

SUBJECT : Science (Biology)
 TOPIC : Improvement in food resources

Pre-content / Content / Post-content	Learning outcome / objectives	
	General	Specific
PRE-CONTENT: Motivating questions related to food production. CONTENT: 1. Types of crops on the basis of food components and seasons. 2. Methods of improving variety of crops. 3. Different ways of managing crop production. (a) nutrient management through manure and fertilizers (b) irrigation (c) cropping patterns 4. Crop protection management 5. Animal husbandry (i) cattle farming (ii) poultry farming (iii) fish culture (iv) bee keeping POST CONTENT: Student will be able to justify the need to conserve and improve upon crop production techniques.	Students will be able to - 1 assess the need to increase the crop yield. 2.explore new and scientific method of crop production. 3. analyze the benefits and limitations of using new techniques in crop production. 4.develop the concept of animal husbandry and recognize and adopt the eco-friendly activities of cultivation. 5.motivate girls to take complete responsibility for farming and cultivation of crops by using new tools and techniques.	Student will be able to - 1.identify the different types of crops. 2. list the methods of getting improved variety of crop. 3. identify the nutrients required for growing crops and the effect of their deficiency. (a) compare the use of manure and fertilizers (b) identify the better method of irrigation depending on crop and place. (c) compare different pattern of growing crops. 4. evaluate the harmful effects of excess use of pesticides, weedicides and fertilizers and identify the better method of controlling pests, weeds etc. 5. evaluate different types of animal husbandry practices, know about their products and interpret the correct way of (a)cattle farming, (b) poultry, (c) fish farming and (d) apiculture.

HOME WORK / ASSIGNMENTS: Students will be given questions from the text book and also various types of objective type questions.

AND PROGRESS

MONTH : April-May
CLASS : IXth

Teacher's activity	Students' activity	Teacher's observations and remedial action taken
Teacher will: -ask few questions on the basis of their previous knowledge. -classify crops as kharif and rabi on the basis of growing seasons. <u>Annexure 15(A)</u> -discuss ways for Crop variety improvement through activity -show the compost pit in school and explain how manure is formed - explain the methods of irrigation through PPT -classify and explain the different cropping patterns with examples -discuss the ways of Crop protection management <u>-Annexure 15(B)</u> - explain the Animal husbandry practices like (i)- cattle farming (ii) poultry (iii) fish production (iv) bee keeping through activity	Students will: -answer and recall the concepts learnt earlier -differentiate between kharif and rabi crops. <u>Annexure 15 (a)</u> -perform the activity and answer the questions based on the topic. -collect dried leaves from the school ground and add in the compost pit differentiate between manures and fertilizers -paste pictures and information about different methods of irrigation on an A4 size sheet - differentiate between intercropping and mixed cropping and write the benefits of crop-rotation - make a list of crops that can be used for mixed cropping and intercropping - prepare a power point presentation on biomagnification due to excess use of pesticides and weedicides and justify the use of biopesticides and organic farming <u>-Annexure 15(b)</u> - perform the activity and answer the questions. - participate in group discussion in the class on the topic 'It is interesting to note that poultry is India's most efficient converter of low fiber food stuff into ghly nutritious animal proteins'.	Teacher will write the observations after completion of the topic/s

Teaching aids: Smart board, stylus, illustrations (pictures), and worksheets.

Methodology / Innovative methods: Activity based (field visit), question answer and discussion methods, audio visual, collaborative learning (group discussion and presentation).

Inter disciplinary links: Art – drawing skill developed, Geography- crops and their growing season

Coordinator

HOD

Vice-Principal

Principal

ANNEXURE 15(A),(a)

Let's improve crop variety through hybridisation

Subject	Science
Class	IX
Chapter/Unit	Improvement of food resources
Topic	Hybridization
Time	40mins
Nature of Activity	Group

What will I learn (Learning Outcome)?

To explore the concept of hybridization.

Skills: Analyzing and Creating

What I have to do?

To remove the stamens before anthesis to obtain female parent and transfer pollen from the desired male parent on to its stigma.

What do I require?

Hibiscus or any other bisexual flower

Twizzers

Small sharp scissors

Brush

Alcohol

Rubber bands

Paper Bags

Paper clips and tags

What do I need to know?

Artificial hybridization is the process in which only desired pollen grains are used for pollination and fertilization

Pollination is the process of reproduction in plants in which plants transfer pollen grains from anther to stigma. Pollination can be of two types:

- Cross-pollination
- Self-pollination

For successful pollination to occur, pollen and stigma should be compatible. Incompatibility may lead to rejection of pollen grains. This situation is undesirable, especially in commercial crop production. Therefore, artificial hybridization was developed.

Emasculation is the process of removing anthers from bisexual flowers without affecting the female reproductive part (pistil), which is used in various plant hybridization techniques.

Emasculation ensures that the flower is pollinated by pollen grains obtained from desirable varieties only

➤ **Teacher's Activity**

Teacher will

- draw a diagram showing hybridization on the board for the students to comprehend the topic.
- provide material to students
- Divide students into groups of four
- provide instructions (student's activity) for the activity

How will I proceed?

