

**Lesson Plan 1**  
**Class – X**  
**Subject: Biology**  
**Topic: Nutrition in plants**

**KPI DEFINITION ADDRESSED TO THE LESSON PLAN**

**KPI 1- To strengthen in- depth understanding of some complex scientific concepts**

**KPI 5- Application of scientific concepts in doing experiments**

**KPI 6- Promoting analytical thinking in order to establish connectivity with the real world situation and compare the different learned concepts.**

**KPI 4 -Encourage maximum participation of students in activities and classroom discussions, practicing NCERT..**

TOPIC- Nutrition in plants

START DATE-

KNOWLEDGE	UNDERSTANDING	APPLICATION	ANALYSIS	SYNTYHSIS	EVALUATION
S 3, 7	S 1, 2, 4,5, 8	S 6			
		B 1, 2, 3	B 4, 5,		
Act 1	Act 2, 3, 5, 6, 7, 8	Act 4			
				As 1, 2	

**Brief Description of the lesson:** This topic emphasizes on the different ways of nutrition in plants, also it compare and contrast the nutrition in animals and plants, it also includes the mechanism of photosynthesis, factors involved in it and their effects on the process. It has also elaborated the structure of leaf and the various organelles involved in the process of photosynthesis.

**UN Sustainable Goals to be achieved (if any):** Goal 12- Responsible goal and consumption, Goal 15-Life on land.

**Objectives:**

**I - Specific Objectives**

To enable the students to-

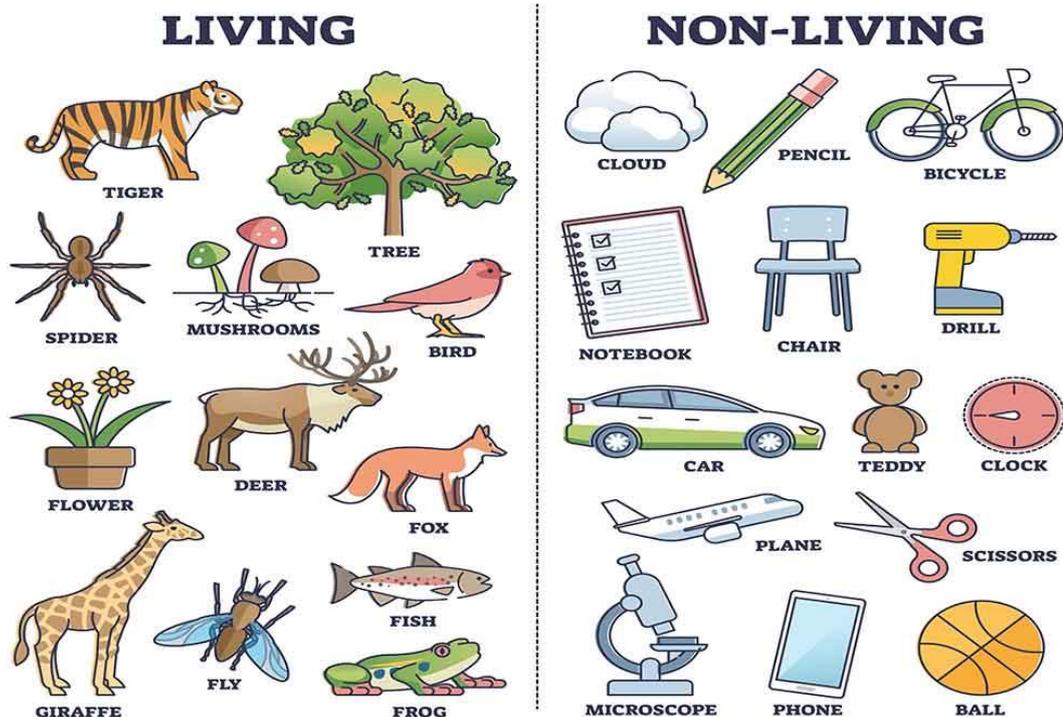
- 1) Categorize the different modes of nutrition.(Comparing-U)
- 2) Differentiate between nutrition in plants and animals. (Comparing-U) **KPI 1**
- 3) Recall the condition required for the process of photosynthesis. (Recalling- K)
- 4) Comprehend about the different modes of nutrition. (Explaining-U) **KPI 1**
- 5) Explain the structure of leaf. (Explaining-U)  
**KPI 1**
- 6) Explain the mechanism of photosynthesis and also the various steps involved into it.(Executing-Ap)  
**KPI 5**
- 7) Exemplify the various organisms exhibiting different modes of nutrition.(Exemplifying-U) **KPI 7**

