

LESSON PLAN [2019 -- 2020]



DLF Public School

THE LEARNING ACADEMY

Managed By *Darbari Lal Foundation*

Teacher Name	Class	Subject	Time slot	Date/period	Lesson	Topic
	IX	Biology	35 min. Pd-1	July	Improvement in food resources	Introduction of lesson
Expected Learning Outcome: Students will be able to- * Identify importance of food and food products.						
Expected skill development: * Reading skills while comprehending the question asked. *Comprehension of the text while asking questions and writing answers. *Critical thinking through open ended questions . Communication with scientific vocabulary, Critical thinking , global citizenship						

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Introduction – Recapitulation of the concept of crop production and management studied in class VIII

Content– [15 min]

*Importance of food for our body

*Need of improving food resources in India.

*Concept of sustainable development (Critical thinking and problem solving)

Teaching methodology- discussion through examples from life, question answer through open ended situations

Think line- Trace examples in your nearby society where you observe sustainable management of land as a resource.[5 min]

Closure-The concept would be summarized asking the following questions-

Q. What is sustainable development?

- Proposed Questions [5min]

Q1. Define the term “Food” and “food resource”?

Q2. India is intensively cultivated, but still we face food crisis in India. why? What can be done to resolve this problem?(C.W)

Evaluation/Assessment: *Oral questionnaire.	
Learners on the way *Individual attention within the class. *Extra input time outside the class. *Peer learning through appropriate seating arrangement. Q. Why is food important for us?	Advanced Learners Assist the peers in comprehending the questions and writing answers with scientific vocabulary. Q. Evaluate your role in the sustainable management of food resources? (Critical thinking)
Materials needed/Resources: *Blackboard, chalk, Book,	
Common Misconceptions: Sustainable development is only for farmers.	Addressing the misconceptions: * addressing the role of human beings in sustainable development.[5min]

- Home Assignments:**

Q. Define a) food b) sustainable development

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Teacher Name	Class	Subject	Time slot	Date/period	Lesson	Topic
	IX	Biology	35 min. Pd-2	July	Improvement in food resources	Improvement in crop yield
Expected Learning Outcome: Students will be able to- *Identify the importance of food products. *Compare Kharif and Rabi crops on the basis of their climatic conditions, temperature and photoperiods for their growth. * Acknowledge improvement in food resources through crop variety improvement, management of crop production and management of crop protection.						
Expected skill development: *Listening skills while discussing the content in the class. * Reading skills while comprehending the question asked. *Comprehension of the text while asking questions and writing answers. *Critical thinking through open ended questions with respect to the management of crops. *Communication with scientific vocabulary, global citizenship						

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Introduction -

*Students will review the concept learnt in the last class through a questionnaire-[5min]

Q1. What is sustainable development?

Q2. What are the major sources of food?

Content to be discussed as –[15 min]

*Identify various types of food products used by us.

*Using a graphic organizer enlist the importance of each food variant.

*Comparison of kharif and rabi crops on the basis of their growing season, climatic conditions, temperature and photoperiods for their growth.

*Enlist names of crops belonging to kharif and rabi.

*Conclude the improvement in food resources through crop variety improvement, management of crop production and management of crop protection through discussions.

Teaching methodology- discussion through examples from life, question answer through open ended situations

Think Line- Q. Can we grow paddy crops in winter season? Why?[5min]

Closure-The concept would be summarized asking the following questions-

Q. Compare kharif and rabi crops.

Proposed Questions [5min] Q1. Why do we need to improve food resources in India? Q2. Identify the various food products obtained from the crops using a graphic organizer.(c.w) Q3. Why is wheat staple food in Northern India, while Rice for southern part of India?	
Evaluation/Assessment: *Oral discussion *asking to summarize at the end through examples for kharif and rabi crops.	
Learners on the way *Individual attention within the class. *Extra input time outside the class. *Peer learning through appropriate seating arrangement. Q. Compare kharif and rabi crops on the basis of photoperiod.	Advanced Learners Assist the peers in comprehending the questions and writing answers with scientific vocabulary. Q. How does photoperiod affect the growth of crops?
Materials needed/Resources: *Blackboard, chalk, Book,	
Common Misconceptions: Confusion in remembrance of kharif and rabi crops [5min]	Addressing the misconceptions: Ask students to think about which season they store which crops and correlate with the growing season.

