INDIAN SCHOOL AL WADI AL KABIR		
Class: VII	**Department: SCIENCE 2020 - 21**	**Date: 30.04.2020**
Worksheet No: 1	**Topic: NUTRITION IN PLANTS**	**Note: A4 FILE FORMAT**
NAME OF THE STUDENT:	**CLASS & SEC:**	**ROLL NO.**

I. OBJECTIVE TYPE QUESTIONS:

1. Organisms which prepare food for themselves using simple naturally available raw materials are referred to as-
   (i) heterotrophs (ii) autotrophs
   (iii) parasites (iv) saprophytes
2. Which of the following statements is/are correct?
   (a) All green plants can prepare their own food.
   (b) Most animals are autotrophs.
   (c) Carbon dioxide is not required for photosynthesis.
   (d) Oxygen is liberated during photosynthesis.
   Choose the correct answer from the options below:
   (i) (a) and (d) (ii) (b) only
   (iii) (b) and (c) (iv) (a) and (b)
3. The process of photosynthesis converts solar energy into-
   (i) kinetic energy (ii) chemical energy
   (iii) potential energy (iv) nuclear energy
4. Mohan wiped the leaves of a plant with an oily cloth to remove all the dust and give it a shiny look. After a few days the plant died because-
   (i) Water could not be absorbed as oil is water repellant.
   (ii) Sunlight can't pass through oil.
   (iii) Oil would have blocked the stomata and prevented gas exchange.
   (iv) Oil would have dissolved the chlorophyll
5. Two organisms are good friends and live together. One provides shelter, water, and nutrients while the other prepares and provides food. Such an association of organisms is termed as-
   (i) saprophyte (ii) parasite (iii) autotroph (iv) symbiosis
6. The term that is used for the mode of nutrition in yeast, mushroom and bread-mould is-
   (i) autotrophic (ii) insectivorous (iii) saprophytic (iv) parasitic

7. When we observe the lower surface of a leaf through a magnifying lens we see numerous small openings. Which of the following is the term given to such openings?

(i) Stomata (ii) Lamina (iii) Midrib (iv) Veins

For question numbers 8-10, two statements are given- one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below -

i) Both A and R are true and R is correct explanation of the assertion.

ii) Both A and R are true but R is not the correct explanation of the assertion.

iii) A is true but R is false.

iv) A is false but R is true

8. Assertion (A): Pitcher plants are green in colour and can photosynthesize but still it feeds on insects.

Reason (R): Pitcher plant grows in soil which is deficient of required minerals specifically nitrogen. [i]

9. Assertion (A): Algae can prepare their own food.

Reason (R): Algae does not contain chlorophyll but can perform photosynthesis. [iii]

10. Assertion (A): Mushroom is a parasite.

Reason(R): It takes in nutrients in solution form from dead and decaying matter. [iv]

II. BASIC CONCEPTS LEVEL QUESTIONS:

1. Differentiate between nutrients and nutrition.

[Hint: Carbohydrates, proteins, fats, vitamins and minerals are essential components of food. These components are called as nutrients. Nutrition is the mode of taking food by an organism and its utilization by the body.]

2. Write the difference between autotrophic and heterotrophic nutrition.

[Hint: The mode of nutrition in which organisms synthesise their own food is called autotrophic nutrition. The mode of nutrition in which organisms do not prepare their own food but are directly or indirectly dependent on plants for food is called heterotrophic nutrition.]

3. What do you understand by photosynthesis? Write the word equation for it.

[Hint: The process by which green plants make their own food from carbon dioxide and water by using sunlight energy in the presence of chlorophyll is called as photosynthesis.
The word equation for it is-

$$\text{Carbon dioxide} + \text{Water} \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} \text{Glucose} + \text{Oxygen}$$

4. How does water and minerals absorbed by roots reach the leaves for synthesising food?

[Hint: There are vessels inside a plant which run like pipes throughout the root, stem, branches and leaves. Water and minerals are transported through these vessels from roots to leaves.]