## II - Behavioral Objectives

To enable the students to-

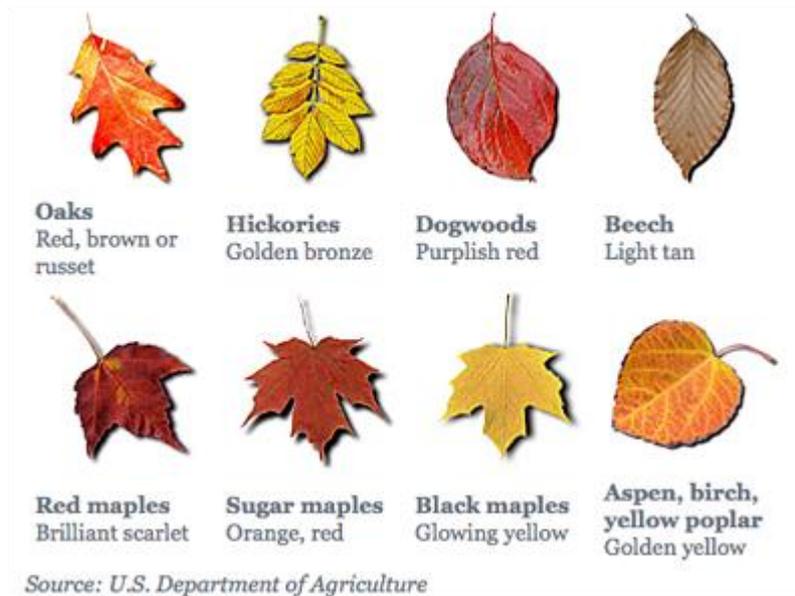
- 1) Study the structure of leaf. (Executing-Ap) **KPI 5**
- 2) Make the temporary mount of stomata. (Executing-Ap) **KPI 5**
- 3) Implement the learned concepts to draw and label the various diagrams. (Implementing-Ap) **KPI 5**
- 4) Select suitable materials to demonstrate that chlorophyll is essential for photosynthesis. (Differentiating- An) **KPI 6**

Activity 1 To demonstrate the differences between living and non living things by setting various examples. Students will learn the concept of life processes like nutrition, respiration etc performed by living organisms.

