3 Micro organisms and Us	1		
1.3 Vaccine, Increasing soil fertility, Cleaning the environment	1		

1.4 Harmful Microorganisms, 1.4 Disease Causing Microorganisms In Humans	1		
1.4 Disease Causing Microorganisms In Plants And Animals	1		
Food Poisoning ,1.5 Food Preservation	1		
1.5 Food Preservation	1		
1.6 Nitrogen Fixation And Nitrogen Cycle	1		

Prior Concept/Skills:

1. Knowledge about diseases.
2. Examples of living organisms
3. Common vaccination given to children
4. Manure

TLM:

1. Picture cards
2. Soil
3. Beaker
4. Sugar
5. Water
6. Microscope
7. Slides

Teacher References:

1. Notes of microorganisms, its types, food preservation
2. NCERT Text books

Period- 1

Learning Objectives: Understands what micro organisms are and different groups.

Classify the types of microorganisms based on their characteristics.

Identify the habitat of microorganisms.

Teaching Learning Material (TLM): Micro organisms chart

Igniting Activity:
Teacher asks students - What are living organisms? [Expected Student Response (ESR): Those organisms that can breathe]
Teacher shows a picture of a money plant and asks : Is this plant a living organism? [ESR: Yes].
Teacher shows a picture of moulds on bread and asks 'If they are living organisms [ESR: Yes]. Teacher shows a picture of microorganisms and says 'Just like humans, plants and animals, these are living beings and are called microorganisms.
Today's class is about microorganisms.

I Do	We do	You Do
• Before beginning the chapter, give an overview of the lesson with the help of a concept map. Explain: Meaning of microorganisms and s how pictures of different microorganisms (e.g., bacteria, fungi, viruses, protozoa). Refer fig.2.4 and 2.5 of the textbook. Take response and discuss that. • Cold call any student [Mid/High learning student] to summarize whatever we have learnt till now. • Cold call any student [high need student] to give one example of microorganism.	• Teachers and students can also follow activity 2.2 from textbook	Students are requested to read page number 22 and write important vocabulary in their notebook

SUMMARY:
Microorganisms, classification of microorganisms and their habitat. Give a sheet of paper and ask students to write whatever they learned about microorganisms in this class.

ASSIGNMENT:
Can microorganisms be seen with the naked eye? If not, how can they be seen?
What are the major groups of microorganisms?
Ask students to revise all the concepts taught today from the textbook.

1. What are micro organisms give examples?
2. Which micro organism is living in all places?
3. Are all micro organisms are useful.

Period- 2

Learning Objectives: Classify microorganisms

Classify different types of microorganisms.

Identify the habitat of microorganisms.

Teaching Learning Material (TLM):

Slides of bacteria, Fungi, Algae, Micro Arthropods.

I Do	We do	You Do

• Teacher will perform Activity 2.1 • Classify: Types of microorganisms based on their characteristics like size, structure, reproduction and habitat by drawing a chart on types of microorganisms on the board. Provide real life examples of their presence around us while discussing each type . • Viruses: an infectious microbe consisting of a segment of nucleic acid (either DNA or RNA) surrounded by a protein coat. • Bacteria: Bacteria are single-celled microorganisms with the absence of the nucleus and other cell organelles • Fungi: Fungi are eukaryotic organisms that include microorganisms such as yeasts, moulds and mushrooms. • Protozoa: Protozoa are unicellular animals. Some are free-living, others are parasites. • Algae: Algae are green substances floating on the surface of a pond, lake, river, stagnant water, moist soil, stones. They tend to grow on wet surface	Activity: Collaborate and sort the microorganisms Instructions: • Do: Provide pictures or cards representing different types of microorganisms. Ask students to categories' them into groups. • Say: Complete the activity in your pairs. • Keep the chart on the type of microorganisms on the board for students' reference. • Move around to check students' work and help those who need support	Activity: Students will write notes on the type of microorganism assigned to them. Instructions: • Assign each student 1-2 specific micro organisms types. • Ask them to independently make notes including information on its characteristics, habitat, and role in the environment. • After students complete, ask 1-2 students to share their notes.

SUMMARY:

The micro organisms are divided into six types they are

1. Bacteria
2. Virus
3. Algae
4. Fungi
5. Protozoa
6. Micro Arthropods

ASSIGNMENT:

1. Which characteristic of this organism makes it algae?

2. Why viruses are called a connecting links?

3. Can you look at the board and find which type of microorganism is this?

Period- 3

Learning Objectives: Explain the uses of micro organisms.

Understand and enumerate the commercial, medicinal and environmental use of microorganisms

Teaching Learning Material (TLM):

Bread, curd, Maida, water and Yeast powder.

I Do	We do	You Do
Teacher explains Microorganisms play an important role in our lives.	Role-playing activity: Instructions:	• Independently, complete the

Some of them are beneficial in many ways whereas some others are harmful and cause diseases. Let us study about them in detail • Curd contains several micro organisms. Of these, the bacterium, Lactobacillus promotes the formation of curd. • It multiplies in milk and converts it into curd. • Bacteria are also involved in the making of cheese, pickles and many other food items. • **Activity 2.3** • Take ½ kg flour (atta or maida), add some sugar and mix with warm water. Add a small amount of yeast powder and knead to make a soft dough. • What do you observe after two hours? Did you find the dough rising? • Maida with yeast powder www.apteachers.in Raised maida Yeast reproduces rapidly and produces carbon dioxide during respiration. Bubbles of the gas fill the dough and increase its volume • This is the basis of the use of yeast in the baking industry for making breads, pastries and cakes. • Microorganisms are used for the large scale production of alcohol, wine and acetic acid (vinegar). Yeast is used for commercial production of alcohol and wine. For this purpose yeast is grown on natural sugars present in grains like barley, wheat, rice, crushed fruit juices, etc • **Activity 2.4** • Take a 500 ml beaker filled up to ¾ with water. Dissolve 2-3 teaspoons of sugar in it. • Add half a spoon of yeast powder to the sugar solution. Keep it covered in a warm place for 4-5 hours. Now smell the solution. • Can you get a smell? • This is the smell of alcohol as sugar has been converted into alcohol by yeast. • This process of conversion of sugar into alcohol is known as fermentation.	Divide students into groups of 4 • Assign roles to the groups (e.g., farmer, doctor, chef) and ask them to make a chart and list down how microorganisms play a role in their respective professions. • Give preparation time (read from textbook, discuss, divide roles), help the groups to list down the uses discussed earlier and ensure each student has a point to present later • Paste the charts on the wall after the presentation. Give feedback to each group on: 1. Conceptual accuracy (make corrections, if required) 2. Group work (equal participation, division on work, collaboration) 3. Role Play (communication and presentation)	worksheet. • After students complete, write the answer on the board for students to check

SUMMARY:

Some micro organisms are very useful for us in food preparation like Bread making and also in commercially in alcohol making.

ASSIGNMENT:

1. Write down the process of making of curd?
2. What procedure you follow to make the Alcohol preparation?
3. What is Fermentation?

4. Which organism is involving in Fermentation?
5. Who discovered the process of Fermentation?

Period- 4

Learning Objectives: Explain the uses of micro organisms.

Understand the commercial, medicinal and environmental use of microorganisms

Teaching Learning Material (TLM):

Antibiotics chart, Vaccines.

I Do	We do	You Do
• The teacher explains that Whenever you fall ill the doctor may give you some antibiotic tablets, capsules or injections such as of penicillin. • The source of these medicines is microorganisms. These medicines kill or stop the growth of the disease-causing microorganisms. Such medicines are called antibiotics. • These days a number of antibiotics are being produced from bacteria and fungi. Streptomycin, tetracycline and erythromycin are some of the commonly known antibiotics which are made from fungi and bacteria. • When a disease-carrying microbe enters our body, the body produces antibodies to fight the invader. • If dead or weakened microbes are introduced into a healthy body, the body fights and kills the invading bacteria by producing suitable antibodies. • The antibodies remain in the body and we are protected from the disease-causing microbes forever. This is how a vaccine works. • Several diseases, including cholera, tuberculosis, smallpox and hepatitis can be prevented by vaccination. • Edward Jenner discovered the vaccine for small pox in 1798. • In 1929, Alexander Fleming was working on a culture of disease causing bacteria. Suddenly he found the spores of a little green mould in one of his culture plates. He observed that the presence of mould prevented the growth of bacteria. In fact, it also killed many of these bacteria. • **Increasing Soil Fertility** Some bacteria (Fig. 2.7) are able to fix nitrogen from the atmosphere to enrich soil with nitrogen and increase its fertility. These microbes are commonly called biological nitrogen fixers.	• Along with their friends, they collected wastes of plants, vegetables and fruits from nearby houses and gardens. • They put them in a pit meant for waste disposal. • After some time, it decomposed and got converted to manure. **Activity 2.5** Take two pots and fill each pot half with soil. Mark them A and B. Put plant waste in pot A and things like polythene bags, empty glass bottles and broken plastic toys in pot B. Put the pots aside. Observe them after 3-4 weeks	• Collect information about the different vaccines available in PHC. • Prepare a manure by using of dried leaves hay and papers. • Collect information about the bacteria increasing the soil fertility.

SUMMARY:

It is important to remember that antibiotics should be taken only on the advice of a qualified doctor. Also you must complete the course prescribed by the doctor. If you take antibiotics when not needed or in wrong doses, it may make the drug less effective when you might need it in future. Also antibiotics taken unnecessarily may kill the beneficial bacteria in the body. Antibiotics, however, are not effective against cold and flu as these are caused by viruses

ASSIGNMENT:

1. Why are children/infants given vaccination?
2. Can you prepare a list of the vaccines that can cure diseases?
3. How compost is making in your house?
4. Which vaccine is curing the Malaria disease?

Period- 5

Learning Objectives: Apply preventive measures for some common human diseases

Analyses the harmful effects of microorganisms in human

Teaching Learning Material (TLM):

Micro organisms and diseases chart.

I Do	We do	You Do
The teacher explains • Some of the microorganisms cause diseases in human beings, plants and animals. Such disease-causing microorganisms are called pathogens. • Some microorganisms spoil food, clothing and leather. • Pathogens enter our body through the air we breathe, the water we drink or the food we eat. • The diseases transmit through air, water, food or physical contact are called communicable diseases. Examples of such diseases include cholera, common cold, chicken pox and tuberculosis. • Some insects and animals act as carriers of disease causing microbes. Ex: Housefly, Mosquito. • The female Anopheles mosquito carries the parasite of malaria (Plasmodium). • Female Aedes mosquito acts as carrier of dengue virus. • All mosquitoes breed in water. Hence, one should not let water collect anywhere, in coolers, tyres, flower pot, etc. • By keeping the surroundings clean and dry we can prevent mosquitoes from breeding. Try to make a list of measures which help to avoid the spread of malaria.	Discussion different diseases, their causative organisms and preventive measures in the table 2.1	• Collect information about different diseases from PHC. • What are preventive measures for communicable diseases? • Is corona a communicable disease?

SUMMARY:

Human Disease	Causative Microorganism	Mode of Transmission	Preventive Measures (General)
Tuberculosis Measles Chicken Pox Polio	Bacteria Virus Virus Virus	Air Air Air/Contact Air/Water	Keep the patient in complete isolation. Keep the personal belongings of the patient away from those of the others. Vaccination to be given at suitable age.
Cholera Typhoid	Bacteria Bacteria	Water/Food Water	Maintain personal hygiene and good sanitary habits. Consume properly cooked food and boiled drinking water. Vaccination.
Hepatitis A	Virus	Water	Drink boiled drinking water. Vaccination.
Malaria	Protozoa	Mosquito	Use mosquito net and repellents. Spray insecticides and control breeding of mosquitoes by not allowing water to collect in the surroundings.

Different diseases are causing by micro organisms and communicable diseases are transmitting from one person to another person.

ASSIGNMENT:

1. What are communicable diseases?
2. Which micro organism causes malaria?
3. How can we control the communicable diseases?
4. How can we control the mosquito population?
5. Which disease can transmit through direct contact?

Period- 6

Learning Objectives: Apply preventive measures for some common diseases

Analyses and discuss the harmful effects of microorganism in plants and animals.

Discuss preventive measures to minimize the harmful effects of microorganisms.

Teaching Learning Material (TLM):

The charts of animal diseases and plant diseases.

I Do	We do	You Do
• Check the student's poster, select 5 best posters and mention some best practices seen in those posters like short and clear explanation, use of real life example pictures, content accuracy, presentation and others. • Robert Köch (1876) discovered the bacterium (Bacillus anthracis) which causes anthrax disease.	**Instructions:** Divide students into their groups Provide handouts and ask each group to discuss on the following points: Diseases caused by microorganisms. Discussion on plant diseases chart	• Collect different picture of animal and plant diseases and make a scrap book. • Collect information from Agriculture department about

<table>
<tr>
<td>

- Anthrax is a dangerous human and cattle disease caused by a bacterium.
- Foot and mouth disease of cattle is caused by a virus
- Discuss specific examples of plant diseases caused by microorganisms, such as fungal diseases (e.g., powdery mildew) and bacterial diseases (e.g., citrus canker), examples of animal diseases caused by microorganisms, such as bacterial infections (e.g., anthrax) and viral infections (e.g., foot-and mouth disease).
- Explain: Different preventive measures to minimizes the harmful effects of microorganisms

</td>
<td>
<table>
<tr><th>Plant Diseases</th><th>Micro-organism</th><th>Mode of Transmission</th></tr>
<tr><td>Citrus canker</td><td>Bacteria</td><td>Air</td></tr>
<tr><td>Rust of wheat</td><td>Fungi</td><td>Air, seeds</td></tr>
<tr><td>Yellow vein mosaic of bhindi (Okra)</td><td>Virus</td><td>Insect</td></tr>
</table>
</td>
<td>different plant diseases and preventive measures.</td>
</tr>
</table>

SUMMARY:

Importance of preventive measures to minimize the harmful effects of microorganisms on plants and animals. b. Discuss strategies such as proper sanitation, hygiene practices, vaccination, crop rotation, and quarantine measures

ASSIGNMENT:

1. **Which micro organism causes Anthrax disease?**
2. **Name the disease that effect by virus in buffaloes?**
3. **How can we cure the yellow vein disease in bendy plant?**
4. What is the mode of transmission of citrus canker?

Period- 7

Learning Objectives: list out various methods of food preservation

Understand the cause of food spoilage

Make connection between food spoilage and food poisoning

Teaching Learning Material (TLM):

Spoiled pickle, biscuit or lays packet

I Do	We do	You Do
• Explain: Discuss the factors that contribute to food spoilage, such as microbial growth and improper storage conditions. • Explain the role of microorganisms (bacteria, fungi, etc.) in food spoilage and their ideal conditions for growth. • Present information on the effects of food spoilage on taste, texture, nutritional value, and safety. • Introduce the concept of food borne illnesses and the risks associated with consuming spoiled food. • Food poisoning could be due to the consumption of food spoilt by some microorganisms.	• Divide the students in pairs • Provide work sheets (with the questions given below) and ask each pair to complete it. Students may refer to the textbook if needed. • Discuss the answers after students complete	• Ask the students to write a paragraph on food borne diseases. • Make a list reasons for food spoilage.

• Microorganisms that grow on our food sometimes produce toxic substances. • These make the food poisonous causing serious illness and even death. So, it is very important that we preserve food to prevent it from being spoilt. • **Food Preservation:** • Spoiled food emits bad smell and has a bad taste and changed colour. • Let us study the common methods of preserving food in our homes. We have to save it from the attack of microorganisms.		

SUMMARY:

The food poisoning leads to vomiting, motions and finally leads to death of a person. Food poisoning could be due to the consumption of food spoilt by some microorganisms. Microorganisms that grow on our food sometimes produce toxic substances.

ASSIGNMENT:

1. What happens if we eat chapatti /rice kept in the open for 2-3 days?
2. Why does food get spoiled if kept for a long duration?
3. Describe two common food borne illnesses and their symptoms.
4. What steps would you immediately take when someone suffers from food poisoning?

Period- 8

Learning Objectives: list out various methods of food preservation

Explore various methods of food preservation.

Teaching Learning Material (TLM):

Salt, oil, dried pickles.

I Do	We do	You Do
• Explore the different methods of food preservation: Introduce • **Chemical method** Salts and edible oils are the common chemicals generally used to check the growth of microorganisms. Therefore they are called preservatives. Sodium benzoate and sodium metabisulphite are common preservatives. These are also used in jams and squashes to check their spoilage. • **Preservation by common salt** Common salt has been used to preserve meat and fish for ages. Meat and fish are covered with dry salt to check the growth of bacteria. • **Preservation by sugar** Jams, jellies and squashes are preserved by sugar. • **Preservation by Oil and Vinegar o Canning** Vegetables, fruits, fish and meat are often preserved by	• Ask them to discuss in pairs Which food preservation method would you choose for a jam, milk, meat, fruits and dry fruits and why? • Teachers move around in the class to check students progress and provide support • Discuss the answers and ask: Can we preserve all types of vegetables by cooling them? Give	• Collect information of different food items preserved in our surroundings.

this method • **Heat and cold treatments** The process was discovered by Louis Pasteur. It is called pasteurization useful for preservation of milk • **Storage and packaging** dry fruits and even vegetables are sold in sealed air tight packets to prevent the attack of microbes Provide examples and explain the principles behind each preservation method. Show pictures or videos (if available) demonstrating different preservation techniques.	reason (help them understand that for different vegetables different methods, give examples).	

SUMMARY:

Different food items are preserving in different ways like Chemical Method, Preservation by Common Salt, Preservation by Sugar, Preservation by Oil and Vinegar, pasteurization, Storage and Packing. These protects the food from spoilage.

ASSIGNMENT:

1. What are the various food preservation methods?

2. Make a poster presentation of various methods of food preservation.

3. What is the importance of food preservation for human beings?

1. How does common salt help in preserving pickles?
2. Why are some foods kept in an airtight container?

Period- 9

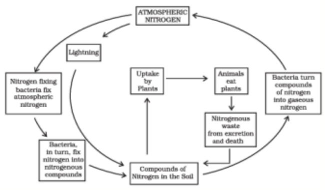
Learning Objectives:understands nitrogen fixation and nitrogen cycle.

Identify and describe the different stages of the nitrogen cycle Period

Apply knowledge of the nitrogen cycle to real-life examples and environmental issues

Teaching Learning Material (TLM):

Root nodules of Blackgram plant, Nitrogen cycle chart.