5. What is chlorophyll? Mention its importance in photosynthesis.

[Hint: Chlorophyll is the green colour pigment generally present in the leaves. It helps to capture energy from sunlight to carry out the process of photosynthesis.]

6. What is stomata and its role in plants?

[Hint: Stomata are the numerous small openings present on the lower surface of a leaf. Each of these pores is surrounded by a pair of guard cells. The stomata help in the exchange of gases, carbon dioxide goes in and oxygen is released out.]

7. What do you understand by parasitic mode of nutrition?

[Hint: In parasitic mode of nutrition, a plant lives on another living plant and derives its nutrition from it. The plant that derives nutrition is called a parasite. The plant from which the parasite gets its nutrition is called the host. Eg. cuscuta and rafflesia.]

8. What are insectivorous plants?

[Hint: The plants which feed on insects by trapping and digesting them.]

9. Define saprophytic nutrition.

[Hint: The mode of nutrition in which organisms take in nutrients in solution form from dead and decaying matter.]

III. <u>INTERMEDIATE LEVEL QUESTIONS:</u>

1. Explain why, we cannot make food ourselves by photosynthesis like plants.
   [Hint: We can not perform photosynthesis because we don't have chlorophyll inside our body.]
2. How do plants get nitrogen for making proteins?
   [Hint: Soil has certain bacteria that convert gaseous nitrogen into a usable form and release it into the soil. These soluble forms are absorbed by the plants along with water. Farmers add fertilisers rich in nitrogen to the soil to make nitrogen available to the plants.]
3. What is the importance of photosynthesis in nature?
   [Hint: There will be no food if the plants would stop conducting the photosynthesis process. The plants take in carbon dioxide and produce oxygen during the process of photosynthesis. Hence, without this process, it would not be possible to survive on earth as there would be no oxygen.]
4. How would you test the presence of starch in leaves?
   [Hint: Take a potted plant and keep it exposed to sunlight for 3-4 hours. Pluck a leaf, boil it in water for 5min and then place it in a test tube containing alcohol. Place the test tube in a beaker containing water. Gently heat the beaker. The chlorophyll of leaf will slowly dissolve in alcohol. Wash the leaf with water and put it on a plate. Add a few drops of iodine solution on the leaf. Blue-black colour will be observed which confirms the presence of starch in leaves.]
5. How humans and animals are directly or indirectly dependent on plants?
   [Hint: All living organisms require food. Plants can make their own food but animals including humans cannot make their food themselves. They get it from plants or animals that eat plants.]
6. Explain how pitcher plants get their nutrition.
   [Hint: Pitcher plants have pitcher like structure which is a modified part of the leaf. The apex of the leaf forms a lid which can open or close the mouth of the pitcher. When an insect lands in

the pitcher, the lid closes and the trapped insect gets entangled into the hair present inside the pitcher. The insect is digested by the digestive juices secreted in the pitcher.

7. Give reason for the following statements-

(i) Sun is the ultimate source of energy for all living organisms.

[Hint: The solar energy is captured by the leaves and stored in the plant in the form of food. All animals directly or indirectly depend on plants for their food.]

(ii) Cuscuta plant is known as parasite.

[Hint- Cuscuta doesn't have chlorophyll. It takes readymade food from the plant on which it climbs. It deprives its host of valuable nutrients.]

8. Justify- "Fungi can be useful as well as harmful."

[Hint: Many fungi like yeast and mushroom are useful. Mushroom is eaten as vegetable and yeast is used in baking. Some fungi can cause diseases in crops and humans.]

9. How do saprophytes obtain their nutrition?

[Hint: The saprophytes secrete digestive juices on the decaying and dead matter. These juices convert the matter into a solution. The saprophytes then absorb the nutrients from the solution.]