➤ **Student's Activity**

Four students in each group will -

- Select a flower in bud condition where anthesis has not occurred. Open the bud carefully and remove the stamens. Mark this as female parent plant.- (Task for student 1)
- Cover the emasculated flower with a plastic bag to protect it from undesired pollen (Bagging). The bag should be held securely in place with a paper clip/ string/thread. Select the size of bag in accordance with the flower size. Bags must be transparent with minute pores.- (Task for student 2)
- Bring into physical contact anthers of a desired male plant containing mature pollen grains with the stigmatic surface of emasculated female flower. Use tweezers/brush if necessary to dust the stigmatic surface with pollen.- (Task for student 3)
- Cover the pollinated flower again with the bag immediately. For identification, label the female parent (Tagging). Each pollinated flower should bear a label containing the name of the seed parent, the letter X (to signify a cross), the name of the pollen parent, and the date on which the cross was effected.- (Task for student 4)

What have I observed?

As per your observations while performing the activity, draw diagrams in the following table-

S. No.	Steps performed	Diagram
1.	Emasculation	
2.	Bagging	
3.	Tagging	

What have I learnt?

-is an important method for crop variety improvement.

- One way of incorporating desirable characters into crop varieties is by-----.
- Hybridisation refers to crossing between genetically -----plants.
- -----is the process of removing anthers from bisexual flowers without affecting the female reproductive part (pistil).
- ----- helps to prevent contamination of stigma with undesired pollens as well as ensure pollination with pollens from desired male parent during *breeding* programme.
- *The*----- should bear the information:
(a) Date of emasculation; (b) Date of pollination; (c) Names of female and male parents, consecutively in the cross.

What am I curious to learn?

- Another method for crop variety improvement is genetic engineering. Let us represent the stages of the process of GM crop production in the form of a flowchart.

Let me evaluate myself

1. Explain the concept of hybridization.
2. State the significance of artificial hybridization.
3. Pomato produced by a cross between potato and tomato is an example of inter-generic hybrid. Under which category would you place Atemoya formed by crossing *Annona squamosa* × *A. cherimola*.
4. Which traits do you think can be incorporated in plants by hybridization?
5. Is it advisable to store the seeds of a hybrid plant for future use? Explain giving reason.

ANNEXURE 15(B), (b)
Animal Husbandry

Duration-40mins

Nature of the Activity- Group

Learning Outcome-

Students will be able to analyse similarities between Cattle farming, Fish Farming, Bee keeping and Poultry.

What we have to do?

To select and string the beads of paper representing characteristics of different Animal Farming Methods.

What do we require?

A chart representing the characteristics of Animal Farming Methods, circular paper cut outs labeled as A,B,C,D ,E and strings/threads.

What do we need to know?

Animal husbandry is the scientific management of animal livestock. It includes various aspects such as feeding, breeding and disease control. Animal-based farming includes cattle, goat, sheep, poultry and fish farming

How will you proceed?

➤ **Teacher's Activity**

Teacher will brief the activity, form 4 groups and make arrangements for the required material.

➤ **Student's Activity**

All the students of the group will together study the given chart representing the various characteristics of each category of Animal farming Method

Each student will pick five circular cut outs with labelling A,B,C,D and E and number them according to the characteristic chosen for a particular category and string it in the form of a necklace.

Worksheet

Categories	A	B	C	D	E
1.	For milk and draught labour	Layers and broilers	Fowl	Dwarf parent preferred for commercial chick production	Mullets and Bhetki

2.	For egg production and chicken meat	Marine and fresh water varieties	<i>Peneous monodon</i>	Lactation period is important while selecting the right breed	Aseel and Leghorn
3.	Cheap source of animal protein	Dairy and draught animals	<i>Apis dorsata</i> , <i>Apis mellifera</i>	Large schools in the open sea can be located using satellites and echo-sounders	Jersey, Red Sindhi
4.	For honey production	Local and Italian variety	<i>Bos indicus</i> and <i>Bos bubalis</i>	Quality of products depends upon pasturage	Rock bee and little bee.

Categories-

Cattle farming
Fish production
Poultry farming
Bee keeping

Cattle farming- A1, D2, _____

Note: More than one point may apply for a particular category.

What have you learnt?

We learnt that:

1. Apart from milch breed, cattle may also be used as _____
2. _____ (feed) for cattle contains high fibre content and provides energy.
3. _____ is done between foreign and local breeds of animals to raise animals with desired qualities.
4. _____ is the culture of fish in sea water.
5. Farm animals require proper care and management such as shelter, feeding, breeding and disease control. This is called _____.

What would I like to know?

1. Which management practices are common in dairy and poultry farming?
2. What is the difference in the management practices for broilers and layers?

Extended Learning

1. Which one of the following species of honey bee is an Italian species?

- (a) *Apis dorsata*
- (b) *Apis florae*
- (c) *Apis cerana indica*
- (d) *Apis mellifera*

2. Poultry fowl are susceptible to the following pathogens

- (a) Viruses
- (b) Bacteria
- (c) Fungi
- (d) All of the above

3. Which one of the following fishes is a surface feeder?

- (a) Rohus
- (b) Mrigals
- (c) Common carps
- (d) Catlas

4. Cattle husbandry is done for the following purposes-

- (i) Milk production
 - (ii) Honey production
 - (iii) Agricultural work
- (a) (i) and (ii)
 - (b) (i), (ii) and (iii)
 - (c) (ii) and (iii)
 - (d) (i) and (iii)

5. Poultry farming is undertaken to raise following-

- (i) Milk production
 - (ii) Egg production
 - (iii) Chicken meat
 - (iv) Feather production
- (a) (i), (ii) and (iii)
 - (b) (ii) and (iv)
 - (c) (ii) and (iii)
 - (d) (ii), (iii) and (iv)