I Do	We do	You Do
• Introduce the concept of the nitrogen cycle. • Show visual aids or diagrams of the nitrogen cycle to provide a visual representation of the process. • Ask students to observe the visual aid and identify any familiar terms or processes related to the nitrogen cycle. • Discuss the stages of the nitrogen cycle. • The teacher explains that Our atmosphere has 78% nitrogen gas. Nitrogen is one of the essential constituents of all living organisms as part of proteins,	• Ask each group to brainstorm on the topics allocated to them. • Topic 1: Stages of nitrogen cycle • Topic 2: Significance of the nitrogen cycle in maintaining ecosystem balance.	 • Study the events in flow chart • Based on the learnings of the class, students are asked to draw and label

chlorophyll, nucleic acids and vitamins. • Bacteria and blue green algae present in the soil fix nitrogen from the atmosphere and convert it into compounds of nitrogen. • Nitrogen is then used for the synthesis of plant proteins and other compounds. • Animals feeding on plants get these proteins and other nitrogen compounds • When plants and animals die, bacteria and fungi present in the soil convert the nitrogenous wastes into nitrogenous compounds to be used by plants again.	• Topic 3: Role of microorganisms in the nitrogen cycle. • Make each group present after discussion.	the nitrogen cycle in their notebook, independently.

SUMMARY:

The bacterium Rhizobium is involved in the fixation of nitrogen in leguminous plants (pulses). Rhizobium lives in the root nodules of leguminous plants (Fig. 2.9), such as beans and peas, with which it has a symbiotic relationship. Sometimes nitrogen gets fixed through the action of lightning. But you know that the amount of nitrogen in the atmosphere remains constant.

ASSIGNMENT:

1. Name the microorganisms which can fix atmospheric nitrogen in the soil.
2. Prepare a nitrogen cycle diagram.
3. Name some nitrogen fixing blue green algae?
4. Which enzyme is used for nitrogen fixation by living organisms?
5. Why are blue-green algae capable of fixing atmospheric nitrogen?

Teachers diary

P No	**Name of the Concept to be taught**	**Date**	**TLM Used**	**Student Response 1/2/3/4/5**	**Topics Indented to Re teach**	**Additional Resources Used to Re teach**
1	Introduction of Microorganisms					
2	Microorganisms and where do they live?					
3	1.3 Microorganisms and Us					
4	1.3 Vaccine, Increasing soil fertility, Cleaning the environment					

5	1.4 Harmful Microorganisms, 1.4 Disease Causing Microorganisms In Humans					
6	1.4 Disease Causing Microorganisms In Plants And Animals					
7	Food Poisoning ,1.5 Food Preservation					
8	Food Preservation					
9	Nitrogen cycle					

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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August 2025

T6N3R7 No bag Day | Z7U8M9 Cluster Complex | C4G3C5 Teacher Resources

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 NI	2 No Bag Day
3 Sunday	4 FA - 1	5	6	7	8 Vara Lakshmi Vratham NI	9 Second Saturday
10 Sunday	11 2.1 – 2.2 + NI	12	13	14	15 Independence day	16 Sri Krishna Ashtami
17 Sunday	18 2.3 – 2.5 +NI	19	20	21	22	23 No Bag Day Cluster meeting
24 Sunday	25 2.6 + 1NI	26	27 Sri	28	29 National Sports Day	30 No Bag Day
31 Sunday						

Week1:	**FA - 1**
Week 2:	**2.1 – 2.2**
Week 3:	**2.3 – 2.5**
Week 4:	**2.6**

TEACHER'S NOTES

September 2025

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5 Milad -Un -Nabi National Teacher's Day	6 No Bag Day
	2.7 – 2.9 +2NI					
7 Sunday	8 Internation al Literacy	9	10	11	12	13 Second Saturday
	2.10 + 3NI					
14 Sunday Hindi Diwas	15 Internation al Day of Democracy	16	17	18	19	20 No Bag Day Cluster and SMC meeting
	NI+ 3.1 – 3.2 UPTO FEMALE RS					
21 Sunday	22 NI	23 NI	24 Dussera Holiday	25	26	27
28 Sunday	29 Dussera Holiday	30 Durgaa shtami				

T6N3R7 No bag Day

Z7U8M9 Cluster Complex

C4G3C5 Teacher Resources

Dasara Holidays 24.09.25 to 02.10.25

Dasara Holidays for Minority Institutions
27.09.25 to 02.10.25

Week1: 2.7 – 2.9

Week 2: 2.10

Week 3: 3.1 – 3.2

Week 4:

Week 5:

TEACHER'S NOTES

October 2025

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
T6N3R7 No bag Day	Z7U8M9 Cluster Complex	C4G3C5 Teacher Resources	1 Dussera Holiday	2 Mahatma Gandhi Jayanti Vijayadashami	3 NI	4 No Bag Day Sakunthala Devi Jayanti
5 Sunday International Teacher's Day	6 3.2 + NI	7	8	9	10	11 Second Saturday
12 Sunday	13 FA - 2	14	15	16	17 NI	18 No Bag Day Cluster meeting
19 Sunday	20 Deepavali	21 3.3 + 2NI	22	23	24	25 No Bag Day SMC Meeting
26 Sunday	27 4.1 – 4.2 NI	28	29	30	31 National	

Week1:

Week 2: 3.2

Week 3:

Week 4: 3.3

Week 5: 4.1 – 4.2

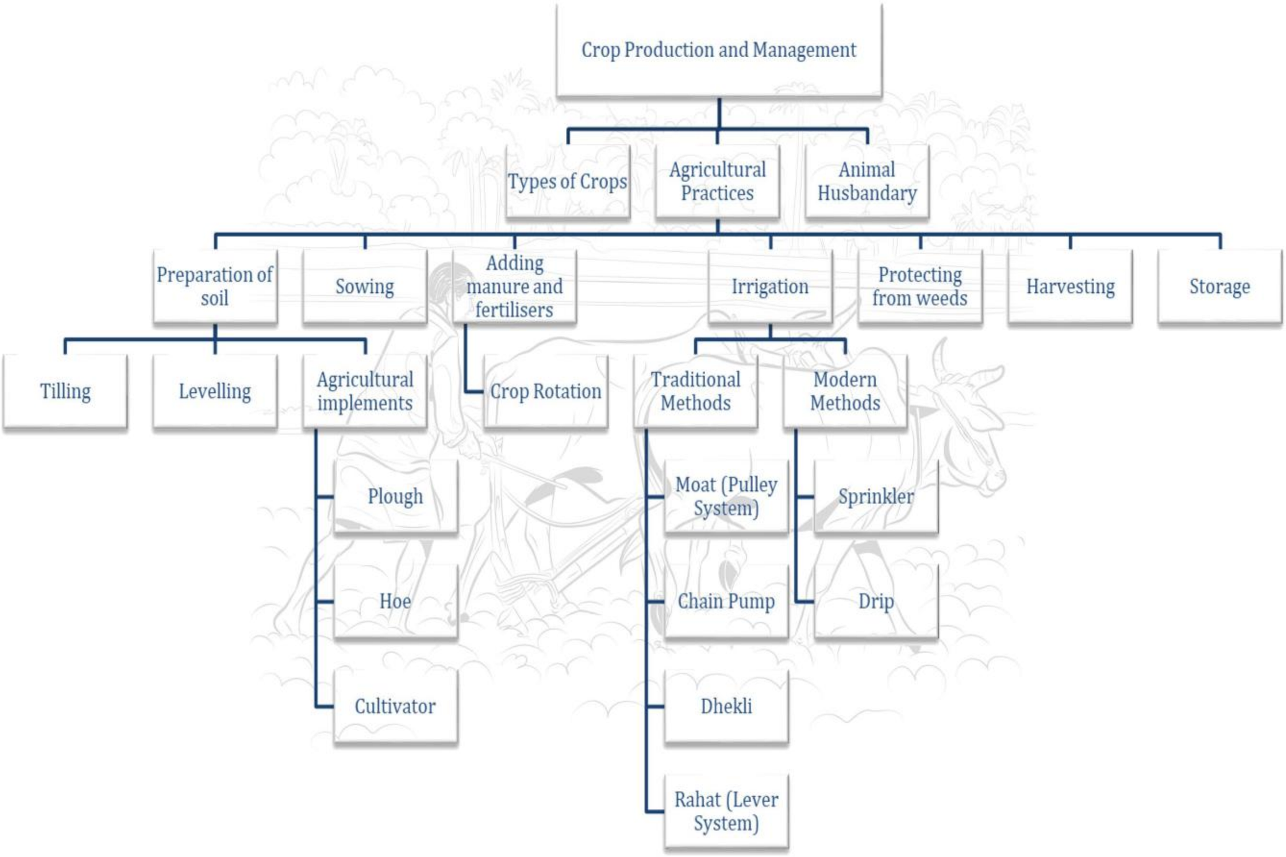
TEACHER'S NOTES

CROP PRODUCTION AND MANAGEMENT
NO OF TEACHING PERIODS: 10

Learning Outcomes: Learners…..

- Classifies crops into chair and rabi.
- Explains about agricultural practices.
- Identify the agricultural tools
- Conducts activity to identify good quality seeds
- Differentiate between manure and fertilizers
- Understands the wastage of water while using wastage of water
- Apply modern methods of irrigation in day to day life.
- Explains the importance of protection of crop from weeds
- Identify the harvesting machines and storage areas
- Understand the importance of animal farming

Mind Map:



PERIOD WISE TOPICS

S.NO	TOPIC	QR CODE
1	Introduction 2.1 Agricultural Practices, 2.2 Basic Practices of Crop Production	
2	2.2 Basic Practices of Crop Production	
3	2.3 Preparation of Soil	
4	2.4 Sowing	
5	2.5 Adding Manure and Fertilisers	
S.NO	**TOPIC**	**QR CODE**
6	2.6 Irrigation- Traditional methods.	
7	2.6 Irrigation-Modern Methods	
8	2.7 Protection from Weeds	
9	2.8 Harvesting, 2.9 Storage	
10	2.10 Food from Animals	

Topic: Crop production and Management **Grade:8** **Subject:** BS Period:1 (Model)

ConceptsCovered:

Introduction

2.1 Agricultural Practices

2.2 Basic Practices of crop production

LearningObjectives:

LO 1 - Students should be able to classify crops on the basis of their properties , characteristics – Kharif and Rabi crops

PriorConcept/Skills:*(Essentialconceptsandskillstobechecked/bridgedbeforeteachingthecurrentconcept .)*

1.Basic plant anatomy and growth

2.Understanding of the plant life cycle

3.Familiarity with basic agricultural practices.

4.Awareness about the agriculture

5.Basic knowledge of soil composition

Teacher Resources:

This includes NCERT Material, OERs, Digital links etc.)

•Link 1 - Worksheet

•Link 2 - Diksha

•Link 3 - Diksha

•Link 5 – Un academy

•Link 6 - Byjus

•Link 7 - Textbook

•Link - NCERT Exemplar questions

TLM

1.Picture cards

2.Index Cards

3.Beaker

4.Moong and gram seeds

5.Paper cups

Igniting Activity:

We grow and eat different types of crops. As we know, crops are grown in different seasons. In this class we will study about different types of crops grown in different seasons.

Hook :

Teacher asks students - “Have you seen farmers growing different crops at different times of the year? Can you tell me which crops are grown in which season (summer, rainy and winter) based on your observation?”

[Expected Student Response (ESR): I have seen rice grown during rainy season, wheat during winter, vegetables like tomato grown across year, onion grows in beginning of winter season etc.]

Teacher asks students - “Why it is necessary to grow crops at such a large scale and in different seasons?”

[Expected Student Response (ESR): Crops are essential as they are source of energy for animals and human beings. Without them we won't be able to survive. To meet large scale demands of growing population it is necessary that crops are grown on large scale according to their sunlight, water, nutrients and temperature needs that is why they are grown in different seasons.]

Teacher invites students to share the process of growing of any crop they have seen or heard about in their surroundings.

<table>
<tr><th>I DO</th><th>WE DO</th><th>YOU DO</th></tr>
<tr>
<td>Begin the lesson by engaging students in discussion about the importance of agriculture and crop production.
•Show images of different types of crops and discuss its significance in our day today life.
•Give an overview of the chapter, topics that will be covered throughout the chapter.
•Encourage the students to ask questions or discuss prior knowledge of crop production and management.

CFUs
1.How do green plants synthesise their own food?
2.What are the different types of crops?
3.What are the seasons for Kharif crops?
4.What are the seasons for Rabi crops?</td>
<td>Divide the class in groups of three where students discuss about 6 different crops they are aware of and can write on a sheet of paper about seasons in which they are grown.</td>
<td>Classify the following crops into Kharif and Rabi crops and write in the tabular column given below:

Maize, paddy, mustard, pea, gram, wheat, groundnut, cotton.
<table><tr><th>KHARIF</th><th>RABI</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>Homework
•Give two examples of each.

(a) Kharif crop
(b) Rabi crop
•Give different types of crops to each student in class. Ask students to identify the given crop as rabi or kharif crops.
•Ask individual students to write about their respective crops in their notebook, and collect the samples of the given crop and paste it in their notebook.
Closing
•Summarise all the important points related to categorization of crops
•Ask students to share examples of rabi and kharif crop which is mostly grown in their region.</td>
</tr>
</table>

SUMMARY

In order to provide food to our growing population, we need to adopt certain agricultural practices.

 Same kind of plants cultivated at a place constitute a crop.

 In India, crops can be broadly categorised into two types based on seasons - rabi and kharif crops.

Factual Questions

1.Define crops.

2.What are the different types of crops? Explain and write two examples of each.

3.Which season is associated with the sowing of Rabi crops in India?

4.Which month marks the beginning of the Kharif season in India?

5.What is the harvesting time for most Rabi crops in India?

6.Name one important Rabi cereal crop grown in India.

7.Which region of India is known for the cultivation of Rabi wheat?

Open ended Questions

1.What shifts or changes were brought in the society as agriculture was introduced?

2.What are the steps that we can take to provide food to everyone in a country like India?

3.Despite favourable climatic conditions, a farmer's crop failed to give good yield. Give the possible reasons for this.

ASSIGNMENT

Ques 1: Differentiate between Rabi and Kharif crops:

Ques 2: List some agricultural practices that should be followed by a person who is interested in producing crops.

Ques 3: Why is soil preparation necessary before sowing the seed?

PERIOD NO 2
Topic to be covered
Basic practices of Agriculture

Learning objectives
•**LO 2-** Understand different concepts and practices involved in crop production.

Ignite Activity

Show this video to the class where students can observe and understand agricultural practice. Ask them to write their observations in their notebooks. Ask a few students to share their observations and use that to begin class discussion.
Objectives of the lesson:

I do	We do	You do
Recap of the concepts discussed in the last class. •Give a brief introduction about agricultural practices.	Divide class in groups of 4. •Assign one crop to each of the groups. •Ask them 'what will be the steps to grow a crop'.	Talk to a farmer you know and ask them about the crops that are grown locally in your area.

•Show video of the same to develop a better understanding in the class 1.Why paddy cannot be grown in the winter season? 2.What are the agricultural practices that the farmers have to take?	•Motivate them to have a group discussion, and ask them to write all the steps discussed in a sequence in their notebook. •Move around to observe student's discussion and ask questions to clarify their misunderstanding.	Note down their names, ask them about information you have read like what are the agricultural practices they take in account

Summary

Basic practices of crop production are

(i) Preparation of soil

(ii) Sowing

(iii) Adding manure and fertilisers

(iv) Irrigation

(v) Protecting from weeds

(vi) Harvesting

(vii) Storage

Factual Questions

1. What are different agricultural practices? Write it in sequence

Open Ended Questions

1. Why do some plants grow weaker than others?

PERIOD NO 3

Topic to be covered
2.3Preparation of soil

Learning objectives

•**LO 3**- Identify and describe tools used in crop production
Ignite Activity

Show this video to the class where students can observe and understand agricultural practice. Ask them to write their observations in their notebooks. Ask a few students to share their observations and use that to begin class discussion.
Objectives of the lesson:
Different crops have different types of requirements. Growing crops in a field is cumbersome and tedious work. It requires lots of hard work and patience. Many environmental factors affect the production of crops in the fields. In this class we will study about the preparation one has to do before sowing seeds in the fields. We will also learn about different types of tools for growing crops in the field.

DO	WE DO	YOU DO
Recap of the concepts discussed in the last class. •Present the concept of soil preparation. •Explain different techniques –tilling, levelling. •Show video of the same to develop a better understanding in the class	Divide class in groups of 4. •Assign one crop to each of the groups. •Ask them 'what will be the steps to grow a crop'. •Motivate them to have a group discussion, and ask them to write all the steps discussed in a sequence in their notebook. •Move around to observe student's discussion and ask questions to clarify their misunderstanding.	Draw a rough sketch of a plough, a hoe and a cultivator and label their different parts. After preparing the sketch, show it to others explaining the different parts and their role. **Homework** 1.Define A. Plough B. Hoe C. Cultivator 2.What are the criteria to select a good seed for sowing in the field? 3.Fill up the blanks. A. Farmers prefer to use seeds which give …………… B. Damaged seeds become ………………. and are thus ……………… C. The use of cultivators saves ……………and …………

SUMMARY

Before sowing the seeds, it is necessary to break soil clumps to get better yield. This is done with the help of various tools. The main tools used for this purpose are the plough, hoe and cultivator

Factual Questions

1. What are different types of agricultural implements? Paste pictures of it and write about it.
2. What is the use of plough?
3. What is the use of planters and seeders?
4. What is the difference between tilling and levelling?
5. What is the role of hoe in farming?

Open Ended Questions

1. How modern days cultivator is different from traditional cultivator?

ASSIGNMENT

Ques 1: Write short notes on Seed drill

Ques 2: What is a plough?

Ques 3: What are the advantages of levelling?

Ques 4: What is the process of separation of grain from chaff called?

PERIOD NO 4

Topic to be covered

2.4 Sowing

Learning objectives

•**LO 3**- Identify and describe the process of sowing seeds

Ignite Activity

Show this video to the class where students can observe and understand agricultural practice. Ask them to write their observations in their notebooks. Ask a few students to share their observations and use that to begin class discussion.