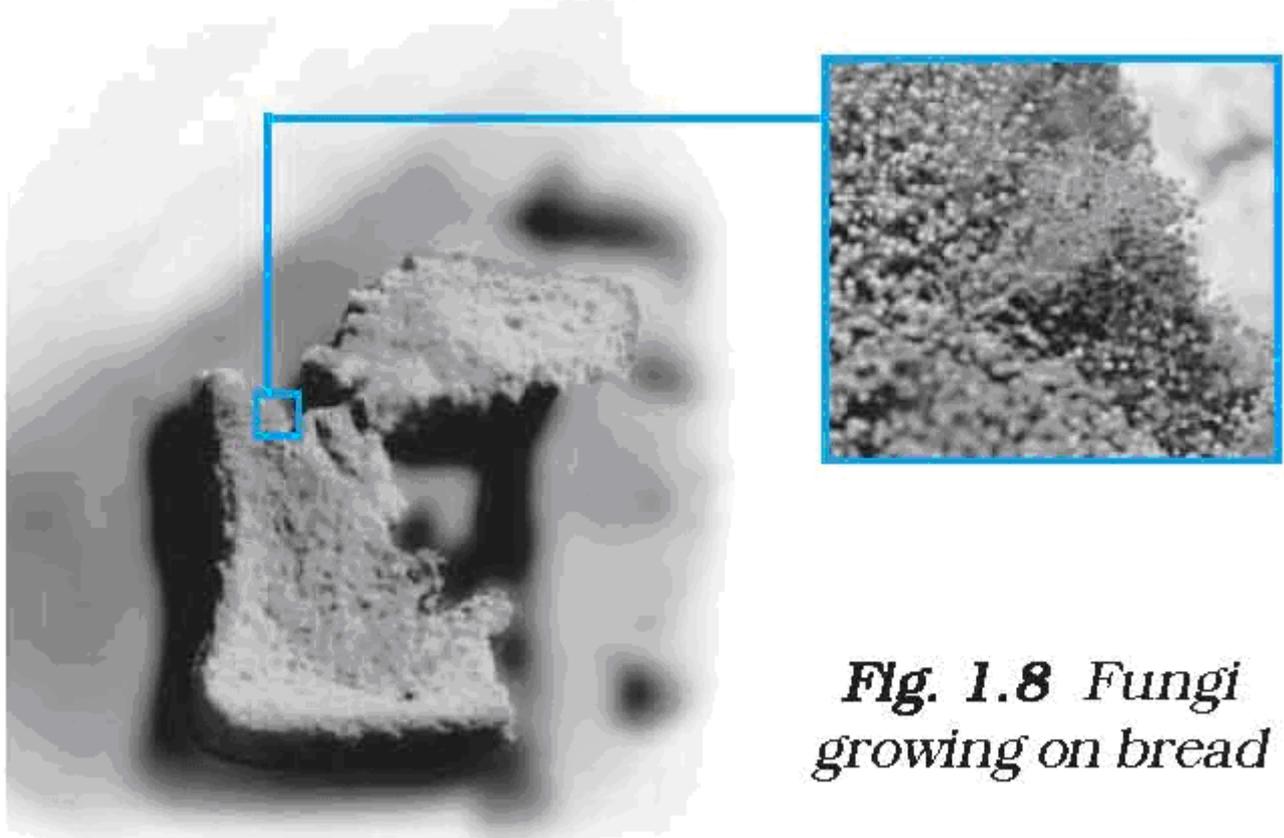


Activity 2 : Take two potted plants of the same kind. Keep one in the dark (or in a black box) for 72 hours and the other in the sunlight. Perform iodine test with the leaves of both the plants as you did in Class VI. Record your results. Now leave the pot which was earlier kept in the dark, in the sunlight for 3 - 4 days and perform the iodine test again on its leaves. Record your observations in your notebook.

The leaves other than green also have chlorophyll. The large amount of red, brown and other pigments mask the green colour (Fig. 1.4). Photosynthesis takes place in these leaves also.



Activity 3 : Take a piece of bread and moisten it with water. Leave it in a moist warm place for 2–3 days or until fluffy patches appear on them (Fig. 1.8). These patches may be white, green, brown or of any other colour. Observe the patches under a microscope or a magnifying glass.



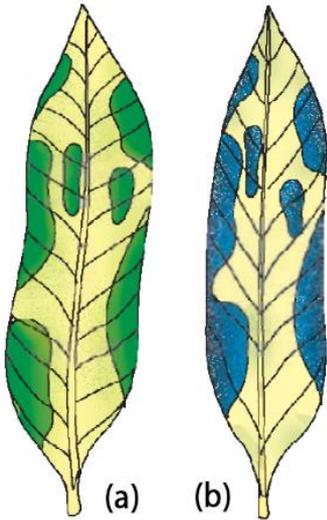
Write down your observations in your notebook. Most probably you will see cotton-like threads spread on the piece of bread.

To explain the examples of heterotrophic mode of nutrition in plants.

Activity 4 Take a potted plant with variegated leaves – for example, money plant or crotons.

- Keep the plant in a dark room for three days so that all the starch gets used up.
- Now keep the plant in sunlight for about six hours.
- Pluck a leaf from the plant. Mark the green areas in it and trace them on a sheet of paper. n Dip the leaf in boiling water for a few minutes.
- After this, immerse it in a beaker containing alcohol.
- Carefully place the above beaker in a water-bath and heat till the alcohol begins to boil.