- Home Assignments:** 5 min
NCERT pg 204- Q1. What do we get from cereals, pulses, fruits and vegetables?
Q. Differentiate between Kharif and Rabi crops.
Q. Can we grow rice in Chennai in winters?

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Teacher Name	Class	Subject	Time slot	Date/ period	Lesson	Topic
	IX	Biology	35 min. Pd-3	July	Improvement in food resources	Crop variety improvement

Expected Learning Outcome:

Students will be able to-

- * Identify methods of improvement in crop varieties through cross breeding and gene transfer.
- *Identify the reasons/ factors for which crop variety improvement is done.

Expected skill development:

- *Listening skills while discussing the content in the class.
- * Reading skills while comprehending the question asked.
- *Comprehension of the text while asking questions and writing answers.
- *Critical thinking through open ended questions with respect to the management of crops.
- *Communication with scientific vocabulary, global citizenship

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Introduction -

*Students will review the concept learnt in the last class through a questionnaire-[5 min]

Content to be discussed as –[15 min]

*Define crop variety improvement.

*Ways of crop variety improvement- gene transfer/ cross breeding

*Need of improving crop variety in India and discuss the factors for which crop variety improvement is done.

Teaching methodology- discussion through examples from life, question answer through open ended situations

Think line- Can a crop variety grown for obtaining oil seeds be used for fodder also? Give an example. [5min]

Can we introduce an American variety in India?

Closure-The concept would be summarized asking the following questions- (5 min)

Q. How can we improve the varieties of crop?

Proposed Questions [5min] Q1. Differentiate between photoperiods of wheat and rice? Q2. What is crop variety improvement? Q3. What are the ways of improving crop varieties.(C.W) Q4. Think of certain factors for which crop varieties can be improved.	
Evaluation/Assessment: *Oral questionnaire	
Learners on the way *Individual attention within the class. *Extra input time outside the class. *Peer learning through appropriate seating arrangement. Q. Identify three factors for which crop variety improvement is done?	Advanced Learners Assist the peers in comprehending the questions and writing answers with scientific vocabulary. Q. Find out few crops which have been introduced in India after genetic modification and what modifications have been done in them?
Materials needed/Resources: *Blackboard, chalk, Book,	
Common Misconceptions: *.Methods of crop variety improvement and need for crop variety improvement is same [5min]	Addressing the misconceptions: *Discuss them separately on board with emphasis on words methods and need.

- Home Assignments:** 5 min

NCERT .Pg 205 Q1- How do biotic and abiotic factors affect crop production?

2- What are the desirable agronomic characteristics for crop improvement?

Q. Enlist the various factors for which crop variety improvement is done.

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Teacher Name	Class	Subject	Time slot	Period	Lesson	Topic
	IX	Biology	35 min.+ 35 min. Pd-4,5	August	Improvement in food resources	Crop production management

Expected Learning Outcome:

Students will be able to-

- * Acknowledge Management of crop production by fertilizers, manures, irrigation facilities and cropping patterns.
- * Identify the macronutrients and micronutrients.
- * Compare the need and use of fertilizers and manures and relate to the concept of organic farming.

Expected skill development:

- * Listening skills while discussing the content in the class.
- * Reading skills while comprehending the question asked.
- * Comprehension of the text while asking questions and writing answers.
- * Critical thinking through open ended questions with respect to the management of crops by addition of fertilizers or manure.
- * Communication with scientific vocabulary, global citizenship

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Introduction-

Students would be reviewing the concept discussed in the last class through questionnaire.[5min]

Content to be discussed as – [15+15 min]

Crop production management includes-

- * Nutrient management
- * Irrigation facilities
- * Manures/ Fertilizer application
- * Cropping patterns.