I DO	WE DO	YOU DO
Recap of the previous class •**Activity:** *Teacher can perform* ***activity*** •Introduce sowing •Explain different instruments used for sowing seed. •Explain how selections of seeds are done and the reasons for farmers to choose high yielding seeds. •Explain different types of agriculture implements. **CFU** 1.Why do we use agricultural implements in fields? 2.What are the different instruments used in the fields in your locality?	Activity: Engage students in a hands-on activity to identify and match different types of agricultural implements used in farming. •Discuss the difference between traditional and modern tool for sowing seeds and which is better in terms of time, energy, cost of labour, environment friendly and ease of use. **Materials Needed:** •Pictures or drawings of various agricultural implements (e.g., plough, seed drill, sprayer, sickle, tractor), Index cards or small pieces of paper writing utensils (markers, pens, or pencils), Timer or stopwatch Activity: Engage students in a hands-on activity to identify and match different types of agricultural implements used in farming. •Discuss the difference between traditional and modern tool for sowing seeds and which is better in terms of time, energy, cost of labor, environment friendly and ease of use. Materials Needed: •Pictures or drawings of various agricultural implements (e.g., plough, seed drill, sprayer, sickle, tractor), Index cards or small pieces of paper writing utensils (markers, pens, or pencils), Timer or stopwatch Explain to the students that their task is to match each agricultural implement picture with its corresponding description or function. •Instruct the students to work together as a group, discussing and analyzing the pictures and descriptions to make the correct matches. •Facilitate a class discussion where students can share their observations, ask questions, and provide additional information about the agricultural implements. •Wrap up the activity by summarizing the functions and purposes of each agricultural implement and their significance in farming practices	Go to the questions given in the book at the end of the chapter and see how many questions are covered in today's class. Answer them individually •Prepare agricultural implements word search. •Distribute to each student. •Ask students to find words from word search. **Homework** 1.Write a paragraph in your own words on each of the following. (a) Preparation of soil (b) Sowing (c) Weeding (d) Threshing 2.Make a poster presentation of different instruments used for sowing seeds. 3.Define sowing. 4.Try to work together at home to carry out **Activity**

SUMMARY

Sowing of seeds at appropriate depths and distances gives good yield. Good variety of seeds are sown after selection of healthy seeds.

Sowing is done by seed drills.

FACTUAL QUESTIONS

1. What kind of cultivator is being used now a days?

OPEN ENDED QUESTIONS

1. What should be kept in mind while sowing the seeds in the fields?

PERIOD NO 5

Topic to be covered

2.5 Adding manure and Fertilizers

Learning objectives

•LO 4 - Students will be able to differentiate between fertilizers and manure

•LO 5 - Understand concept of crop rotation and its benefits

Ignite Activity

Do you take some extra nutrients in any form? Does your mother add any powder such as Horlicks, Bournvita, Boost in your milk? Have you ever thought about the purpose of it? Think over it and let's discuss it.

Objectives of the lesson: Every crop / plant needs some additional nutrients for proper growth and development. For this, we provide nutrients in the form of some chemicals and some properly decomposed waste materials. For example, dead plants, debris, kitchen waste etc. These provide nutrients to the plants for their proper growth. In this, period we will study about manures and fertilizers

I DO	WE DO	YOU DO
Introduce the role of fertilizers and manure in providing essential nutrients to the crops. •Differentiate between organic and inorganic fertilizers.	**Activity:** •Engage students in creating their own fertilizer recipes using common household items. **Materials Needed:** •Various household items that can be used as fertilizer ingredients (e.g., coffee grounds, crushed eggshells, banana peels, tea leaves, vegetable scraps) •Containers or jars for mixing and storing the fertilizer recipes •Labels or markers **Instructions:** •Introduce the concept of fertilizers to the students explaining that they provide essential nutrients to plants for healthy growth. •Discuss different types of organic fertilizers and their benefits. •Show the students the various household items that can be used as fertilizer ingredients, explaining their nutrient content and their potential benefits to plants. •Divide the kids into small groups or pairs. •Provide each group or pair with containers or jars for mixing and storing their fertilizer recipes.	How do you think organic foods are grown? Do they use manure or fertilizers? Discuss and answer. Go to the questions given in the book at the end of the chapter and see how many questions are covered in today's class. Answer them individually **Case Study:** Fertilizers and Manure in Indian Agriculture Scenario: Rahul, a farmer from a rural village in India, has been practising traditional farming methods for many years. However, he has noticed a decline in crop yield and soil fertility over time. He wants to explore the use of fertilizers and manure to improve his farming practices and increase productivity. Let's analyze Rahul's situation and write the role of fertilizers and manure in Indian agriculture. **Homework:** •**Activity:** You can prepare manures at your home. Dig a small area of land, and make one pit. add some dead plants, leaves, debris, kitchen waste such as vegetable peel. Sprinkle some water over it and cover it with loose soil. leave it as such for 1-2 months. Keep sprinkling water over it time to time, and check it after two months. You will find some

	•Instruct the kids to create their own fertilizer recipes using the provided household items. They can experiment with different combinations and ratios to make unique blends. Encourage the kids to label their containers or jars with the name of their fertilizer recipe using labels or markers. •Discuss with the kids the importance of understanding the nutrient needs of different plants and how their fertilizer recipes can cater to those needs. •Let the kids share and discuss their fertilizer recipes with the rest of the class, explaining their choices and the potential benefits of their blends. Conclude the activity by emphasizing the creativity and importance of using organic fertilizers to promote plant health and environmental sustainability	loose black colored soil. This is manure. It has nutrients which help plants to grow better. •Explain how fertilizers are different from manure. •Why is soil fertility important for crop production? •What are the main nutrients required by plants for healthy growth? •How can fertilizers help in replenishing nutrient levels in the soil? •What are the advantages and disadvantages of chemical fertilizers? •What are the different types of organic manure commonly used in Indian agriculture? •What are the environmental implications of excessive fertilizers? •What government initiatives and programs are available in India to promote organic farming and sustainable fertilizer usage?

SUMMARY

Soil needs replenishment and enrichment through the use of organic manure and fertilisers. Use of chemical fertilisers has increased tremendously with the introduction of new crop varieties.

Factual Questions

1. Differentiate between fertilisers and manure.

2. Which one is a natural fertiliser?

3. What are the benefits of fertiliser?

4. How do plants get nutrients?

5. What is in chemical fertiliser?

Open Ended Questions

1. How can you prepare manure in your own garden? List the things which are required for preparing manure.

2. How does manure affect the quality of soil?

ASSIGNMENT

Ques 1: Which of the following nutrients replenishes the soil after growing leguminous plants?

(a) Nitrogen

(b) Oxygen

(c) Phosphorus

(d) Potassium

Ques 2: What are the advantages of manure?

PERIOD NO 6 Topic to be covered 2.6 Irrigation Traditional Methods Learning objectives **LO 6** - Students should be able to know about irrigation and identify different types of irrigation practices. Ignite Activity Teacher will start the discussion with different types of methods students have seen farmers adopting to irrigating their field like borewell, pipe, sprinklers, canal etc. Explaining the objectives of the lesson: In this class we will study the significance of water in crop production, importance of irrigation and different methods of irrigation used in various agricultural fields.		
I DO	WE DO	YOU DO
Do a brief recap of the last class. •Discuss the significance of water in crop production. •Explain the importance of irrigation. •Introduce different methods of irrigation- Traditional methods •Let's watch a video to understand irrigation.	Objective: To engage students in an interactive game that simulates the process of watering plants and teaches them about water management. **Materials Needed:** •Pictures or drawings of different plants like rice, wheat, coffee, maize, potato, onion etc. •Watering cans or bottles •Containers (e.g., buckets, bowls) •Water source (e.g., cups of water) •Dice or number cards •Paper and pencils for scoring **Instructions:** •Divide the class into small groups of 3-4 students. •Provide each group with pictures or drawings of different plants, representing their water requirements and characteristics •Set up the containers in a line or at different locations within the classroom. •Assign each container a different point value based on its distance or difficulty level. •Instruct the students to take turns rolling the dice or selecting number cards to determine how much water they can collect. •Provide watering cans or bottles filled with water as the water source. •The students must pour the collected water from their watering cans or bottles into the containers, aiming to water the appropriate plants based on their water requirements. •Each student records their points on a sheet of paper after watering each plant.	What is irrigation? Describe two methods of irrigation which conserve water. •What are the different sources of irrigation? •Check in your village or area, which type of irrigation is used for crop plants? •Define the dhekli and Rahat system of irrigation. In which part of our country these systems of irrigation are used? •In which method of irrigation systems, cattle's are used?

	•After a certain number of rounds or a designated time, tally up the points to determine the winner or team with the highest score. •Facilitate a class discussion where students reflect on their strategy, decision-making, and the importance of water management in plant growth. •Encourage students to share their observations and insights about the different water requirements of the plants and how it affected their game play.	

SUMMARY

Supply of water to crops at appropriate intervals is called irrigation.

The various traditional ways are:

(i) moat (pulley-system)

(ii) chain pump

(iii) *dhekli,* and

(iv) *rahat*(Lever system)

Factual

1. Define irrigation and different types of irrigation systems.

OPEN ENDED

Can you discuss the challenges and opportunities of implementing sustainable irrigation

practices in regions with water scarcity?

PERIOD NO 7
Topic to be covered 2.6 Irrigation Modern Methods Learning objectives **LO 6** - Students should be able to know about irrigation and identify different types of irrigation practices. Ignite Activity Teacher will start the discussion with different types of methods students have seen farmers adopting to irrigating their field like borewell, pipe, sprinklers, canal etc. Explaining the objectives of the lesson: In this class we will study the significance of water in crop production, importance of irrigation and different methods of irrigation used in various agricultural fields.

I DO	WE DO	YOU DO
Do a brief recap of the last class. •Discuss the significance of water in crop production. •Explain the importance of irrigation.	Prepare a model showing Drip irrigation and	1.What is irrigation? Describe two methods of irrigation which conserve water.

•Introduce different methods of irrigation-surface, sprinkler and drip irrigation. •Let's watch a video to understand irrigation.	Sprinkler method Irrigation method.	2.What are the different sources of irrigation? 3.What do you mean by the term 'modern system" of irrigation? Give some examples. 4.How does drip irrigation system help us in conserving water?

SUMMARY

Modern methods of irrigation help us to use water economically. The main methods used are as follows:

Sprinkler System
Drip system
FACTUAL

1. The system of irrigation where in water is supplied drop by drop near the roots of plants, is called

(a) pulley system

(b) drip system

(c) sprinkler system

(d) lever system

OPEN ENDED

1.What are the ecological and environmental consequences of improper irrigation practices, and how can they be mitigated?

2. How can small-scale farmers in developing countries access and afford efficient irrigation systems to improve food security and livelihoods

ASSIGNMENT

Ques 1: Which of the following irrigation systems is used on an uneven surface?

A. Sprinkler system

B. Drop system

C. Drip system

D. Both A and B

PERIOD NO 8
Topic to be covered 2.7 Protection from weeds Learning objectives **LO 7-** Students will be able to understand the importance of weeds. Ignite an Activity

What will you do if you find stones in Rice. Stones are the unwanted materials in rice. In the similar way what to do with unwanted plants in crop field.

I DO	WE DO	YOU DO
Introduce the topic of weeds. •Discuss the importance of weeding in crop management and present different weeding methods.	Activity and Instructions: To help students understand the concept of weeds, their impact on crop production, and different methods of weed management. **Materials Needed:** •Pictures or samples of common weeds (either printed or projected) •Whiteboard or flipchart paper •Markers or chalk •Handouts or worksheets with blank spaces for note-taking **Instructions:** •Demonstration: Begin the activity by discussing the concept of weeds with the students Show pictures or samples of common weeds to the students and ask them to identify and name each weed. Write down the names of the weeds on the whiteboard or flipchart paper Introduce different methods of weed management, such as mechanical, cultural, chemical, and biological control methods. Briefly explain each method and its advantages and disadvantages. **Instructions:** •Divide the students into their groups. •Assign each group a specific weed Instruct the groups to research and gather information about their assigned weed, including its characteristics, life cycle, and methods of control. •After the allotted time, have each group present their findings to the class. •Facilitate a class discussion where students can compare and contrast the different weeds, their characteristics, and the strategies for managing them. •Summarize the key points discussed during the activity, •Conclude the activity by highlighting the role of farmers, agricultural practices, and scientific research in developing sustainable weed management strategies.	**Materials Needed:** •Pencils or pens •Field guides or online resources about weeds (optional) •Teacher can collect few samples of weeds for student observation or students can be asked to bring (one day before) **Instructions:** •Explain: Students will be taking on the role of "weed detectives" to identify and learn about common weeds found in their local area. •Say: explore outdoor areas such as school gardens, parks, or nearby natural spaces to search for different types of weeds. •Encourage the students to observe the characteristics of the weeds they find, such as the leaf shape, color, stem structure, and any distinguishing features. •In their notebooks have the students sketch or describe the weeds they encounter, making note of any identifying characteristics. •Ask students to record additional information about their selected weeds, such as the common and scientific name, origin, growth habits, and potential impacts on the ecosystem. •Encourage the students to research and learn more about their selected weeds, including their history, ecological roles.

SUMMARY

In a field many other undesirable plants may grow naturally along with the crop. These undesirable plants are called **weeds**.

The removal of weeds is called weeding. Weeding is necessary since weeds compete with the crop plants for water, nutrients, space and light. Thus,

they affect the growth of the crop. Some weeds interfere even in harvesting and may be poisonous for animals and human beings.

FACTUAL

1. What is the process of removing weeds from a crop field called?

2. What can be done to remove weeds from the agricultural fields?

3. What will happen if the weeds are not removed from the crop field?

OPEN ENDED

How does the presence of weed in a field affect the crop?

ASSIGNMENT

1.Activity: Make a herbarium sheet (at least 5 pages) of weeds.

•Collect some weeds from the crop field or from your garden.

•Remove the soil from the roots and press them in a sheet of newspaper and dry it.

•After 2-3 days paste them on an A4 sheet paper.

•Show your herbarium sheet in the class.

2.What are weeds? How can we control them?

3.What are some common weeds in crop fields, Name them.

4.Why do we need to remove weeds from agricultural fields.

PERIOD NO 9
Topic to be covered 2.8 Harvesting 2.9 storage Learning objectives **LO 8-** Understand the concept of harvesting. •**LO 9**- Students should be able to know the importance of storing grains properly to protect them from pests and environmental conditions. Ignite an Activity What do you do if a fruit ripen on a tree. How can we sore it?

I DO	WE DO	YOU DO
Explain the importance of harvesting crops at the right time. •Present different ways of harvesting methods.	**Activity**: **Harvesting Trivia** **Materials Needed:** •Whiteboard and markers, or a projector for displaying questions. •A list of trivia questions related to harvesting and agriculture. **Instruction:**	**Activity:** Terms related to agricultural practice are given below. Rearrange them in the correct sequence. **Harvesting, sowing, manuring, tilling and**

•Discuss the need for proper storage of harvested grain	•Prepare a list of trivia questions related to harvesting, agriculture, and the harvest season. You can create your own questions or use the following examples: •What is the primary purpose of harvesting in agriculture? •Name three common crops that are harvested in the fall. •What tools are commonly used for harvesting wheat? •What are the challenges farmers face during the harvest season? •How does the weather affect the timing of the harvest Start the activity by explaining that it's a fun trivia quiz related to harvesting and agriculture. Divide the class into teams (you can have 2 or more teams depending on the class size). •Project or write the trivia questions on the whiteboard one by one. Each team takes turns choosing a question and attempting to answer it. You can assign points for correct answers. If a team answers a question incorrectly, allow other teams to try to answer for bonus points. Keep track of the scores on the board. After all the questions have been answered, have a brief discussion about the correct answers. Encourage students to share any interesting facts they learned during the quiz. Emphasize the importance of understanding agriculture and the harvest process	**ploughing, irrigation, weeding.** Instructions: Ask students to make a flow chart in their notebook. Collect their notebooks for correction and feedback after they complete.

Brief revision of the previous class. •Introduce different grain storage techniques and its benefits.	**Objective:** To simulate the process of grain storage and create awareness about the importance of proper grain storage techniques to prevent spoilage and maintain quality. **Materials Needed:** •Small containers or cups (representing grains) •Plastic bags or airtight containers (representing grain storage facilities) •Labels or markers •Whiteboard or chart paper •Writing utensils (markers, pens, or pencils) **Instructions:** •Begin the activity by explaining to the students the importance of proper grain storage in preserving the quality and preventing spoilage. •Distribute the small containers or cups to the students, representing grains. •Instruct the students to label each container with the name of a different grain (e.g., wheat, rice, corn). •Explain that the students will be simulating the process of grain storage using plastic bags or airtight containers.	Go to the questions given in the book at the end of the chapter and see how many questions are covered in today's class. Answer them individually

	•Divide the students into small groups and provide each group with a plastic bag or airtight container to represent a grain storage facility. Instruct the students to transfer a portion of their labelled grains into the storage facility and seal it tightly. •Encourage the students to discuss and brainstorm the conditions necessary for proper grain storage, such as keeping the storage facility dry, cool, and protected from pests. •Ask each group to present their storage facility to the class and explain the measures they have taken to ensure proper storage. •Facilitate a class discussion where students can share their observations and discuss the importance of each measure in preventing spoilage and maintaining grain quality. •Use the whiteboard or chart paper to record the key points discussed during the activity. •Summarize the discussion by highlighting the importance of proper grain storage techniques, such as controlling moisture, temperature, and pests, to prevent losses and ensure food security. •Conclude the activity by emphasizing the role of farmers and storage facilities in maintaining grain quality from harvest to consumption	

SUMMARY

The cutting of crop after it is mature is called **harvesting**

Separation of the grains from the chaff is called threshing.

Proper storage of grains is necessary to protect them from pests and microorganisms.

FACTUAL

What is harvesting?

Where do we usually store our harvested crops?

OPEN ENDED

Can you discuss the technological innovations in harvesting equipment and their impact on crop yield and quality

ASSIGNMENT

1.Define harvesting.

2.What are the different ways of harvesting a crop?

3.Define the term “Chaff”

4.What is the purpose of threshing the crops?

5.What is the function of a harvester?

6.What is winnowing? Explain

1.Ask students to observe how their mother stores grains and what methods she uses to preserve the grains.

Write experiences in their notebook.

2.How does the presence of moisture in grains affect its storage?

3.What is the importance of drying grains in sunlight before storing them for future use?

PERIOD NO 10

Topic to be covered
2.10 Food from Animals

Learning objectives
LO 10 - Explore the concept of animal husbandry and analyse the food that we get from them.