- What happens to the colour of the leaf? What is the colour of the solution?
- Now dip the leaf in a dilute solution of iodine for a few minutes.
- Take out the leaf and rinse off the iodine solution.
- Observe the colour of the leaf and compare this with the tracing of the leaf done in the beginning
- What can you conclude about the presence of starch in various areas of the leaf?



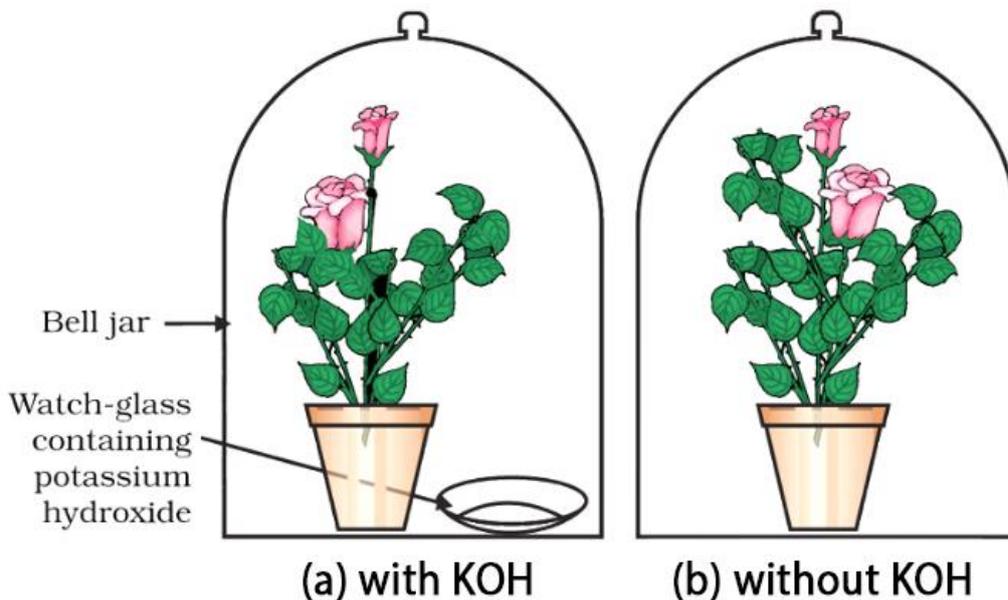
**Variegated leaf**

(a) before starch test

(b) after starch test

Activity 5 Take two healthy potted plants which are nearly the same size.

- Keep them in a dark room for three days.
- Now place each plant on separate glass plates. Place a watch-glass containing potassium hydroxide by the side of one of the plants.
- The potassium hydroxide is used to absorb carbon dioxide.
- Cover both plants with separate bell-jars
- Use vaseline to seal the bottom.



(a) with KOH

(b) without KOH

Activity 6 To make students study the various steps involved in the process of photosynthesis.

<https://youtu.be/to3tuyPzbtc>

Skills developed: Observation, critical thinking, creative thinking

Brainstorming about the working and construction of thermos flask which maintains the temperature of the substance kept inside it.

**Digital Content to be used:**

Video demonstration on modes of nutrition in organisms [https://youtu.be/-4OuB\\_AIUbc](https://youtu.be/-4OuB_AIUbc)

Video showing process of photosynthesis <https://youtu.be/K8OssnSp8ks>

Video showing photosynthesis in xerophytic plants <https://youtu.be/18pvQ8G1G38>

Video showing ascent of sap in plants <https://youtu.be/k9uYKcdMFnc>

**Expected Learning Outcomes**

**Students will be able to**

1. Know about the conditions required for the process of photosynthesis. (Recalling-K)
3. Identify the various modes of heterotrophic nutrition in plants. (Recognizing-K)
4. Compare the different types of nutrition in organisms.(Differentiating-An)
5. Express the various steps involved in the process of photosynthesis.(Checking-Ev)
4. Appreciate the importance of photosynthesis. (Executing-Ap)
5. Use the concept of photosynthesis to study in the various plants. (Executing-Ap)

**Review of the Lesson Plan:** To be done when the lesson gets over

**Problems faced –**

**Success-**

**Failure-**

**Real Learning Outcomes-**

**Students Response / Participation-**

**Teachers Learning to be added.**