Nutrient management-

Macronutrients- required in large quantity(C, H, O)

Micronutrients –required in small quantity (B, Zn, Mn)

*Students would identify the source of obtaining these nutrients.

If the soil does not provide these nutrients in the required quantity what can the farmer do?

Replenish the soil with manure or fertilizer????

*Discuss the types of manure and its importance.

*Discuss the types of fertilizers and its importance.

Compare manure and fertilizers on the basis of their origin/benefit to soil/water holding capacity/ water solubility/transportation.

*Introduce the concept of organic farming.

Teaching methodology- discussion through examples from life(TPS), question answer through open ended situations

Think line- Ram, a farmer cultivates Pea on his land continuously for five years. Does he need fertilizers to enrich his field? [5 min]

Closure- The concept would be summarized asking the following questions-10 min

Q. How do plants obtain micronutrients?

Q. Compare fertilizers and manures.

Proposed Questions [10min] Q1. Identify the agronomic character for crop grown for fodder ? Q2. Can we develop summer adaptability for Wheat crop? If yes, how? Q3.Why do you think C and H are considered as macronutrients? Q4. Soil testing should be made as a compulsory practice for Indian farmers. Justify the statement. Q5. Now a days many products are available in the market with organic written on it. What do they signify?	
Evaluation/Assessment: *Written Questionnaire *Comparison of manure and fertilizer	
Learners on the way *Individual attention within the class. *Extra input time outside the class. Q. What are macro-nutrients and why are they called so?(c.w)	Advanced Learners Assist the peers in comprehending the questions and writing answers with scientific vocabulary. Q6. Fertilizers show short term benefits and manure show long term benefits. Justify the statement.(h.w)Critical thinking
Materials needed/Resources:*Blackboard, chalk, Book,	
Common Misconceptions: *Fertilizers are necessary for soil. Fertilizers will only damage the crop and soil.[5min]	Addressing the misconceptions: *Importance of fertilizer application and precautions to be discussed.

- Home Assignments:**

NCERT –Pg 206 Q2-How do plants get nutrients? Pg 214- Q Why are manures and fertilizers used in field?

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Teacher Name	Class	Subject	Time slot	Date/period	Lesson	Topic
	IX	Biology	35 min. Pd-6	August	Improvement in food resources	Crop production management- Irrigation and cropping patterns

Expected Learning Outcome:

Students will be able to-

- *Identify the need of irrigation for India and compare modern and traditional methods of irrigation.
- *Review the process of crop rotation and compare mixed farming and intercropping.

Expected skill development:

- *Listening skills while discussing the content in the class.
- *Reading skills while comprehending the question asked.
- *Comprehension of the text while asking questions and writing answers.
- *Critical thinking through open ended questions with respect to the management of crops by providing water supply to the soil.
- *Communication with scientific vocabulary, global citizenship

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Introduction-

Students would be reviewing the concept discussed in the last class through questionnaire.[5min]

Q1. Application of fertilizers continuously for a period of time adds pollution to the nearby water bodies. Correlate the observation.

Q2. How can vermicompost be prepared?

***Content** to be discussed as –[15min]

*Need of irrigation facilities in India.

*Comparison of traditional and modern methods of irrigation in India.

*Identify various cropping patterns and compare mixed cropping and intercropping

*Discuss and Enlist the advantages of various cropping patterns.

Teaching methodology- discussion through examples from life, question answer through open ended situations

Think line- The crops to be chosen for mixed/ intercropping should have similar or diverse requirements for nutrients or irrigation?