<table>
<tr><th>I DO</th><th>WE DO</th><th>YOU DO</th></tr>
<tr>
<td>Explain animal husbandry
•Explore the food that we get from animals and nutritional value of them.
•Revision of the whole chapter.
•Encourage students to ask their doubts and try solving them in revision sessions</td>
<td>Objective: To engage students in a small group activity where they analyze a case study related to animal husbandry and discuss the key concepts and principles involved.
Instructions:
•Divide the class into small groups of 3-4 students each.
•Provide each group with a case study scenario related to animal husbandry. You can create your own scenario or use the following example:
•Scenario: A farmer has a small poultry farm with 50 chickens. Lately, some of the chickens have been showing signs of illness and decreased egg production. The farmer is concerned and seeks advice on how to address the situation and prevent further losses.
•Instruct each group to read and analyze the given case study, identifying the key issues, challenges, and potential solutions related to animal husbandry.
•Encourage the groups to discuss and brainstorm possible reasons for the chickens' illness and decreased egg production, as well as appropriate actions the farmer can take.
•Allocate a specific time for the groups to collaborate and come up with their recommendations.
•After the allotted time, have each group present their analysis and recommendations to the class. Allow for a brief discussion and clarification of each group's insights.
•Facilitate a class discussion where students can compare and contrast the recommendations provided by different groups, highlighting the diverse perspectives and approaches to addressing the case study scenario.</td>
<td>Make the following Table in your notebook and complete it.
<table>
<tr><th>S.NO</th><th>FOOD</th><th>SOURCES</th></tr>
<tr><td>1</td><td>Milk</td><td>Cows, buffaloes, donkeys</td></tr>
<tr><td>2</td><td></td><td></td></tr>
<tr><td>3</td><td></td><td></td></tr>
<tr><td>4</td><td></td><td></td></tr>
<tr><td>5</td><td></td><td></td></tr>
</table>
2.Define animal husbandry.
3.What is the importance of animal husbandry for a farmer in the village?</td>
</tr>
</table>

	•Summarize the key concepts and principles discussed during the activity, emphasizing the importance of proper animal care, disease prevention, and management practices in animal husbandry. •Conclude the activity by discussing the broader implications of animal husbandry on food production, animal welfare, and sustainable agriculture.	

SUMMARY

Food is also obtained from animals for which animals are reared. This is called animal husbandry.

FACTUAL

Define animal husbandry.

What are food items we get from animals which are essential for our growth?

OPEN ENDED

Despite being one of the growing economies, our country still has a large section of population going hungry and malnourished. Do you think an efficient crop production mechanism is the only solution to this? Discuss in the class what else needs to be done to root out hunger and malnutrition from our country.

ASSIGNMENT

Select the correct word from the following list and fill in the blanks.

float, water, crop, nutrients, preparation.

(a) The same kind of plants grown and cultivated on a large scale at a place is called ______________.

(b) The first step before growing crops is ______________ of the soil.

(c) Damaged seeds would ______________ on top of water.

(d) For growing a crop, sufficient sunlight and ______________ and______________ from the soil are essential.

Teachers diary

P 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**
1	**Introduction ,2.1 Agricultural Practices,2.2 Basic**						

	Practices Of Crop Production						
2	**2.2 Basic Practices Of Crop Production**						
3	**2.3 Preparation Of Soil**						
4	**2.4 Sowing**						
5	**2.5 Adding Manure And Fertilizers**						
6	**2.6 Irrigation-Traditional methods.**						
7	**2.6 Irrigation-Modern Methods**						
8	**2.7 Protection From Weeds**						
9	**2.8 Harvesting, 2.9 Storage**						
10	**2.10 Food From Animals**						

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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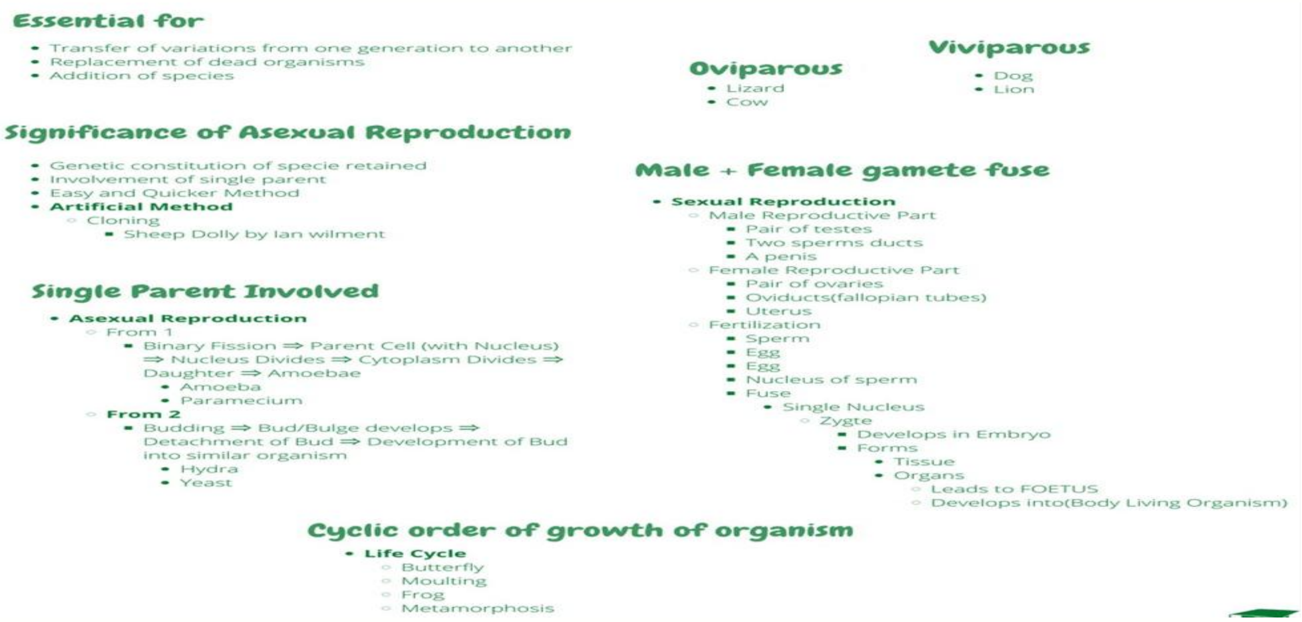
3. Reproduction in Animals

NO OF TEACHING PERIODS: 8

Learning Outcomes: Learners…..

1. **differentiates between sexual and asexual reproduction**
2. **draw neat labeled diagram of male reproductive system**
3. **draw neat labeled diagram of female reproductive system**
4. **explain the process of fertilization**
5. **explain the process of development of embryo**
6. **give examples for oviparous and viviparous animals**
7. **identifies asexually reproducing animals**
8. **understands binary fission in amoeba**

MIND MAP:



PERIOD WISE TOPICS

S.No.	Topic	S.No.	Topic
1	**Introduction, 3.1 Modes Of Reproduction**	5	**Development Of Embryo**
2	**3.2 Sexual reproduction Male Reproductive Organs**	6	**Viviparous And Oviparous Animals and Young Ones to Adults**
3	**Female Reproductive Organs**	7	**3.3 Asexual Reproduction ,(Budding in Hydra)**
4	**Fertilization**	8	**Binary Fission in Amoeba**

Period:1

Concepts Covered:

1. Modes of Reproduction

Learning Objectives:

- SWBAT Reproduction
- SWBAT know the types of Reproduction

Prior Concept/ Skills:

- Animals and their babies, male and female parts of flower,

TLM Required:

Pictures or toys of animals

Teacher Resources:

- Textbook:Link1
- Crash Course:Reproduction in Animals: Link2

Igniting Activity:

Close your eyes for a moment and imagine a world where a single spark sets off a chain reaction, leadingtothebirthofnewlife.Imaginecreatures,bigandsmall,eachwiththeirownremarkable way of passing on their essence to the future.

Today, we're about to step into this world of awe-inspiring marvels, where life's blueprint is rewritten and generations to come are shaped.

Experience and reflection:

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

Learning Point:

- **differentiates between sexual and asexual reproduction**

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. Types of reproduction i) Sexual ii) Asexual	**Activity: Group Discussion** **Discussion topic:** Imagine a world without any form of reproduction. How would this impact the survival of species and the diversity of life on Earth?	Instruct students to open their notebooks and begin the "Life Cycle Illustration" activity. Ask each student to select an organism (e.g., a plant, animal, or insect) that they find interesting. It could be anything from a sunflower to a frog. They can draw the various stages, from birth or hatching to reproduction.

CFU: Factual Question • What are the types of reproduction? Open-ended question number • What will happen if an organism stops the reproduction? **Closing:** Recap on the topic. Make it relevant to students' daily lives & see if they can understand its importance.	**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.	**Homework:**3D_i_a Assign students to create a poster or banner on the awareness of sex education. Name the young ones of different animals

Summary:

Reproduction and its importance: It is a process by which the organisms produce new offspring of their own species. Reproduction is important for the existence of a species.

Modesof reproduction:The modes of reproduction are based on the requirements of the number of parents, which are:

(i) Sexual reproduction (ii)Asexual reproduction

Period:2

Concepts Covered:

1. Sexual Reproduction
2. Male reproductive system

Learning Objectives:

- SWBAT understand the sexual Reproduction
- SWBAT Draw the male reproductive system

Prior Concept/Skills:

- Animals and their babies, male and female parts of flower, difference between male and female animals

TLM Required:

- Pictures of male reproductive system

Teacher Resources:

- Textbook:Link1
- CrashCourse:ReproductioninAnimals:Link2

Igniting Activity:

By showing some animals ask them to find the male and female

Experience and reflection:

Is there any role of ox for production of calf from cow?

Learning Point:

- **Draw neat labelled diagram of male reproductive system**

<table>
<tr><th>I do (Direct Instructions)</th><th>We do (Guided Practice)</th><th>You do (Independent Practice)</th></tr>
<tr><td>

1. Start by reviewing the basics of reproduction.
2. Explain to students that reproduction is the process by which organisms produce offspring.
3. Detailed explanation onmain types of reproduction - sexual & asexual
4. Next, introduction to the male reproductive organs & their detailed explanation.

CFU:

1. What is sexual reproduction?
2. True or false: Each sperm is made up of a couple of cells with all the usual cell components.
3. Define Reproductive organs and their functions

Open-ended question

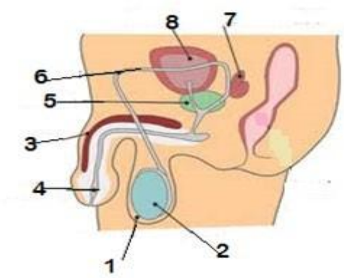
1. What will happen if the sperm's tail doesn't move?

</td><td>

Activity: Labelling diagrams and discussion

Instruction:

- Divide students into groups & give each group a set of diagrams of male reproductive organs.
- Have each group label different parts of male reproductive organs.
- After labelling the diagrams, discuss the function of male reproductive organ.



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Provide a worksheet with the following questions: 1. What are the main types of reproduction? 2. What is reproduction, and why is it essential for the survival of a species? 3. What are the primary male reproductive organs, and what are their main functions in the process of reproduction?

Homework 3D_i_a Research and present a case study of an animal that exhibits interesting courtship behaviors as part of its sexual reproduction process. Include the purpose of these behaviors and their impact on mating success.

</td></tr>
</table>

Summary:

1. **Sexual Reproduction** In sexual reproduction, the species consist of male and female reproductive organs. The kind of reproduction in which the fusion of male and female gametes takes place is called sexual reproduction.

Period 3

Concepts Covered: Female reproductive system

Learning Objectives: SWBAT Draw the male reproductive system

Prior Concept / Skills:

- Animals and their babies, male and female parts of flower, difference between male and female animals

TLM Required:

Pictures of female reproductive system

Teacher Resources:

- Textbook:Link1
- CrashCourse:ReproductioninAnimals:Link2

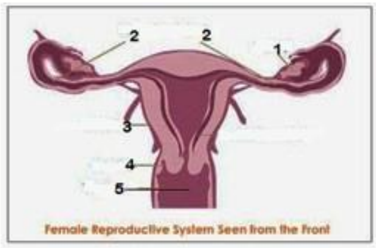
Igniting Activity:

Why our mother carries 9 months in womb and why not the hen?

Experience and reflection:

Why only the female varies baby?

Learning Point:

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
1. Start by reviewing the basics of reproduction. 2. Explain to students that reproduction is the process by which organisms produce offspring. 3. Detailed explanation on main types of reproduction - sexual & asexual 4. Next, introduction to the female reproductive organs & their detailed explanation. **CFU:** 4. What is sexual reproduction? 5. True or false: Each sperm is made up of a couple of cells with all the usual cell components. 6. Define Reproductive organs and their functions	**Activity: Labelling diagrams and discussion** **Instruction:** • Divide students into groups & give each group a set of diagrams of female reproductive organs. • Have each group label different parts of female  Female Reproductive System Seen from the Front reproductive organs.	Provide a worksheet with the following questions: 1. What are the main types of reproduction? 2. What is reproduction, and why is it essential for the survival of a species? 3. What are the primary female and female reproductive organs, and what are their main functions in the process of reproduction? Homework 3D_i_a Research and present a case study of an animal that exhibits interesting courtship behaviors as part of its sexual reproduction process. Include the purpose of

Open-ended question number 2 2. What will happen if the sperm's tail doesn't move?	• After labelling the diagrams, discuss the function of each organ.	these behaviors and their impact on mating success.

Draw neat labelled diagram of female reproductive system

Summary:

Organs for reproduction: The female reproductive organs include ovaries, oviducts, and uterus where as the reproductive organs in the male include testes, sperm ducts, and penis. The ovary produces female gametes called ova (egg cells) and the testes produce male gametes called sperms. Thefusionofthesegametes(ovumandsperm)iscalledfertilization.Theeggdevelopedafter fertilization is called a zygote.

Period:4

Concepts Covered:

- Fertilization

Learning Objectives:

- SWBAT differentiate the internal and external fertilization

Prior Concept/Skills:

- Animals and their babies, male and female parts of flower, difference between male and female animals, fruit formation in plants.

TLM Required:

- Model of ovum and sperm cell

Teacher Resources:

- Textbook:Link1
- CrashCourse:ReproductioninAnimals:Link2

Igniting Activity:

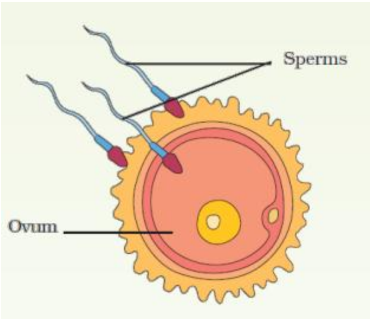
- Tell me how fruit formed in plants?

Experience and reflection:

What is the role of pollen grain in flower?

Learning Point:

- **explain the process of fertilisation**

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
• Begin the class with revision of the previous class. • The teacher will define fertilization and explain the process. • Use a diagram of male and female reproductive systems to illustrate the process. Also, show the pictures of fertilization .  **Closing:** Recap on the topic delivered.	**Activity: Case study discussion** **Case study:** Rajesh and Priya, a married couple from a conservative Indian family, have been trying to conceive for a few years without success. Their families and community emphasize the importance of having children to continue the family lineage. Facing pressure, Rajesh and Priya decide to explore fertility treatments, including in vitro fertilization (IVF). However, they also grapple with the conflict between their desire for a child and the preservation of their cultural values **Instructions:** • Read the following case study in group and discuss the following question in their respective group. • Discuss the potential social stigma that Rajesh and Priya might face if they choose to pursue fertility treatments. • Consider the traditional gender roles in Indian society. How might these roles impact the experience of infertility for both men and women?	The independent activity will involve drawing a diagram of the process of fertilization. **Homework:**3D_i_a Q & A 1. Describe the process of fertilization in humans. 2. What are the challenges that can occur during the process of fertilization?

Summary:

Types offertilization: The fertilization can occur inside or outside the parent body, so it is divided into two types:

(a) **Internal Fertilization:** The fertilization taking place inside the body of female species is called internal fertilization. This phenomenon is observed in human beings and other animals, for example, hens, cats, dogs, and other mammals.

(b) **External fertilization**: The fertilization taking place outside the body of the female species is called external fertilization. This is generally observed in aquatic animals such as frogs, fish, etc.

Process of fertilization: After fertilization, a zygote is formed, which begins to develop into an embryo. The zygote divides itself repeatedly which results in an embryo, which then gets embedded in the wall of the uterus and develops into body parts. The stage when the embryo develops well-defined body parts is called foetus. **Viviparous animals:** Organisms such as humans, cats, cows, and other mammals which give birth to young ones are called viviparous.

Period:5

Concepts Covered:

- **Development Of Embryo**

Learning Objectives:

- SWBAT understand the Development of Embryo

Prior Concept/Skills:

- Incubation the egg by hen

TLM Required:

Model of **Development Of Embryo**

Teacher Resources:

- Textbook:Link1
- CrashCourse:ReproductioninAnimals:Link2

Igniting Activity:

- Can we get the chick by braking egg? Why ?

Experience and reflection:

What is the role female while developing a baby?

Learning Point:

- **explain the process of development of embryo**

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
• Begin the period with a conversation on the importance of understanding human development with the students. • Give a brief explanation of internal fertilization and external fertilization. • Show a diagram or animation of stages of embryo development & explain. Link5	**Activity: Presentation** • Divide students into small groups, assign each group one of the stages of embryo development. • Provide materials such as coloured markers, and charts. Instruct them to create a visual	Illustrate the timeline in your notebook depicting the stages of embryo development in humans or another species of your choice. Include labels and descriptions for each stage. **Homework:** Answer the following question: 1. In humans, the development of a

Closing: Summarize the main points of the lesson and emphasize the significance of understanding of the development. Reproduction, whether sexual or asexual, is crucial for maintaining species' existence within ecosystems. However, sexual reproduction has a benefit over asexual reproduction in that it leads to more species variation, evolution, and improved environmental adaptability.	representation of their assigned stage & write a brief explanation of the development of that specific period. Each group will present a visual representation and explanation to the class.	fertilized egg takes place in the a. Ovary b. testis c. oviduct d. uterus 2. Sets of reproductive terms are given below. choose the set that has an incorrect combination a) sperm, testis, sperm duct, penis b) Menstruation, egg, oviduct, uterus c) sperm, oviduct, egg, uterus d) ovulation, egg, oviduct, uterus 3. Why is reproduction important? 4. What is fertilization?

Summary:

After fertilization, a zygote is formed, which begins to develop into an embryo. The zygote divides itself repeatedly which results in an embryo, which then gets embedded in the wall of the uterus and develops into body parts. The stage when the embryo develops well-defined body parts is called foetus.

Period:6

Concepts Covered:

- **Viviparous And Oviparous Animals**
- **Young Ones To Adults**

Learning Objectives:

- SWBAT identify the **viviparous and oviparous animals**
- SWBAT **describe how the young ones to adults**

Prior Concept/Skills:

- Different animals and their features

TLM Required:

- Chart of different animals

Teacher Resources:

- Textbook:Link1

• CrashCourse:ReproductioninAnimals:Link2

Igniting Activity:

• Did you see the egg of donkey? discuss

Experience and reflection:

Can you say a particular animal lay eggs or babies?

