INDIAN SCHOOL AL WADI AL KABIR

Class: VII	**Department: SCIENCE**	**Date: 18.04.2021**
Worksheet No: 1	**Topic: NUTRITION IN PLANTS**	**Note: A4 FILE FORMAT**
NAME OF THE STUDENT:	**CLASS & SEC:**	**ROLL NO.**

I. VERY SHORT ANSWER (1M):

1. Name various modes of nutrition. [Hint: Various modes of nutrition are – a] autotrophic nutrition, b] heterotrophic nutrition, c] saprotrophic nutrition, d] parasitic nutrition.]
2. What are insectivorous plants? [Hint: The plants which feed on insects by trapping and digesting them.]
3. 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.]
4. What is a symbiotic relationship? [Hint: Hint: Some organisms live together to share shelter and food with each other. These are said to have a symbiotic relationship.]
5. Define saprophytic nutrition. [Hint: The mode of nutrition in which organisms take in nutrients in solution form from dead and decaying matter.]
6. Can plants use nitrogen in the manner they use carbon dioxide? [Hint: The plants cannot use nitrogen in the manner they use carbon dioxide. They need nitrogen in soluble form.]
7. Mushrooms are also a plant but cannot prepare its own food. Why is it so? [Hint- No chlorophyll is present.]
8. What is the function of guard cells of stomata? [Hint: Guard cells help in controlling the opening and closing of stomata for gaseous exchange.]
9. Explain why we cannot make food ourselves by photosynthesis like plants. [Hint: We cannot perform photosynthesis because we don't have chlorophyll inside our body.]
10. Farmers spread manure of fertilisers in the field or in gardens, etc. Why are these added to the soil? [Hint: As plants absorb mineral nutrients from the soil, their amounts in the soil

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keep on declining. Fertilisers and manures contain plant nutrients such as nitrogen, potassium, phosphorus, etc. which need to be added from time to time to enrich the soil.]

For question numbers 11-13, 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 the 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

11. **Assertion (A):** The green pigment present in the leaves of plants is called chlorophyll.

    Reason (R): This green pigment is responsible for the green colour of most of the plants.

    [Ans: ii] Both A and R are true but R is not the correct explanation of the assertion.]

12. **Assertion (A):** Some plants are heterotrophic.

    Reason (R): Few plants cannot synthesise food on their own and depend upon other plants and small animals.

    [Ans: i] Both A and R are true and R is the correct explanation of the assertion.]

13. **Assertion (A):** Lichens are a symbiotic association of algae and fungi.

    Reason (R): The fungus supplies food to the algae and, in return, the algae supply water and minerals to the fungus.

    [Ans: iii] A is true but R is false.]

II. PASSAGE BASED QUESTIONS:

Proteins are nitrogenous substances which contain nitrogen. From where do the plants obtain nitrogen? Recall that nitrogen is present in abundance in gaseous form in the air. However, plants cannot absorb nitrogen in this form. Soil has certain bacteria that convert gaseous nitrogen into a usable form and release it into the soil. The bacterium called Rhizobium can take atmospheric nitrogen and convert it into a soluble form. These soluble forms are absorbed by the plants along with water. Plants can synthesise components of food other than carbohydrates such as proteins and fats.

1. Which of the following is a nutrient?

   a) Protein b) Fat

   c) Vitamin d) All of these

2. The mineral needed by plants to make proteins is –

   a) neon b) iodine

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c) nitrogen d) calcium

3. What is the role of the bacteria in leguminous plants?
   a) Convert oxides of nitrogen into soil nitrates.
   b) Convert gaseous nitrogen into a usable form and release it into the soil
   c) Convert soil nitrates into gaseous nitrogen.
   d) Convert plant proteins into fats.
4. These are nitrogen fixing bacteria which takes nitrogen gas from air and converts into usable form –

   a) Rhizobium b) Yeast

   c) Paramecium d) All the above

III. a) SHORT ANSWER TYPE QUESTIONS (2 M):

1. Why do organisms need to take food? [Hint: Organism needs food – a] to get energy to do work., b] is to help in growth and development of the body, c] for replacement and repairing damaged parts of body, d] to fight against diseases and protects us from infections.]
2. 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.]
3. 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 utilisation by the body.]
4. 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.]
5. 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 -

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

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6. 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.]
7. What are 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.]
8. 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 masks the green colour.]
9. 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.]
10. 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, categorised as a 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.

b) SHORT ANSWER TYPE QUESTIONS (3 M):

1. 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.]
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.]

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3. 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.

4. 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.]

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

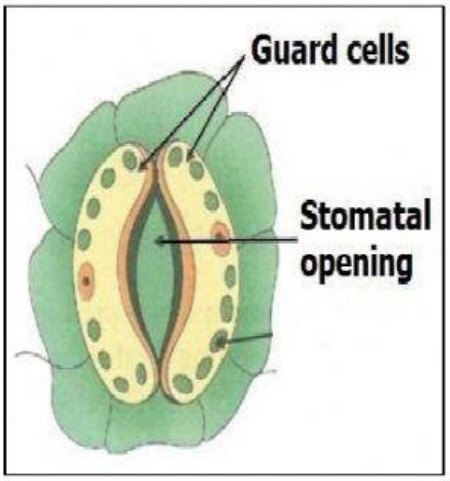
   [Hint: In parasitic mode of nutrition, a plant lives on another living plant and derives its nutrition from it. The plant that derives nutrition is called a parasite. The plant from which the parasite gets its nutrition is called the host. Eg. Cuscuta and Rafflesia.]

6. A farmer grew rice in one season and beans in the next season on the same field. He found that he did not have to add nitrogen fertiliser to the soil. How do you this happened?

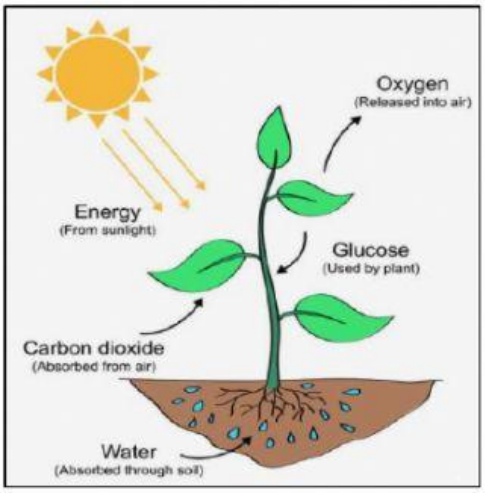
   [Hint- Beans is a leguminous plant. Rhizobium bacteria grow in the roots of leguminous plants. It converts atmospheric nitrogen into soluble form. Thus, soil is enriched with nitrogen mineral.]

7. Draw a neat and labeled diagram of -

   a] Stomata b) Photosynthesis



a] Stomata



b] Photosynthesis

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8. 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.]
9. 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.]
10. 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.]

IV. LONG ANSWER TYPE QUESTIONS (5 M):

1. 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.]
2. 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

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nitrogen compounds (like nitrates). Some of these nitrogen compounds are used by the leguminous plants for their growth.]

3. 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.]

4. 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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