Closure-The concept would be summarized asking the following questions- 5 min

Q. Compare traditional and modern methods of irrigation.(c.w)

Proposed Questions [10min] Q3. A farmer lives in the semi- arid regions of Uttar Pradesh. Which method of irrigation would you suggest him and why? Q5. Can Soyabean and Maize be planted together for intercropping? Q6. Define crop rotation.(h.w) Q7. Can the financial condition of a farmer effect the yield of his crops?	
Evaluation/Assessment: *Oral questionnaire	
Learners on the way *Individual attention within the class. *Extra input time outside the class. *Peer learning through appropriate seating arrangement. Q. Name any two modern methods of irrigation in India.	Advanced Learners Assist the peers in comprehending the questions and writing answers with scientific vocabulary. Q. Find out the cropping patterns used in your area.
Materials needed/Resources: *Blackboard, chalk, Book,	
Common Misconceptions: *Most of the irrigation crisis is only in Rajasthan. *We can grow only two crops in a year.[5 min]	Addressing the misconceptions: Discuss about unequal distribution of monsoons across the country. Discuss crops with shorter maturation duration.

• **Home Assignments:** [5 min]

Q. Compare intercropping and mixed cropping.

Q. a) Identify the pattern of cropping

SSPPSSPPSSPP

b) Suggest crops which can be grown by this pattern.

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NCERT –Pg 214, Q3-What are the advantages of intercropping and crop rotation?

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Teacher Name	Class	Subject	Time slot	Date/period	Lesson	Topic
	IX	Biology	35 min. Pd-7	August	Improvement in food resources	Crop protection management

Expected Learning Outcome:

Students will be able to-

* Acknowledge the need of protecting crops from weeds and pests and enlist the various ways to protect from them.

Expected skill development:

*Listening skills while discussing the content in the class.

* Reading skills while comprehending the question asked.

*Comprehension of the text while asking questions and writing answers.

*Critical thinking through open ended questions with respect to the methods of protection of crops from weeds/ pest.

*Communication with scientific vocabulary, global citizenship

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Introduction-

Students would be reviewed about the concept discussed in the last class through questionnaire.[5 min]

Q1. Which is a better pattern of cropping- mixed or intercropping and why?

Q2. Identify any two plants which can be grown by intercropping?

Q3. Can intercropping prevent the attack of weeds or pest?

***Content** to be discussed as – [15 min]

*Crops need protection from-

1. Weeds

2. Pests

3. Microorganisms

*Enlist their names and Discuss how do they damage our crops.

*Discuss and compare the methods of protection- Manual/ Chemical/ Biological

*Enlist names of various agents used for protection.

*Discuss how cropping patterns and soil management can also prevent the effect of weeds and pest.

Teaching methodology- discussion through examples from life, question answer through open ended situations

Think line- Q. Why should preventive measures and biological control methods be preferred for protecting crops? [5 min]

Should weedicides be used in the field with any precaution?

Closure-The concept would be summarized asking the following questions- 5 min

Q. How do weeds attack our crops?

Q. How can we protect our crops from pest.

Proposed Questions Q4. How do pest/ weeds damage crops?(c.w) Q5. Identify a weed which is edible and can be consumed also?	
Evaluation/Assessment: *Oral questionnaire * reviewing the various methods of weed and pest control.	
Learners on the way *Individual attention within the class. *Extra input time outside the class. *Peer learning through appropriate seating arrangement. Q. How can we protect our crops from weeds?	Advanced Learners Assist the peers in comprehending the questions and writing answers with scientific vocabulary. Q. Can weedicides and pesticides have any effect our health?
Materials needed/Resources: *Blackboard, chalk, Book,	
Common Misconceptions: *All weeds are harmful.	Addressing the misconceptions: *Give examples of edible weeds.

- Home Assignments:** [5 min]

Q. How can we protect crops from weeds and pest?

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Teacher Name	Class	Subject	Time slot	Date/period	Lesson	Topic
	IX	Biology	35 min.+ 35+35 min. Pd-8, 9, 10	August	Improvement in food resources	Animal husbandry
Expected Learning Outcome: Students will be able to- * Acknowledge the Concept of Sustainable agriculture for India * Define the meaning and importance of animal husbandry. * Identify and compare the various management practices involved in it.						
Expected skill development: *Communication and collaboration *Developing scientific vocabulary and it's proper usage. *Critical thinking through open ended questions *Student leadership						

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Introduction-

Students would be reviewed about the concept discussed in the last class through questionnaire. [5 min]

***Content** to be discussed as – [10 min]

Why is India lacking in its food production when so many efforts are being made at all the three levels of management??? (CTPS)

Introduce the production systems in India as NO cost/LOW cost/HIGH cost.