Learning Point:

• **give examples for oviparous and viviparous animals**

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
• Begin the period with a conversation on the Begin with a brief introduction to reproduction in animals and explain two main categories i.e Viviparous and oviparous animals • Give a definition of viviparous animals Examples - Mention common animals like humans, dogs, cats, and elephants. Also, highlight the characteristics of viviparous animals. • Oviparous Animals - Give definition explaining this animals are those who lay eggs instead of giving birth to young ones. Ex, mention animals like birds (chicken, sparrows), reptiles (turtles, snakes), insects (butterflies, ants). Also, highlight the characteristics of these animals. • By greeting & a warm-up activity, engage the students for the topic of the day. • Discuss the importance of animal development and its role in the circle of life. • Introducing the concept of	**Activity: Creation and discussion** Instructions: • Divide the class in small groups • Ask groups to discuss and create a list of five different types of viviparous & oviparous animals found in India as well as the world. • Encourage them to use their textbooks, reference books & if possible internet to gather information for the task. Walk around the classroom, provide guidance and support to groups as needed. **Activity: Group discussion** • Divide the students into small groups to discuss the lifecycles of specific animals	Also, conclude lesson by distributing worksheets or activity sheets related to viviparous & oviparous animals. Questions: 1. You are visiting a farm with your family. In one corner of the farm, you see baby chicks hatching from eggs in a warm, cozy nest, while in another area, you notice tiny kittens nursing from their mother. Can you explain why the baby chicks and kittens are born or hatched differently? 2. Oviparous animals usually lay eggs because… a. It is more energy- efficient. b. It allows for better protection of offspring. c. It promotes genetic diversity. d. It speeds up the reproductive process. 3. What is a key characteristic of viviparous animals? a. They lay eggs. b. They give birth to live offspring. c. They hatch from eggs d. They have external fertilization.

metamorphosis and the different stages of its development. • Explain the concept of animal development using relatable eg, frogs, and butterflies. Highlighting four mainstages: Egg, Larva, Pupa/Chrysalis, and adult.	(frogs, butterflies) Give students a chance to reflect & encourage collaboration. After the discussion, each group will present their findings to the class.	Distribute a worksheet with questions related to the stages of development. In this work students will work individually to answer questions encouraging their critical thinking. Review the answers as a class to ensure their understanding. **Homework:3D_i_a** Create a project called "Animal Life Cycle Diorama.". Students have to create it showcasing different stages of development of an animal of their choice.

Summary:

Viviparous animals: Organisms such as humans, cats, cows, and other mammals which give birth to young ones are called viviparous animals.

Oviparous Animals: Egg-laying animals are called oviparous animals, e.g., frogs, lizards, butterflies, etc. In metamorphosis, the larva is transformed into an adult. It is not observed in humans but it is observed in insects like butterflies, silkworms, frogs, etc.

Period:7

Concepts Covered:

- **Asexual Reproduction,**
- **Budding In Hydra**

Learning Objectives:

- SWBAT classify the types of **Asexual** Reproduction
- SWBAT **draw the picture of hydra and identify the buds**

Prior Concept/Skills:

- Vegetative propagation

TLM Required:

Chart of different lower animals

Teacher Resources:

- Textbook:Link1
- CrashCourse:ReproductioninAnimals:Link2

Igniting Activity:

- Is it possible to split an organism into tow babies?

Experience and reflection:

- Is there any role of male and female part in vegetative propagation?

Learning Point:

- **identifies asexually reproducing animals**

I do (Direct Instructions)	We do (Guided Practice)	You do(Independent Practice)
• Begin the day by discussing basic concepts of reproduction and recall what they know about it. • Introduce the term 'asexual reproduction' and explain its type of reproduction that doesn't involve fusion of gametes (sex cells) from two parents. Also, mention that it's nature's way of cloning, where offspring are genetically identical to their parents. • Provide examples of asexual organisms. • Explain different methods of asexual reproduction a) binary fission, b) Budding, c) Fragmentation, d) spore formation. **Closing:** Summarize the key points of the lesson. Encourage students to be curious and observe the natural world around them.	**Activity: Discussion and presentation** • Create small groups & assign each group a specific method of asexual reproduction. • Provide the handouts with information and pictures related to the assigned method. Ask students to discuss and present one by one.	Distribute a worksheet with questions related to the asexual reproduction process. **Homework:** Draw the diagram of binary fission in amoeba in the respective notebook.

Summary:

1. **Asexual Reproduction**: this is the type of reproduction in which only a single parents required. Such a type of reproduction is called asexual reproduction. Species like hydra, amoeba, and other microscopic unicellular organisms.

(c)Budding: In hydra, new individuals develop from buds formed from the parent body. This method of asexual reproduction by forming buds is called budding.

Period:8

Concepts Covered:

- **Binary Fission In Amoeba**
- **cloning**

Learning Objectives:

- give example for **understands binary fission in amoeba**
- **draw the picture of understands binary fission in amoeba**

Prior Concept/Skills:

- Vegetative propagation

TLM Required:

Chart of different lower animals, Doly and other cloned animals

Teacher Resources:

- Textbook:Link1
- CrashCourse:ReproductioninAnimals:Link2

Igniting Activity:

- Is it possible to split an organism into two babies?
- Can you create your own copy?

Experience and reflection:

- Is there any role of male and female part in vegetative propagation?

Learning Point:

- **understands binary fission in amoeba**

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
• The teacher recaps the concepts that have been finished and then introduces the two main concepts of the period. • Present a simple explanation of Cloning which focuses on Dolly the Sheep as an example of a cloned animal. Show images as well as videos of Dolly the sheep for engagement of students • Discuss the process of somatic cell nuclear transfer, which was used to create Dolly. • Emphasise the ethical and scientific implications of cloning. **Closing:** Summarise the key points discussed in the class. discuss the doubts if students have any.	**Activity: Discussion and Activity: Case study discussion.** • Givecasestudyto the students on cloning. • Ask students to discuss different animals that have been cloned. • The participants of the groups will discuss the cloning process, purpose of cloning that particular animal, and potential benefits and drawbacks of it. Each group will present their findings to the rest of the class.	Each student will get a worksheet that includes questions about cloning and its significance. **Homework**: 3D_i_a Assign tasks related to parthenogenesis. Ask students to research parthenogenesis, its occurrence in various species, and its biological

		significanc e.

Summary:

(d) **Binaryfission:**When an organism reproduces by dividing itself into two from a single parent, this type of asexual reproduction is called binary fission. For example, microscopic organisms like amoeba reproduce by dividing themselves into two. In this

method the organism divides its nucleus into two parts, thus each part contains a nucleus.

Teachers 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 Re teach	Additional Resources Used to Re teach
1	**Introduction, 3.1 Modes Of Reproduction**						
2	**3.2 Sexual reproduction Male Reproductive Organs**						
3	**Female Reproductive Organs**						
4	**Fertilization**						
5	**Development Of Embryo**						
6	**Viviparous And Oviparous Animals And Young Ones To Adults**						

7	**3.3 Asexual Reproduction ,(Budding In Hydra)**						
8	**Binary Fission In Amoeba**						

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:

………
………
………
………
………
……………………………………………………………….

November 2025

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
T6N3R7 No bag Day	Z7U8M9 Cluster Complex	C4G3C5 Teacher Resources				1 No Bag Day Andhra Pradesh Avatarana
2 Sunday	3 4NI	4	5	6	7	8 Second Saturday
9 Sunday	10 SA - 1	11 Education Day	12	13	14 en's 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 4.3 – 4.5 NI	25	26 National India	27 Jayamti	28	29 No Bag Day SMC Meeting
30 Sunday						

14 - 20 National Library Week

Week1:

Week 2:

Week 3:

Week 4: 4.3 – 4.5

TEACHER'S NOTES

December 2025

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 World AIDS 4.6 – 4.7 + 2NI	2	3	4	5	6 No Bag Day Mega PTM/SMC
7 Sunday	8 4.8 – 4.9 + 2NI	9	10 Human	11	12	13 Second Saturday
14 Sunday	15 4.9 + 2NI	16	17	18	19	20 No Bag Day Cluster Meeting
21 Sunday	22 Mathematics Day Christmas Holiday	23	24 National	25 Christmas	26	27 No Bag
28 Sunday	29 NI	30 NI	31 NI	T6N3R7 No bag Day	Z7U8M9 Cluster Complex	C4G3C5 Teacher Resources

Christmas Holidays for Christian Minority Institutions 21.12.25 to 28.12.25

Week1: 4.6 – 4.7

Week 2: 4.8 – 4.9

Week 3: 4.9

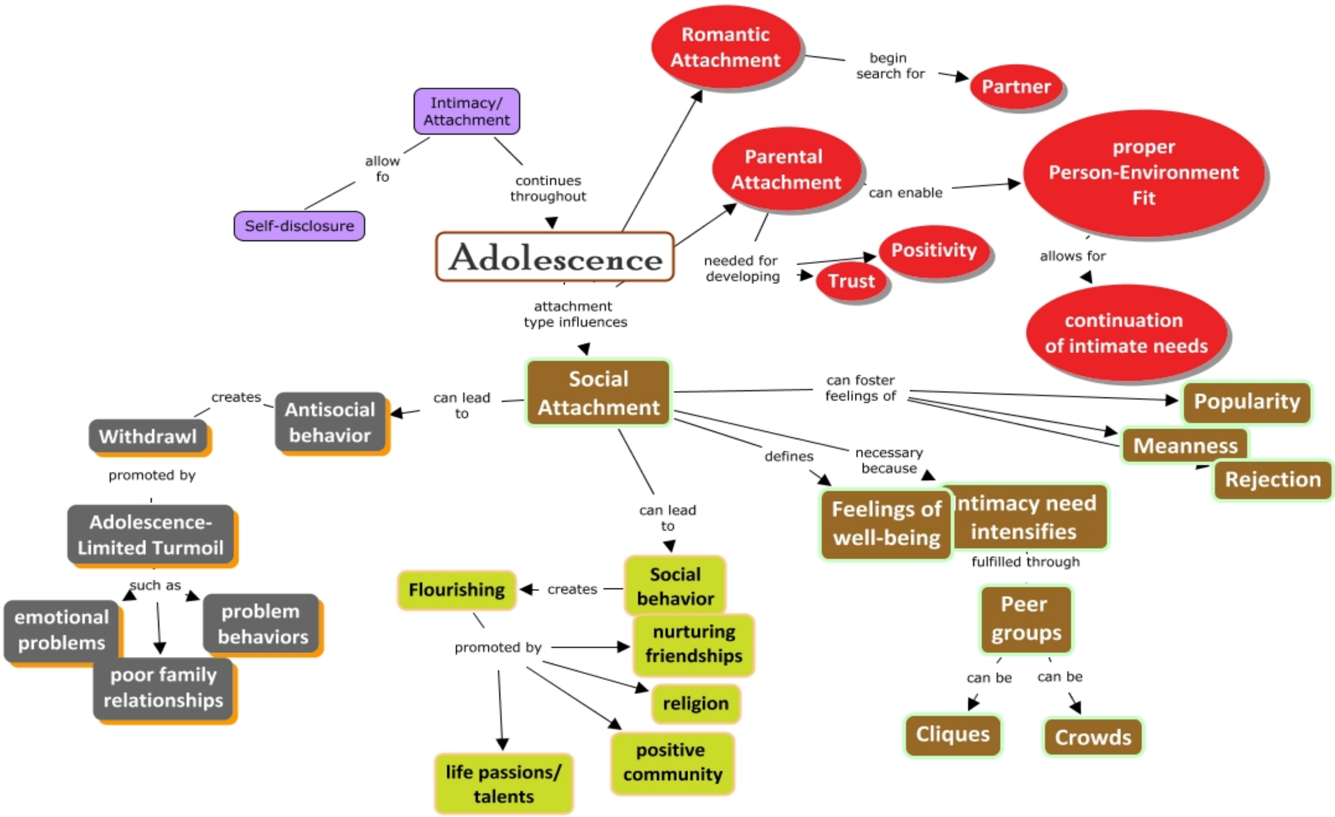
Week 4:

Week 5:

TEACHER'S NOTES

CHAPTER – 4 **Reaching the Age of Adolescence**

MIND MAP



Name of the Chapter: Reaching the Age of Adolescence

Learning Outcomes:

- understand about adolescence and puberty
- list out the changes at puberty
- list out the changes at puberty
- identify the secondary sexual characters in females and males
- explain the role of hormones in initiating reproduction
- explain menstruation in humans
- understand the sex determination process in humans
- prepare a table of endocrine glands and their functions
- explain the role of hormones in completing the life history of insects and frogs
- identify the importance of reproductive health
- explain the importance of personal hygiene and physical exercise
- understand the harmful effects of drugs

Y9E1X7

Chapters and Concepts

Topic / Concept	Number of Periods	Timeline for Teaching	Any specific information
Introduction ,4.1 Adolescence and Puberty	1		
4.2 Changes At Puberty	1		
4.2 Changes At Puberty	1		
4.3 Secondary Sexual Characters	1		
4.4 Role Of Hormones	1		
4.5 Reproductive Phase Of Life In Humans	1		
4.6 How Is The Sex Of Baby Determined	1		
4.7 Hormones Other Than Sex Hormones	1		
4.8 Role Of Hormones In Completing The Life History Of Insects And Frogs	1		
4.9 Reproductive Health	1		
Personal Hygiene And Physical Exercise	1		
Say No To Drugs	1		

Prior concept / Skills:

Essential concepts and skills to be checked / bridged before teaching the current concept.)

1. Able to express his/her feelings on changes taking place inside his/her body.
2. Able to share about food habits and social behavior.
3. Basic knowledge about personal hygiene and self-care practices.
4. A general understanding of how humans grow and develop from infancy through childhood.

Teacher References:

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

1. Reaching the Age of Adolescence : Part 1/2-Link1
2. Reaching the Age of Adolescence : Part 2/2-Link2
3. When you are actually an adult? Shannon Odell-Link3
4. Reaching the Age of Adolescence Class 8 Science (Biology) / BYJU'S - Class8-Link4
5. Extra Questions related to the chapter Link 5
6. Reproductive Health Link6
7. SCERTAP Textbook

TLM (Teaching Learning Material) :

- White/blackboard
- Blank Papers
- Markers
- Pictures of certain topics
- Drawings
- Chalks

CONCEPT: **1**

ADOLESCENCE & PUBERTY, SECONDARY SEXUAL CHARACTERS

TEACHING LEARNING PROCESS

Learning Objective/s:

Period - 1 SWBAT

LO1 - Define adolescence and adolescent age in order to explain changes at puberty

Period - 2 SWBAT

LO2-Enumerate different variations that take place in body at puberty to explain the effect of adolescence on changing the human body

Period - 3 SWBAT

LO3 Identify secondary sexual characteristics in order to illustrate growth during puberty and understand the role of hormones in controlling this.

Induction/Introduction:

Show pictures of the topic to the students, such as what happens during puberty and height-to-weight ratio. Divide the class into groups and have a quiz competition on the changes occurring during adolescence.

Experience and Reflection:

Have you or someone you know experienced any physical changes during puberty? How did it feel, and how did you or they adapt to these changes?

Period 1

Explicit Teaching / Teacher Modeling *(I Do)* **(8 minutes)**	**Group Work** *(We do)* **(16 minutes)**	**Independent Work** *(You do)* **(8 minutes)**
2_i_a Greet the students and create a healthy environment for them. Begin the lesson by doing a recap on reproduction in animals and on a new topic about what they understand about adolescence, and write their answers on the board.	**3_i_b** Divide the class into small groups and distribute handouts with information on adolescence, its facts & stories from the Diksha sites book. Instruct each	**3A_i_a** Provide each student with blank chart paper and sketch pens/markers. Ask them to create a poster about the importance of adolescence which can highlight the physical,

Take reference of the images mentioned in the introduction section and discuss adolescence and puberty. Explain that it is a crucial stage between childhood & adulthood and it involves physical, social and emotional changes. Also elaborate in detail the first page of the textbook (Textbook Page no. 2,3) **Closing will be done at the end of the period: 2.ii.a** While concluding the session, summarize all the key points that were discussed during the lesson. •Growing up is a natural process. •The period of life when the body undergoes changes leading to reproductive maturity is called adolescence. •Adolescence begins around the age of 11 and lasts up to 18 or 19 years of age. •The human body undergoes several changes during adolescence. These changes mark the onset of puberty.	of the groups to read and discuss content together. Assign specific roles within each group & have them present a summary of their discussion on the class. Link7 Below points could be considered in the handouts - **Physical Changes**: Adolescence is marked by significant physical changes, including growth spurts, changes in voice pitch, and the development of secondary sexual characteristics like breasts and facial hair. **Brain Development**: During adolescence, the brain undergoes significant development, especially in the prefrontal cortex responsible for decision-making and impulse control. **Emotional Rollercoaster**: Adolescents often experience a wide range of emotions, sometimes intensely. This is due to hormonal changes and the brain's reorganization. **Peer Influence**: Adolescents are highly influenced by their peers. They seek approval and acceptance from their friends, which can sometimes lead to peer pressure. **Identity Formation**: Adolescents explore their identities, trying to answer questions like "Who am I?" They may experiment with	emotional and social changes that occur during this period. **Homework: 3D_i_a** Go through the **activity 5.2** of the textbook (Page no. 6-7) and prepare a graph for your own height considering the height you have achieved and the height which you might achieve considering the growth percentage at different ages. (Students need to complete **activity 5.1**beforestartingthis activity).

	different styles, beliefs, and values. **Academic Challenges**: Adolescents face increased academic demands and may struggle with time management and study skills. **Risk-Taking**: The adolescent brain is more prone to taking risks, which can sometimes lead to impulsive behaviors.	

Period 2		
Explicit Teaching / Teacher Modeling *(I Do)* **(8 minutes)**	**Group Work** *(We do)* **(16 minutes)**	**Independent Work** *(You do)* **(8 minutes)**
2_i_a Greet the students and create a positive environment for learning. Do a small recap of period 1 & give a chance to students to share their homework with the whole class or peer next to each other. The teacher should use visual aids to show the physical changes, i.e. changes in body shape, voice change, and development of sex organs. Discuss the changes in the body shape and growth of body hair in girls' development of breasts, and heavy voice in boys. Also, address emotional changes such as mood swings, and self-consciousness as well as mental, intellectual and emotional maturity. Let them know that these changes are normal and everyone experiences them while he/she is growing up. Read aloud the section 5.2 from text book page no. 4-8. **Closing will be done at the end of the period: 2.ii.a**	**3_i_b** 1. Divide the students into small groups and provide them with a case study or scenario on which they can find any strategies to deal with the changes and emotions they feel during the puberty period. 2. Encourage students to share their ideas and solutions with the whole class after having a group discussion. 3. Read the below scenario and answer the following questions: Imagine there's a new student named Rajat who has just joined your class. Rajat is going through puberty and has been experiencing a lot of changes and emotions. Rajat is feeling overwhelmed by these	**3A_i_a** Instruct students to individually solve the questions below. While the students are solving the questions, walk around the class to offer support & help clarify doubts of students. • What is adolescence? • What is puberty? • Who are adolescents? (10-19 years, boys & girls) **Homework:3D_i_a** Write a short journal about your thoughts and feelings on puberty changes **OR** Create a poster that can educate others about puberty and its effects.