10. How do fungi and algae in lichens benefit each other? What is their relationship called?

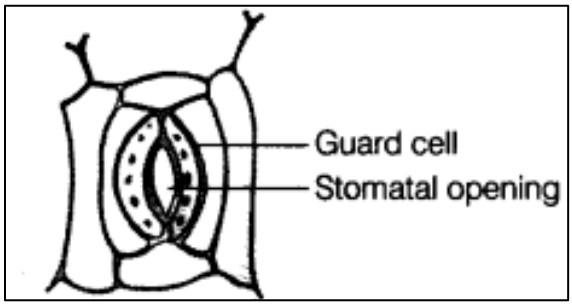
[Hint: Sometimes organisms live together to share shelter and food with each other. These are said to have a symbiotic relationship. Lichen is an association between algae and fungi. Algae contains chlorophyll and provide food and nutrition to the fungus. While the fungus provides water, minerals and shelter to the algae.]

11. Explain symbiotic association found in rhizobium bacteria and legumes.

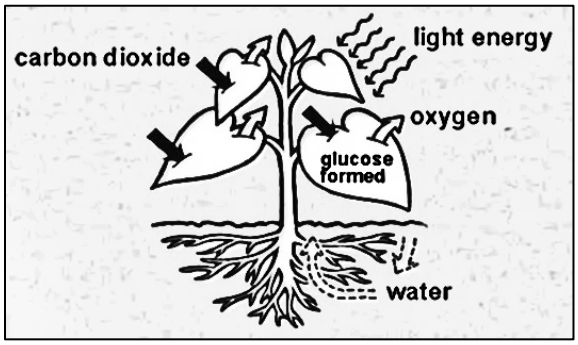
[Hint: Rhizobium bacteria is present in the soil which can convert nitrogen present in air in the soluble form that can be consumed by the plants. But rhizobium cannot make its own food. It generally lives in the roots of the plants such as peas, beans, grams and legumes and provides nitrogen to these plants. In return the plants provide food and shelter to the bacteria. This is an example of a symbiotic relationship.]

12. Draw a neat and labeled diagram of-

(i) stomata



(ii) photosynthesis



IV. ADVANCED LEVEL QUESTIONS

1. A person observes that some plants have deep red, violet and brown coloured leaves. Can these leaves carry out photosynthesis? Give reason for your answer.
[Hint- Yes, these leaves also have chlorophyll. Large amount of red, violet and brown pigments mask the green colour]
2. Two potted green plants A and B of the same kind were taken to perform an experiment. Plant A was kept in a dark room, while the Plant B was kept in sunlight for 3–4 days. A leaf from each of the plant was taken to perform the iodine test. Which of the leaves turned blue-black in colour and why?
[Hint- Plant B- It performed photosynthesis in the presence of sunlight and starch was formed. This starch showed blue-black colour with iodine. Plant A did not perform photosynthesis in the absence of sunlight and no starch was formed.]
3. Can we say that the insectivorous plants are partial heterotrophs? Explain.
[Hint: Yes, insectivorous plants are partial heterotrophs. Insectivorous plants have green leaves and can perform photosynthesis to prepare their own food. but they grow in nitrogen deficient soil. So, they feed on insects to obtain nitrogen compounds needed for their growth.]

V.EXEMPLAR QUESTIONS:

1. Nitrogen is an essential nutrient for plant growth. But farmers who cultivate pulses as crops like green gram, bengal gram, black gram, etc. do not apply nitrogenous fertilisers during cultivation. Why?
[Hint: The plants such as gram, peas, pulses are called leguminous plants. These plants have root nodules in them which have a symbiotic association with bacteria such as Rhizobium. These bacteria convert gaseous nitrogen of air into water soluble nitrogen compounds (like nitrates). Some of these nitrogen compounds are used by the leguminous plants for their growth.]
2. Wild animals like tiger, wolf, lion and leopard do not eat plants. Does this mean that they can survive without plants? Can you provide a suitable explanation?
[Hint: Animals like tiger, wolf, lion and leopard are carnivorous and do not eat plants. They hunt and eat herbivorous animals like deer, giraffe, etc., which are dependent on plants for food. If there are no plants, herbivorous animals will not be able to survive as they will have no food. This will ultimately affect carnivorous animals. They will have nothing to eat and thus would not survive from this.]

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