*Review the concept of sustainable agriculture.

*Alternate sources of income for the farmers- Introduce the need and importance of animal husbandry.

The class would be divided into groups of 5-6 students. Each group would be given a topic to **brainstorm** on the specific criterias mentioned for each type of animal management.(Communication and collaboration, Student Leadership)[20 min]

Students will bring the chart paper from home.

Group 1- Cattle farming, 2- Poultry farming,

3- Pisciculture, 4-Bee culture,

5- common management practices, 6- other sources of food from animals

Criteria of discussion- (to be written on the board)

Food product / exotic and indigenous varieties / feeding / management / breeding / protection / any special development in technology in recent years

The students would be presenting their findings on a **mindmap** and any two individuals from each group would summarize the entire content in front of the whole class. The facilitator would add on the necessary points if required and these mindmaps would be displayed in the class.

***Content** to be discussed as –

CATTLE farming for- milk and drought [15 min]

*Names of indigenous and exotic varieties of cattle.

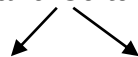
*Maintenance of cattle- living conditions/ type of nutrition/ protection from diseases.

POULTRY reared for- eggs and meat [15 min]

*Names of indigenous and exotic varieties of birds.

*Maintenance of cattle- living conditions/ type of nutrition/ protection from diseases.

Fish culture- Capture and Culture [15 min]



Aquaculture

Mariculture

*Names of fishes cultured in fresh and marine water.

*Concept of composite fish culture- its advantages and disadvantages.

*Method to overcome the disadvantage of composite fish culture.

Bee culture- for honey and wax [10 min]

*Enlist the names of varieties of bee

*Discuss on the Factors on which the quality of a bee depends and pasturage.

Teaching methodology- discussion through examples from life, question answer through open ended situations, Brainstorming sessions

Think line- (CT) [10 min]

Q. Can cattle and birds be raised together on the same farm?

Q. Are any vaccines given to cattle and poultry? Are they similar to human vaccines?

Q. How does the method of hormonal stimulation overcome the problem of composite fish culture?

Q. Can we introduce Italian bee in India?

Proposed Questions after the discussions [10 min] Q1. Define animal husbandry (h.w). Q2. Why should the floor of cattle be slopy? (c.w) ? Q3. Will layers and broilers have a similar pattern of nutrition? If yes then why and if no then why not? Suggest changes. Q4. What should be the criteria for selection of fishes in fish culture? Q5. Will the flowers in the surrounding area have any effect on the quality of honey produced by the bees? Q6. Is composite fish culture practice in India?	
Evaluation/Assessment: *Oral discussion participation *asking to summarize at the end by any participant through MINDMAP.	
Learners on the way *Individual attention within the class. *Extra input time outside the class. *Peer learning through appropriate seating arrangement. *Chance given to them to present the findings of the group,	Advanced Learners Assist the peers in comprehending the questions and writing answers with scientific vocabulary.
Materials needed/Resources: *Blackboard, chalk, Book,	
Common Misconceptions: * Birds are only reared for eggs. *Confusion in the terminology	Addressing the misconceptions: *Broilers are also reared

- Home Assignments:**

[10 min]

S. No-1-NCERT pg 210 Q1-Q. Which method is commonly used for improving cattle breeds and why?

, Pg211 Q1-Discuss the implications of the following statement-:"It is interesting to note that poultry is India's most efficient converter of low fibre food stuff into highly nutritious animal protein food.

, 1- What management practices are common in dairy and poultry farming?

,2- What are the differences between broilers and layers and their management?

,Pg 215 Q7- What are the benefits of cattle farming?

S. No-2-Pg 213 Q1- How are fish obtained?

,2- What are the advantages of composite fish culture?.

Pg 215 Q8- For increasing production, What is common in poultry, fisheries and bee keeping?

,9- How do you differentiate between capture fishing, mariculture and aquaculture?