Recap main points of the session. Emphasize that this is the phase of human development during which a person's body undergoes significant changes, both physically and emotionally, as it transitions from childhood to adulthood. These changes include the development of secondary sexual characteristics, such as the growth of body hair, changes in voice pitch, and the onset of menstruation (in girls), as well as the emergence of new emotions and feelings.	changes and is unsure how to cope with them. He has noticed physical changes like growth spurts, voice cracking, and acne, and has also been experiencing mood swings, from feeling really happy one moment to suddenly feeling sad or angry. 1. How would you approach Rajat to show understanding and support for what they might be going through? 2. Can you share your own experiences with puberty, both the positive and challenging aspects? How did you cope with them? 3. What advice or strategies can you suggest to help Rajat deal with the physical changes and mood swings?	

<table>
<tr><th colspan="3">Period 3</th></tr>
<tr><th>Explicit Teaching / Teacher Modeling (I Do) (8 minutes)</th><th>Group Work (We do) (16 minutes)</th><th>Independent Work (You do) (8 minutes)</th></tr>
<tr><td>2_i_a
Greet the students and start the lesson by asking questions to gauge their prior knowledge of puberty and sexual development.
Recapitulate the concept of primary sexual characters briefly and connect it to the idea of secondary sexual characters that they will</td><td>3_i_b
Divide class into small groups and provide each group with chart paper and markers.
Assign specific secondary sexual character to each group
Instruct groups to discuss and draw illustrations of their assigned factors along</td><td>3A_i_a
Referring to the secondary sexual characteristics we studies in this session, prepare a list of some visible characteristics which are present in you and your friend's body (after taking their permission)

<table><tr><th>Name</th><th>Characteristics</th><th>Visible or Not</th></tr><tr><td></td><td></td><td></td></tr></table></td></tr>
</table>

<table>
<tr>
<td>be learning today.
Explain the importance of understanding secondary sexual characters.
Showcase the images of secondary sexual characters in males and females. While doing that describe each factor eg. Breast development, facial hair, voice changes, and body hair and explain how they differ between males &females.
Discuss about hormones and their roles in changes in the body.
Read aloud the section 5.3 from text book page no. 8-11.
Closing will be done at the end of the period: 2.ii.a

Recap main points of the session. Emphasize that this is the phase from which every child goes through. It is important to feel comfortable while going through the changes.</td>
<td>with a brief description of its purpose in human development.

The secondary sexual characteristics in males are:
Hair growth on the face in the form of a beard and moustache
The growth of testicles
Heavier musculature
Adam's apple development
The larynx becomes larger resulting in a deeper voice
The secondary sexual characteristics in females are:
Development of breast
Lighter musculature
Shrill and a higher pitch voice
Broadening of hips</td>
<td><table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>
Homework:3D_i_a

Write a short note on secondary sexual characters in your own words.</td>
</tr>
</table>

CFUs

Factual:

1. Whatisthetermusedtodescribethephaseofdevelopmentbetweenchildhoodandadulthood?
2. At what age range does adolescence typically begin?
3. Whose height grows faster initially - boys or girls?
4. When does puberty end?
5. Do boys and girls undergo the same physical changes at puberty?
6. Whataretheprimaryhormonesresponsiblefortriggeringpubertyinmalesandfemales?
7. Nametwophysicalchangesthatoccurinbothmalesandfemalesduringpuberty.
8. Explainthedifferencebetweenprimarysexualcharacteristicsandsecondarysexual characteristics.
9. List three secondary sexual characteristics that develop in males during puberty.

1. Discuss the physical and psychological changes that occur during adolescence.
2. How does adolescence differ from childhood and adulthood?**LO-1**
3. List the secondary sexual characteristics that develop in boys and girls during adolescence. **LO-3**
4. Why do boys have a hoarse voice at puberty?**LO-2**
5. How does the body shape change at puberty?**LO-2**
6. Why do many young people have acne and pimples during adolescence?**LO-2**

CONCEPT – 2

SEX ROLE OF HORMONES, REPRODUCTIVE PHASE OF LIFE IN HUMANS SEX DETERMINATION, HORMONES OTHER THAN SEX HORMONES

TEACHING LEARNING PROCESS

Learning Objective/s:

Period4 SWBAT

- **LO 4** - Elaborate the functions of hormones secreted by endocrine glands in order to explain the growth in male and female body at puberty
- **LO5**-Describe menstruation, menarche and menopause to explain the reproductive phases of life in humans

Period5 SWBAT

- **LO6**-Illustrate the procedure for determining the sex of a baby in order to establish that the gender of the child is decided by the chromosome from male sperm

Period6 SWBAT

- **LO7**-Elaborate the importance of hormones other than sex hormones
- **LO8**-Understanding the role of hormones in completing the life history of insects and frogs

Induction/Introduction:

Show the pictures of organs in our body, types of hormones secreted by them and their specific functions. Ask student show they will affect our daily lives and why they are so crucial for our overall well-being.

Outcomes: By the end of the chapter, students will be able to describe menstruation, menarche and menopause to explain their productive phases of life in humans, elaborate the functions of hormones secreted by endocrine glands, understand the procedure for determining the sex of a baby and understand the importance of hormones other than sex hormones.

Experience and Reflection:

Do you think our lifestyle like eating habits, stress, work pattern impact secretion of hormones in our body? Share an example of your family members or friends who have experienced this.

Period 4

Explicit Teaching / Teacher Modeling *(I Do)* **(8 minutes)**	Group Work *(We do)* **(16 minutes)**	Independent Work *(You do)* **(8 minutes)**
2_i_a • Start the lesson by having a discussion about the importance of hormones and their role in the human body. • Explain those hormones are chemical messengers produced by various glands in the body. • Give more importance to mention that hormones play a significant role in the reproductive phase of human life. • Introduce the concept of endocrine & pituitary glands, testosterone, and estrogen to make students understand it. • After that introduce concepts like menstruation, menarche, and menopause for more in- depth discussion on this important topic. • Explain the functions of sex hormones, like regulating the menstrual cycle, controlling sperm production and triggering ovulation. • Read aloud the section 5.4 and 5.5 from textbook page no. 10-13. **Closing will be done at the end of the period: 2.ii.a** • Recap the main points covered during the session. • Emphasize the importance of sex hormones in the reproductive phase and the need for responsible behaviour during this time. • Explain the importance of breaking taboos and bring awareness towards menstruation. •	**3_i_b** • Divide students into small groups. • Prepare a poster presentation explaining the menstrual cycle. • The video can be referred to understand the process.	**3A_i_a** Students will write the answers of below questions in their own words and share - 1) How to identify the secondary sexual characters? 2) Are chemical substances. 3) Male hormone is also known as . 4) What secretes sex hormones? 5) What is menarche? 6) What is menopause? **Homework:3D_i_a** In your own words, utilize a graphic organizer to illustrate and explain how the sex hormones produced by the pituitary gland stimulate changes in the body. OR • Think about 5 taboos related to menstruation which you have heard from elders. • Present and discuss the causes of these taboos and how to bring

		awareness towards this.

Period 5

Explicit Teaching / Teacher Modeling *(I Do)* **(8 minutes)**	**Group Work** *(We do)* **(16 minutes)**	**Independent Work** *(You do)* **(8 minutes)**
• Greet students and begin the lesson by introducing the topic of sex determination in babies. • Connect it with the concept of hormones and their role in human development. • Present a brief overview of the male and female sex chromosomes (X and Y). Discuss how the combination of the sex chromosomes from the father and mother determines the sex of the baby. • Explain the process of sex determination in humans, where a baby with XX chromosomes develops into a female, and a baby with XY develops into a male. • Read aloud the section 5.6 from text book. **Closing will be done at the end of the period:** • Review key points discussed during the lesson. • Summarize the importance of hormones in determining the sex of a baby and the development of sexual characteristics.	• Divide students into small groups and instruct them to do role play on the topic of the determination of sex. • In these enactment or role play students can talk about the taboos of the society in which there's not enough awareness like preference for sons, female infantice, dowry system, gender roles etc. • The below video can help students to write dialogues for their role play (First two minutes are relevant) Link9	Give each student an individual worksheet with questions related to sex chromosomes and hormone role in sex determination. Instruct students to individually work on the worksheet. 1) What are chromosomes? 2) Name two sex chromosomes. 3) Name the sex chromosomes present in female? 4) What chromosomes occur in male? 5) Unfertilized egg carries chromosomes. **Homework:** Talk to your parents or neighbors about the historical understanding of sex determination and gender roles in different cultures and write your findings in the form of a short essay. (500 words)

Period 6

Explicit Teaching / Teacher Modeling *(I Do)* **(8 minutes)**	Group Work *(We do)* **(16 minutes)**	Independent Work *(You do)* **(8 minutes)**
2_i_a • Begin the lesson by asking students what they know about hormones and if they are aware of any hormones other than sex hormones. • Give a brief explanation of hormones as chemical messengers that regulate various physiological processes in the body. • Present a list of different hormones on the board i.e. insulin, adrenaline, growth hormone, thyroid hormone, metamorphosis, insect hormones. • Choose each of the hormones and explain its function and the gland that produces it. • Elaborate on how the hormone affects the body and why it is crucial for the proper functioning of processes. • Explain the role of hormones in completing the life history of insects and frogs. • Read aloud the section 5.7 and 5.8 from textbook page no. 14-17. **Closing will be done at the end of the period: 2.ii.a** Recap the main points discussed during the lesson. Emphasize the importance of hormones in maintaining bodily functions and overall health.	**3_i_b** • Divide students into small groups and tell them to name different glands and their location in the body. • Also, instruct them to include the hormone's name, gland that secretes it, and its functions. • After finishing the discussion1 member from each team will present the main points of the discussion to the class. <table><tr><th>Name of glands</th><th>Hormones</th><th>Functions</th></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>	**3A_i_a** What is hormonal imbalance and possible causes for it? Write it in your own words. **Homework:3D_i_a** Collect information from magazines or from doctors and prepa re a note on the importance of consuming iodized salt. You can also look for this information on the internet. **(Activity 5.3, Textbook page 16)**

CFUs

Factual:

1. The male hormone is called

a. Estrogen

b. Testosterone

c. Thyroxine

d. Insulin

2. What is menstruation and when does it typically begin for most girls?
3. Describe the menstrual cycle, including its phases.
4. Explain the importance of maintaining good hygiene during menstruation.
5. What is the average length of a menstrual cycle and is it the same for every person?
6. Name the female and male hormone.
7. What are hormones, and where are they produced in the body?
8. Name the hormones responsible for the development of secondary sexual characteristics in males and females.

Assessment

1. Explain the development of sex organs in male and females. **LO-4**
2. How do hormones work in a human body? **LO-4**
3. What are sex hormones? How do they work in the human body? **LO-4**
4. What is menstruation? **LO-5**
5. Explain the terms menarche and menopause. **LO-5**
6. What happens when the egg is fertilized? **LO-5**
7. What is the role of hormones in completing the life history of insects and frogs? **LO-8**
8. Mention different types of glands, their functions and the hormones secreted by them.**LO-7**
9. Explain the process of sex determination in humans.**LO-6**

CONCEPT - 3

REPRODUCTIVE HEALTH, IMPORTANCE OF BALANCED DIET AND HARMFUL EFFECTS OF DRUGS

TEACHING LEARNING PROCESS

Learning Objective/s:

Period7 SWBAT

- **LO9** - Identify key aspects of reproductive health and its significance in maintaining overall well-being
- **LO10** – Elucidate the need for a balanced diet in order to explain the nutritional needs of adolescents

Period8 SWBAT

- **LO11** - Understand the importance of personal hygiene and physical exercise to maintain reproductive health.
- **LO12** - Identify the harmful consequences of taking drugs in order to explain why drugs are not solution to confused and insecure feeling during adolescence

Induction/Introduction:

Talk about student’s favourite food items and why they like to eat them.

Outcomes: By the end of the chapter, students will be able to identify key aspects of reproductive health and its significance in maintaining overall well-being. Students will also be able to understand the importance of balanced diet, personal hygiene, physical exercise and the harmful consequences of taking drugs.

Behaviour Expectations: 1.i.b

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

Experience and Reflection:

Encourage students to share their experiences with the class on how they take care of their personal hygiene. **2.ii.b**

Period7 LO9,10

Explicit Teaching / Teacher Modeling *(I Do)* **(8 minutes)**	**Group Work** *(We do)* **(16 minutes)**	**Independent Work** *(You do)* **(8 minutes)**
2_i_a • The teacher starts by asking students if they know what reproductive health means and invites a few responses. • Reproductive Health refers to the overall well-being and proper functioning of the reproductive system and its related processes in both males and females. It includes physical, mental, and social aspects that contribute to a person's ability to reproduce if they choose to do so. • Connect the responses given by students during Introduction activity to the importance of eating a balanced diet to maintain overall physical and mental well being. • Read aloud the section 5.9 (about balanced diet) from textbook page no. 18-19. **Closing will be done at the end of the period: 2.ii.a** • Recap the main points discussed during the lesson.	**3_i_b** • Divide the class into small groups • Write down the items of food in your breakfast, lunch and dinner you had on the previous day. **2.ii.b** • Identify the items responsible for proper growth. • Also identified the junk food that you consumed the previous day. • Discuss which food was useful and which was harmful for your body in the long run. **(Activity 5.4, Textbook page 18)**	**3A_i_a** Lila always eats only dal and rice in every meal. She often falls ill and has become prone to diseases. Can you suggest changes in her diet which can make her healthy and free from disease? **Homework:3D_i_a** Collect and paste pictures of food items that are essential for our well being and categorize them according to their nutritional components like carbohydrates, proteins, fats, fibers etc.

• Emphasize the importance of taking care of reproductive health not only at a certain age but also when we grow older.		

Period8
LO11,12

Explicit Teaching / Teacher Modeling *(I Do)* **(8 minutes)**	**Group Work** *(We do)* **(16 minutes)**	**Independent Work** *(You do)* **(8 minutes)**
2_i_a • Connect the responses of students asked regarding the process of personal hygiene and continue to discuss its importance in maintaining good reproductive health. • Use posters to present the key aspects of personal hygiene which includes hand washing, dental care, bathing and proper clothing. • Give a demonstration of each of the activities and discuss why it's essential to maintain these practices. • The result of the continuous practice would be that it will help prevent illnesses and to maintain good health. • Discuss the importance of doing physical exercises like walking, running, dancing, playing sports, yoga etc. • Discuss with students why they should only take medicines which are prescribed by an affiliated doctor and the harmful impacts of unnecessary drugs on our body. • Read aloud the section 5.9 from text book page no.18-21. **Closing will be done at the end of the period: 2.ii.a** • Summarize the main points covered in the lesson, with a focus on the importance of maintaining good personal hygiene.	**3_i_b** • Divide the class into small groups • Distribute the below tasks to different groups and present it after preparation. **Task1** Prepare a poster to share the importance of personal hygiene and different steps to do so. **Task2** Prepare a poster to share importance of physical exercise and types of exercise students can do at their home. **Task3** Prepare a poster to create awareness towards bad habits like consumption of alcohol, smoking cigarettes, taking unnecessary drugs which later impact the body in harmful ways.	**3A_i_a** Prepare a list of habits which you will include in your daily life to maintain a good health. **Homework:3D_i_a** • For this task, tell students to meet a gynecologist or a doctor and take his/her interview on the topic of how to maintain personal hygiene as well as reproductive health. • Ask students to give a presentation about the interview in the next session. **OR** Collect data on the number of children in your class who exercise regularly and who do not exercise regularly. Did you notice any

• Encourage students to adopt healthy habits and take responsibility for their own well-being.		difference in their fitness and health? Prepare a report on the benefits of regular exercise. **(Activity 5.6, Textbookpage20)**

CFUs

Factual:

1. What is the full form of HIV/AIDS?
2. What could be the best practices to be followed by adolescents to maintain their personal hygiene?
3. Name the food items that provide fats for energy and proteins for growth?
4. Whatarethepotentialrisksassociatedwithearlypregnanciesforboththemotherandchild?

Teachers diary

Pe rio d No	Name of the Concept to be taught	Date	Activities Conducte d during the teaching	TLM Used	Student Response 1/2/3/4/5	Topics Indented to Re teach	Additional Resources Used to Re teach
1	**Introduction ,4.1 Adolescence And Puberty**						
2	**4.2 Changes At Puberty**						
3	**4.2 Changes At Puberty**						
4	**4.3 Secondary Sexual Characters**						
5	**4.4 Role Of Hormones**						
6	**4.5 Reproductive Phase Of Life In Humans**						

7	**4.6 How Is The Sex Of Baby Determined**						
8	**4.7 Hormones Other Than Sex Hormones**						
9	**4.8 Role Of Hormones In Completing The Life History Of Insects And Frogs**						

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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January 2026

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
T6N3R7 No bag Day	Z7U8M9 Cluster Complex	C4G3C5 Additional Resources		1 New year NI	2 NI	3 No Bag Day
4 Sunday	5 FA - 3	6	7	8	9 NI	10 Second Saturday
11 Sunday National Youth Day	12 Pongal Holidays	13	14	15	16	17 No Bag Day
18 Sunday D.R.Kaprekar Jayamti	19 5.1 – 5.2 + NI	20	21	22	23	24 No Bag Day Cluster,PTM, SMCmeeting
25 Sunday Republic day	26	27 5.3 – 5.4 NI Annual Day	28	29	30 atma Gandhi Vardhanti	31

Pongal Holidays 10-01-2026 TO 18-01-2026,
Pongal Holidays for Christian Minority Schools 10-01-2026 TO 15-01-2026

Week1:	
Week 2:	
Week 3:	
Week 4:	**5.1 – 5.2**
Week 5:	**5.3 – 5.4**

TEACHER'S NOTES

February 2026

Sunday	30	Tuesday	Wednesday	Thursday	Friday	Saturday
1 Sunday	2 5.5 – 5.6 + 2NI	3	4	5	6	7 No Bag Day
8 Sunday	9 FA - 4	10	11	12	13 NI	14 Second Saturday
15 Sunday Maha Sivaratri	16 5.7 – 5.12 NI	17	18	19	20	21 No Bag Day Cluster, PTM, SMC meeting
22 Sunday	23 NI	24 NI	25 NI	26 NI	27 NI	28 No Bag Day National Science Day

No bag Day

Cluster Complex

Teacher Resources

Week1: **5.5 – 5.6**

Week 2:

Week 3: **5.7 – 5.12**

Week 4:

Week 5:

↓ TEACHER'S NOTES ↓

Unit - 5

Name of the Chapter: Conservation of Plants and Animals

Learning Outcomes:

Z3E7T9

a. explain the importance of conserving plants and animals;

b. explain the causes of deforestation.

c. explain the consequences of deforestation.

d. understand the need of conservation of forest and wild life and make efforts to conserve plants and animals.

e. collects information about biosphere reserves in India.

f. identifies the flora and fauna

g. discuss about endemic species

h. collects information about sanctuaries and national parks of India

i. explain the importance of red data book

j. recognize the importance of recycling of paper

Chapters and Concepts

Topic / Concept	Number of Periods Required	Timeline for Teaching	Any specific information
Introduction	1		
5.1 Deforestation And It's Causes	**1**		
5.2 Consequences Of Deforestation	**1**		
5.3 Conservation Of Forest And Wild Life	**1**		
5.4 Biosphere Reserve	**1**		
5.5 Flora And Fauna	**1**		
5.6 Endemic Species	**1**		
5.7 Wild Life Sanctuary , 5.8 National Park	**1**		
5.9 Red Data Book ,	1		

5.10 Migration	
5.11 Recycling Of Paper, 5.12 Reforestation	1

PRIOR SKILLS:

1. Understanding the life processes in plants and animals, like photosynthesis, respiration, reproduction, and adaptation.
2. Knowledge of what ecosystems and their components (producers, consumers, decomposers), are.
3. Understanding of food chains and webs and the interdependence of species within an ecosystem.
4. Familiarity with different types of habitats (e.g., forests, wetlands, grasslands)and the types of plants and animals that typically inhabit them.
5. Awareness of how human activities can impact the environment, such as deforestation, pollution, and habitat destruction.
6. Awareness of how human activities can impact the environment, such as deforestation, pollution, and habitat destruction.

Understanding the life processes in plants and animals, like photosynthesis, respiration, reproduction, and adaptation.

7. Knowledge of what ecosystems and their components (producers, consumers, decomposers), are.
8. Understanding of food chains and webs and the interdependence of species within an ecosystem.
9. Familiarity with different types of habitats (e.g.,forests, wetlands, grasslands) and the types of plants and animals that typically inhabit them.
10. Awareness of how human activities can impact the environment, such as deforestation, pollution, and habitat destruction.
11. Awareness of how human activities can impact the environment, such as deforestation, pollution, and habitat destruction.

Teacher References:

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

1. Forest Biodiversity and Ecosystem Link1
2. Conservation of Plants and Animals – NCERT Solutions Link3
3. Conservation of Plants and Animals – Notes Link4
4. SCERT AP Textbook Link5

TLM (Teaching Learning Material):3.A.ii

- Chart papers

- Notebooks
- Sketch Pens
- Markers
- Pictures printouts
- Old Newspapers

Period 1

Concept 1: Introduction

Learning Objective/s: explain the importance of conserving plants and animals

Prior concept and skill: To effectively teach the lesson on national parks, wildlife sanctuaries, and biosphere reserves, students should have a basic understanding of ecosystems, biodiversity, conservation principles, ecological concepts, geographic knowledge, and critical thinking skills. This includes familiarity with habitats, ecosystem services, endangered species, food chains and webs, adaptation and evolution, map skills, and local ecosystems.

Teaching Learning Materials: List of wild life sanctuaries, national parks etc,

Igniting activity 4min: "Endangered Species Alert!"

Mystery Box or Envelope:

1. Prepare a mystery box or envelope with a picture or description of an endangered species like sparrow etc.

2. Students will receive the mystery box or envelope and try to guess the species.

Questions and Discussion:

1. Ask students:

   - What do you think is happening to this species?

   - Why is it important to protect this species?

   - What can we do to help?

2. Encourage discussion and curiosity.

Explicit teaching/Teacher Modelling (I Do)(8 min)	**Group Work** *(We Do)* (16 Minutes)	You do (independent practice) 8min
The teacher will start the discussion by connecting the questions from the introduction exercise and explaining in brief about the idea of conservation of plants and animals and its importance which they will be learning about in this period. CFU Conceptual understanding: What is the need of conservation?	Continue the discussion on the igniting activity. And take notes. What do you think is the reason for reduction of number of organisms of a particular type? Discuss within groups.	What happens if an organism population is completely vanished from your place? Home work: Ask your parents, grand parents and elders on the organisms that are abundant during their time and now. And also ask about new plants or

What do you understand by balance in nature? Open ended questions: What happens if all the vanished organisms reappear at your place?		animals that are not seen during their childhood.

Closing Summary: "Today, we've explored the importance of national parks, wildlife sanctuaries, and biosphere reserves in protecting endangered species and preserving ecosystems. We've learned about the role of conservation and the impact of human actions on the environment." Reflection: "As we conclude this lesson, take a moment to think about how you can contribute to conservation efforts in your daily life. Every small action counts, and together we can make a difference."
Assessment: List out the animals and plants that exist during your grand fathers time but absent today.

Period 2

Concept 2: 5.1 Deforestation And It's Causes

Learning Objective/s: SWBAT

-define the concept of deforestation.

-examine the causes of deforestation.

Prior concept and skill:

Teaching Learning Materials:

Igniting activity 4min:

The teacher would start the class by showing them the video of the 10 most beautiful forests in the world and then initiate the discussion on What is forest? Why are they important? What is deforestation? etc.

10Most Beautiful Forests Link6

Explicit teaching/Teacher Modelling (I Do)(8 min)	**Group Work** *(We Do)* (16 Minutes)	You do (independent practice) 8min
• the teacher would explain: What deforestation is and its causes along with the consequences of deforestation. • Deforestation is the process of cutting down, clearing, or removing large areas of forests or trees, often for various human activities such as agriculture, logging, urban development, or mining. This action results in the permanent removal of trees and	Teachers would divide the students into small groups or pairs. Provide each group with a printed or projected image depicting a scene related to deforestation (e.g., a cleared forest, logging activities, forest fire, endangered species,	• The Teacher would ask the students to write an opinion essay expressing their views and understanding of the “causes and consequences of deforestation”. • Classify them into natural and man-made.

vegetation from an area, disrupting natural ecosystems and potentially leading to environmental problems, including loss of biodiversity, increased greenhouse gas emissions, and soil erosion. Deforestation can have a significant impact on our planet's health and the delicate balance of ecosystems. • Causes of Deforestation include clearing forests for agriculture, and cutting down of trees for wood to make furniture, furniture and construction materials, mining activities, infrastructure projects, forest fires, climate change etc. CFU Factual a. What is the definition of deforestation? b. Which human activities are primarily responsible for causing deforestation? c. What are some of the environmental consequences of deforestation? Open ended: a. Why do you think deforestation is considered a global environmental issue?	etc.). The teacher will instruct the groups to closely observe the picture and discuss the following questions: • What do you see in the image? Describe the scene. • How do you think this relates to deforestation? • What are the advantages and disadvantages of deforestation? • What impact might this have on the environment, wildlife, and people? • What are the consequences of deforestation ?	• Students should choose one or more consequences to focus on and provide evidence to support their opinions. Students have to provide factual evidence and examples to support their viewpoints. Encourage students to use persuasive language and maintain a clear and organised structure in their essays. 1(i)a **Homework** Discuss with your parents and write a brief note about how the area surrounding your home has transformed during the past decade in relation to the presence of plants and animals. OR What are the causes of deforestation? Prepare a list and classify them into natural and man-made. **(Activity 6.1,**

Closing We have explored deforestation, its causes and environmental impact. Deforestation is the clearance of forests for human activities of natural disasters. Man made causes include agricultural expansions, urbanization and logging while natural causes include forest fires and drought. As we conclude lets recognize the importance of forests and the consequences of deforestation.
Assessment What is deforestation? What are the man made causes of deforestation? What are the natural causes of deforestation?

Period 3

Concept 3: 5.2 Consequences Of Deforestation

Learning Objective/s: explain the consequences of deforestation

Explicit teaching/Teacher Modelling (I Do)(8 min)	**Group Work** *(We Do)* (16 Minutes)	You do (independent practice) 8min
Explaining Consequences of Deforestation Points to Explain: 1. Environmental Impacts: - Increased temperature and pollution - Climate change and global warming - Disrupted water cycle and rainfall patterns 2. Soil Degradation: - Soil erosion and loss of fertile land - Desertification and reduced water holding capacity 3. Loss of Forest Products: - Shortage of timber, non-timber products, and medicinal plants 4. Consequences of Continued Deforestation: - Increased risk of natural calamities (floods, droughts) - Loss of biodiversity and ecosystem disruption CFU Factual: 1. What are the consequences of deforestation on the environment? 2. How does deforestation affect soil quality and fertility? 3. What are the impacts of deforestation on forest products and biodiversity? Open ended: a. In your opinion, what are the most significant consequences of deforestation for both the environment and society?	Teachers would divide the students into small groups or pairs. Provide each group with a printed or projected image depicting a scene related to deforestation (e.g., a cleared forest, logging activities, forest fire, endangered species, etc.). The teacher will instruct the groups to closely observe the picture and discuss the following questions: • What do you see in the image? Describe the scene. • How do you think this relates to deforestation? • What are the advantages and disadvantages of deforestation? • What impact might this have on the environment, wildlife, and people? • What are the consequences of deforestation ?	1. create a collage illustrating the consequences of deforestation. 2. Using magazines, scissors, glue, and paper, students will cut out images and words related to deforestation consequences (e.g., pollution, soil erosion, climate change). 3. Students will arrange and glue the images and words onto a piece of paper to create a visual representation of the consequences of deforestation. 4. Students can add captions or short sentences to explain their collage. Homework Animal life is also affected by deforestation. How? List the points and discuss them in your class. **(Activity 6.2, Textbook page 32)** OR Design a poster that highlights the importance of forest and wild life conservation. This can include key facts, images, and slogans to raise awareness.
Closing We've explored the significant consequences of deforestation, including environmental impacts like increased temperature, pollution, and climate change, as well as soil degradation and loss of forest products. Deforestation leads to soil erosion, desertification, and reduced water holding capacity, ultimately affecting our planet's ecosystem. It's essential to adopt sustainable practices to conserve our forests and mitigate these consequences.		
Assessment Explain how deforestation affects biodiversity. Provide examples of endangered species impacted by deforestation.		

How does deforestation contribute to climatic change?

Period 4

Concept 4: 5.3 Conservation Of Forest And Wild Life

Learning Objective/s: understand the need of conservation of forest and wild life and make efforts to conserve plants and animals

Igniting activity 4min: "Forest Guardians"

Think-Pair-Share:

1. Ask students to think about their favorite animal or plant species.

2. Pair students to discuss:

- What would happen if their favorite species lost its habitat?

- How can we help protect their favorite species and its habitat?

3. Share answers as a class.

And ask the following question to start the lesson.

"What can we do to become forest guardians and protect our planet's biodiversity?"

Explicit teaching/Teacher Modelling (I Do)(8 min)	**Group Work** *(We Do)* (16 Minutes)	You do (independent practice) 8min
"Today, we're going to explore the importance of conservation and protected areas. We'll learn about the different types of protected areas, such as wildlife sanctuaries, national parks, and biosphere reserves. We'll also discuss the role of government initiatives and personal actions in conserving forests and wildlife." Conservation of Forest and Wildlife Key Concepts: 1. Biosphere: The part of the earth that supports life. 2. Biodiversity: The variety of organisms, their interrelationships, and relationship with the environment. 3. Protected Areas: Wildlife sanctuaries, national parks, and biosphere reserves. Protected Areas: 1. Wildlife Sanctuary: Areas where animals are protected from disturbance. 2. National Park: Areas reserved for wildlife to freely use habitats and resources. 3. Biosphere Reserve: Large areas for conservation of wildlife, plants, and traditional tribal life. Conservation Efforts:	"Conservation Council" Objective: To discuss and propose conservation strategies for a specific ecosystem or species. Instructions: 1. Divide students into small groups of 4-5. 2. Assign each group a specific ecosystem (e.g., forest, wetland, coral reef) or species (e.g., tiger, elephant, panda). 3. Ask groups to research and discuss the following: - Threats to the ecosystem or species - Current conservation efforts - Proposed solutions or strategies for conservation 4. Each group will create a visual presentation (e.g., poster, infographic, short video) to showcase their findings and proposals.	1. What is the primary purpose of a wildlife sanctuary? a) To protect animals from hunting b) To promote tourism c) To support agriculture d) To conserve water resources 2. What is biodiversity? a) The variety of organisms and their relationships b) The study of climate change c) The conservation of water resources d) The protection of soil quality Home work:

1. Government Initiatives: Laws, policies, and agencies to protect forests and wildlife. 2. Personal and Societal Efforts: Individual and community actions to conserve forests and wildlife. Importance: 1. Preserving Biodiversity: Protecting unique ecosystems and species. 2. National Heritage: Conserving areas of biological importance. CFU Factual: What are the three types of protected areas mentioned in the text that are designated to conserve forests and wildlife? Open ended: What do you think are some effective ways to balance human needs with wildlife conservation?	5. Allow time for groups to present their work to the class. Facilitation Tips: 1. Encourage active listening and respectful discussion within groups. 2. Circulate around groups to provide guidance and answer questions. 3. Consider setting a timer to keep groups on track and ensure equal presentation time. Reflections: What were some of the most significant challenges facing the ecosystem or species you researched?	Find out the number of national parks, wildlife sanctuaries and biosphere reserves in your district, state and country. Record in Table. Show these areas in an outline. map of your state and India.
Closing We've explored the importance of conservation and protected areas, including wildlife sanctuaries, national parks, and biosphere reserves. These efforts help preserve biodiversity, protect unique ecosystems, and support the coexistence of humans and wildlife. By understanding the role of government initiatives and personal actions, we can work together to become forest guardians and protect our planet's precious natural resources.		
Assessment What is biodiversity? What are the different ways of conservation of biodiversity? Can you think of any examples of successful conservation efforts in your community or region?		

Period 5

Concept 5: 5.4 Biosphere Reserve

Learning Objective/s: Understand the significance of maintaining the delicate balance of ecosystems within biosphere reserves.

collects information about biosphere reserves in India

Igniting activity 4min:

National Parks of India Link 15 Link16

National Park Poster Project: Watch the above video and go through the document and share your observations with your classmates regarding major pointers about different national parks. Create a poster highlighting their assigned national park's unique features, wildlife, and attractions.

They can use images, maps, and informative captions to showcase the park's beauty and significance.

After completing the posters, have each group present their work to the class, promoting discussion and appreciation for various national parks.

Explicit teaching/Teacher Modelling (I Do)(8 min)	**Group Work** *(We Do)* (16 Minutes)	You do (independent practice) 8min
• The Teacher would start the class by briefly summarising the previous classes. The teacher asks for their reflections on the introduction activity. • After taking responses from the students, the teacher would introduce them to the new terminology: Biosphere reserve. Biosphere reserves are the areas meant for conservation of biodiversity. Biodiversity is the variety of plants, animals and microorganisms generally found in an area. The biosphere reserves help to maintain the biodiversity and culture of that area. A biosphere reserve may also contain other protected areas in it. • Read Aloud section 6.4 from SCERT textbook page no. 34-35. • The teacher would also explain the current policies or schemes related to the conservation of forest, biosphere etc. and its characteristics and functions. 2(i)a **Closing should be done at the end of the class** Teacher will summarize the important points regarding the biosphere reserve and clear any doubts students are having. • Biosphere reserves conserve the species, ecosystems, genetic diversities, and landscapes without affecting the inhabitants. • It ensures sustainable developments, including economic, cultural , socialand economic developments.	• The Teacher would present a fictional scenario where each group is assigned a different biosphere reserve facing a specific conservation challenge. • The challenge may involve protecting a threatened species, restoring degraded habitat, addressing pollution, or mitigating the impact of climate change. • Each group will work together to create a comprehensive conservation proposal for their assigned biosphere reserve. • The proposal should outline the specific conservation challenge, the proposed strategies, and the expected outcomes. • Students can refer to the current policies. • Encourage creativity in finding innovative solutions and ask them to write it in their journal. **1(i)b** Example scenarios: • Scenario1:"**Protecting the Nesting Grounds**" Challenge: A fictional biosphere reserve is home to a nesting site for migratory birds, which is at risk due to human disturbance and tourism activities. Conservation Challenge: The students' group must propose measures to protect the nesting grounds, such as enforcing no-entry zones during nesting season,	• During the independent activity, the students are asked to reflect on which Scenario they have liked/interested/ challenging them individually among all the group scenarios and why and write them in their journal. Homework • Find out the number of national parks, wildlife sanctuaries and biosphere reserves in your district, state and country. Record in Table 6.1. Show these areas in an outline map of your state and India. **(Activity 6.3,** Textbookpage34) **OR** • Collect information about any biosphere in India and prepare a poster presentation including the

• The biosphere reserves restore any damage caused to the ecosystems and habitats. • These areas provide a lot of information on how to restore, conserve, and develop the ecosystem. The research provides ways to recreate landscapes that have been affected by human activities. • They help in maintaining healthy ecosystems by preventing soil erosion, protecting water springs, and maintaining the decomposers to maintain the soil quality. Thus, we know that biosphere reserves are a great source for biodiversity conservation CFU Factual 1. What is a biosphere reserve? 2. Name one biosphere reserve located in your country or region. 3. What is the primary goal of establishing a biosphere reserve? Open ended: 1. How do biosphere reserves balance conservation with sustainable development? 2. Why do you think local communities play a crucial role in biosphere reserves?	establishing observation platforms and organizing bird watching eco-tours to raise awareness about responsible tourism. • Scenario 2: "**Saving the Old Growth Forest**" Challenge: A fictional biosphere reserve contains a rare old-growth forest that is at risk of deforestation due to illegal logging activities. Conservation Challenge: The students' group must develop strategies to protect the old-growth forest, such as enhancing patrolling and surveillance, involving local communities in forest monitoring, and promoting the use of sustainable alternatives to wood products. • Scenario 3: "**Clean Up the River**" Challenge: A fictional biosphere reserve's river is polluted with plastic waste and harmful chemicals, endangering aquatic life and surrounding ecosystems. Conservation Challenge: The students' group must propose a plan to clean up the river, including organising river clean-up events, implementing recycling programs, and advocating for stricter waste disposal regulations.	area it covers, its location, its unique features, the biodiversity it covers, the conservation efforts done by the government, etc. • List the factors disturbing the biodiversity of your area. Some of these factors and human activities may disturb the biodiversity unknowingly. List these human activities. How can these be checked?

Closing In our exploration of conservation and protected areas, we've learned about the importance of preserving biodiversity and ecosystems. Biosphere reserves are such areas where conservation of forests and biodiversity is made possible.
Assessment Define a biosphere reserve and explain its main objectives in promoting conservation and sustainable development

Period 6

Concept 6: 5.5 Flora And Fauna

Learning Objective/s: Identify and analyse the human activities that pose risks to flora and fauna, such as deforestation, pollution, and habitat destruction.

Prior concept and skill: the students had a fair knowledge on concepts such as ecosystems, habitat, classification, adaptation, food chains, and biodiversity. Students had a foundational understanding of plant and animal characteristics, environmental interactions, and how living organisms adapt to their surroundings**.**

Teaching Learning Materials:

Igniting activity 4min:

1. What types of plants can you find in this area?

2. Can you identify any animals or insects living here?

3. How do these living things interact with their environment?

4. What do you notice about the diversity of plants and animals?

5. How might humans impact this ecosystem?

<table>
<tr><th>Explicit teaching/Teacher Modelling (I Do)(8 min)</th><th>Group Work (We Do) (16 Minutes)</th><th>You do (independent practice) 8min</th></tr>
<tr>
<td>The teacher will explain What is Flora and Fauna are and their importance.
Read Aloud section 6.5 from SCERT textbook page no. 36- 37.
Flora: Flora refers to all the plant life or vegetation in a particular region, habitat, or ecosystem. These include trees, shrubs, grasses, flowers, and other types of plants. The term "flora" is used to describe the collective plant species found in a specific area, whether it's a forest, desert, wetland, or any other type of environment.
Fauna: Fauna, on the other hand, refers to all the animal life or wildlife in a given area, ecosystem, or region. This encompasses a wide variety of creatures, including mammals, birds, and reptiles, amphibians, insects, and aquatic organisms. "Fauna" describes the</td>
<td>In groups of 5, students will prepare a list of flora and fauna present in the premises of their schools.(Activity6.5,Textbook page 38)

Flora will include all the plants like flowers, shrubs, herbs, trees etc., while fauna includes all the animals like insects, birds etc.

<table><tr><th>Flora</th><th>Fauna</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td>
<td>Prepare a list of a minimum of 10 flora and fauna of your area.
Also think and write about human activities that pose a threat to flora and fauna species.
Homework
List the factors disturbing the biodiversity of your area. Some of these factors and human activities may disturb the biodiversity unknowingly. List these human activities. How can</td>
</tr>
</table>

diverse range of animal species that inhabit a particular environment and interact with the local ecosystem. • Human activities like deforestation, construction, pollution, overfishing, over hunting, climate change, poaching, illegal trade, agricultural practices, infrastructure development etc. pose a threat to flora and fauna species. CFU Factual What is the term used to describe all the plant life in a particular region or period? Open ended What may be the interconnectedness between flora and fauna?		these be checked? Discuss in your class and write a brief report in your notebook.

Closing Through their exploration of flora and fauna, students have discovered the diversity of plants and animals in their environment. Students have learned to identify and appreciate the unique characteristics of different species and their habitats. By recognizing the interconnectedness of living things, students have gained a deeper understanding of the importance of conservation and responsible stewardship of the natural world.
Assessment 1. Describe the difference between flora and fauna. 2. Explain the importance of conservation and how humans can contribute to protecting the environment.

Period 7

Concept 7: 5.6 Endemic Species

Learning Objective/s: Identify the endemic species and analyse the measures for their protection.

Explicit teaching/Teacher Modelling (I Do)(8 min)	**Group Work** *(We Do)* (16 Minutes)	You do (independent practice) 8min
After the quick recap of the previous class the teacher will explain the concept of Endemic species •Read Aloud section 6.6 from SCERT textbook page no. 38- 39. •Endemic species are those species of plants and animals which are found exclusively in a particular area. They	The teacher will ask the students to divide into groups. The teacher would show the video of the students about wildlife sanctuaries and national parks'	• Now, the teacher would ask the students to imagine a world without wildlife sanctuaries, national parks, Endemic species,

are not naturally found anywhere else. A particular type of animal or plant may be endemic to a zone, a state or a country. Endemic Animals: • **Nilgiri Tahr** (Nilgiri tragushylocrius):This is a mountain goat species found in the Western Ghats, particularly in the Nilgiri Hills. It is known for its distinctive curved horns and is a flagship species for conservation efforts in the region. • **Lion-Tailed Macaque** (Macaca silenus): This primate species is a lso found in the Western Ghats. It is known for its striking appearance, with a mane of hair resembling a lion's tail. • **Purple Frog** (Nasika batrachussahyadrensis):Endemic to the Western Ghats, the purple frog is a unique amphibian with a robust body and a purplish-brown colouration. It is a fossorial species, spending most of its life underground. • **Loris**: The slender loris and the Bengals low loris are both endemic to India. They are small, nocturnal primates found in the southern and northeastern regions. Endemic Plants: • **Neelakurinji** (Strobilanthes kunthiana): These blue-violet flowers bloom once every12 years in the Western Ghats, making them a rare and spectacular sight. Neelakurinji is known for its mass flowering event. • **Khasi Pine** (Pinus kesiya): This pine tree is native to the northeastern state of Meghalaya and some other parts of the Eastern Himalayas. • **Nagaland Bamboo** (Bambusatulda): Found in the northeastern state of Nagaland, this bamboo species is culturally and economically important for the region. • **Andaman Pygmy Hog** (Nesolagustimminsi): This small	importance and ask them to reflect on the video. Students will reflect on the video and discuss among themselves to answer the following questions as a group. What are endemic species? What is a wildlife sanctuary? What is a national park? What is the difference between an endemic species and a wildlife sanctuary? Why do you think we should protect the national parks? Why do you think wildlife sanctuaries are important for conservation? How does this activity inspire you to protect wildlife and their habitats? etc amples: Meaning, Importance and Need of Wildlife conservation Link 19 Why we need National Parks Link 20	and Flora and Fauna and ask them to write a short paragraph/ draw describing human life on earth without all of them. Homework The teacher will ask students to list out some endemic species of flora and fauna present in their area using their elders' help. Further, they will also document their experience of endemic species with which they are already familiar.

mammal is endemic to the Andaman Islands in the Bay of Bengal. It is one of the world's most endangered species. • **Bhagwan Mahavir** (Moloch gibbons): This species of gibbon is found in the forests of the northeastern states of India, including Assam and Arunachal Pradesh. • **Himalayan Quail** (Ophrysia superciliosa): This bird species was once found in the Himalayan region of India but is now considered possibly extinct as it hasn't been reliably sighted in many decades. These are just a few examples of the many endemic species of plants and animals that inhabit the diverse ecosystems of India. Conservation efforts are crucial to protect these unique and often endangered species and their habitats. CFU Factual 1. What are endemic species? 2. Give some examples of endemic species. Open ended 1. Elaborate the human activities that pose a threat to endemic species of your area.		

Closing Endemic species are plants and animals found exclusively in a specific area. Examples of endemic flora include sweet neem and wild mango, while examples of endemic fauna include bison, the Indian giant squirrel, and the flying squirrel. These species face threats such as habitat destruction, increasing population, and the introduction of new species. Protecting endemic species is crucial for preserving biodiversity and maintaining healthy ecosystems. Conservation efforts are necessary to safeguard these unique species and their habitats.
Assessment What is an endemic species, and why are endemic species important for ecological balance and biodiversity?

Period 8

Concept 8: 5.7 Wild Life Sanctuary , 5.8 National Park

Learning Objective/s: collects information about sanctuaries and national parks of India

Explicit teaching/Teacher Modelling (I Do)(8 min)	**Group Work** *(We Do)* (16 Minutes)	You do (independent practice) 8min
The Teacher would explain the difference between a National park and a Wildlife sanctuary. NationalParksLink21 Difference between National Parks and Wildlife sanctuaries Link 22 • If possible, then a visit can be planned to a nearby national park or wildlife sanctuary, or if someone has visited, they can share their experience in story form. • The teacher would also explain some threatened species which are protected and preserved in wildlife sanctuaries. **Note-**Teacher could prepare charts for nearby biosphere reserve, national park and wildlife sanctuary highlighting the area covered, types of animals and plants present there, weather conditions, temperature, endangered species present there etc. CFU Factual 1.Name some wildlife sanctuaries and national parks.	• Teacher would ask the students to divide into their groups. • The teacher would ask the students to imagine if they were in charge of constructing the new National park, how would they do it? What are some points/precautions/measures that they would keep in mind while constructing the national park? Encourage the students to discuss and prepare a detailed plan in the group	Teachers can ask the individual students to sketch a national park by writing the definition and importance of the National Park. or Match the following terms with their correct definitions. Write the letter of the definition next to the corresponding term. ***Terms:*** b. Biosphere Reserve c. Endemic Species d. Wildlife Sanctuary e. Nationa lPark *Definitions:* A. A protected area designated to conserve the natural habitat and wildlife while allowing limited human activities. B. A region with a unique ecosystem that is home to species found no where else on Earth. C. A designated area where wildlife is protected and preserved, and hunting and other harmful activities are prohibited. D. A large-scale conservation area that aims to protect biodiversity, promote sustainable development, and support scientific research. **Homework** Have you visited any zoos? How are the conditions provided to the animals? Were they suitable for the animals? Can animals live in artificial settings instead of their natural habitat? In your opinion, will the animals be

Open ended 2. Why is it essential to construct wildlife sanctuaries and national parks?		comfortable in a zoo or in their natural habitat? Write your thoughts in the form of an essay.

Closing Wildlife sanctuaries and national parks provide protection for wild animals, prohibiting human activities like poaching and hunting. These protected areas preserve flora, fauna, landscapes, and historic objects. Endangered animals, such as tigers, are safeguarded, and conservation efforts like Project Tiger aim to ensure their survival. Small animals, often overlooked, play a crucial role in ecosystems and are also in danger of extinction, highlighting the importance of conservation.
Assessment Provide two examples of species that are commonly protected in wildlife sanctuaries, and explain why they require such protection.

Period 9

Concept 9: 5.9 Red Data Book, 5.10 Migration

Learning Objective/s: interpret the importance of Red Data Book to explain why keeping track of endangered species is important
Analyze the pros and cons of Migration.

Prior concept and skill: Students are already sensitized with the concept of conservation.

they also had the knowledge on migration.

Teaching Learning Materials:

Igniting activity 4min: the teacher can start the lesson by asking questions like

How do you record your work?

Is it possible to record endangered species details?

Explicit teaching/Teacher Modelling (I Do)(8 min)	**Group Work** *(We Do)* (16 Minutes)	You do (independent practice) 8min
• explain the content regarding the Red data book and Migration. • ReadAloudsections6.9and 6.10fromSCERTtextbook page no. 44-45. • The teacher will invite students to respond to the below questions: ○ Have you seen any birds which are not commonly seen in your area? How it looked, describe its appearance. ○ Do you think migration is essential for animals or not? Share your opinion with your partners.	Teacher will make students pairs and encourage them to write the experiences of the below questions and share them with each other. • Have you seen any birds which are not commonly seen in your area? How it looked, describe its appearance.	• Prepare your own red data book. Write down the names of 5 trees, 5 animals, 5 birds and 5 flowers which you think are endangered and need special measures to protect them from getting extinct. Homework

Here are the key reasons why the Red Data Book is important: • Biodiversity Conservation: The Red Data Book serves as a comprehensive record of endangered and threatened species. It helps prioritize conservation efforts for these species, preventing their extinction and maintaining biodiversity. • Identifying Threatened Species: It categorises species into different threat categories, such as critically endangered, endangered, and vulnerable. This classification helps conservationists and policymakers focus on species in greatest need of protection. • Ecosystem Health: Biodiversity is essential for the health and stability of ecosystems. The Red Data Book helps identify species that are indicators of ecosystem health. The decline of such species can signify environmental problems. • Scientific Research: The data and information in the Red Data Book provide valuable insights for scientific research. It aids scientists in understanding population trends, distribution, and threats to various species. • Policy and Legislation: Governments and conservation organizations use the Red Data Book as a basis for creating policies and legislation related to wildlife conservation. It informs the development of laws and regulations aimed at protecting endangered species. • Awareness and Education: The Red Data Book helps raise awareness about the importance of biodiversity and the threats faced by many species. It can be used in educational programs to teach students about the need for conservation. 2. Economic Value: Many species listed in the Red Data Book have economic value, whether through ecotourism, agriculture, or	• Do you think migration is essential for animals or not? Share your opinion with your partners.	• Read the “Do You Know” section given in SCERT textbook page no. 46-47 and discuss with your parents about birds and animals that they see in their area only ina specific season. Write the summary of the discussion in your notebook

pharmaceuticals. Conserving these species can have economic benefits in addition to ecological ones. 3. Ethical Responsibility: Recognizing the value of all life forms, the Red Data Book reflects our ethical responsibility to protect species from extinction. It encourages a sense of stewardship and responsibility towards the planet's biodiversity. CFU Factual 1. What is the purpose of the Red Data Book? 2. What type of information does the Red Data Book provide about species? 3. Why is it important to identify and monitor endangered species listed in the Red Data Book? 4. Give an example of an endangered species listed in the Red Data Book and explain the threats it faces. 5. Define migration in the context of animals and humans. 6. What are some common reasons why humans/animals/birds migrate?		

Closing should be done at the end of the class The teacher will summarize the period by highlighting the importance of the red data book and understanding the migration of animals. The Red Data Book is a crucial conservation tool that plays a significant role in biodiversity conservation.
Assessment 1. What is the purpose of migration? 2. What are recorded in red data book?

Period 10

Concept 10: 5.11 Recycling of Paper, 5.12 Reforestation

Learning Objective/s: explain recycling to describe ways to reduce deforestation

Explain reforestation to describe ways to reduce it

Igniting activity 4min: "Tremendous Impact"
Imagine a world without trees. No oxygen, no shade, no homes for countless species. How would our planet survive?
Hook:
"Did you know that 17 trees are needed to make just 1 tone of paper?"
This surprising fact sparks curiosity and sets the stage for exploring the importance of conservation, recycling, and reforestation.

Explicit teaching/Teacher Modelling (I Do)(8 min)	**Group Work** *(We Do)* (16 Minutes)	You do (independent practice) 8min
• The Teacher would start the class with a quick recap of previous classes. • Then explain the content regarding the recycling of papers and reforestation.. • ReadAloudsections6.11and 6.12fromSCERTtextbook page no. 44-47. • The teacher will invite students to respond to the below questions: o Have you seen any notebooks or rough notebooks which have yellowish-coloured pages? What could be the reason they look like that? (The teacher will explain about recycling papers and how we should use those kinds of notebooks more for protecting the environment and for our survival in the long run) o Do you have any favorite plants of yours which you have planted on your own? Share your experience. The teacher will summarize the period by highlighting the importance of recycling of papers and reforestation. CFU Factual 3. Discuss the importance of reducing paper consumption in the context of environmental conservation.	Teacher will make students pairs and encourage them to write the experiences of the below questions and share them with each other. Have you seen any notebooks or rough notebooks which have yellowish-coloured pages? What could be the reason they look like that?(The teacher will explain about recycling papers and how we should use those kinds of notebooks more for protecting the environment and for our survival in the long run) Do you have any favorite plants of yours which you have planted on your own? Share your experience.	• If it takes 17 full-grown trees to make 1000 Kgs of paper and recycling of paper is essential, suggest some ways to reuse paper in our daily lives. Homework • Plant any seed in a pot and take care of it for 15 days. How do you feel while looking after it, share your experience in the form of a story.

4. Define reforestation and its significance for the environment. Open ended 1. Imagineaworldwithoutpaperrecycling.Howwoulditimpactnaturalresources, forests, and landfill waste? 2. Suppose you were involved in a reforestation project in a deforested area. What factors would you consider when selecting tree species to plant, and why?		

Closing

To combat deforestation, recycling paper and reforestation are crucial. Recycling paper saves trees, energy, and water, while reducing harmful chemicals. Reforestation involves restocking destroyed forests with native tree species, and can occur naturally if areas are left undisturbed. Conservation efforts, such as the Forest (Conservation) Act, aim to preserve and conserve natural forests, emphasizing the importance of planting more trees to retain green wealth for future generations.

Assessment

1. Discuss the environmental benefits of recycling paper. How does paper recycling help conserve natural resources and reduce pollution? (LO 10)

Define reforestation and explain why it is important for the environment and biodiversity.

Teachers 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 Re teach**
1	Introduction						
2	5.1 Deforestation And It's Causes						
3	5.2 Consequences Of Deforestation						
4	5.3 Conservation Of Forest And Wild Life						
5	5.4 Biosphere Reserve						
6	5.5 Flora And Fauna						
7	5.6 Endemic Species						
8	5.7 Wild Life Sanctuary , 5.8 National Park						

9	5.9 Red Data Book , 5.10 Migration						
10	5.11 Recycling Of Paper, 5.12 Reforestation						

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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LIST OF MATERILS REQUIRED TO PERFORM ACTIVITIES

CLASS: VIII

ACTIVITY NO:	ACTIVITY NAME	RESOURCES REQUIRED
	CHAPTER: 2. MICROORGANISMS FRIEND AND FOE	
2.1	Observation of soil microbes	Soil, slides coverslips, stain, microscope
2.2	Observation of pond water under microscope	Pond water sample, slides, coverslips, stain (safranine), microscope
2.3	Action of yeast on maida dough	½ kg maida, yeast powder, bowl, water
2.4	Demonstration of fermentation of sugar	Beaker, water, sugar, yeast powder, aluminium wrap
2.5	Identification of decaying and nondecaying	2 pots, plant waste, polythene waste.
	Demonstration of cleaning nature of micro organisms	
	CHAPTER : 3. CROP PRODUCTION AND MANAGEMENT	
3.1	Separation of good, healthy seeds from damaged seeds	Beaker, water, seeds
3.2	Importance of manure and fertilizers	3 cups, soil, manure, urea, seeds, water
	CHAPTER: 4. REPRODUCTION IN ANIMALS	
4.1	Observation of frogs eggs in pond.	Field visit
4.2	Observation of eggs of frogs, lizards, butterfly	Eggs can be collected, hand lens, simple microscope Charts
	CHAPTER : 5. REACHING THE AGE OF ADOLESCENCE	
5.1	Finding the maximum height.	Chart given in page no 4 of sem 2 text book
5.2	Age to height graphs comparison	Graphs
5.3	Importance of iodized salt	Magazines/ Visit to doctor and interview
5.4	Diet analysis proper diet and junk food	White papers to write the names of food items
5.5	Poster making on proper diet for adolescents.	Chart, Pictures of food items
5.6	Importance of exercise in adolescents	Questionnaire to collect the information

CHAPTER - 6 : CONSERVATION OF PLANTS AND ANIMALS

6.1	Classification of causes of deforestation	Chart/ white sheets to list out the causes
6.2	Effects of deforestation on animals	Chart/ white sheets to list out the points
6.3	List of national parks, wildlife sanctuaries	Chart/ white sheets to list out the national parks and sanctuaries, and biosphere reserves Magazines or internet
6.4	Factors disturbing the biodiversity of your area	Chart/ white sheets to list out the points
6.5	Flora and Fauna of your area	Chart/ white sheets to list out the flora and fauna, things required for observation such as hand lens
6.6	List of endemic plants and animals in your area	Chart/ white sheets to list out the endemic plants and animals, Magazines or internet
6.7	Visit to zoo	Optional